Government of India
Bhabha Atomic Research Centre
Product Development Division

Ref: PDD/HCOS/ 555.

December 14, 2021

Sub: Procurement of raw material, preparation of fabrication & general assembly drawings, manufacture, assembly, installation and erection of a SS 304 made duct for replacement of existing old duct for HIRUP Hot Cell exhaust system , PDD, BARC, Mumbai.

Dear Sir,

In connection with the above mentioned work you are requested to submit your quotation on the basis of the following requirements. The detail Job Specification is attached.

1. The party should furnish their **PAN No.** and **GST No.** along with the quotation, otherwise their quotations are **liable to be rejected** and it may also please be emphasized that quotation are submitted on printed letter heads.
2. The address on the envelope should read:

   Shri S. C. Parida
   Head, Product Development Division, PDD office
   Soth side, S-62, Room no-3
   Bhabha Atomic Research Centre, Trombay
   Mumbai – 400085
   Attention: Saroj Kumar/ A. K. Pradhan.
3. Contact for assistance/Clarification: Saroj Kumar (**022 2559 2543 /022 2559 6878**sarojk@barc.gov.in).
4. Head, **Product Development Division**, BARC reserves the right to accept / reject any or all quotations without assigning any reason.
5. Offer shall clearly indicate time require to complete the work, GST etc.
6. Fabricator should be experience of similar type of work and should have own workshop.

Saroj Kumar
15/12/21

(Saroj Kumar, SO/D)
HCOS, PDD, RC&IG

Enclosures: Job Specification

Technical Specification for Duct Replacement at HIRUP HOT CELL

1. Scope

Procurement of raw material, preparation of fabrication & general assembly drawings, manufacture, assembly, installation and erection of a SS 304 made duct for replacement of existing old duct for HIRUP Hot Cell exhaust system, PDD, BARC, Mumbai.

2. Specifications

Sr. No	Code	Details
1	ASTM A-312	Specification for seamless & welded austenitic SS pipes
2	ASTM A-262	Practice for detecting Susceptibility to inter-granular attacks.
3	ASTM-A-276-304	Specification for stainless steel bars & shapes
4	ASTM:A-370	Test methods & definitions for mechanical testing of steel products.
5	ASTM-E-8M	Test methods for tension testing of metallic materials[Metric]
6	ASTM E-165	Test methods for liquid penetrate Examination
7	AISI 302	Specification for stainless steel shims.
8	IS: 2102	General tolerance for linear & angular dimensions without individual tolerance indications.
9	ASTM A182	Specification of Flanges.
10	IS 1364	Specification of fasteners.

3. Materials & workmanship

(a) All the raw material shall be of reputed makes preferably (SAIL/JINDAL/TISCO e.t.c) conform to ASTM:A-370 national/international standard.

(b) All materials, parts & components shall be new. All the components shall be machined & finished to the dimensions, tolerances & surface finish as per the applicable drawing.

(c) The supplier shall do the assembly of machining components as per applicable drawing before delivery of items. Modification/alteration of components if any shall be done with prior permission of the purchaser.

(d) The workmanship shall be in accordance with high grade practice. All parts shall be free of sharp edges, sharp corners, burrs, nicks, cuts, scratches & other visible defects.

(e) The supplier shall produce mill test certificate at the raw material site inspection; Mechanical& chemical testing shall be followed for quantification.

4. General Function & Description

This duct has been used to achieve adequate number of air changes in HIRUP Hot Cell. Existing Duct needs to replace due to aging. Specification of duct for HIRUP Hot Cell.

Approx. Length of duct	**: 30 meter**
Approx. Cross section of rectangular duct	**: 600mm 300mm (Avg)**
Approx. Material of construction (MOC)	**: SS304**
Approx. Thickness	**: 1.5 mm**
Angle will use length 110metrs	**: 40 40 3 (SS304L)**
Mechanical damper	**: 2 Qt**
Brass tubes dia. 1-2inch	**: 3-4m**

Note: Party should capable to do the Quality welding on 1.5mm ss304 plate. They must have to demonstrate before accepting the work order. Site visit is mandatory. Selected party has complete work in amber zone radiation area.

