



An ISO 9001
Company

Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirappalli – 620014, TAMIL NADU, INDIA

MATERIALS MANAGEMENT / CAPITAL EQUIPMENT

ENQUIRY NOTICE INVITING TENDER

Phone: +91 431 257 7653
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Email : skaruna@bheltry.co.in
Web : www.bhel.com

TWO PART BID

Tender to be submitted in Two Parts

Enquiry
Number:

2731100012

Enquiry
Date:

29.09.2011

Due date for submission of
quotation :

29.10.2011

You are requested to quote the Enquiry number date and due date in all your correspondences. This is only a request for quotation and not an order.

Please note that under any circumstances both delayed offer and late offers will not be considered. Hence vendors are requested to ensure that the offer is reaching physically our office before 14.00 Hrs on the date of tender opening


Item No.	Item Description	Quantity
10	Supply of Optical Equipment Set consisting of (JIG Transit, Alignment Telescope and Tilt Level) as per the technical Specification, & commercial conditions applicable (to be downloaded from web site www.bhel.com or http://tenders.gov.in)	1 Set.

Important Points to be taken care during the submission of offer:-

1. Check list to be filled and enclosed along with the offer failing which, the offer will not be considered for evaluation.
2. Guarantee for the Items to be 18 months from the date of supply or 12 months from the date of commissioning.

BHEL's General guidelines /instructions including bank guarantee formats and list of consortium banks, commercial terms checklist can be downloaded from BHEL web site <http://www.bhel.com> or from the government tender website <http://tenders.gov.in> (public sector units > Bharat Heavy Electricals Limited page) Tender Enquiry reference "2731100012"

Tenders should reach us before 14:00 hours on the due date
Tenders will be opened at 14:30 hours on the due date
Tenders would be opened in presence of the tenderers who have submitted their offers and who may like to be present

Yours faithfully,
For **BHARAT HEAVY ELECTRICALS LIMITED**

Manager / MM / Capital Equipment

SPECIFICATIONS FOR OPTICAL EQUIPMENT SET (JIG TRANSIT, ALIGNMENT TELESCOPE AND TILT LEVEL)

BHE: BARC:OPT :Rev 01

01/09/2011

Optical equipments, viz, optical jig transit square, optical alignment telescope and optical tilt level along with various accessories and attachments are required for precision heavy engineering products manufacture and inspection. The detailed specifications required for the procurement of these items are given below.

SPECIFICATION FOR OPTICAL JIG TRANSIT SQUARE WITH METRIC MICROMETER

PROPOSED APPLICATIONS AT BHEL :

- Optical alignment of components – in the line of sight – in vertical planes.
- Measurement of axis / marking / plan shift in vertical planes..
- Measurement of out of straightness .
- Auto collimation and auto reflection for perpendicular planes establishment.
- Establishment of optically vertical planes and measurement.
- Establishment of perpendicular planes and perpendicular axes using 2 equipments along with accessories.
- Expected distance coverage for alignment = up to 25 metres.
- Cross fixture alignment and verification for continuous optical work.

REQUIRED QUANTITY : 2 NUMBERS.

BHEL'S SPECIFICATION REQUIREMENT	VENDOR'S CONFIRMATION	DEVIATION, IF ANY
1. A telescopic line of sight is to be established using the instrument. The instrument shall establish a vertical plane during its one sweep along the azimuth axis. Also, it shall be rotatable about azimuth axis in horizontal plane. Locking at desired stage is required.		
2. Focus : 50mm to infinity		
3. The equipment should have micrometer with least count of measurement 0.02mm or better in order to measure out of alignment in HORIZONTAL plane. Plane variation with respect to established azimuth line of site / vertical plane is to be measured. Range of measurement = minimum 1 mm. Both spirit level and coincidence level are to be available for convenient, accurate, precise and		

