

Annexure-A:

Scope of Work and Technical Specification document

Technical document for engineering services using optical metrology and 3 dimensional measurements, the specification for alignment and inspection service of Beam source, BLC and INTF vessel components with Laser tracker CMM.

A) Introduction

This Technical document is technical specification for engineering of services using optical metrology of 3 dimensional measurements of beam source, BLC, INTF vessel components in INTF DNB lab. The typical instrument envisaged is laser tracker station which can be measured with retro reflectors.



Figure 1: typical laser tracker workstation with retroreflectors envisaged.

B) Scope of Work.

Able to take measurements to support alignment activity for beam line components inside vessel in INTF lab with the given tolerance of up to 50 microns. Measurement should be with the help of optical metrology laser tracker (laser based CMM station with retroreflective reflectors or touch probes) due to the above tolerance level and space constraint. The measurements to be done on manufactured part with respect to the requirements for alignment with respect to datums and imaginary plane with ability to perform distant field of view measurements.

The typical job requirements would be.

- 1) Alignment and measuring of components with respect to required datums and Imaginary planes with accuracy level of up to 50 microns within given space envelope mentioned above. These

requirements may also include measurement of component and comparison of measurements at the above said accuracy levels.

- 2) The measurement can be in constraint spaces, the vendor should be expertise in such jobs with machines like optical laser-based coordinate measuring machines (CMM)laser tracker station distant SMRs or touch probes or combination of both. They should all the hardware's and software's with portable work station to do these kinds of job with minimum possible errors.
- 3) The maximum work envelope of the job will **be 10meter * 10meter * 10meter.**
- 4) Tonnage of components will be in the range of 2 T to 5T which will be mounted on base frame inside the vessel.
- 5) Proper plan of requirement and job description of work will be intimated 15 days before the commencement of each work in form of order. **The contract shall be for 2 years with proper job requirement. A minimum of 30 days of work will be given to vendor during the Contract period.**
- 6) During the contract period the service provider can be called for maximum of **8 times in two years. At least a minimum two experienced manpower shall be provided for each call and execution of job.**

C) Requirements from vendor

1) To be able to measure and align the structure and components as per requirements in scope of work and given work volume. Should able to generate cloud points, various reference plane, points according to the requirement of work. The detailed requirement will be given to the service provider before the commencement of work by respective II engineer.

2) They should able to do measurements of up to accuracy level 50 microns. They should also able to analyze the measurement with allied software's which have the ability to generate planes, geometrical shapes, coordinates and cloud points. They have to submit the final measurement as per the requirement given by II engineer in pdf and .xls format (Both digital and printed format). Various cloud points and shapes, if required needs to be transferred in digital format.

3) The engineering service provider shall have the experience of measurement using optical metrology. **Proof of similar job executed with tolerance level (up to 50 microns) using CMM laser tracker shall be provided in form of unpriced PO copy along with Invoice/Measurement report.**

4) They should have persons with proven technical capabilities to use optical laser tracker system and allied software's. **The service provider shall have minimum of 5 manpower in their establishment.** Documentary Proof shall be given about the personnel in the form of their resume which reflects minimum of one year of experience doing similar kind of job, **holding at least diploma level certificate.**

The personnel shall be given clearance before commencing the work in Iter-India (II) lab according to scope of work. **Iter -India has the rights to impose penalty clause in view of lack of quality and absenteeism by service provider.**

5) The optical metrology systems and all the accessories including software's, computer to analyze the measurement is in the scope of vendor. **Valid calibration certificate should be available for the instruments and equipment's by the certified bodies.** These documents are mandatory before the commencement of work.

6) The requirements needed for the work/service under the scope of service provider from Iter-India, IPR, should be communicated one week prior to commencement of work.

7) Place of work (doing measurement) will be in ITER DNB lab in Bhat campus of Institute of plasma research (IPR), Ahmedabad.

