BHABHA ATOMIC RESEARCH CENTRE
RADIOCHEMISTRY DIVISION

Ref:RCD/SM/2017/OPA/79997 15-05-2017

Sub: Minor fabrication for Gamma Ray shield at Radiochemistry Division, RLG, BARC

Quotations are invited for the fabrication for gamma Ray shield at Radiochemistry Division, RLG, BARC. The whole setup should be non-magnetic and will be made by pouring molten lead in enclosures made with Aluminum sheet. The detailed specifications and terms and conditions are as per enclosed annexure I and II.
Quantity: 1 in No.

Your sealed quotation **super-scribing the Enquiry reference number and subject**, addressed to **Head, Radiochemistry Division, BARC** , Mumbai 400 085 and kind attention to **Saurabh Mukherjee** should reach on or before **16th June, 2017** by **Registered Post or Indian Govt Speed Post** and the same will be opened on the following date. The quote should show PAN number, VAT number, Service Tax registration number, Name and address of the bank, Account number, IFS code and MICR No. of the concerned vendor.

Saurabh Mukherjee
Scientific Officer (D)
RCD, BARC

Enclosure: (1) Annexure 1
(2) Annexure 2

ANNEXURE 1

1. **Scope Of Work:**
   Minor fabrication for Gamma Ray shield at Radiochemistry Division, RLG, BARC

2. **Specification:**
   The drawing of the Gamma ray shield set up with the listing of different components is attached herewith (**annexure II**).

3. **Payment:**

(a) 100% by payment will be made ONLY through ECS after the satisfactory completion of work.

(b) Payment will be released on receipt of the bill duly certified by user department, indicating the service contract number, PAN number, VAT number, Service Tax registration number, Name and address of the bank, Account number, IFS code and MICR No. which appears on the cheque leaf, of the party.

4. **COMPLETION REPORT:** A completion report may please be forwarded to this office with a copy to the user department after completion of work, but well before the expiry of the contract, certifying that the equipment has been upgraded as per the terms and conditions of the contract and also with your proposal for extension of the work order, if any, indicating our work order No. and date for our consideration.
5. Please ensure that our work order No. is quoted in all correspondence and bill etc.
6. Kindly acknowledge receipt and confirm that the work order will be carried out in terms of the work order.
7. **Inspection:**
   The purchaser shall have free access at all possible times to all shop where material is being fabricated and assembled and all reasonable facilities for such inspection shall be provided. Approval from our inspecting engineer should be obtained prior to completion of work.

8. **Confidentiality Clause:**
   a. Confidentiality: No party shall disclose any information to any third party concerning the matter under this contract. In particular any information identified as **'Proprietary'** in nature by the disclosing party shall be kept strictly confidential by the receiving party and shall not be disclosed to any third party without the prior written consent of the original disclosing party.
   b. "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 provision by any contractor, adviser or employee of the contractor will invite penal consequences under the aforesaid legislation.
   c. Prohibition against use of 'BARC's name without permission for publicity purpose: The contractor or subcontractor, consultant, adviser or employee

engaged by the contractor shall not use the name of the BARC for any publicity purpose though any media like press, Radio, TV or Internet without the prior written approval of BARC.

9. **Terms and Conditions:**

(a) Payment will be made after satisfactory completion of the work and on production of bill, advance stamped receipt and certificate of guarantee for workmanship.

(b) Entire Job will be completed within **45 days** from the receipt of the work order and acceptance in writing by the firm.

(c) The supplier should have working staff holding valid PVC who may be permitted within BARC for carrying out work connected with the work order.

(d) Income Tax at 2% will be deducted from your Bill.

(e) Any delay which is attributed to the contractor is liable for penalty @½% per week (Max. 5%) to be imposed to the contractor.