BHEL'S SPECIFICATION REQUIREMENT	VENDOR'S CONFIRMATION	DEVIATION, IF ANY
quick setting and levelling. The coincidence level should have a 360-degree rotating turret to view the magnified bubble image from any position.		
4. Measurement accuracy – 3 arc seconds or better – supplier to mention distance wise accuracies achievable.		
5. Jig transit should have combined traditional main telescope with a fixed-focus cross telescope mounted in the horizontal axis of the instrument. This second telescope is to be fixed at infinity focus to make collimation or auto collimation with another optical instrument or a mirror quick and easy. This requirement is for making transit perpendicular to an optical reference line quickly. By simply shifting from the main eyepiece to the cross-axis eyepiece, an operator should be in a position to establish or verify his position relative to the basic reference line in seconds.		
6. Ball bearing mounts should permit accurate sweeping of the telescope in both horizontal and vertical planes.		
<p>7. The following are the desirable requirements for main telescope.</p> <p>Length: 14" minimum (with micrometer)</p> <p>Magnification: 20X minimum at near distance and 30X minimum at very far distance.</p> <p>Field of view: 1 degree minimum</p> <p>Image: Straight /Erect.</p> <p>Optics: Low reflective.</p> <p>Effective aperture: 1.25" minimum</p>		
<p>8. The following are the desirable requirements for cross telescope.</p> <p>Length: 11" minimum.</p>		

BHEL'S SPECIFICATION REQUIREMENT	VENDOR'S CONFIRMATION	DEVIATION, IF ANY
Magnification: 45X minimum Field of view: 1 degree minimum Image: Erect / Straight. Optics: Low reflective. Effective aperture: 1.25" minimum		
9. The equipment shall be supplied with CALIBRATION certificate traceable to National / International standards.		
10. Operation and maintenance manuals for the equipment and accessories shall be given in both hard and soft form along with the offer. IN ENGLISH.		
11. The supplier is requested to provide the list of customers using their equipment.		
12. Supplier is required to call the customer – BHEL - for the pre-despatch inspection at his works. Also, the supplier has to commission the equipment and accessories at our works. Supplier has to provide a training for 3 days for our staff. Supplier has to give performance guarantee of 12 months for the commissioned item from the date of commissioning.		

**SPECIFICATION FOR OPTICAL ALIGNMENT TELESCOPE
WITH METRIC MICROMETERS**

PROPOSED APPLICATIONS AT BHEL :

- Optical alignment of components – number of components – in the line of sight – in horizontal and vertical planes.
- Measurement of positional accuracy of drilled holes.
- Measurement of out of straightness of deep bores / holes.
- Auto collimation and auto reflection.
- Establishment of optically horizontal and vertical planes using optical squares and set tallyvels.
- Establishment of perpendicular planes and perpendicular axes using 2 equipments along with accessories.
- Expected distance coverage for alignment = up to 25 metres.

REQUIRED QUANTITY : 1 NUMBER.

BHEL'S SPECIFICATION REQUIREMENT	VENDOR'S CONFIRMATION	DEVIATION, IF ANY
1. A telescopic line of sight is to be established using the instrument.		
2. Focus : 0 to Infinity		
3. The equipment should have X and Y micrometers with least count of measurement 0.02mm or better in order to measure out of alignment in two mutually perpendicular directions with respect to set line of sight. Range of measurement = minimum 1 mm or more in both X and Y axes.		
4. Measurement accuracy – 3 arc seconds or better – supplier to mention distance wise accuracies achievable along with the offer.		
5. It should be a metric version of the alignment telescope. It is to be designed specifically to make measurements of deviations from a reference line, and secondarily, to provide an extremely straight optical reference line for any number of alignment applications. It should have two built-in optical micrometers which measure at right angles to each other. They should measure lateral shifts perpendicularly from the line of sight, in both the horizontal and vertical directions. The equipment should have a built-in auto reflection target on its objective lens and should be supplied with auto collimation illumination unit .		
6. The details of the desirable requirements are : Magnification: Should vary automatically from 4X minimum at		