8) Vendor should provide the rate of doing this service, the duration and resources required will be required for work. If there is a requirement to access the nature of work, vendor may visit the ITER-India, IPR campus to understand the nature of work (with prior intimation in writing), when particular requirement of work.

9) The measurement methodology followed shall be discussed first and only after agreement with ITER-India, the activity shall be carried out.

10) The contract will be for two year with minimum order quantity as 30 days. **The contractor has to mention Per day rate for the measuring activity and MOQ (30 days) price as per the price bid format.**

11) The payment will be made **on quarterly basis on the invoice generated on each quarter based on service days.**

D) Software required .

The vendor should have the software to be integrated with laser tracker hardware with mobile workstation. **The vendor should have valid license for software. software should able to work with various file generated from Catia for CAD comparison.** They have to submit the final measurement as per the requirement given by II engineer in pdf and .xls format (Both digital and printed format). Various cloud points and shapes, if required needs to be transferred in digital format.

E) Document deliverables:

The dimensional inspection report shall be submitted (both digital and printed Format) for all the above features, to the satisfaction of ITER-India. Timeline for the report submission should be within 1 week from the completion of service. The dimensional report shall be submitted for each job requisition raised.

F) Facilities provided by Iter India.

Iter - India will be providing necessary 3 phase power supply for the working of laser tracker station and work station. The lab is air-conditioned area with ambient temperature from 24 deg to 30 deg. Minimal accessibility will be provided for the accessibility to the components. It is responsibility of contractor to look into the accessibility and to do a proper measurement planning aligning with safety requirements. It is responsibility of the contractor to access the safety requirements and provide safety peripherals like harness, helmet for the working personnel.

G) Penalty clause.

Quality of inspection - If there is discrepancy is/are found in quality of inspection/inspected items or analysis report for particular work as per the requirement of order, the penalty equivalent to amount of 2 days shall be impose.

Non attendance - In case of Non attendance after intimation for inspection call, Purchaser has the right to impose penalty equivalent to amount of 2 day rate of the contract on billed amount for the applicable quarters.

Bidder Signature		
Name of the signatory & Title	Name	Title
Bidder's Official seal		
Place & Date	Place	DD-MM-YYYY

Annexure-A1 : Related Drawings and cad model for related work to be carried out.

