



MNIT/Tender-Str./ARSP/2011/001

Date: 16/11/2011

TENDER DOCUMENT

COMPUTER CONTROLLED SHAKING RIG OF 600 kgf

- 1) Cost of the Tender document: Rs. 1000.00
- 2) Last date and time for sale of Tender document: 07/12/2011 (up to 14:00 hrs)
- 3) Last date and time for receipt of bid: 07/12/2011 (up to 14:30 hrs.)
- 4) Time and date of opening of technical bids : 07/12 /2011 (15:00 hrs.)

Assistant Registrar (Stores and Purchase)



CONTENTS OF THE TENDER DOCUMENT

S.N.	DESCRIPTION
1	Notice Inviting Tender
2	General Terms & Conditions
3	Technical Specification
4	Check List



MNIT/Tender-Str./ARSP/2011/001

Date: 16/11/2011

NOTICE INVITING TENDER

Tenders are invited through Two Bid systems (Part-I :Technical Commercial Bid and Part-II : Financial Bid i.e. Price Bid, from eligible bidders for, **COMPUTER CONTROLLED SHAKING RIG OF 600 Kgf**, to be supplied installed and commissioned at MNIT, Jaipur as per the Technical specification. The detailed tender document is available on MNIT website: <http://mnit.ac.in/>. The cost of the Tender document has to be enclosed in the form of a Demand Draft in favour of “Registrar MNIT Jaipur”. The Supplier must submit the Techno-commercial and Financial Bid in two separately sealed envelopes; the Financial Bid will be applicable only after the clearance of Techno-commercial Bid. The duly filled Tender document in sealed envelope must be submitted to “**Registrar, Malaviya National Institute of Technology Jaipur, JLN Marg, Jaipur-302017**”.

Note:

1. Cost of the Tender document: Rs. 1000.00
2. Sale of tender document: 16.11.2011 to 07.12.2011 (between 1400 hrs to 1700 hrs on all working days from the Office of Assistant Registrar, Stores and Purchase, MNIT Jaipur)
3. Last date and time for submission of Tender : 07.12.2011 (up to 14: 00 hrs)
4. Date & time of Tender opening (Only Techno-commercial Bid) : 07.12.2011 (15:00 hrs)
5. Earnest Money Deposit (EMD) to be submitted along with the Techno-commercial Bid: Rs.50,000.00 (Fifty Thousand)
6. Price Bid: Date and Time will be intimated at later date.
7. Offer by Fax/e-mail will summarily be ignored.



2. GENERAL TERMS & CONDITIONS

2.1 Pre-Qualifying conditions:

- i. The bidder should have manufactured, supplied and installed minimum 600 Kgf force rating Vibration Test System in any National Institute of Technology (NIT)/Indian Institute of Technology/IISc, & the same must have been successfully working for last 3 years and at-least one system should have supplied in NABL Accredited Lab in India. Installation report and Performance certificate to this effect have to be provided in evidence for qualification of bids for further evaluation, and be marked as **Annexure-P1**
- ii. The firm must be financially sound to execute the work order and must have an annual turnover of minimum Rs. 05 crores continuously for last three financial years. A certificate to this effect must be attached, and be marked as **Annexure-P2**.
- iii. The firm should be registered with Income Tax and Sales Tax Departments (Registration Numbers should be clearly mentioned and valid documentary evidence be attached, and same should be marked as **Annexure-P3**).

2.2 Two Bid system:

The bid must be submitted in two parts comprising Part-I: Technical Commercial Bid & Part-II: Financial Bid (i.e. Price Bid). The Part-I (Techno-commercial) bid should contain the EMD, detailed technical specifications as per the Tender. The Part-II (Financial Bid) should contain the price offered. Both the parts should be properly marked and enclosed in two separate sealed envelopes for their proper identification. The envelopes superscribed TECHNO-COMMERCIAL BID and FINANCIAL BID should again be sealed in a third bigger envelope super-scribing , “ BID FOR COMPUTER CONTROLLED SHAKING RIG OF 600 Kgf”. The Part-I (Techno-commercial bid) will be opened on the date of tender opening and the Part-II (Financial Bid) after evaluation of Part-I. The Part-II of only those bidders shall be opened who are found technically qualified.

