

**Government of India  
Bhabha Atomic Research Centre  
Reactor Engineering Division**

Energy Engineering Section  
Engg. Hall-7  
Trombay, Mumbai-85

**Ref: RED/VLS/AKS/MF/II/15793/2022**

**24/02/2022**

**Sub:** Invitation to quote for two-part tender for “Structural steel and Aluminum fabrication and stiffening work on existing different structure at Gamma Garden, BARC, Mumbai-85 as per Detailed technical specifications Annexure-I”.

Dear Sirs,

Sealed quotations are invited on behalf of the President of India by Head, Reactor Engineering Division for Execution of “**Structural steel and Aluminum fabrication and stiffening work on existing different structure at Gamma Garden, BARC, Mumbai-85 as per Detailed technical specifications Annexure-I**”. This work is to be executed at the purchaser’s premises.

**General Notes:**

- 1) The work will be carried out at the purchaser’s premises (Gamma Garden, BARC, Mumbai-85) and bidder shall provide all necessary infrastructures for carrying out the work.
- 2) Supplier shall arrange sufficient number of qualified/experienced manpower to carry out the assignment.
- 3) Quotations shall be submitted in two parts i.e. “TECHNICAL” & “FINANCIAL”. These quotations shall be put in two separate envelopes and sealed properly. These two envelopes shall be put in a main envelope and sealed properly.
- 4) **Type of quotation (Financial or technical) must be clearly mentioned on each envelope. Reference no. of this letter**, date and time of opening of bids also should be clearly mentioned on the all sealed envelopes containing the quotation.
- 5) Quotations shall be provided on a company letterhead describing Name, address and contact details. All quotations must be complete with proper reference number, signed and stamped by the authorized representative of the bidder. Without this information the offer will be treated as invalid.
- 6) In “TECHNICAL” bid, supplier shall furnish the details of manpower, equipments, machinery, infrastructure and at least two similar nature of prior work carried out by him in last three years for assessment by the purchaser. **Copy of work order/completion certificates of at least two similar assignment carried out in the past three year shall be attached in technical part of bid. Without this information the offer will be rejected.**
- 7) The “TECHNICAL” quotation must clearly indicate compliance with the technical specification as per Annexure-I. **Offers that do not comply with the technical specification in all respects will be rejected.**

- 8) The "TECHNICAL" quotation must be given in the letter head of the bidder. All documents being submitted for "TECHNICAL" quotation shall be listed in this letter.
- 9) The quotations must reach to Alok Kumar, SO/F,RED, Engg. Hall-7, BARC, Mumbai-85 latest by **14/03/2022**. Quotations will be opened on **15/03/2022** at 15:00 Hrs.
- 10) The quotations have to be sent by speed post only. Hand delivered quotation will not be entertained.
- 11) The bidder may contact on telephone no.: Alok Kumar: 022-25597161 for inquiries related to MF.
- 12) "TECHNICAL" part of quotations will be opened first and "FINANCIAL" part of quotation will be opened only if the "TECHNICAL" bid is found to be acceptable as per terms and conditions of technical specifications.
- 13) Payment will be made as per government rules after the completion of the work to purchaser's satisfaction against submission of original bill in triplicate and advance stamped receipt.
- 14) Income tax @2% and GST as applicable will be deducted from the bill. Taxes if applicable shall be paid as per government rates.
- 15) Bidder shall mention their PAN and VAT/GST nos. in the quotation.
- 16) The offer shall be kept open for acceptance for a minimum period of 60 days from the date of opening of the quotation.
- 17) The bidder shall furnish the detailed information regarding whether an ex-employee of BARC is working in their organization or whether any of their relative is working in DAE/BARC or whether he/she is an ex-employee of DAE/BARC. In case of absence of such information, or wrong information the quotation or contract is likely to be rejected or cancelled.

#### **CONFIDENTIALITY CLAUSES:**

I. Confidentiality:

No party shall disclose any information to any third party concerning the matters under this contract generally. 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. This clause shall apply to the sub-bidders, consultants, advisers or the employees engaged by the party with equal force.