10. Exemption certificate for Octroi and excise duty will be provided if mentioned in the quotation.

ANNEXURE –II

Technical Specification for Tender No. RCD/SM/2017/OPA/79997

Job Description:

The job involves fabrication of gamma ray shield which will be installed around a vacuum chamber of CF63 Flange. The intended fabrication work requires welding of Aluminum sheets (Al 6061) of 6 mm thickness and filling it up molten pure lead. Care should be taken so that there is no gamma streaming. The total weight of the lead including the Aluminum case will be approximately 1000- 1200 kg. The support system will be assembled from extruded aluminum bars of cross section 80 mm x 80 mm.

There will be 5 pieces of such aluminum casing containing lead. These casings will be placed around a 5-way cross UHV chamber. The flange size of UHV chamber is CF 63. Additionally, there will be one lead insert and two lead plugs. The aluminum casings (with lead inside them) will form a interlocked structure around the UHV chamber. Care should be taken such that the weight of the entire assembly should not be on the vacuum chamber. Instead, it should rest on an aluminum table (as shown in attached drawing). It is felt that a very close interaction will be required during the fabrication of the job.

Job Description:

The requirement of the setup is to provide gamma radiation shielding. The entire shielding is assembled in such a way that there is no gamma ray streaming. The total weight of the lead will be approximately 1000-1200 kg. The entire lead shielding will be supported by a stand made of extruded aluminum with cross section of 80 mm x 80 mm. The detail description of each component is as follows:

1. **Lead in Aluminum casing**: This consists of 5 parts. These parts are divided into two groups- top and bottom. The top group consists of 3 parts labeled- Top Aluminum casing-1 and Top aluminum casing-2 and Lead insert. The corresponding figures are- Figure 3 ,4 and 5. The bottom group consists of 3 parts labeled- Bottom Aluminum Casing 1, 2 and 3 (figure 6, 7 and 8). Each part consists of outer casing made of Aluminum sheet of thickness 6 mm. Shielding will be made by filling up the casing with molten lead of appropriate dimensions. The casings should be designed in such a way that there is no direct line of sight to the radioactive source. This is to prevent gamma ray streaming. There are two additional lead plugs (figure 9). These plugs (2 units) will be made of pure lead.
2. **Support for the whole setup**: The entire assembly of lead in aluminum casing shall be supported on a strong support made of extruded aluminum of 80 mm x 80 mm profile. The drawing is shown in Figure2.

Scope of work: Fabrication and Supply of gamma ray shielding as per following specifications:

1. Fabrication and supply of shielding must be done as per drawing provided. The casing of the shield will be made of aluminium alloy (6061) and it will be filled with lead. The stand for the shield will be made of Al-6061.
2. The supplier shall prepare the detailed fabrication drawings and must submit the drawing to undersigned for scrutiny before starting the fabrication.