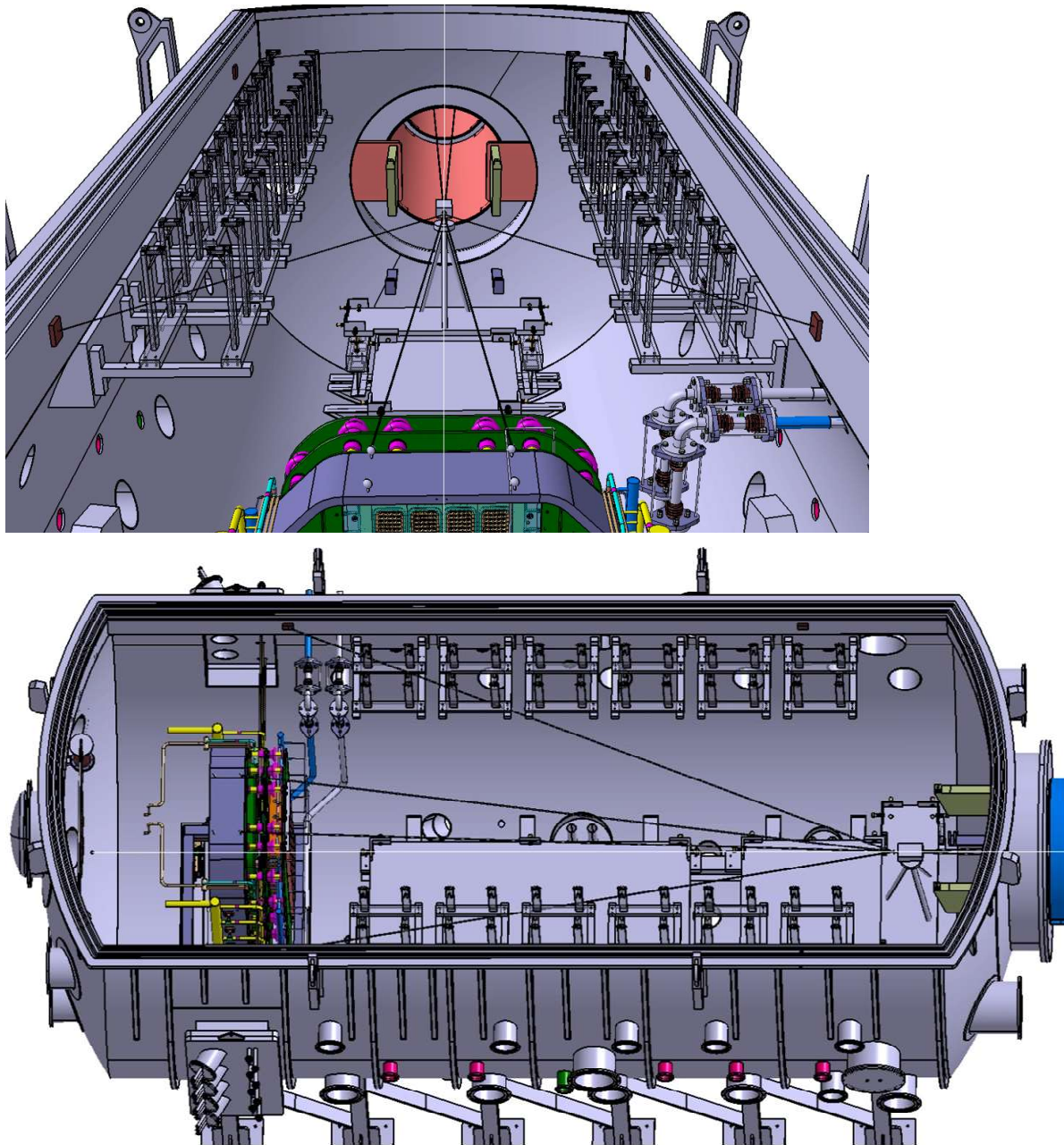


Figure 2:typical cad view of alignment envisaged for beam source with INTF vessel.