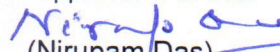
II. "Restricted information" categories under Section 18 of the Atomic Energy Act, 1962 and "Official Secrets" under Section 5 of the Official Secrets Act, 1923:-

Any contravention of the above-mentioned provisions by any bidder, sub-bidder, consultant, adviser or the employees of a bidder will invite penal consequences under the aforesaid legislation.

III. Prohibition against use of BARC's name without permission for publicity purposes: -

The bidder or sub-bidder, consultant, adviser or the employees engaged by the bidder shall not use BARC's name for any publicity purpose through any public media like Press, Radio, T.V. or Internet without the prior written approval of BARC.

Thanking you,

  
(Nirupam Das) 24.02.2022  
Head, ITDS

RED, BARC, Mumba-85

Enclosure: Annexure-I

## **Annexure-I**

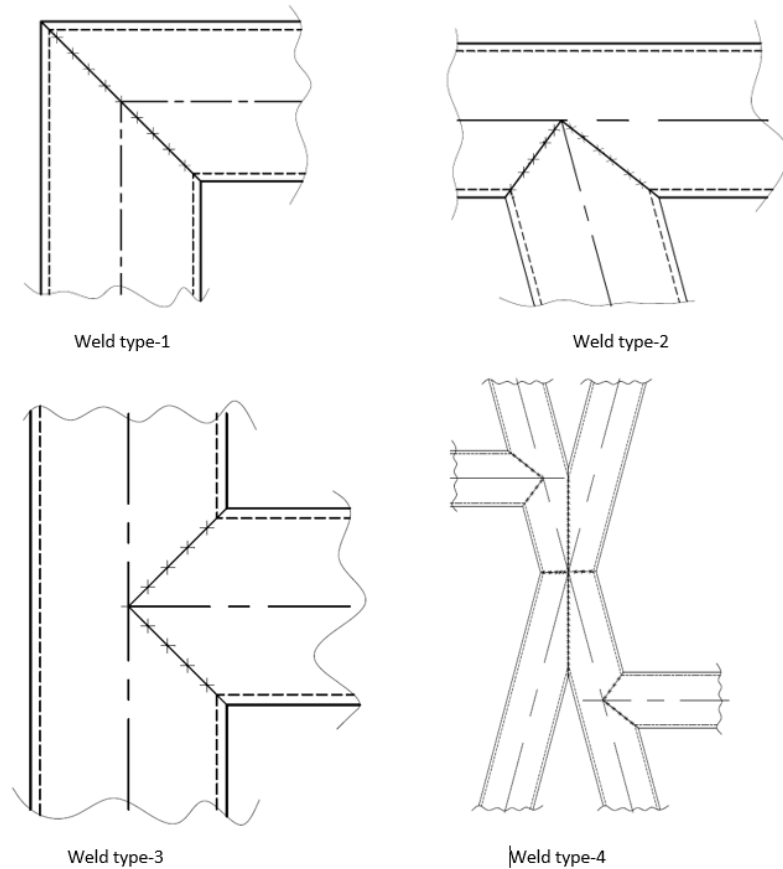
### **Scope of work and Technical Specification**

**Item:** Structural steel and Aluminum fabrication and stiffening work on existing different structure at Gamma Garden, BARC, Mumbai-85