BHEL'S SPECIFICATION REQUIREMENT	VENDOR'S CONFIRMATION	DEVIATION, IF ANY
<p>zero focus to 46X minimum at infinity.</p> <p>Straightness of line of sight: + 0.002" (0 to 50'); + 0.004" (50' to 100'); 0.5 arc seconds beyond 100'</p> <p>Field of view: 0.5 degree minimum at infinity & 40 mm minimum at zero focus.</p> <p>Effective aperture: 40 mm minimum.</p> <p>Eyepiece: Fully erect / straight image on. diopter scale. Right-angle eyepiece and complete projection accessories should be available.</p> <p>Optical Micrometer: Accuracy shall be ± 0.005 mm over full range.</p> <p>Focusing knob: Drum shall be graduated to show focusing distance in meters.</p> <p>Barrel diameter shall meet A.I.A. specifications.</p>		
<p>7. The equipment shall be supplied with CALIBRATION certificate traceable to National / International standards.</p>		
<p>8. Operation and maintenance manuals for the telescope and accessories shall be given in both hard and soft form along with the offer. IN ENGLISH.</p>		
<p>9. The supplier is requested to provide the list of customers using their equipment.</p>		
<p>10. Supplier is required to call the customer – BHEL - for the pre-despatch inspection at his works. Also, the supplier has to commission the equipment and accessories at our works. Supplier has to provide a training for 3 days for our staff. Supplier has to give performance guarantee of 12 months for the commissioned item from the date of commissioning.</p>		

SPECIFICATION FOR OPTICAL TILTING LEVEL WITH METRIC MICROMETER

PROPOSED APPLICATIONS AT BHEL :

- Optical alignment of components – number of components – in the line of sight – in horizontal planes.
- Measurement of positional accuracy of drilled holes.
- Measurement of out of straightness of deep bores / holes.
- Auto collimation and auto reflection. Axes marking on huge jobs.
- Establishment of optically horizontal planes..
- Establishment of HORIZONTAL planes and measurement in vertical direction with respect to established plane using 2/3 equipments along with accessories.
- Expected distance coverage for alignment = up to 25 metres.
- Cross fixture alignment and verification for continuous optical work.

REQUIRED QUANTITY : 2 NUMBERS.

BHEL'S SPECIFICATION REQUIREMENT	VENDOR'S CONFIRMATION	DEVIATION, IF ANY
1. A telescopic line of sight is to be established using the instrument. The instrument shall establish an horizontal plane during its one rotation/revolution about azimuth axis. Locking or fixing at desired stage is required.		
2. Focus :50mm to infinity.		
3. The equipment should have micrometer with least count of measurement 0.02mm or better in order to measure out of alignment in vertical plane. Level variation with respect to established line of sight / horizontal plane is to be measured. Range of measurement = minimum 1 mm. Both spirit level and coincidence level are to be available for convenient, precise, accurate and quick setting and levelling. The coincidence level should have a 360-degree rotating turret to view the magnified bubble image from any position.		
4. Measurement accuracy – 3 arc seconds or better – supplier to mention distance wise accuracies achievable.		
5. Tilting level should have combined precision with rugged reliability to execute the most demanding leveling jobs. The telescope should have adjustments to maintain the		

BHEL'S SPECIFICATION REQUIREMENT	VENDOR'S CONFIRMATION	DEVIATION, IF ANY
<p>line of sight straight throughout a focusing range. This straightness is to be maintained at $\pm 0.025\text{mm}$ from 50 mm to 5200mm and one arc second from 5200mm to infinity. The main telescope tube should have a removable section to facilitate conversion for auto collimation, auto projection, or installation of a right angle eyepiece. The optical micrometer should produce repeatable readings with a resolution of 0.02mm.</p>		
<p>6. The details of the desirable requirements are : Telescope Length: 40 cm minimum with micrometer installed. Magnification: 20X minimum at 50mm and 30X minimum at infinity. Field of View: 1 degree minimum. Image: Erect / straight. Optics: Low reflective type. Effective aperture: 1.25" minimum.</p>		
<p>7. The equipment shall be supplied with CALIBRATION certificate traceable to National / International standards.</p>		
<p>8. Operation and maintenance manuals for the telescope and accessories shall be given in both hard and soft form along with the offer. IN ENGLISH.</p>		
<p>9. The supplier is requested to provide the list of customers using their equipment.</p>		
<p>10. Supplier is required to call the customer – BHEL - for the pre-despatch inspection at his works. Also, the supplier has to commission the equipment and accessories at our works. Supplier has to provide a training for 3 days for our staff. Supplier has to give performance guarantee of 12 months for the commissioned item from the date of commissioning.</p>		

