Sub: Design, Fabrication, Supply, Installation, testing and Commissioning of Precision Air Conditioning system for Assembly facility of AFD, BARC, Trombay as per tentative layout, drawings and specifications

Sealed quotations are invited for & on behalf of President of India for Works Contract for “Design, Fabrication, Supply, Installation, testing and Commissioning of Precision Air Conditioning system for Assembly facility of AFD, BARC, Trombay as per tentative layout, drawings and specifications.” The scope of work, general technical requirements / specifications and other terms & conditions are as follows:

Scope of Work and Specifications

Location: AFD, South site, BARC, Trombay

Precision Air Conditioning is required for “Assembly Hall” in Atomic Fuels Division, BARC. Indoor units are to be located in Assembly Hall as indicated in the sketch-1. Outdoor units are to be located in the room indicated in Sketch-1

Clause No.1: Design selection, Fabrication, Supply, Installation, testing and commissioning of 3 nos. of 12 TR Precision Air Conditioning units with EC Fan & Motors, Fixed Scroll Compressor and indoor/outdoor mounting stand.

1.1 Scope of Work:

A. Design selection, Supply, Installation, testing and Commissioning of Microprocessor based 3 nos. of 12 TR Precision Air Conditioning units with Top discharge and air flow of 6000 CFM along with incoming MCB, Cooling Coil. Backward curved plug fan with direct drive Electronically commutated motor, microprocessor panel with sequential Controller, Air filter washable type, with strip type re-heater & steam electrode type humidifier, air cooled type condenser and fixed scroll Compressor.

B. Supply and Installation of MS stand for Indoor Unit-3 nos.

3 nos. of painted MS Stand for Indoor Units shall be supplied and fitted as per requirement.

C. Supply and Installation of MS stand for Outdoor Unit – 3 nos.
3 nos. of painted MS stand shall be supplied and fitted as per requirements.

D. Dismantling and Shifting of existing Air Conditioning System containing 2 nos. Air Conditional package units, ducts etc at designated place.

1.2 Brief Description:
Supply & Installation of New Microprocessor Based 12 TR Precision Air Conditioning units with Top discharge and air flow of 6000 CFM along with incoming MCB, Cooling Coil. Backward curved plug fan with direct drive Electronically commutated motor, microprocessor panel with sequential Controller, Air filter washable type, with strip type re-heater & steam electrode type humidifier, air cooled type condenser and fixed scroll Compressor – 3 nos. as per following specifications:

1.2.1 Supply of Microprocessor based PAC units- 3 nos.
   a. Supply & Installation of New Microprocessor Based 12 TR Precision Air Conditioning units with Top discharge and air flow of 6000 CFM along with incoming MCB, Cooling Coil. Backward curved plug fan with direct drive Electronically commutated motor, microprocessor panel with sequential Controller, Air filter washable type, with strip type re-heater & steam electrode type humidifier, air cooled type condenser and fixed scroll Compressor. The Condenser should be air cooled type with IP54 protection. The unit should have EC fans & fan should vary the speed automatically based on air return temperature without manual intervention. The microprocessor should have Dual set points for temperature to set accordingly as per requirements.
   b. AC Units shall be selected as per following design requirements:
      i. Nominal Capacity of PAC unit : 12 TR Top Discharge, Air Flow : 6000 CFM
      ii. Temperature control in Assembly area: 25°C ± 1°C
      iii. Humidity control in Assembly area : RH 50% ± 5%
      iv. Ambient temperature : 40°C (DB)
      v. At a time two PAC Units shall be working and one will be stand by.

Note: Unit shall be capable of accepting signal from the fire control console and it should be automatically switched off in case of fire.

1.2.2 Cabinet Construction:
   a. The frame and panels shall be constructed of minimum 1.0 mm (18 gauge) thick corrosion resistance sheet metal and have modular construction with raling and hinged doors.
   b. Cabinet shall be powder coated and have a texture finish.
   c. The cabinet shall be provided with double skin side panels with inner panel of minimum thickness of 0.8 mm and outer panel of thickness of 1.0 mm.
   d. Insulation in the side panels should be 19 mm thick glass wool and front & back panels should be insulated with 25 mm thick special acoustic mineral wool.