#### **1. Scope of Work:**

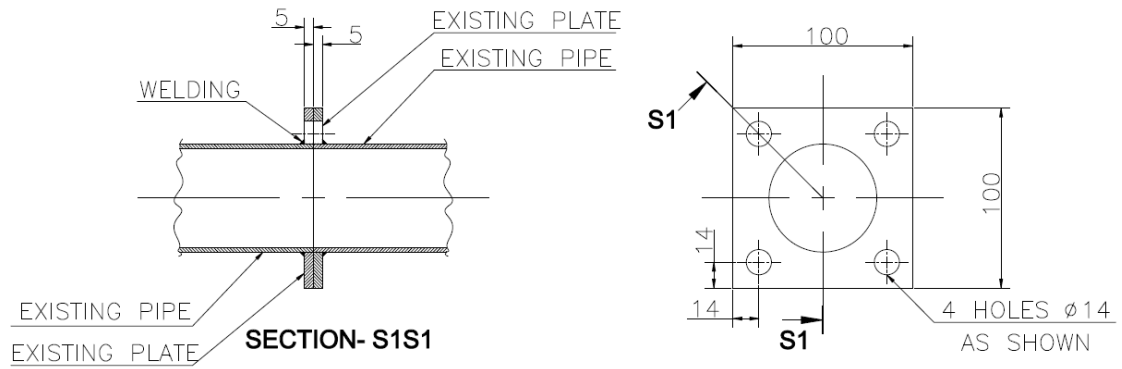
Scope will be purchase of material, cutting, edge preparation, grinding, drilling, welding, painting using structural materials like square hollow section, plates, pipes, etc. Fabricated items will be welded to existing structure at Gamma Garden, BARC, Mumbai-85. All the manpower required for the work shall be arranged by the fabricator. All the material, nut and bolts, handling equipment and welding machines, consumables, welding consumables are in the scope of fabricator. Supplier also has to make fabrication drawing of stiffening member clearly showing length, edge and welding. Approximate weight of Al6061T6 is 775kg and structural steel weight 7.1 ton. Details of works are described in subsection 1.a to 1.g

**1.a- Al-Al pipe work:** Fabricator has to purchase Al6061T6 pipe having diameter and thickness as listed in table-1. This pipe has to be cut and welded with existing Al pipe structure. Typical welding involved in Al-Al fabrication is shown in figure1-a. Length of Al6061T6 pipe and quantity covering all module is given in table-1. Edge of these has to be prepared for pipe to pipe weld. Some of these pipes has to be cut for joining cross member. Total weld length is given in table-2.



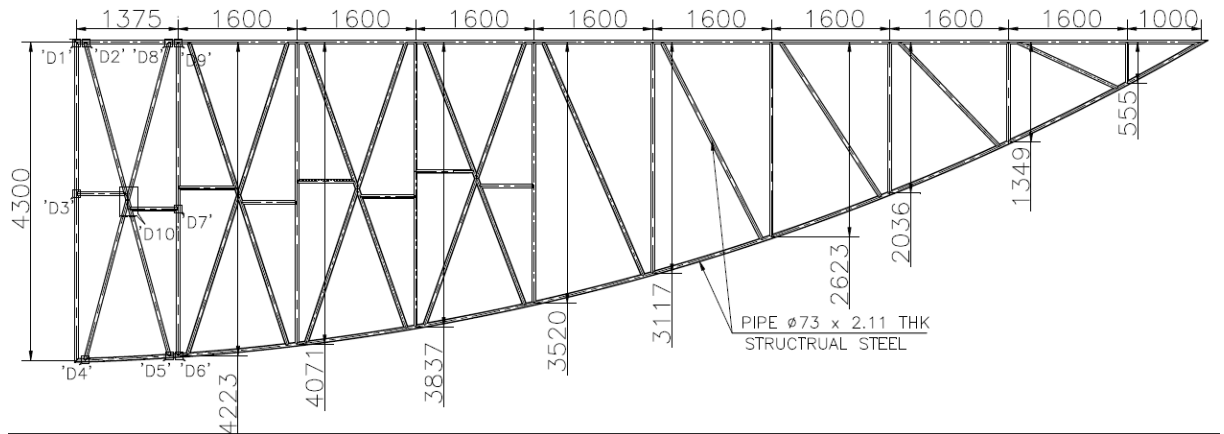
**Figure-1.a: Different type of Al-Al pipe weld required in structure**

**1.b- Al6061T6 plate and Structural Steel plate:** Fabricator has to make forty (40) numbers of Al6061T6 and mild steel plate (100mmX100mm size) with matching M12 hole as shown in figure-1.b. Nut and Bolts (SS) matching M12 hole (60 total) is also in scope of fabricator. Length of bolts should be more than 50mm to make bolted connection between SS and Al. Al plate will be welded with Al pipe and mild steel plate will be welded with mild steel pipe as shown in figure-1.b. Total numbers of Al and SS plate along with number of nut and bolts are listed in table-1.