(S. Mukherjee)
SO (D), Radiochemistry Division

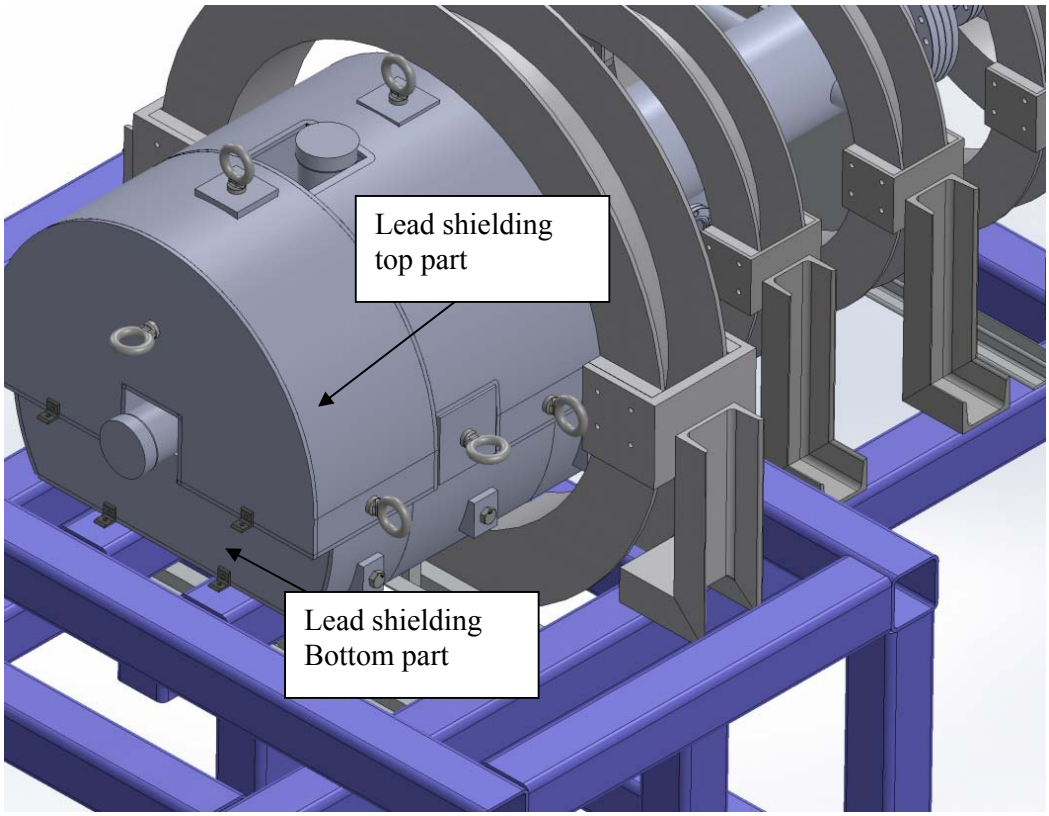

Figure 1. Schematics of complete shielding set up. It is an assembly of 5 aluminum casings with its own support table. All the parts are to be made of aluminum alloy-6061. The inside of the casings will be filled with molten lead.