2.3 Bid Security, that is, Earnest Money Deposit (EMD):



The EMD of Rs.50,000/- in the form of Demand draft from any scheduled bank drawn in favour of **Registrar, MNIT Jaipur**, must accompany with Part-I (Techno-Commercial Bid). The EMD shall be refunded to unsuccessful bidders, after finalization of the tender. The EMD shall be forfeited if any bidder withdraw his offer before finalization of the tender or fails to submit work order acceptance within 15 days from the date of work order.

2.4 Performance Security:

To ensure due performance of the contract, Performance Security of 10% of the total Purchase Order Value (POV) shall have to be furnished by the successful Supplier; this can be in the form of Demand Draft or Fixed Deposit receipt from any scheduled bank. The Performance Security shall remain valid for a period of sixty days beyond the date of completion of all contractual obligations of the supplier including warranty obligations.

2.5 Other Conditions:

- i) The offers submitted by downloading from the Institute website (<http://mnit.ac.in/>) shall be considered valid only when accompanied by a demand draft for Rs.1000.00 drawn in favour of “Registrar, MNIT Jaipur” payable at jaipur towards the cost of tender documents indicated in the NIT. The draft towards EMD should be enclosed with the Part-I i.e, Techno-commercial bid of tender document. In case of non- submission of tender fee and EMD as detailed above, the tender shall be treated as invalid.
- ii) All the pages of bids including the documents submitted therein must be duly signed and stamped, failing which the offer shall be liable for rejection.
- iii) The Institute reserves the right to cancel the tender without assigning any reason at any stage of the tender process.
- iv) The Institute also reserves the right to alter/modify any or all of the conditions of this tender.
- v) The details of Technical Specification must be clearly mentioned, use of general terms as, “as per specification of tender document”, will make the bid liable for rejection.
- vi) Any deviation in Technical Specification may be clearly mentioned in the Technical Bid (i.e. Part-I).



- vii) The Price quoted must clearly mention, Basic Price, Taxes/Levies, Packaging, Installation Charges etc., and if it is free of cost the same must also be stated. The use of vague terms, such as, as per actual shall not be used.
- viii) The Institute takes no responsibility for delay or non receipt of Tender Document sent by post and also reserves the right to accept; or reject any or all the tenders in part or full without assigning any reason thereof.
- ix) The rates quoted must be inclusive of all charges e.g. packing, forwarding taxes, railway freight, transit insurance and delivery.
- x) Rates of imported goods must be quoted **excluding Custom duty** as the Institute is exempted from payment of custom duty. The rates of indigenous equipments may be quoted without **Excise Duty** as the Institute is exempted from payment of Excise Duty.
- x) Detailed specifications and "make" of each item should be mandatorily and clearly mentioned by the manufacturer, supported by the illustrated pamphlets wherever possible. Quotations without specifying the make and other particulars may be rejected.
- xi) The accessories included in the equipment should also be clearly mentioned.
- xii) The rates quoted must have the validity of at least for three months from the last date of receipt of quotations.**
- xiii) The Institute is not bound to accept the lowest tender and may reject any tender or any part of the tender giving justification for such an action.
- xiv) The Institute has the right to call a pre bid conference/meeting of all eligible bidders, to acquaint them about the nature/scope of the contracted items. The bidders must provide their contact details for this purpose specifically.
- xv) The bidders may call for any clarification about the bid, however, such clarification shall be at least a week before the bid closing date; the Institute reserves the right to respond to such clarification.