1.2.3 Refrigeration Circuit:
   • The refrigeration system shall be direct expansion type and each unit must incorporate hermetic scroll compressors having independent evaporator coil circuit. Compressors will be with necessary protection devices and valves. The system shall include a manual reset HP control and an auto reset LP switch, filter drier and charging port. A thermal expansion valve, sight glass and filter drier
shall be provided in each circuit. Additionally the system must be provided with vibration absorbers on the suction & discharge side of compressor piping to minimise chances of any leaks due to compressor vibrations during start/stop cycle; this must be in addition to the anti-vibration mounts provided for the compressors.

1.2.4 Evaporator Coil(DX)
- The evaporator coil shall be constructed of rifled bore copper tubes and louvered aluminium fins, with the aluminium/Gi frame. The coil should be straight/ slant coil configuration and drip tray should be fabricated from minimum 1.0 mm (18 gauge) thick SS with powder coating to avoid corrosion. The drip trays must be doubled angled for condensate flow and easily removable for cleaning. The cooling coil shall be of suitable rows deep and designed for high sensible cooling. The distance between the fins should not be less than 1.8 mm and the face velocity shall not be more than 2.75 m/s.

1.2.5 Compressor:
- The compressor shall be of the high efficiency complaint fixed scroll design with an E E R of not less than 11.1 BTU/H/watt (C O P of not less than 3.25) at ARI rating condition. Each compressor shall have in-built overloads, HP and LP controllers and mounted on vibration isolators. Compressor can be single/double of the required capacity as per manufacturer standard.
- Crankcase heaters are not required as compressor is mounted in the indoor unit. Compressor should be without Rota lock valves as ball valves are to be provided in the refrigerant circuit for service purpose.

1.2.6 Vibration Absorber:
- All units must have VIBRATION ABSORBERS in compressor suction & Discharge lines to prevent cracks on high pressure copper lines during start/stop cycle of compressor.

1.2.7 Power Monitoring Switch:
- All units must be provided with CE certified main power line supervisor switch to the monitor under voltage / over voltage/ phase reversal of incoming power supply. Provision of one common power monitoring device in the electric panel will not be acceptable. The switch provided must be of reputed make and complying with EU norms.

1.2.8 Fan and Motor: ELECTRONICALLY COMMUTATED DRIVES for indoor unit:
- Fans: Unit must be provided with direct drive backward curved fans each running with DC drive electronically communicated motors, the fan should be aligned and balance statically and dynamically. The fan speed must be controlled based on the room return air temperatures and also must have automatic speed control without manual intervention. The fans can be one/two/three nos. as per the manufacture’s standard.
- Units should be with latest innovative EC fan technology with "COMPOSITE" Blade material of diameter exceeding 600 mm.
- Units shall be factory balanced in accordance with section 15071, Mechanical Sound and Vibration Control.
- Noise Level: Maximum 70 db at 1 meter from the unit.
1.2.9 **Accessibility and Service Area:**
   a. The unit shall be accessed from front which will be enabling to access all the main components of the machine from the front for installation purpose and routine servicing.
   b. The unit shall be serviceable from the front with a maximum service space required of 1 meter.

1.2.10 **Electrical Heating:**
   a. The electric heating elements shall operate at a level not exceeding 60 kW/m². The low watt density element shall be of finned tubular nickel plated steel construction.
   b. The heating circuit shall include dual safety protection through loss of air and high temperature controls.

1.2.11 **Humidification:**
   a. Humidity shall be achieved by using immersed-electrode type humidifier by which steam shall be produced and the steam shall be distributed evenly into the bypass air-stream of the process cooling unit. The Humidifier operation should have periodic flushing cycle. The Humidifier should guarantee a perfect efficiency with low energy consumption and great durability of components. The humidifier shall be fully serviceable with replaceable electrodes.
   b. Steam humidifier Capacity will be minimum 5 kg/hr with 3 phase electrodes having function of auto drain and proportional control for capacity complete with steam supply and water drain hose pipe.

1.2.12 **De-Humidification:**
   - De-humidification to be achieved by controlling the evaporator fan speed. Due to reduce in fan speed, air contacting period with coil will increase and dehumidification takes place.

1.2.13 **Filtration:**
   - Filtration level shall be minimum 90% - 10 microns. Filter should be HPDE media and washable type. Filter with combustible/ dry disposable media are strictly not accepted.