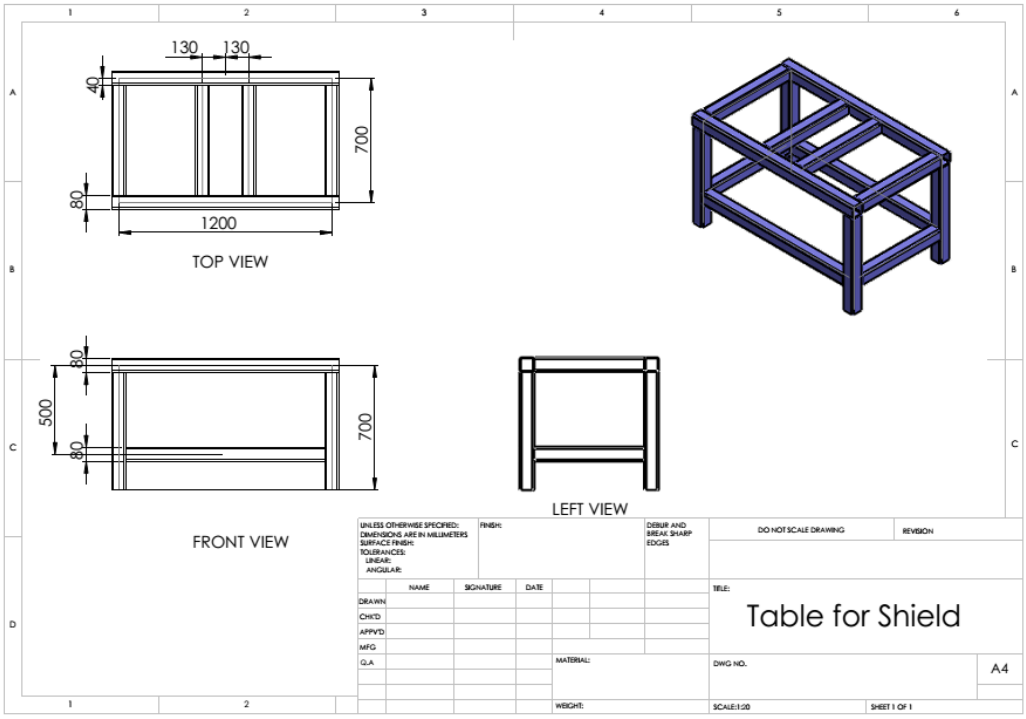

Figure 2. Design of the Aluminum stand. It will be made of T-slotted Al-6061 alloy of 80 x 80 mm profile.

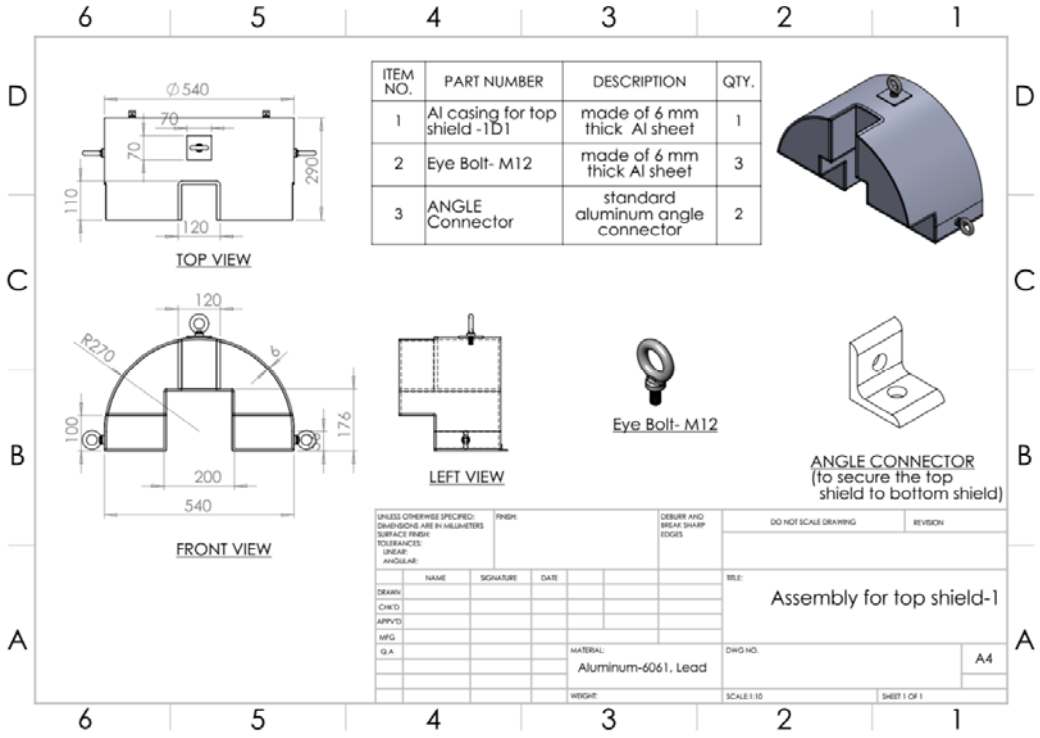

Figure 3. Design of Top Aluminum casing- 1. The casing is made of Al-6061 alloy and the inside will be filled with lead. All the eyebolts should be removable.