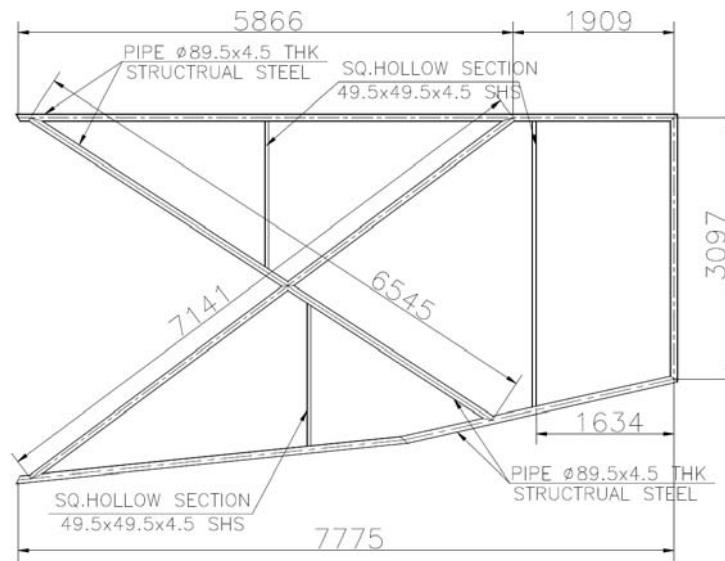
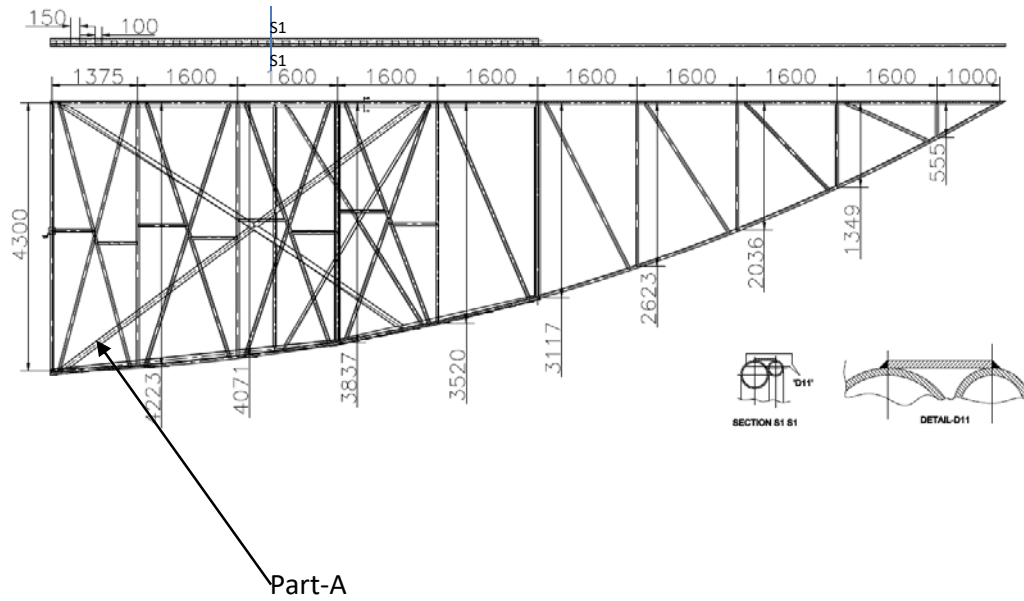


**Figure-1. b: AI to Structural steel connection**

**1.c Structural Steel – Structural Steel pipe work:** Three numbers of structure as shown in figure 1.c and two number of structure as shown in figure 1.d is to be fabricated by supplier. Structure shown in figure 1.d is combination of structure shown in figure 1.c and part-A as shown in figure 1.d. Each structure shown in figure 1.d will be welded with 1.75mX 3.5m 20mm thick mild steel plate. Fabricator has to purchase Mild steel IS 1239 Yst310 pipes of diameter as given in table-1. These pipes have to be cut and welded. Pipe size and their approximate length and weight are given in table-1.