- xvi) The bidder shall examine all instructions, terms & conditions and specification, failure to furnish all information in due format will be at bidders risk, and may result in rejection of the bid.
- xvii) The call of tenders does not bind the Institute to place the order. The bids submitted in response to the invitation may be rejected without assigning any reason. The bidder must be a manufacturer or authorized dealer.
- xviii) The Institute, at its discretion, may extend the last date of submission of tender and opening of the tender.
- xix) The final acceptance of a tender lies with the Institute, and there is no binding on the Institute to accept the lowest bid.
- xx) Any effort by the bidder to canvas/influence the Institute may lead to summary rejection of the bid, without giving any further reason.
- xxi) The document/literature/leaflet submitted with the bid shall be the property of the Institute without any cost.
- xxii) The tender would be regarded as turned down, if no award of contract has been obtained till the expiry of tender validity, and no separate communication will be made in this regard.

2.6 Payment Conditions:

- i) Payment will be made Indian Rupees only, through e- transaction (electronically) or else through account payee cheque. To facilitate electronic payment the supplier must give following information: (a) Title of the Account, (b) Bank name and Branch (c) Account number and (d) IFSC code. The supplier must also attach one cancelled cheque of the firm to facilitate the e-transfer of funds.
- ii) The payment will be made under following two stages:
 - a) Payment after the receipt of goods and found in order by the designated authority of the Institute i.e. Project Coordinator/ HOD: 50 % of the POV



- b) On satisfactory Installation testing and commissioning: Balance payment.
- iii) The defective, substandard and contrary to the specification items/ instruments supplied have to be replaced by the supplier at its risk and cost within a period of seven days.
- iv) In case of indigenous instrument/ equipment quoted by Indian firms/ representatives/ Indian agents of foreign supplier / manufacturers in rupee terms, the payment will be made in Indian rupees directly after supply and satisfactory commissioning/installation of equipment/instruments.

2.7 Penalty in case of Delay in delivery of Items/Equipments

If the supplier fails to deliver the goods within the period specified in the Purchase Order (PO), the Institute on receipt of request from the supplier may, at its discretion, allow an extension in time. The Institute will be at liberty to impose penalty in case of delay in delivery of items as stipulated as under.

- i) Delay up to one month 1% of the item cost.
- ii) Delay exceeding one month but exceeding two month: 2% of the item cost.
- iii) Delay exceeding two month but exceeding three month: 5% of the item cost.
- iv) Delay exceeding three month: 10% of the item cost.

2.8 Failure of delivery

In case of failure to supply the goods within the prescribed time and in accordance with the specifications give in the tender, the Institute shall be free to cancel the Purchase Order, and will be at liberty to procure the instruments/ equipment from the firm at the cost of the renderer firm, without prejudice its general right to effect recovery from the supplier.



3. TECHNICAL SPECIFICATION

3.1 SCOPE OF WORK:

A computer controlled shaking rig of 600 kgf, sine force rated vibration system, to be supplied, installed, commissioned and tested in the Department of Structural Engineering, MNIT Jaipur, as per the detailed technical specification as detailed out below. It has following five main components, (1) Electro Dynamic Shaker with Air cooling Blower (2) Power Amplifier with Safety and Logic unit; (3) Vibration Controller with Front-end DSP hardware and software (4) Piezoelectric Accelerometer and (5) Set of Manuals, Interconnection cables and Mains input cables.