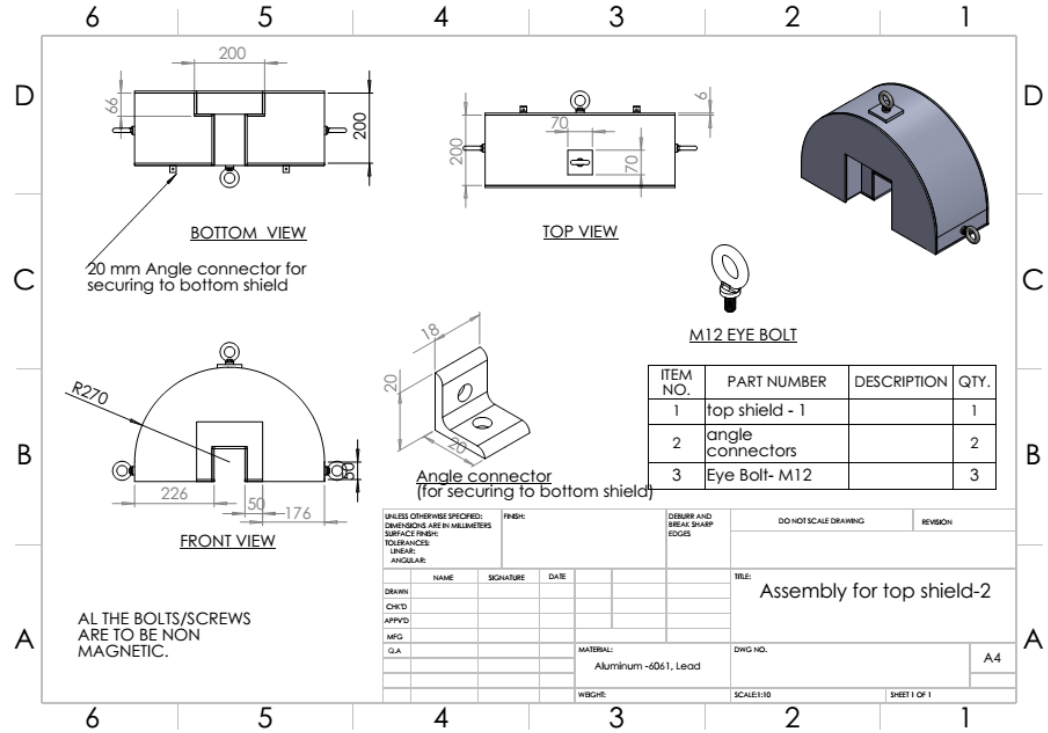

Figure 4. Design of Top Aluminum casing- 2. The casing is made of Al-6061 alloy and the inside will be filled with lead. All the eyebolts should be removable.