1.2.14 **Electric Panel:**
   - Control cabinet to be provided with type 2 enclosure, with grounding lug, combination magnetic starters with overload relays, Circuit breakers and cover interlock and fusible control circuit transformer.
   - The electric panel provided for the unit must be equipped with main incoming power isolation switch, additionally the unit must be provided with under voltage/ over voltage/ phase reversal/ single phasing protection, all three phase motors must be operated only via 24 V coil voltage contactors and MPCB’s, additionally step down transformer must be provided for power supply to the unit controller. The electrical panel must also be providing with relay block for common alarm.

1.2.15 **Air Cooled Condenser:**
   a. The condenser shall be factory matched to provide an operating range of 0 °C to 43 °C ambient. Condenser shall be suitable for 24 hour operation and be capable of providing vertical or horizontal discharge.
b. The condenser frame shall be constructed from heavy duty steel with powder coating to avoid corrosion and incorporate a copper tube and aluminium fin coil.

c. The coil shall be minimum of 3 rows deep with suitable coil surface area and with a minimum fin spacing of 2.0 mm and maximum face velocity of 3.6 m/s.

d. The condenser shall be direct drive axial type AC Motor.

e. The Condenser shall be air cooled type with IP54 protection.

1.2.16 Micro Processor Controller:

- Each air condenser should have single microprocessor with following controls:

  1.2.16.1 Control Type:

  a. The controls shall be a microprocessor programmable logic controller. The control shall have separate indication of operating modes (cooling, heating, humidifying, de-humidifying), alarm conditions (temperature high, loss of sensors, compressor HP & LP, wet floor, no air flow and low humidifier water). The display and indication shall be visible on the front without removing any external panels. Locals and remote alarm will be triggered if an alarm condition is reached. Each unit must be provided with large screen GRAPHICAL DISPLAY and additionally the controller must have feature of DUAL SET POINT programming.

  b. The control should have an auto-restart feature which will return the unit to normal operation resumption of mains power.

  c. Automatic load/ time and alarm sequencing function to be performed by the unit.

  d. Microprocessor must have output point for ON/OFF of motorized damper and must be suitable to be integrated with fire point for unit shut off in case receiving signal from fire panel or fire detectors.

  e. The unit controller must have option of (DUAL SET) point for energy saving i.e. customer must have the option to set two independent set point for the unit based on operational requirements and energy saving concepts.

1.2.17 Display:

  a. In normal operating mode the the screen should display unit number, temperature and relative humidity set points and actual, operating status.

  b. The unit must have a large screen LCD display on controller with user friendly menus and minimum two level password protection.

  RS485 interface port for BMS compatibility with ModBus RTU protocol is required.

1.2.18 Alarm:

  a. The following alarm should be available:

  b. Temperature High/Loss of sensor:

  c. Compressor 1 High/ Low Pressure

  d. Compressor 2 High/ Low Pressure

  e. Wet Floor

  f. No Air Flow

  g. Low Humidifier Water

  h. Temperature High/Low
i. Humidity High/Low

1.2.19 **Safety Protections:**

a. The unit shall also incorporate the following protection:
   b. Single phasing preventers
   c. Reverse phasing
   d. Phase unbalancing
   e. Phase failure
   f. Over load tripping (MPCB) of all components
   g. Wet floor sensor

1.2.20 **Safety interlocks:**

- Operation of heaters & humidifiers shall be possible only when blower fan is in operation.

1.2.21 **Sequencing:**

- The Sequencing should be feature of PAC units. The unit shall be designed to work for equal no. of run hours also in case of fault the stand by unit should start.

1.2.22 **Microprocessor Controls:**

i. Following information shall be available on the display on the units:
   a. Room temperature and humidity
   b. Supply fan working status
   c. Current date and time
   d. Electric Heaters working status
   e. Manual/Auto unit status
   f. Temperature set point
   g. Humidity set point
   h. Working hours of main component i.e. fan, heater, humidifier
   i. Unit working hours
   j. Modes of operation (cooling, heating, humidification, de-humidification)
   k. The last 10 intervened alarms

ii. The Microprocessor shall be able to perform following functions:
   a. Password for unit calibration values modification
   b. Automatic reset of program
   c. Cooling capacity control
   d. Compressor starting timer
   e. Date and time of last 10 intervened alarms
   f. Start/stop status storage by switch

1.2.23 **Supply and Installation of MS stand for Indoor Unit-3 nos.**

3 nos painted MS Stand for Indoor Units suitable to AC units shall be supplied and fitted as per requirement.
1.2.24 Supply and Installation of MS stand for Outdoor Unit – 3 nos..