LIST OF ACCESSORIES AND ATTACHMENTS TO BE SUPPLIED ALONG WITH THESE EQUIPMENTS:

The optical equipments shall be supplied with the accessories and attachments (required for various optical inspection activities) as listed below for use with the equipments, viz jig transit, alignment telescope and tilt level (for their various applications). Applications include use of these equipments in horizontal condition / vertical condition / slightly tilted condition to operate by 'buck in' etc.

ACCESSORIES AND ATTACHMENTS FOR OPTICAL INSTRUMENTS	REQUIRED QUANTITY
1. Right Angle Swivel Eyepiece adopter	1
2. Combination Right Angle Eyepiece	1
3. Coordinate optical Micrometer Metric with adopter	1
4. Right Angle Eyepiece for Alignment Telescope	1
5. Angle Reading Attachment	2
6. Mounting Base for Alignment Telescope	2
7. Tilt Mounting Base for Alignment Telescope	1
8. Stride Level for optical instruments.	1
9. Cross Level for optical instruments	1
10. Spherical Mount for Alignment Telescope	2
11. Candle Stick tool for spherical mount	2
12. Spring Clamp for spherical mount	2
13. Optical Tooling Scale 500 mm	1
14. Optical Tooling Scale 1000 mm	1
15. Magnetic Scale Holder for 500mm scale	1
16. Vee Block Kit for scale holder	2
17. Scale Level for 500mm scale	1
18. Scale Level for 1000mm scale	1
19. Light Kit AC/DC Power	1
20. Light Kit DC power	1
21. Tilt Collimator	1
22. Multi Target Collimator	1
23. Bore Target Kit (Large) Dia-6" to 150"	2
24. Magnetic back Mirror Dia 4inch	1
25. Glass Align. Target Dia 2 ¼ inch mounted	4
26. Glass Align. Target Dia 2 ¼ inch Unmounted	4
27. Glass Align. Target Dia 1 1/2 inch Unmounted	4
28. Glass displacement Target dia 1 ½" mounted	4
29. Mirrored Target dia 2 ¼ inch unmounted	2
30. Glass Auto reflection Target	1
31. Plastic Auto reflection Target	1
32. Adhesive Target 2 ½" sq. (Pack of 10)	2
33. Adhesive Target 1 ¾" sq. (Pack of 100)	1
34. Open Target dia 2¼ inch	2
35. Plastic Target dia 2 ½ inch	4
36. Plastic Target dia 1 ½ inch	4

ACCESSORIES AND ATTACHMENTS FOR OPTICAL INSTRUMENTS	REQUIRED QUANTITY
37. Alignment telescope base for azimuth and elevation adjustments	2
38. 20" -26" Short and heavy stand for optical equipments.	1
39. Heavy Duty Stand (tall) height: 68" to 113"	1
40. 14" - 17" Short portable stand	1
41. Magnetic scale holder for 1000mm optical scale	1
42. Bull's eye target made of Aluminium	2
43. Plexi glass bull's eye target 21/4" Size	2
44. Plexi glass bull's eye target 11/2" Size	4
45. Dovetail adaptor for optical equipments	2
46. 21/2 inch mirror magnetic for auto collimation	1
47. Precision lift adapter	2
48. 250mm Optical scale	2
49. Co-ordinate adjuster	2
50. Optical metric micrometer	2
51. Cross axis vial for alignment telescope	2
52. Hollow adaptor for optical equipments	1
53. Lateral slide adaptor for optical equipments	1

QUALIFYING CRITERIA FOR THE SUPPLY OF OPTICAL JIG TRANSIT SQUARE WITH METRIC MICROMETER AND ACCESSORIES

The BIDDER / VENDOR has to necessarily provide the following details, for making an assessment of the firm's capability and competency:

[The BIDDER is expected to give complete details against each clause in the table given below and wherever necessary an additional sheet may be attached (giving clear reference number) to cover the required details]

S. No.	PARTICULARS	VENDOR's RESPONSE
1.0	Number of Years of Experience of the BIDDER/ VENDOR in the field of supplying OPTICAL TELESCOPES, TILT LEVELS AND JIG TRANSITS for Industrial measurement and Inspection activities.	
2.0	Number of such equipments supplied & commissioned till date. Model numbers, ranges and the least counts of supplied equipments shall be mentioned.	
3.0	Year of launch of the Model quoted against this Enquiry?	
4.0	Are there any other models launched after the quoted Models? Otherwise, indicate the likely year in which the next model is	

S. No.	PARTICULARS	VENDOR's RESPONSE
	likely to be launched?	
5.0	Number of each type of optical equipments supplied & commissioned till date in the quoted Models.	
6.0	Number of each type of optical equipments supplied & commissioned till date for the different applications / customers.	
7.0	Details of Design Set-Up / Codes and Standards used. Facilities for calibration and international traceability details for calibration.	
8.0	Details on International standards followed in verification of equipment. Details regarding periodic recalibration and sources / tie-ups for such recalibrations including the proposed cost of calibration and lead time for calibration.	
9.0	Details on functional / performance Testing of the Equipment and all accessories quoted. Gathered data from users on the equipment performance. Sample references (minimum 2) from renowned customers shall be added for similar models.	
10.0	Details on manufacturing and testing aspects of equipment.	
11.0	Any Additional Data to supplement the manufacturing capability of the BIDDER.	

The BIDDER / VENDOR has to compulsorily meet the following requirements to get qualified for submitting an offer for the impact tester.

S. No.	REQUIREMENTS	VENDOR's COMMENTS
12.0	The BIDDER / VENDOR shall have a minimum of FIVE Years of Continuous Experience in the Supply of these types of optical equipments. Kindly indicate the actual experience.	
13.0	The BIDDER / VENDOR shall have supplied at least 3 numbers of optical equipments of these 3 types in the last 5 years . Kindly confirm and indicate the number of equipments (quoted model) sold in 2006/11 in the world.	
14.0	The bidding FIRM should have 'in-house' or 'self-owned' or 'tied-up' facility for MANUFACTURE and TESTING of OPTICAL EQUIPMENTS. In case of authorised agents of original equipment suppliers, the certificate of authorization copy shall be enclosed with the offer.	

S. No.	REQUIREMENTS	VENDOR's COMMENTS
15.0	Reference List of Customers and Performance Certificates from CUSTOMERS (minimum 2 Customers) with full contact details of CONTACT PERSON.	
16.0	The BIDDER / VENDOR should have sound financial position and should furnish Finance Statements (Summary of P & L Statement and Balance Sheet) for the immediate past 3 years.	
17.0	In case of short listing by the Purchaser in the process of vendor assessment, the BIDDER / VENDOR has to co-ordinate for the visit of Assessing Team, to the WORKS of the BIDDER / VENDOR with a notice period of 10 Days.	

The BIDDER / VENDOR has to comply with the following, for accepting the Technical Offer for scrutiny by the Purchaser:

S.No.	REQUIREMENTS	VENDOR's COMPLIANCE
18.0	The BIDDER / VENDOR shall submit the offer in TWO PARTS - Technical (in line with the BHEL's Technical Specifications) & Commercial and Price Bid.	
19.0	The Technical Offer shall contain a comparative statement of Technical Specifications given by BHEL and the Offer Details submitted by the Bidder, against each clause.	
20.0	A just 'CONFIRMED' or 'COMPLIES' or 'YES' or 'NO-DEVIATION' or similar words in the technical comparative statement may lead to disqualification of the Offer.	
21.0	The Technical Offer shall be supported by Product Catalogue, drawings, manuals and Data Sheets in ORIGINAL (soft +hard copies).	
22.0	The Commercial Offer shall contain the Scope of Supply and the Un-Priced Part of the Price-Bid for confirmation.	