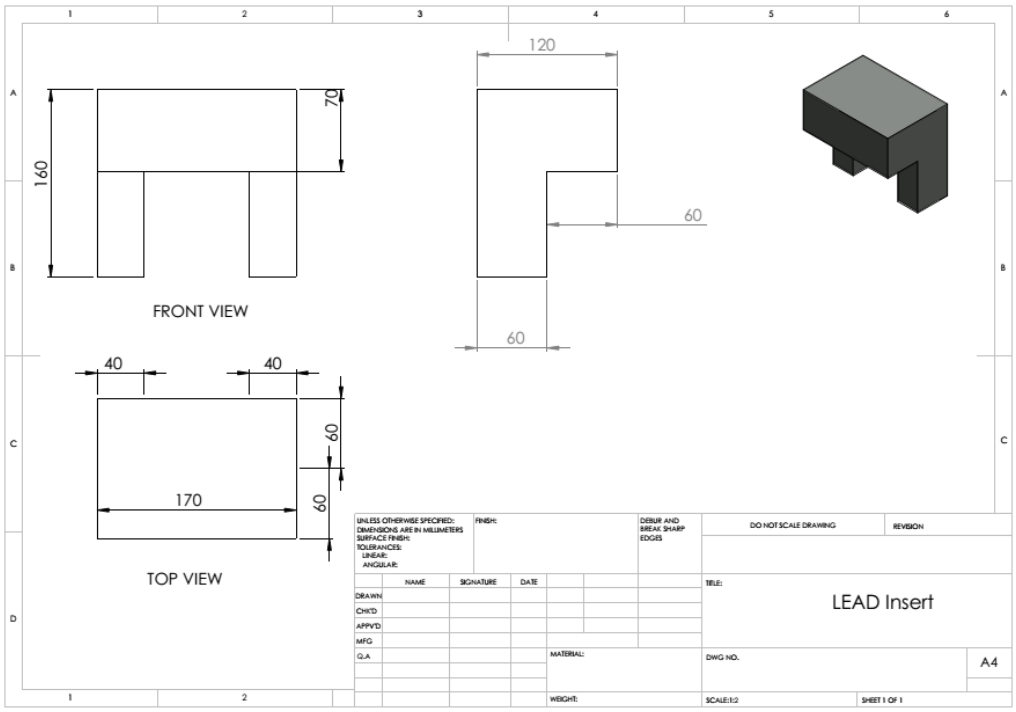

Figure 5. Design of Lead insert. This part will be made of pure lead

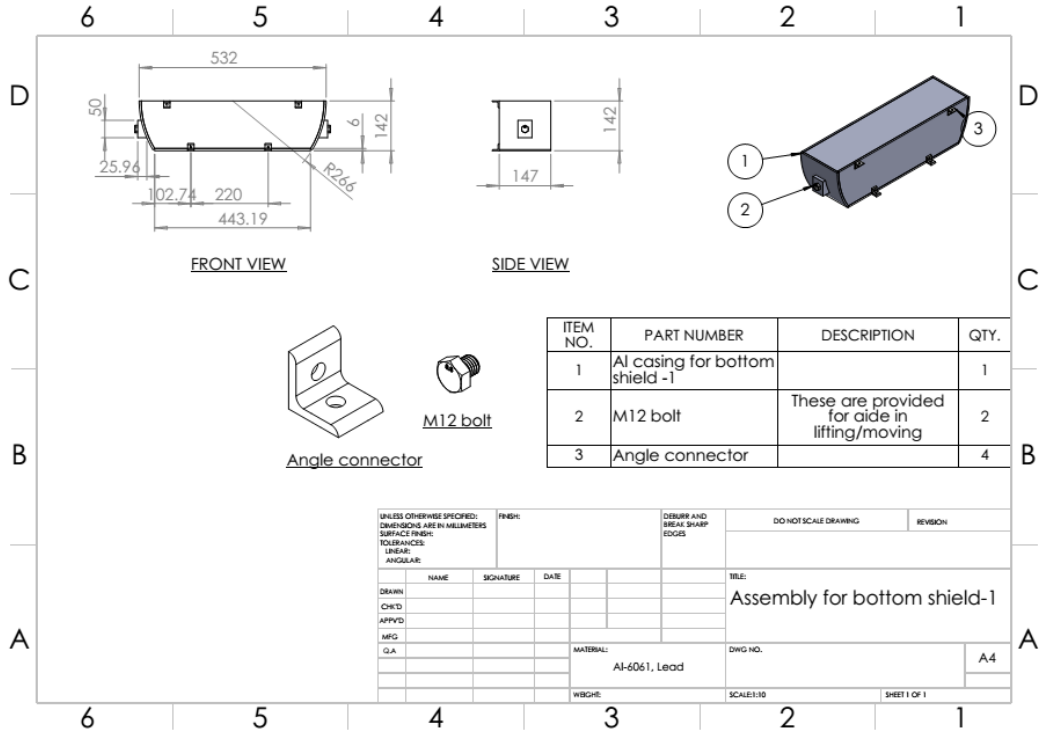

Figure 6. Design of Bottom Aluminum casing- 1. The casing is made of Al-6061 alloy and the inside will be filled with lead.