3 nos. of painted MS stand suitable to Outdoor unit shall be supplied and fitted as per requirements.

Clause No. 2. Refrigerant Copper piping with 19 mm thick Nitrile rubber insulation:

2.1 Scope:
A. Supply and laying of Refrigerant pipe consisting of Copper pipe without insulation (Hot gas of 1 1/8 & 7/8 Liquid line) - 75 meter (25Rmt/unit)
   1 unit is considered as a set of 1 meter of each pipe.
   Total 75 meter length of hot gas pipe 1 1/8 & 75 meter length of Liquid line pipe 7/8 is required.
B. Supply and wrapping 19 mm thick insulation of Nitrile rubber for copper piping (for hot gas pipe) - 75 meter
   (25Rmt/unit)

2.2 Brief Description:

2.2.1 Contractor has to supply and laying Refrigerant piping consisting of Copper pipe without insulation
   (Hot gas of 1 1/8 & 7/8 Liquid line) for 3 AC package - 75 meter (25Rmt/unit)
   1 unit is considered as a set of 1 meter of each pipe.
   Total 75 meter length of hot gas pipe 1 1/8 & 75 meter length of Liquid line pipe 7/8 is required.
   Approx. distance between Indoor to Outdoor @25RMT/unit

2.2.2 Contractor has to supply and wrapping 19 mm thick insulation of Nitrile rubber for copper piping (for hot gas pipe) - 75 meter (25Rmt/unit)

Clause No. 3. Supply and Charging of Refrigerant Gas R407C (First Charge) : 35 kg

3.1 Scope:

A. Supply and charging of 35 kg Refrigerant Gas R407C in 3 AC units for commissioning purpose (First Charge).

3.2 Brief Description:

3.2.1 Refrigerant Gas R407C shall be supplied and charged by Contractor in all 3 AC package as per air Conditioning standard for commissioning of air conditioning system.

Clause No. 4. Supply and laying of GI piping for Humidifier water supply and drain with insulation:
4.1 Scope:

A. Supply and laying of GI drain piping 40 mm dia with 6 mm thick Insulation of Nitrile Rubber shall be done approx. 50 Rmt.
B. Supply and laying GI piping 20 mm dia. for Humidifier shall be done approx. 50 Rmt. The GI piping shall be painted as per EIC.

4.2 Brief Description:

4.2.1 Contractor has to Supply and laying of GI drain piping 40 mm dia with 6 mm thick Insulation of Nitrile Rubber shall be done approx. 50 Rmt.

4.2.2 Contractor has to Supply and laying GI Humidifier piping 20 mm dia. for Humidifier shall be done approx. 50 Rmt. The GI piping shall be painted as per EIC.

Clause No. 5. Supply & laying of Electric cables (Armoured for indoor to outdoor and main power connection for indoor to control panel):

5.1 Scope:

A. Supply, laying, dressing, termination of main power Copper cable of size 4 C x 16 sq.mm from indoor unit to electrical panel
B. Electric cabling (Armoured) from indoor to outdoor units

5.2 Brief Description:

5.2.1 Main power Copper cable of size 4 C x 16 sq.mm & approx. 60 Rmt shall be Supplied, laying, dressed, terminated from indoor unit to electrical panels of all PAC units.

5.2.2 Electric cabling (Armoured) shall be supplied approx. 75 Rmt or as per actual requirement & laying between indoor to outdoor units of 3 nos. PAC units.

Clause No.6. Supply, fabrication and installation of Aluminium Powder Coated GI Duct.- 50 sq meter

6.1 Scope:

A. Supply, fabrication & installation of 50 sq meter Galvanised Steel Sheet metal duct for air supply.
   i. Removal of existing ducts.
   ii. Supply air duct of size as per site requirement.
   iii. Joint should be leak proof.
   iv. Painting: Inside - 2 coats of epoxy primer,
       Outside - 2 coats of epoxy primer with 2 coats of epoxy paint.
B. Construction: Preferably folding construction. Flanges to be made to install dampers and diffusers.
C. Support: Any supporting structure (Like angle, channel, beam etc. other than GI) required for fabrication and support will be in the scope of contractor.
D. Scaffolding: Duct to be installed at a height up to approx. 3-4 meter from floor level. Sufficient supporting structure/scaffolding to be provided and erected by the contractor to carry out the work. Cost of these shall be included in this item only.

