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Ref:No.PU/ES/52/2011-12/67

Date: 13.10.2011

Sub: Quotation invited for supply of **Pre-fabricated shelter** in Department of Earth Sciences – Reg.

Sir,

I invite Sealed Quotations for supply of **Pre-fabricated shelter** as per the terms given below:

Items and Specifications

Pre-fabricated shelter:

Continuous CO2 monitoring equipment along with accessories and calibration gas cylinders is to be housed in this shelter in order to protect it from wind and weather.

The Pre-fabricated shelter will be placed outdoor, 300 m from the seacoast in Pondicherry University Campus, Pondicherry.

Detailed specifications for Pre-fabricated shelter are mentioned in ***Annexure – I***

Terms & Conditions:

1. The quotations should be Sealed and superscribed as “Quotation for supply of Pre-fabricated Shelter”
2. The quotations should reach the undersigned at 3.00 PM on or before **31-10-2011**.
3. Rate must be valid for 1 year or at least upto 31st March 2012.
4. The rate quoted should be duly on FOR destination basis and should be inclusive of all taxes.
5. Payment will be made against bill after receipt of items in good condition at our premises
6. University has right to select or reject any quotation partly or fully without assigning any reason.
7. Specifications of item should be clearly mentioned and rate of main equipment and accessories should be separately mentioned .

Yours sincerely,

(S. BALAKRISHNAN)

Encl.: Annexure – I.

Annexure – I

Pre-fabricated shelter:

Continuous CO₂ monitoring equipment along with accessories and calibration gas cylinders is to be housed in this shelter in order to protect it from wind and weather.

The Pre-fabricated shelter will be placed outdoor, 300 m from the seacoast in Pondicherry University Campus, Pondicherry.

The prefabricated shelter should have the following features:

Fast deployment and pre-equipped delivery of the shelter even in difficult-to-access areas.

Quick to dismantle.

Has high salvage value.

Could be used at different locations.

High thermal insulation.

Very stable structure.

Light weight structure.

Prefabricated shelter specifications:

General design criteria:

- The shelter will be sealed anti-corrosion rectangular manufactured and equipped on the factory with internal dimensions of length 3.69m * width 2.46m * height 2.55m.
- The shelter shall have a water protection standard of IP34.
- The shelter has to lay on rectangular I beams to ensure the stability of the structure.
- The shelter has to have rigid steel column at corner to ensure the ability of lifting in addition two four anchors at the roof.
- The shelter will have a standard light color to ensure the good reflection of the sun light.
- The shelter has two roof layers (out side) each one is a 2-sided slope shape to ensure the water drainage out side the roof (slope of 20 degree).
- These layers should be separated vertically by tar 50mm to prevent the direct sun shine, and the lower one has tar sheet to prevent the water drainage inside the shelter.
- The accessories (locks, hinges, screws and bolts, etc.), will have an anti-corrosive protection.
- The design and manufacture of the shelter to be totally tight against all nature phenomena as heat, water, moisture, dust and air infiltration/penetration into shelter.
- The shelter should have a lifetime expectancy of 20 years. All the component materials are non-degradable, non-perishable and have durable nature.
- Shelters will be designed and will incorporate reinforcement as to withstand deformation and/or buckling forces to which the shelter may be subjected to during handling.
- Shelter construction is to be robust enough to withstand wind pressures as detailed in loads section
- Shelter should be detailed and sealed to eliminate internal condensation and/or penetration of moisture vapor. .
- All openings in the body of the shelter should be created by using cable entry (AC cables, power cables, earth cables...).

Environmental conditions:

The shelters shall be designed and manufactured for a design life of 20 years minimum under the following environmental conditions:

Outside temperature range of $-10\text{ }^{\circ}\text{C}$ to $+45\text{ }^{\circ}\text{C}$.

Humidity – 100%

Direct solar radiation

Withstand a 3 sec. gust wind speed of 51 m/sec.

Wind speed resistance -- 160 km/h (0.50 kN/m² up to 0.80 kN/m²)

Resistant to rain (IP 34), wind, sand, and dust

Heat permeability coefficient (thermal rating) less than or equal to 0.8 W/m² K

Inside temperature range 18 – 22 $^{\circ}\text{C}$.

Loading conditions:

Floor – 1000 kg/m² as distributed load

Floor – 400 kg as concentrated load

Floor - 600 KG/M² in middle area

Floor – 30 kg/cm² as punching load

Wall – 51 m/s. as wind load

Roof – 150 kg/m² as distributed load

Technical specification of shelter:

External roofing:

Composed of profiled galvanized pre-painted steel sheets, fixed on steel angle purlins and trusses, supported on the walls. PUF of thickness 50mm and density 40kg/m³ fully wrapped in polyethylene sacks are fixed between steel sheets for thermal and sound insulation.

Pre-painted steel sheeting used for walls and roof must be prime quality steel to ASTM A 653:

- Minimum thickness: 0.5mm TCT (total coating thickness).
- Coating: front 5ml primer total 20ml in color white including primer. Back 7ml standard backing primer suitable for adhesion and PU foam.
- Zinc: ASTM A 924 zinc 180gr/m² (galvanized steel).

External walls:

Composed of sandwich panel construction of 80mm thick and standard dimensions 2550*1220 mm constructed of galvanized and pre-painted steel sheets of 0.5mm thick fixed on 15mm block board fixed on galvanized steel subframe from both sides with injected polyurethane foam insulation in between. Thickness of polyurethane must be 49mm minimum and together with the wood thickness must give a thermal transmittance value of 0.5 W/m² degrees centigrade or less. The pre-painted steel must be glued to the wood using silicon based adhesive for the outside and special non water based adhesive for the inside panel. Adhesive must be applied on the full face of the wood and mechanically pressed to insure proper adhesion.

The wall will be sturdy to provide the following features:

- A great impact resistance.
- The possibility of solid points of anchoring at any place of the surface.

This feature allows walls to support air conditions, power distribution panels, cable entries, cable ladders and doors comfortably.

The thermal insulation is rigid polyurethane foam of density 40kg/m³ and thermal conductivity of aged polyurethane of 0.027W/MC°. Foam is of the type used for panel filling and is injected within the first four months of production.

All metal parts are of galvanized steel to protect against corrosion.

External door:

The size 900*2000 mm made of steel sheeting with suitable insulation and special rubber sealant to keep out water, wind and dust .The door frame will be made of galvanized steel and painted with special external grade powder coating. Hinges are pickproof type.

Look with anti panic device is provided for door including master key for a group of shelters. A padlock with keys must be provided with doors.

The door must be supplied with door closer.

Internal roofing:

15mm block board covered with pre-painted steel sheeting and fixed to the bottom chords of the truss with a layer of 50mm PUF on top for thermal insulation as explained in item 1 above.

The ceiling allows for solid point anchoring at any point of the surface and is highly impact resistant. For high loads fixing can be at joint area.

Flooring:

Steel chaise: framing of heavy standard hot rolled sections welded together to make a rigid chassis. The chassis is designed to withstand uniform load of 1000 kg/m². Epoxy special anti rust paint is used for weather protection of all exposed steel elements.

Finishing: plywood boards are placed on the secondary beams of the chaise. Plywood is of thickness of 19mm. the plywood shall be covered with antistatic PVC sheet.

Electrical & Lighting:

1. 5A multipart power points x 8 Nos.
2. 15A multipart power points x 4 Nos.
3. MCB 32A x 2 Nos

Air-conditioning:

2 x 1.5 ton window A/C of reputed make conforming to ISI Standards with Power saving rating of 3 Stars or above.