5. Scope of Work

The scope of work includes:

(a) Preparation of detailed fabrication drawing.

(b) Preparation of QAP.

(c) Procurement of raw material (plates, flanges, fastener, angles, bend etc).

(d) Raw material inspection& fabrication of associated components as per final approved drawings.

(e) Removal of old duct from HIRUP Hot Cell and dispose of as per the advice of indenting officer.

(f) Duct must be extended 3 meter above the High Bay roof with bends. Additional support must be given for stability against wind load (Angle, Anchor etc).

(g) For removal of old duct scaffolding, crane, Truck, tools and tackles has to be arrange by the fabricator. Also all the necessary arrangement will be made by the fabricator to removal of old duct and erection & installation fresh fabricated duct on HIRUP walls from blowers mouth. Segment of duct may join by the flanges.

(h) During the installation bends, elbows, flanges, Taper duct needed to mount the duct assembly on HIRUP wall. Suitable support/anchor/C-clamp/Nut-Bolt (MOC-SS304) etc need to mountain duct.

(i) During the installation all safety measure must be taken from the fabricator to safe the Person, Property etc.

(j) Air sampling instrument, point with necessary piping of SS 304 must be supply and install by the fabricator.

(k) Flow meter and pressure drop instrument quantity two of each from reputed brand must be supply with suitable display at suitable location.

(l) Submission of inspection & test reports, history document & reproducible of as built drawings.

(m) Supplier shall be responsible for all work of the subcontractor of the supplier. The supplier shall also be responsible for carrying out inspection at subcontractors works. The subcontractor's works shall also be accessible to the purchaser or his authorized representative at all reasonable times to carry out quality control & inspection if required.

(n) Angle will be use in vertical direction in all four edges of duct and also on the circumference of duct.

(o) Routing of duct should be carried out according to old available duct routing.

(p) Suitable cross-section shall be fabricated to accommodate flange joints and stability of the duct.

6 Requirements

6.1 General

All materials shall be examined for conformance to the requirements ASME code for Nuclear Power Plant Components Section viii, Division 1. Proof in the form of correlated mill certificates that the required tests have been carried out at will be acceptable. But if co related certificates are not available, the supplier shall perform these tests. All materials shall be new & shall meet the special requirements listed in the specifications. Small changes in the final assembly and its component may take place during fabrication phase; supplier shall take about 10% weight, welding and fabrication margin beyond drawing scope.

6.2 Materials

6.3 Free Issue Material

There will be **No Free Issue Material (NFIM)** supplied to the fabricator.

6.4 Additional Tests

The purchaser reserves the right to specify any additional test on the materials other than those covered in the pertinent specifications & this specification. Cost of such tests shall be borne by the purchaser.

6.5 Manufacturing Requirements

Detailed Quality Assurance Plan **(QAP)** along with manufacturing process sheet (to achieve the requirements specified) shall be prepared by the supplier & prior approval shall be taken before start of actual job. The QAP provided in this specification as annexure-A is only for guidance of quality aspects involved in the manufacture of components. Manufacturing drawings as applicable shall be submitted to the indenter for prior approval.

6.6 Joints & Fittings

Fittings & alignment shall be carried out to comply the requirements of drawings & specifications. The fabricator shall ensure that all the joints fit uniformly together over their mating surfaces.

6.7 Welding

All welding shall comply with requirements of ASME boiler & pressure vessels section viii & section IX. Electrode designations & qualifications shall be as per AWS standards.

(a) All welders, welding m/c & welding procedures shall be qualified in accordance with the requirements of section IX of ASME boiler & pressure vessel code. Welder classification Record, welding procedure specification (WPS) & welding procedure qualification records (PQR) shall be approved by the indenter.