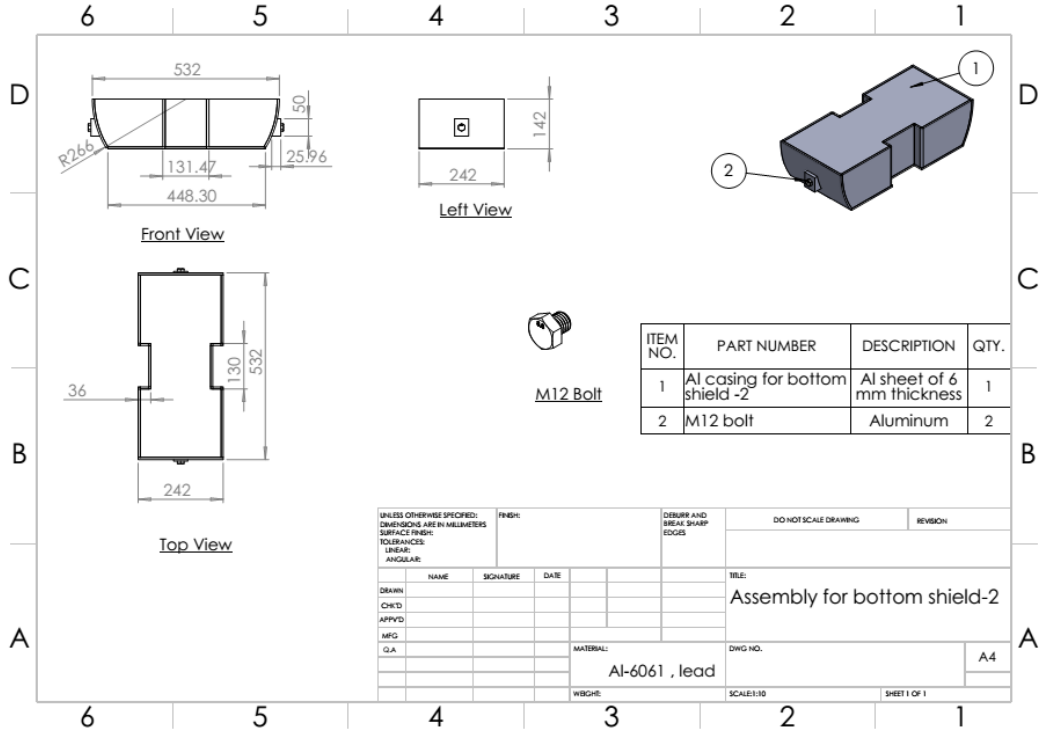

Figure 7. Design of Bottom Aluminum casing- 2. The casing is made of Al-6061 alloy and the inside will be filled with lead.