**Figure-1.c: Structural Steel Structure**



**Figure- 1.d: Structural steel structure stiffened by Part-A**

**1.d- Structural Steel Plate:** Fabricator has to purchase Structural Mild steel IS 2062: E250 Grade-A plate of size 1.5 m X 4.4m and thickness 20mm as listed in table-1. On this plate structural steel pipes will be welded. Fabricator has also to purchase two plates of size 1.7mX3.5m thickness 20mm. Part-A as shown in figure-1.d will be welded on these plates.

**1.e- Welding and bolting:** All welding will be carried out at site i.e. Gamma Garden, BARC, Mumbai-85. Welding type used in work consists of pipe to pipe welding. Weld length and sizes of different weld types are given in table-2. All Structural steel to Structural steel weld should be SMAW weld. Al-Al weld should be TIG/MIG or plasma with 5356 or 4043 filler material. Supplier has to submit NABL approved certificate of Al-Al welding on test piece covering welding type as shown in figure-1.a. This certificate should show welding is free from defects and it pass bend and strength test. Fabricator has to comply safety measures while welding. Fabricator has to submit welder qualification certificate conforming IS standard not older than 6 months of all welder else fabricator has to qualify all his welders through qualifying test as per IS:7310(1974).

Liquid penetration test and visual inspection of welds will be carried out by authorized representative of the purchaser. Fixture and material required for testing are in scope of fabricator. SS-Al part is connected by plate and bolt as described in section 1.b.

**1.f- Painting:** After welding welded structures should be painted with good quality of air dried corrosion resistant paint along with one coat of red oxide zinc chrome primer.

**1.g Material Handling:** All fabrication work will be carried out at designated location at premises. Supplier has to use suitable material handling equipment for lifting and movement of structure. Material handling equipment used for job are in the scope of fabricator.

**2. Delivery Period:** 3 Months

**3. Free Issue Material:** Nil. No free issue material will be provided.

**4. Quality Assurance Plan and acceptance criteria:** Inspection and testing given in this section will be carried out as a part of quality assurance plan. These inspection and testing are also hold point for job. Inspection and testing in sequence of fabrication is given in this section (4.a-4.d). Fabricator has to start next step of sequence only if previous step is approved by indenter or his representative at BARC. Fabricator has to submit approved test report or test certificate asked in each sequence of fabrication (4.a-4.e).

**4.a. Testing of material:** Original Mill certificate or certificate from NABL approved laboratory for all material to be used has to be submitted by fabricator. Material should comply to IS standard mentioned in table-1. All the structural materials offered for fabrication shall be new. Used and reconditioned materials will not be accepted. Materials shall be straight and free from bends and kinks.

**4.b. Cutting and machining of material in different size:** Supplier has to cut purchased material in different length for stiffening and machine its edge for welding. Before cutting supplier has to prepare fabrication drawing. This drawing should clearly show length, diameter of pipe, edge preparation of various part machined for welding. The part shall be checked for dimension and edge preparation.

**4.c. Welder certificate and Welding Procedure Specification (WPS):** Fabricator has to ensure all his welders are properly trained for both structural steel-structural steel and aluminum - aluminum welding for types of weld shown in figure1-a for diameter of pipes as listed in table-1. Fabricator has to submit welder qualification certificate conforming IS standard not older than 6 months of all welder else fabricator has to qualify all his welders through qualifying test as per IS:7310(1974).

Supplier had to submit Welding Procedure Specification before start of welding. Supplier had to start welding after approval of WPS.

**4.d. Welding:** All welding shall be uniform and free from defects such as undersized welds, undercut, overlap, surface porosity etc. Liquid penetration and visual test of all welding will be carried out by fabricator. Fabricator has to submit liquid penetration test certificate of all welds.

**4.e Cleaning of workspace:** Supplier has clean the space allotted for work. This space should be free from fabrication debris.

## **5. Terms and Conditions:**

- (a) All the materials, manpower, welding machines, welding consumables, tools and accessories required for the work is in the scope of fabricator.