3.2 DETAILED TECHNICAL SPECIFICATION

3.2.1 ELECTRODYNAMIC SHAKER (Item Code STDL-01)	
Nominal Force	<ul style="list-style-type: none">➤ 600 Kgf (peak Sine)➤ 420 Kgf (rms Random)
Armature Top Diameter	≥180 mm, to have stainless steel inserts for fixing the fixture
Frequency Range of operation	1 Hz to 3500 Hz
First major Armature resonance	To be less than 3200 Hz
Armature Positioning	Automatically operated with optical sensor and electronic control
Maximum Velocity	>1.6 m/sec (for all modes)
Maximum Displacement	≥38 mm
Axial Acceleration	≥75 g
Cross axial acceleration	≤5% of main axis
Stray magnetic field	To be less than 25 gauss at 150 mm above armature
Body suspension	By using air spring to be kept below 3 Hz
Payload capacity	≥150 Kg with internal pneumatic support
Trunion Assembly	Required for 90 ⁰ rotation of shaker
Interlocks for safety	The shaker should be protected for safety and should have interlocks for electromagnetic field-failure, armature- failure, over-load, over-temperature, insufficient air-flow, excess displacement on any side.
Shaker Cooling	A Centrifugal type Air Blower system operable from Amplifier/ Drive console by a proper rated starter and phase preventer system. The cooling system with 10 feet length air carrying hose pipe and an



	acoustic silencer at the air-delivery-end for less than 70 dB acoustic noise.
3.2.2 POWER AMPLIFIER (Item Code STDL-02)	
Amplifier Type	Digital, Class 'D', Switching
Power Output	6 KVA from Power Module which can be stacked in the rack console of Amplifier
Frequency Range	DC to 4000 Hz
Power Efficiency	>95%
Input Impedance	10 K Ohm
Harmonic distortion	Better than 1%
Signal to Noise ratio	≥70 dB
Switching Frequency	≥150 KHz
Modulation Range	DC to 10 KHz
Input Sensitivity	10 Vrms
Drive method	Direct coupled to Shaker without any matching transformer
Drive and Signal Cable	≥ 5 meters from Shaker
Power loss protection	Smooth shut down in case of power shut down.
Remote Operation	The Power Amplifier should be operable through a PC based GUI using RS232 or RS485 interface.
Amplifier Control	Amplifier operation should also be controlled from PC for operations like reset, output gain, Online and offline, blower ON-OFF
Data Logging	Voltage, Current, Temperature, operating time, interlocks should be logged on to the computer hard disk for records and analysis
Signal Selection	Digitally interlocked signal selection should be provided for internal source, sine, random to eliminate possibility of any sudden jerk on vibrator table to safeguard the test article and fixture
3.2.3 Vibration Controller (Item Code STDL-03)	
Type	The Vibration controller should have USB connectivity to PC for PC Controlled operation.
Input/ Output Channels	4 input/ 2 output channels (Servo & COLA) using 24-bit ADC & DAC for high accuracy.
Signal to Noise Ratio	>105 dB



Input & Output signal	20 Volt peak-peak
Harmonic Distortion	≤ 98 dB full scale
Accelerometer	Charge/ ICP type
Software packages	Sine, Resonance Search Track & Dwell and Random
(i) Sine	
Frequency range	1 Hz to 5 KHz
Controlled Dynamic range	95 dB or better
Loop time	10 msec or better
Sweep rate	Programmable (Linear and Logarithmic).
Control strategy	Single/ multiple in average/ maximal/ minimal mode
Graphical test profile	Reference spectrum, Control spectrum, measured spectrum, Drive spectrum
Test parameters	Acceleration, Velocity, Displacement, Frequency, Test duration etc.
Documentation	The software should have facility to export test results and graph in to MS Office during and after the test. The user should be able to store test results for future analysis.
Safety features	Signal loss, control and abort limits, event driven operation etc.
(ii) Random	
Reference profile	Unlimited breakpoints for PSD values (g^2/Hz) to create desired test profile.
Frequency range	Upto 4000 Hz
Resolution	Upto 400 spectral lines or better
Randomization strategy	Based on Gaussian distribution
Controlled Dynamic range	95 dB or better
Loop time	200 mS @ 2000 Hz/400 lines (typical)
Degree of Freedom	2 to 1000 DOF
Sigma clipping	Programmable for 1.8 to 8
Test Level scheduling	Software should have provision to initiate the test at lower level which should be programmable in terms of (- dB level)
Soft start/shut down	Should be programmable by the user maximum upto 30 seconds.
Control strategy	Single/ multiple in average/ maximal/ minimal mode
Graphical test profile	Reference spectrum, Control spectrum, measured spectrum, Drive spectrum