6.2 Brief Description:

6.2.1 Supply duct approx. 50 sq meter as per required size and layout drawing shall be fabricated from 20 gauge thick (or more as per size) GI sheet.
6.2.2 Providing of neoprene rubber commercial grade gasket required for flange joints should be in the scope of contractor.
6.2.3 Material like Nut, Bolt with washer shall be GI.
6.2.4 Fabrication of duct shall be made by folding of GI sheet to minimize the weld joint.

6.2.5 Flanged joints:

i. All flanges facing of duct shall be true and perpendicular to the axis of duct to which the flanges are welded. Thickness of flange shall be twice the thickness of duct thickness.
ii. Bolts on flange joint shall be drawn up to provide even and adequate pressure with the gaskets.
iii. Neoprene rubber/natural rubber gasket 3mm thick for all flanges joints should be provided for M.S. ducts.

Note: Supports, anchors, guide and all necessary accessories for supporting the ducting system shall be provided and installed by the contractor.

Clause No. 7. Supply and Installation of Aluminium powder coated air grills with VCDs – 2 sq. meter

7.1 Scope:
A. Supply, fabrication and installation of Aluminium Powder Coated Air Grills with VCD for supply air line – 2 sq. meter
B. Grill with VCD for newly constructed supply air duct of required sizes as per site requirement.
C. Support: Hardware will be Steel and gasket shall be neoprene commercial grade only.
D. locations of damper and Grill are given in the drawings and shall be fabricated & installed as per layout drawing.

7.2 Brief Description:

7.2.2 Supply, fabrication and installation of Aluminium Powder Coated Air with VCD for supply air line – 2 sq. meter

A. Grill: 2sq meter
   i. The body & louvers of grills shall be fabricated by Aluminium sheet.
ii. Height of grills shall be such that area of grill shall be 33% more than the cross section area of duct.

iii. Construction: Single deflection, fixed angle type, Body minimum 1.5 mm thick. Blade 1mm thick.
iv. Support: Hardware will be Steel and gasket shall be neoprene commercial grade only
v. Joint should be leak proof.
vi. Locations of damper and Grill are given in the drawings and shall be fabricated & installed as per layout drawing.

B. VCD:- 2sq meter
i. Supply, fabrication & installation of VCD -2 sq meter
ii. Dampers for newly constructed air duct of various size as per site requirement.
iii. Depending on the size of the damper, thickness of the body and flanges should be selected and shall not be less than 16 gauge thick.
iv. Construction: Al, modulating type, opposed blade, multi-louvered. Blade thickness not less than 1mm thick. Providing of commercial grade neoprene gasket,
v. Nut-bolts with washer will be in the scope of contractor for the dampers, and cost should be included in this item only.
vi. Support: Any supporting structure (Like angle, channel, beam etc.) required for fabrication and support will be considered in this item only.

Clause No. 8. Motorised damper for PAC unit

8.1 Scope: Supply & installation of Motorized Damper for PAC unit:
3 nos of motorized damper for 3 PAC units shall be supplied and installed as per requirement.

8.2 Brief Description:

8.2.1 3 nos of motorized damper for 3 PAC units shall be supplied and installed as per requirement.
8.2.2 Damper shall be strong and Linkage shall be suitable for damper.
8.2.3 Joint should be leak proof.

Clause No. 9. Modification in existing wall of outdoor unit room for provision of Louvers and connecting Duct.

9.1 Scope: Necessary modification in the wall for the outdoor units is in the scope of Contractor. This will involve providing suitable opening in the existing wall with louvers for exhaust air. Suitable duct may be provided between exhaust fan and the wall opening to avoid release of heated air inside the outdoor unit room.
The size of cutout in the existing wall and design, fabrication, supply & erection of connecting duct is in the scope of Contractor.

9.2 Brief Description:

9.2.1 Design of Louvers and cut out in existing wall of out door units room.
9.2.2 Fabrication, supply and erection of louvers.
9.2.3 Design, fabrication, supply and erection of connected Ducts between outdoor units and louvers.

Clause No. 10. Dismantling and Shifting of existing Air Conditioning System containing AC package units and ducts etc.