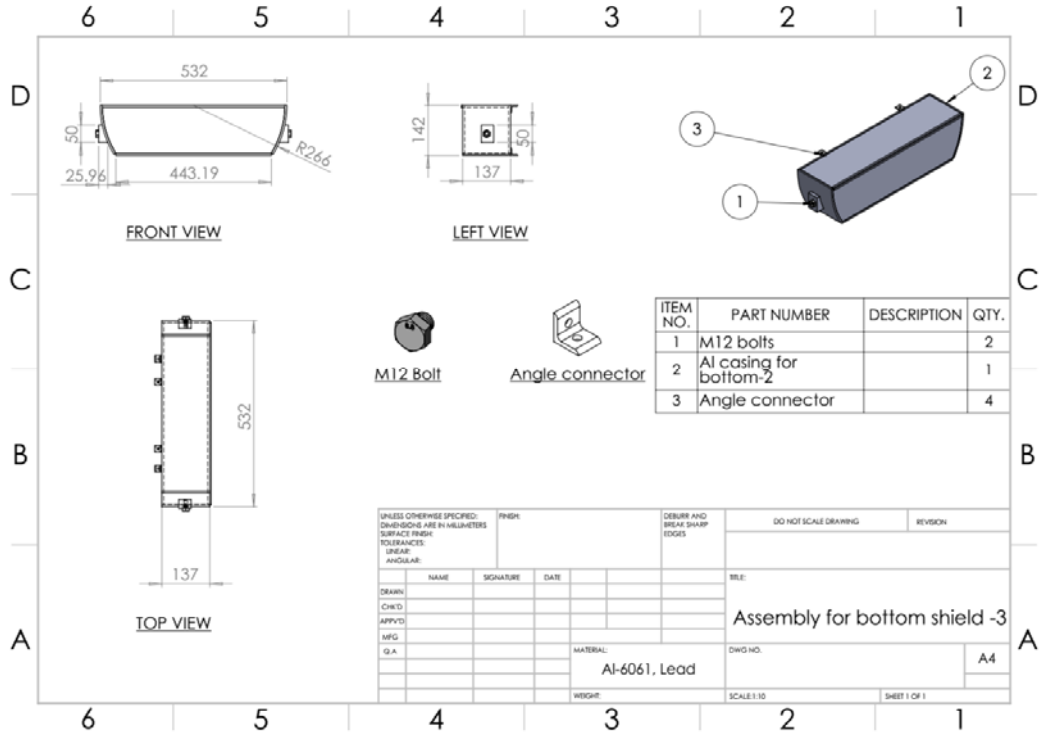

Figure 8. Design of Bottom Aluminum casing- 3. The casing is made of Al-6061 alloy and the inside will be filled with lead.

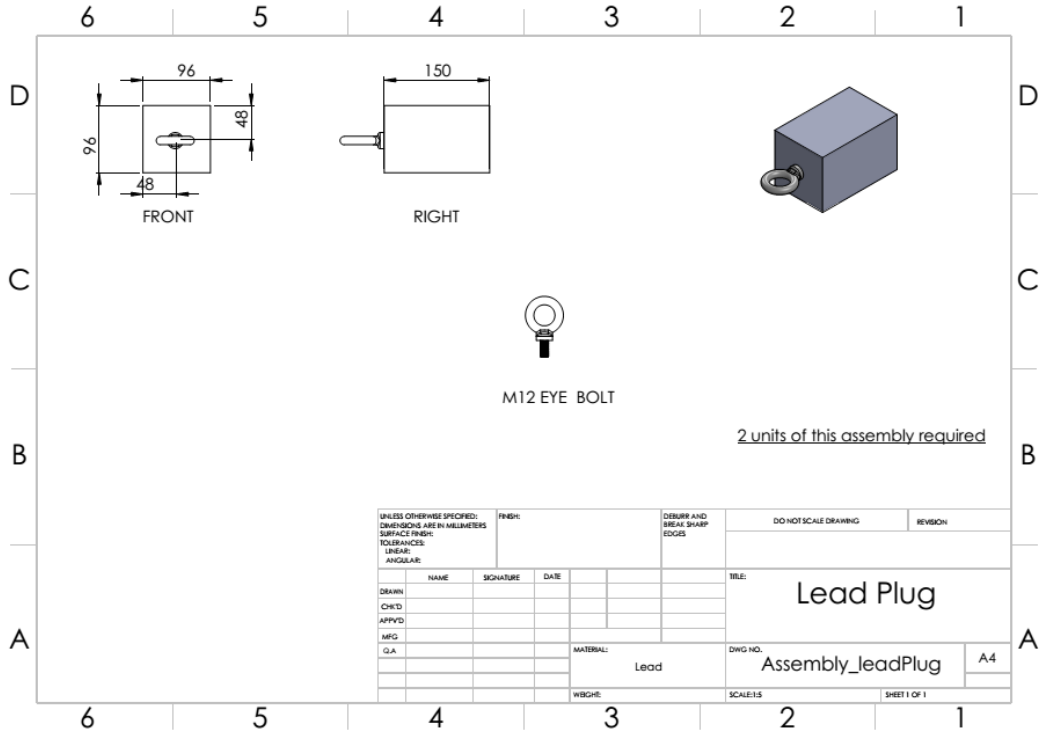

Figure 9. Design of Lead plug. This part will be made of solid Lead with an eye bolt for handling (2 units).