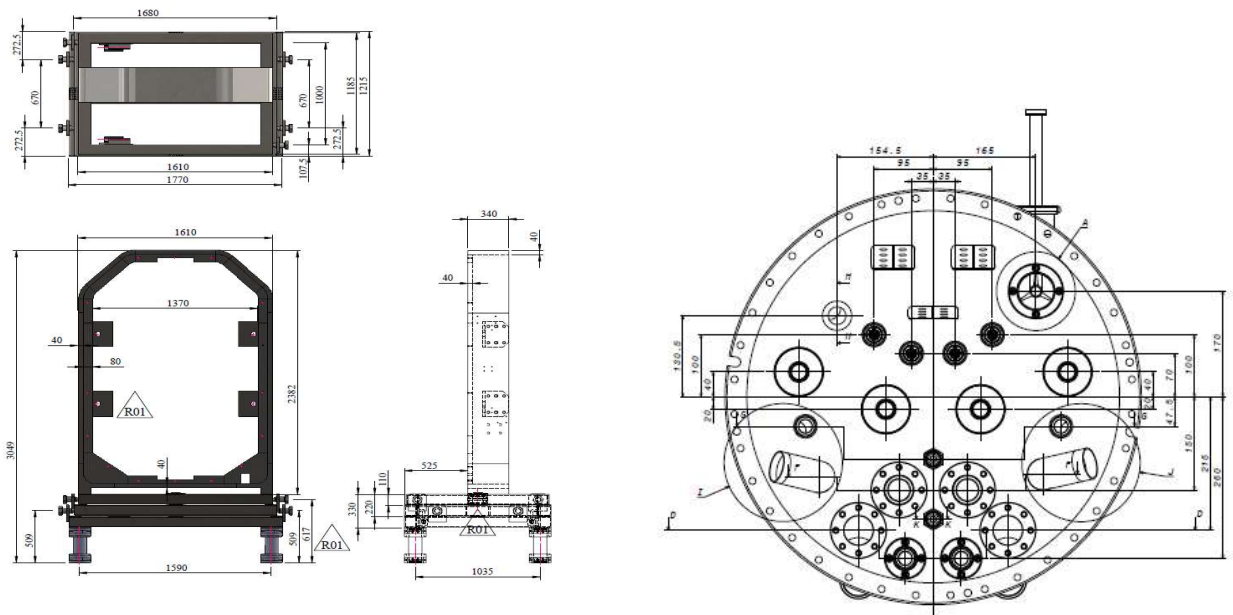


Figure 3: Model of beam source support structure which have to be compared with CAD model.

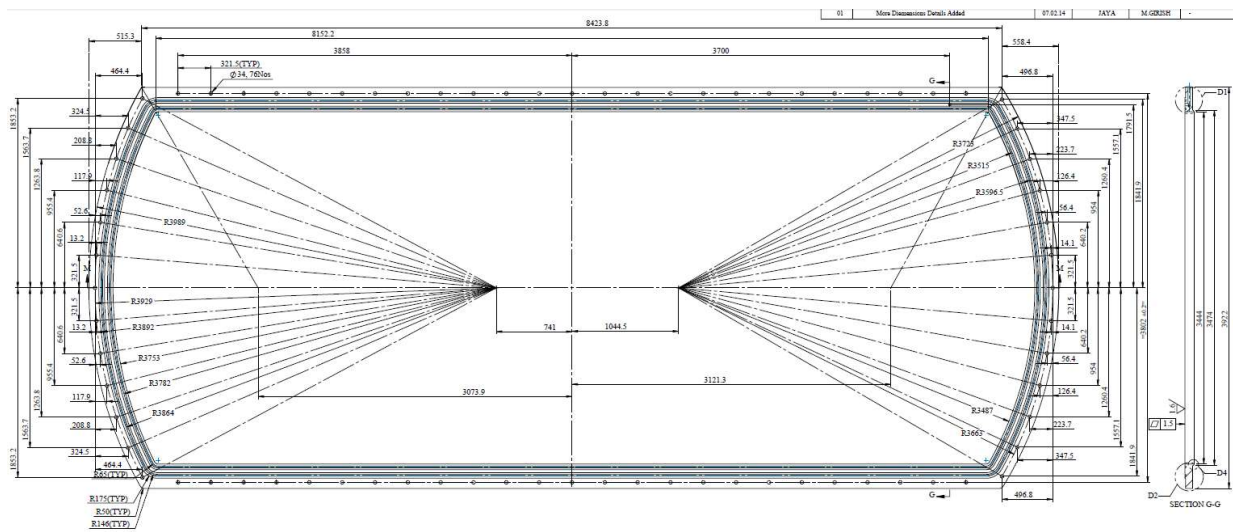


Figure 4: typical model of vessel flange for which in situ flatness to be measured.

Annexure-A2

2) Technical compliance sheet

Sl no	Parameters	Value	Remarks by vendor	Additional remarks
1	Laser tracker measurement envelope.	10m*10m*10m	Yes/No	
2	Type- station with retroreflectors or equivalent	Please mention the typical laser tracker instrument /model to be used for measurement.	Yes/No	
3	Able to measure < 50 microns in the Sl1 mentioned envelope.	50 microns	Yes/No	
4	Should be able to all geometric measurements with allied software for CAD comparison and measure GD&T aspects compactable with Catia models.		Yes/No	
5	Number of manpower.	>5	Yes/No	
6	Equipment should be calibrated	Calibration certificate should be less than of one year for the instrument.	Yes/No	
7	Previous experiences		Yes/No	
8	Quality Certification of organization.		Yes/No	

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