10.1 Scope:
A. Dismantling of all existing package of capacity 7.5 TR – 2 nos.
B. Dismantling all existing Ducts approx. 50 meter length.
C. shifting at designated place

10.2 Brief Description:

10.2.1 Dismantling of all existing package – 2 nos
10.2.2 Dismantling all existing Ducts approx. 50 meter length.
10.2.3 Shifting at designated place

Clause11: SHUTDOWN PROVISION:

Part of the job to be carried out in the plant shut down period. Suitable planning is to be done for shut down work and same to be completed in the approved period. Minimum required shutdown shall be provided for erection & commissioning of duct and accessories.

Pre - bid meeting:
The contractor shall have to attend the pre-bid meeting to comprehend the detailed scope of work before submission of the offer. The same will be arranged by the undersigned.

For attending the pre bid meeting, the supplier has to submit the documents of experience in similar type of site work for design, installation and commissioning along with financial and technical capability to the undersigned through email/post/personal latest by 14/08/2020.
Suitable contractors will be informed to attend the pre-bid meeting by 19/08/2020.
The pre-bid meeting will be held on 25/08/2020 between 10.00 hrs to 15.00 hrs.

Pre-bid meeting will not be arranged for next dates if vendors unable to attend prebid meeting on permitted dates for any reasons.

For pre-bid meeting prior intimation at least three working days in advance is necessary for arranging the meeting and may be contacted on phone no. 022-24614/25594909 or mail to
bmsharma@barc.gov.in, giving complete details viz. name of firm, name of visitors, occupation/designation, identity proof. Contractor shall have to carry valid Photo identity card (Driving licence, passport, adhaar card) while visiting this premises. Failing to bring valid identity cards, vendors will not get access into our premises.

Contractor should not carry any type of electronic items such as mobile, pen drive, camera etc with him/her at the time of visit.

The Contractor shall have the experience of design, fabrication & commissioning of Precision Air Conditioning systems and ducting work of G.l. as well as M.S. or similar nature of site work to precisely control the temperature as well as humidity in the enclosed area. The Firm has to provide the documentary evidence for execution of similar type of the work order and financial/technical capability also before Pre-bid meeting. Without documentary evidence Pre bid meeting may not be considered.

The quotations submitted without attending Pre-bid meeting, will not be considered.

General Technical Requirements
1) Work completion (supply and commissioning) period is 6 months from the date of issue of the work order.
2) Supplier shall carry out actual measurements as per site condition after placement of work order.
3) Supplier shall prepare its own design & fabrication drawings as per actual site conditions and should get it approved from the purchaser's representative before commencement of work.
4) All fabrication work shall be carried out as per approved drawings only.
5) All material supply is in the scope of supplier. Supplier shall use all relevant IS standard material for this work. Material testing reports (Chemical, Mechanical etc.) from govt. approved labs should be submitted for approval. Material identification and stamping shall be witnessed by departmental representative.
6) Supplier shall have to pass weld qualification and only qualified welders shall perform this work.
7) In case of any technical doubts, supplier shall contact the purchaser’s representative for clarifications.
8) Supplier shall have to arrange for Arc welding m/c. along with all consumables (welding electrodes etc) required for this work.
9) Gas cutting, arc welding, grinding work etc. shall be carried out with utmost care. Supplier shall follow all safety measures while carrying out such work. Department shall provide gas cylinders for gas cutting purpose, if required.
10) Burrs, sharp edges, projections etc. caused due to cutting, welding etc shall be removed to maintain smooth surface. Supplier shall maintain best quality workmanship.
11) QAP (Quality Assurance Plan)
QAP should include:-
(i) Raw material Testing, (ii) Manufacturing operations, (iii) Fabrication Steps.
(ii) In-process Inspection Stages, (vi) Welding procedures, Weld sequencing and Cleaning procedures, (vii) Procedures for weld checking
12) Fabrication and Testing Criteria
i) The surface shall be absolutely free from dents, scratches, burrs, pits and weld spatters etc.
ii) Adequate care shall be taken up to control the distortion to ensure flatness of surfaces.
iii) Workmanship shall be in accordance with high grade practice and adequate to achieve accuracies and finish to get satisfactory surface level.
13) **Welding requirements**

   i) Welding procedures and welder shall be qualified as per ASME section IX proper to production weld.
   ii) All the welding on MS to MS shall be done by SMAW using E6018/E7018 welding electrodes.
   iii) Butt weld joints between structural members should be ground flushed and finished smooth.