- (b) Necessary safety precautions shall be taken by the fabricator at the site during the work and fabricator shall be fully responsible for any accident or damage caused by his personnel. No compensation will be paid by the purchaser in such case.
- (c) Fabricator must provide safety gears such as safety shoes, gloves, goggles, safety belts, helmets to their staff while carrying out the fabrication work at the site.
- (d) Appropriate material handling equipment's shall be employed during loading, unloading, fabrication of the structural work to ensure safety of the personnel.
- (e) Fabricator shall use proper railings, scaffoldings while working at higher elevations to ensure the safety.
- (f) Fabricator shall maintain the work area in orderly and neat manner.
- (g) The work shall be subject to review by the purchaser or his authorized representative. Work shall be conducted under their guidance and to the full extent of satisfaction of the purchaser.

<b>Table-1</b>					
<b>Material pipe, square and hollow section</b>					
<b>Size</b>	<b>Material</b>	<b>Length (m)</b>	<b>Quantity</b>	<b>Total (length) (m)</b>	<b>Total Approx. wt. (kg)</b>
Pipe OD 50mm 2.5mm thk Ref: drawing figure 1.a	IS: 2678 Al6061T6	4.3	10	43	45.59
		4.5	10	45	47.71
		4.6	10	46	48.77
		4.2	10	42	44.53
		4.3	10	43	45.59
		4.5	10	45	47.71
		4	10	40	42.41
		3.9	10	39	41.35
		4.3	10	43	45.59
		3.6	10	36	38.17
		3.5	10	35	37.11
		3.1	10	31	32.87
		3	10	30	31.81
		2.6	10	26	27.57
		2.6	10	26	27.57
		2	10	20	21.21
		2.1	10	21	22.27
		1.4	10	14	14.84
		1.7	10	17	18.02
		1	10	10	10.60
6.5	10	65	68.92		

Size	Material	Length (m)	Quantity	Total (length) (m)	Total Approx. wt. (kg)
Pipe OD 48.4mm thk 2.9mm	Mild steel IS 1239 Yst310	5	22	110	374
		5.1	22	112.2	381.48
		4.5	22	99	336.6
		4.6	22	101.2	344.08
Pipe OD 73 thk 2.11 Figure 1.c and 1.d	Mild steel IS 1239 Yst310	400		400	1600
Pipe OD 89.5 thk 4.5 Figure 1.d	Mild steel IS 1239 Yst310	30		30	300
Pipe OD 60.8mm thk 4.5mm	Mild steel IS 1239 Yst310	4.4	13	57.2	383.5
		0.150	30	4.5	30.17
		1	4	4	26.82
Square hollow Section (49.5X49.5X4.5 SHS)	Mild steel IS 4239 Yst310	5.2	4	20.8	144.6
		4	6	24	166.8

<b>Plate</b>					
<b>Type</b>	<b>Material</b>	<b>Size</b>	<b>Quantity</b>	<b>Total</b>	<b>Total Approx. wt. (kg)</b>
Al6061T6 Plate	Al6061T6	Size 100mmX100mm 10mm thk	40	4mX100mm 10mm thk	12
MS Plate	Mild steel IS 2062: E250 Grade A	Size 100mmX100mm 5mm thk	40	4mX100mm 5mm thk	17
M-12 Nut and Bolts	SS	M-12 length of bolt should be more than 50 mm	60	--	--
MS Plate	Mild steel IS 2062: E250 Grade A	Size 1.5mX4.4m Thickness 20mm	1	Area 6.45 m <sup>2</sup> thk 20mm	1040
MS Plate	Mild steel IS 2062: E250 Grade A	Size 1.7mX3.5m Thickness 20mm	2	Area 6m <sup>2</sup> thk 20mm	1900

<b>Table-2</b>	
<b>Weld and clamp details</b>	
<b>Weld</b>	<b>Total Length</b>
<b>Fillet Weld 3mmX3mm</b> <b>Al-Al</b>	<b>350m</b>
<b>Fillet Weld 4.5mmX4.5mm</b> <b>Mild steel- mild steel</b>	<b>350m</b>
<b>Nut and bolt (M12 nut and bolts length more than 50mm)</b>	<b>160</b>