Test parameters	Grms level, PSD level, Frequency, Test duration etc.
Documentation	The software should have facility to export test results and graph in to MS Office during and after the test. The user should be able to store test results for future analysis.
Safety features	Signal loss, control and abort limits, event driven operation etc.
3.2.4 Piezo-electric Accelerometer (Item Code STDL-04)	
Type	Charge-type sensor (pC/g output)
Nominal Sensitivity	10 to 30 pC/`g`
Frequency Range	3 Hz – 6 KHz
End Connector	10-32 microdot-BNC type on both ends
Connecting Cable	5 m length, lo-noise connecting cable

Notes:

1. Input Power: 3 Phase 415VAC $\pm 10\%$, 50 Hz
2. Operating temperature and relative humidity: Up to 50⁰C and 60% to 80%

3.3. SPECIAL CONDITIONS:

- i) The system must be compatible with the existing slip Table (Size: 600 mm X 600 mm) in the Department of Structural Engineering, MNIT Jaipur.
- ii) The related accessories necessary for carrying out test and measurement, and the software accessories are to be supplied by the firm alongwith the equipment free of cost.
- iii) The supplier/ manufacturer must install commission and test the equipment in MNIT, Jaipur premises free of cost.
- iv) Guarantee period for the equipment should be 3 year minimum from the date of commissioning.
- v) The supplier/ manufacturer must ensure to integrate with existing Horizontal Slip Table in MNIT, Jaipur premises free of cost. All test parameters will be demonstrated to MNIT Officials to complete the installation.
- vi) The bidder will have to demonstrate all the features of the vibration system as mentioned in the tender to the Principal Investigator/ HOD or a technical evaluation team constituted for this purpose.
- vii) Spare parts like fuses, Interlocking and operation cards, Electronic-relays and components, controller components and other vulnerable parts for three years consumption should also be quoted.
- viii) The backup copies of the programmed software should be provided.
- ix) At least two of our officials should be trained by the supplier/ manufacturer for operation and maintenance of the equipment free of cost at least for a period of three days.



MALAVIYA NATIONAL INSTITUTE OF TECHNOLOGY JAIPUR

J.L.N. Marg, Jaipur-302017, Tel.: 0141-71335, 2713312, Fax: 0141-2529078

- x) The equipment should be supplied with two copies of technical manual/ literature/ circuit diagram in English version.
- xi) The equipment should be supplied on door delivery basis free of cost at MNIT, Jaipur premises.
- xii) The supplier/ manufacturer should confirm that the quoted equipment confirms completely to the tender specification and if not, should indicate the deviation clearly.



MALAVIYA NATIONAL INSTITUTE OF TECHNOLOGY JAIPUR

J.L.N. Marg, Jaipur-302017, Tel.: 0141-71335, 2713312, Fax: 0141-2529078

4. CHECK LIST

S.N.	Description	Remarks
i	I have read all the Terms & Conditions of the Tender and acquainted myself with them completely.	
ii	Both the parts of the Bid, namely, Techno-Commercial Bid (Part-I) and Financial Bid (Part-II) have been sealed in two separate envelopes.	
iii	All the proofs/testimonials in support of eligibility have been attached along with Part-I of the Bid; and all such documents have been duly authenticated.	
iv	The Demand Draft in support of Bid Security (i.e. EMD) of each item has been attached with Part-I of the Bid.	
v	The Part-II of the Bid contains only the Price Quoted in Indian Rupee. The price quoted includes- all Taxes, Levies, Shipping/Transportation, Transit Insurance, Delivery to the Institute, Packaging, Installation and Commissioning charges.	
vi	The items offered are in conformity with the Technical Specification.	
vii	I have mentioned any deviation from Technical Specification, if any.	
viii	I have enclosed the Demand Draft of Rs. 1000/- toward Tender fee.	

Place:.....

Date:

Name and Authorized Signature