The supplier shall develop weld penetration & processes to obtain consistent welding. All surfaces should be thoroughly cleaned to prevent weld contamination.

b) TIG method of welding is preferred for Stainless steel. The filler material shall conform to AWS. Welding electrodes & filler materials shall conform to ASME section II.

c) Root & final passes of all butt welds, groove joints (or root & each layer of welds in specific cases as per drawings) &welds shall be subjected to liquid penetrate examination in accordance with ASME section-V& acceptance shall be as per section VIII.

d) After weld edge preparation, the surfaces shall be subjected to Liquid Penetrate

6.8 Surface Finish

All the external surfaces of the Duct/components should be buffed to mirror finish.

6.9 Fabrication

Contractor shall prepare fabrication drawings based on tender drawings, indicating complete fabrication details, dimensional tolerances, weld sizes, bill of material etc& submit four copies of these drawings for purchaser’s approval.

Contractor shall submit the following documents for approval.

i) Detailed fabrication drawings.
ii) Fabrication procedure
iii) WPS, PQR
iv) Welding procedure.
v) Inspection & quality control plan.

Fabrication shall be done in accordance with above approved documents/procedures. The supplier shall submit a quality assurance plan along the offer.

7 .1 Quality Assurance cum Stage Inspection Plan

Sr. No.	Item/Activity	Characteristics to be checked	Type/extent of check	Ref. Document/ Accepted standard
A	**Raw Materials**			
1	Plate, , structural Material	Visual inspection, Inspection	Major	Approved Fab. Drawing
2	Testing	Mech/Chemical Analysis	Major	Do
B	**In process**			
1	Welding procedure specification & welding procedure qualification	Review	ASME Sec IX	App Fab Drg& relevant doc
2	Material cutting	Dimension profile check	Measurement 100%	App Fab Drg
3	Weld set up	Dimensions/Alignment	Do	Do
4	All Welds butt & fillet	Weld soundness	100% DP test after Final Run	App Fab drg& ASME SEC V
5	Butt weld joints	Do	Do	Do
6	Fab & assembly of parts	Dimensions/shape check	Measurement 100%	App Fab Drg
7	Soap Bubble test& Di-penetration test	Review	ASME Sec V	Do
C	Overall Dimensions	Correctness if any	Do	Do
D	Final Inspection	Functional Check, Finishing	Moving parts Dim 100%	App Fab drg

8 Guarantee

The supplier shall give a guarantee for satisfactory workmanship & performance for a minimum period of 12 months from the date of delivery. The guarantee shall cover failure occurring to the units caused by defective workmanship or material found as being defective.

9 Packing/Delivery

The material shall be properly packed for safe transportation & storage. The Material shall be delivered to the stores at

RLG Zonal Stores,

Bhabha Atomic Research Centre,

Trombay, Mumbai - 400085.

10 Purpose

All drawings, specifications etc. that may be furnished to supplier by the purchaser are property of purchaser and are intended to be complementary and to provide for and comprise everything necessary for the completion of works/supply. These are not to be used for any works or performance other than those for which these have been provided and shall be returned to purchaser immediately on completion of work/supply, in good condition.

11 Property of purchaser

If, during the process of execution of the contact, any improvement, refinement or technical changes and modifications are effected by Supplier, such changes shall not affect the title to the property of purchaser and all the information, specifications, drawings etc including the improvement/ modifications effected by Supplier shall continue to be the property of purchaser. Supplier shall not have any claim or rights whatsoever in respect of purchaser's drawings, specifications, prototypes etc. even where improvement, refinement, modifications etc. have been effected by Supplier.

12 Confidential Information

The drawings, specifications, samples and such other information furnished to Supplier relating to the supply/works, sub-system/equipment etc. are to be treated as confidential which shall be held by Supplier in confidence and shall not be divulged, transferred, exchanged, gifted or communicated to any third party without the prior written consent of purchaser. Supplier therefore binds himself, his successors, heirs, executors, administrators, employees and the permitted assignees or such other persons or agents directly or indirectly concerned with the works/supply to the confidential nature of the drawings, specification, prototypes, samples etc.

(Saroj Kumar)
SO/D, HCOS, PDD

(A. K. Pradhan)
Head, HCOS, PDD