14) **Inspection and final acceptance**

   i) Physical verification of all items as per technical specifications.
   ii) All weld surfaces shall have a smooth finish for easy decontamination.

15) Supplier shall clear off all left out material at the end of the work and ensure clean work area before handing over.

16) Supplier should have the previous experience of design, fabrication & commissioning of AC package ventilation systems and ducting work of GI as well as M.S. at approx. 3 meter height elevation work or similar nature site work along with quality assurance plan and should provide documentary evidence for the same.

17) Suppliers having knowledge and experiences of preparing above mentioned documentations, BARC procedures, standard welding procedures, safety procedures, material testing and inspection facilities, calibrated equipments etc. shall be preferred for the work contract.

18) Supplier shall give the quotation on lump sum basis having basic cost & taxes separately.

**Other Terms & Conditions**

1. The offer should **clearly/separately** mention the **basic cost of supply, GST etc.**
2. The offer should also contain the work completion period.
3. Validity of offer shall be minimum 90 days, otherwise the offer will be rejected.
4. Any delay which is attributable to the contractor is liable for penalty @ ½ % per week (max. 5%) to be imposed on the contractor.
5. In case of delay in work completion, supplier may send request letter to concerned authority for extension in work completion period with proper justification for delay in work. Concerned authority may or may not give extension with or without penalty depending on the justification for delay.
6. Income tax @2% will be deducted from the Suppliers bill.
7. Supplier should give guarantee for a period of **One Year** for the material quality and workmanship.
8. Contractor may furnish their **PAN no. & copy of Sales Tax/ Service Tax Registration Certificate.**
9. 100% payment will be arranged after satisfactory completion of work at AFD and on submission of:
   a) Bills in triplicate
   b) Advanced stamped receipt
   c) Delivery Challan
   d) Guarantee Certificate
   e) GST Undertaking Certificate
10. During execution, all safety measures such as safety shoes, hand gloves, headgear for welding, certified machines for electrical jobs etc. are to be followed. The supervisor shall be experienced enough for safety (fire & personal) to oversee the site activities.
11. The upkeep of area is the responsibility of contractor. Any unwanted or extra materials shall be kept at designated area which will be shown by departmental supervisor. For elevated jobs proper Safety Belts shall be used by all workers.

12. Contractor shall obtain police verification certificate (PVC) for all his employees including his supervisors and workers engaged in the work.

13. Supplier shall obtain Medical Fitness certificates for all his workers involved in this work.

14. Any casualty during this work period of contractor work men will not be bearded by organisation. Organisation is not liable for any type of compensation for any casualties.

Confidentiality clause:-

I. Confidentiality:
No party shall disclose any information to any third party concerning the matters under this contract generally. In particular, any conformation identified as “Proprietary” in nature by the disclosing party shall be kept strictly confidentiality by the receiving party and shall not be disclosed to any third party without the prior written consent of the original disclosing party. This clause shall apply to the sub-contractors, consultants, advisers or the employees engaged by a party with equal force.

II. “Restricted information” categories under Section 18 of the Atomic Energy Act 1962 and “Official Secrets” under Section 5 of the Official Secrets Act 1923.:
Any contravention of the above-mentioned provisions by any contractor, sub-contractor, consultant adviser or the employees of a contractor will invite penal consequences under the aforesaid legislation.

III. Prohibition against use of BARC’s name without permission for publicity purposes.:
The contractor of sub-contractor, consultant, adviser or the employees engaged by the contractor shall not use BARC’s name for any publicity purpose through any public media like Press, T.V. or Internet without the prior written approval of BARC.

14. Quotations are to be in printed letter head / quotation format which should consists of sales tax registration number registered with local ST authority / CST authority, PAN of the firm, service tax registration number etc. Quotations that are received in computer generated form will be considered as invalid & rejected.

15. Tax registration number etc. Quotations that are received in computer generated form will be considered as invalid & rejected.

16. Sealed quotations must be forwarded by Registered Post or Speed Post only. Quotations forwarded through any other routes shall not be considered.

Sealed quotations super scribed on the envelope with the reference number of this letter must reach latest by 15/09/2020 at 1500 hrs and addressed to:

B.M.Sharma,
SO/E
Technical Services Section,AFD
Bhabha Atomic Research Centre
Trombay, Mumbai-400085

( B.M.Sharma)
Scientific officer / E, TSS, AFD
(For & on behalf of President of India)