Sub : Minor Fabrication - invitation of quotations.

1. Quotations are invited for the minor fabrication job, as per the enclosed specifications.
2. Bidder shall quote for fabrication of the items with material.
3. Taxes shall be quoted separately.
4. The quotations must reach to the Head, TPD within 16 days of the date of this letter and must be sent by *Indian Speed post / Indian Post* only in a sealed envelope superscripted with the above reference number and due date given above.
5. The address on the envelope should read:
   
   **Head,**
   
   **Technical Physics Division**
   
   **Bhabha Atomic Research Centre**
   
   **PURNIMA Labs., Trombay, Mumbai 400085.**

6. The bidder shall have to take an insurance policy against any material issued to him by the purchaser.
7. The fabrication work shall be subject to inspection by our representative. The finished components shall not be dispatched prior to approval by our representative at the bidder’s works. Necessary inspection facilities should be provided to our engineers during fabrication at bidder’s premises.
8. The bidder shall deliver the finished item and install it after approval by our representative, within 90 days from the date the firm purchase order issued to the bidder. The finished item shall be delivered, installed, commissioned inside the new-Apsara recator hall, BARC, Mumbai – 400085.
9. Head, TPD, BARC, reserves the right to accept/reject any or all quotations without assigning any reason.
10. The bidder should furnish the GST, PAN and TIN numbers in their quotations without which the quotations will be rejected.
11. Quote for each part separately.
12. Detailed drawing will be made available after issue of order.
13. Clarifications for executing the order can be sought after issue of order.

[Signature]

Head,

TPD
Design, Fabrication, Supply, Installation and Commissioning of shielding hutch at site

Specifications:

Item: Shielding Hutch – Quantity – 1set

Introduction:
Beamline hutch of size 3.4 m(l) x 3.9 m(w) x 2.1m (h) is a shielded enclosure where nuclear emissions consisting of high energy gamma ray and neutron beams are used for experimentations. The construction of beam line hutch is like a room with vertical walls all around and ceiling which has layered shielding material of lead and Borated polythene plates. Since these shielding materials do not have appreciable mechanical strength of its own, they are supported by fabricated steel extruded sections along with base plates to fit on both the sides of the shielding wall and thus making the assembly self-supporting integrated structure.

A. Scope of work and Technical Specification: Design, manufacturing, assembly, supply, installation and commissioning of shielding hutch at site.

1. Size of the Hutch: ~3.4m (L) x 3.9M (W) x 2.1m (H) with opening for shielded door and stepped end construction to prevent radiation streaming (Fig1).
2. Shielding wall Material – 200mm Borated Polythene + 150mm lead. Walls to be erected on steel base plates and supported by the structural steel support frames anchored with base plates sandwiching the shielding material plates from both inside and outside. (shielding material like Borated polythene and lead to be provided by the user at site) – (Fig1 & Fig2)
3. Hutch ceiling – ~ 16mm steel plates + 50mm thick borated polythene + 3mm thick lead sheets laid over the entire roof on structured steel frame support. (shielding material like Borated polythene and lead to be provided by the user at site) – (Fig1 & Fig3)
4. To pre-plan the arrangement of layers of shielding material sheets according to thickness and given peripheral dimensions.
5. To procure, fabricate and erect at site, the structural steel support frames anchored with base plates sandwiching the shielding plates from both inside and outside.
6. Assembly should be such that all joint line interface of shielding materials are non-coincident so that no streaming radiation leaks out of the fabricated hutch.
7. No drilling or machining of cut outs are permitted on the shielding material body.
8. Borated Polythene plates are to be joined by approved Araldite Epoxy resin if required for proper laying.
9. Ceiling sandwich structure should be designed to withstand the gravity loads of the shields and max deflection should not be more than L/500
10. The structure should be earthquake proof considering the response parameters at the installation site.
11. Design and structural simulation should be performed for the given loads and approval should be obtained from user before actual fabrication. The structure should be demountable whenever needed in future.
12. Vertical structured wall should be able to withstand the lateral thrust exerted by shielding materials of lead and Borated Polythene.
13. No thru thickness drilling or machining is allowed across the shielding material. All the shielding blocks are to be retained in position by the sandwich structure thus constructed on the floor of the reactor building.
14. All steel surfaces should be treated with anti-corrosion coating like powder coating.
15. Total weight of hutch including shielding material = ~40 tonnes
16. Material of construction: Structural steel IS 2062 steel sections with suitable fasteners
17. Method of construction: Pre-fabricated structure to be assembled at site.
A. **BIDDER QUALIFICATION:**
   The type of work required to be carried out needs Design, manufacturing, assembly, installation and commissioning. The bidder should be capable of doing the things as required as per specifications. The material to be used for manufacturing should be new/ virgin. Used materials/ recycled items/ repaired items **will not be acceptable and will be rejected.** A list of similar system supplied to other institute /laboratory should be provided to ascertain bidder's adequate expertise in the field of similar instrumentation.

B. **INSTALLATION & commissioning at the user site:** The supplier shall install the system and demonstrate the operation of the system as per specifications. Technical documents, user manual, drawings of assemblies should be supplied.

C. **WARRANTY:** Warranty against equipment failure for a minimum period of one year after installation and final acceptance shall be provided. The vendor shall guarantee the spares and services to the supplied equipment at least for a period of five years from the date of supply.

D. **Testing and acceptance criteria**
   - Supplier has to submit their drawings, installation and testing procedure as per specifications along with the quotation
   - On site measurement of system main specifications will be carried out such as dimensions, stepped out check for radiation leakage etc.
   - Without satisfactory installation, commissioning, testing of parameters as per specifications the product will not be accepted.

E. **Security permission:** Supplier shall appoint engineers/technicians/workers with high integrity for installation & training and will be solely responsible for their safety at workplace. The Supplier’s workers deputed to work inside BARC premises must have necessary Police Verification Certificate. It will be supplier’s responsibility to obtain police verification certificate of such workers well in time, so that committed delivery schedule is not affected. All BARC security rules for contract workers will be applicable. The working hours for the work inside BARC shall be 9.30 a.m. to 5.30 p.m. on all Working days. (Monday to Friday).
Fig-1 Isometric view of Shielding Hutch
Fig-2 Isometric view of Supporting Structured steel frame
Fig-3. Top shielding details