



अमृतं तु विद्या

Bharatiya Vidya Bhavan's Sardar Patel College of Engineering

(Government-Aided Autonomous Institute)

MUNSHI NAGAR, ANDHERI (WEST), MUMBAI - 400 058.

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INVITATION LETTER

Package Code: TEQIP-III/MH/bspc/30

Current Date: 09-May-2019

Package Name: Servo Hydraulic Shake Table

Method: Shopping Goods

To,

[REDACTED]
[REDACTED]
[REDACTED]

Sub: INVITATION LETTER FOR Servo Hydraulic Shake Table

Dear Sir,

1. You are invited to submit your most competitive quotation for the following goods with item wise detailed specifications given at Annexure I,

Sr. No	Item Name	Quantity	Place of Delivery	Installation Requirement (if any)
1	Servo Hydraulic Shake Table	1	Sardar Patel College of Engineering	YES

2. Government of India has received a credit from the International Development Association (IDA) towards the cost of the **Technical Education Quality Improvement Programme [TEQIP]-Phase III** Project and intends to apply part of the proceeds of this credit to eligible payments under the contract for which this invitation for quotations is issued.

3. **Quotation**

- 3.1 The contract shall be for the full quantity as described above.
- 3.2 Corrections, if any, shall be made by crossing out, initialling, dating and re writing.
- 3.3 All duties and other levies payable by the supplier under the contract shall be included in the unit Price.
- 3.4 Applicable taxes shall be quoted separately for all items.
- 3.5 The prices quoted by the bidder shall be fixed for the duration of the contract and shall not be subject to adjustment on any account.

- 3.6 The Prices should be quoted in Indian Rupees only.
4. Each bidder shall submit only one quotation.
5. Quotation shall remain valid for a period not less than 30days after the last date of quotation submission.
6. Evaluation of Quotations: The Purchaser will evaluate and compare the quotations determined to be Substantially responsive i.e. which
- 6.1 are properly signed; and
- 6.2 Confirm to the terms and conditions, and specifications.
7. The Quotations would be evaluated for all items together.
8. Award of contract The Purchaser will award the contract to the bidder whose quotation has been determined to be substantially responsive and who has offered the lowest evaluated quotation price.
- 8.1 Notwithstanding the above, the Purchaser reserves the right to accept or reject any quotations and to cancel the bidding process and reject all quotations at any time prior to the award of Contract.
- 8.2 The bidder whose bid is accepted will be notified of the award of contract by the Purchaser prior to expiration of the quotation validity period. The terms of the accepted offer shall be Incorporated in the purchase order.
9. Payment shall be made in Indian Rupees as follows:
- Satisfactory Delivery & Installation - 90% of total cost**
Satisfactory Acceptance - 10% of total cost
10. Liquidated Damages will be applied as per the below:
Liquidated Damages Per Day Min % : N/A
Liquidated Damages Max % : N/A
11. All supplied items are under warranty of 12 months from the date of successful acceptance of items and AMC/Others is .
12. You are requested to provide your offer latest by **05:30** hours on **22-May-2019**.
13. Detailed specifications of the items are at Annexure I.
14. Training Clause (if any) **Yes**
15. Testing/Installation Clause (if any) **YES**
16. Performance Security shall be applicable: **0%**

17. Information brochures/ Product catalogue, if any must be accompanied with the quotation clearly indicating the model quoted for.
18. Sealed quotation to be submitted/ delivered at the address mentioned below, **BVB Sardar Patel College of Engineering J P Nagar, Munshi Nagar Andheri (West) MUMBAI, Bhavan's Campus, Munshi Nagar, Andheri (W), Mumbai 400058**
19. We look forward to receiving your quotation and thank you for your interest in this project.

(Authorized Signatory)
Name & Designation



TEQIP III Co-ordinator
BVB'S Sardar Patel College of Engineering
Mumbai - 400 058.



Procurement Coordinator TEQIP III
Sardar Patel College of Engineering
Munshi Nagar, Versova Road,
Andheri (West), Mumbai - 400 058.

Annexure I

Sr. No	Item Name	Specifications
1	Servo Hydraulic Shake Table	Table: ☐ Shake table rated for 1000 kg payload capacity ☐ Table dimension: 1.0 meters x 1.0 meters ☐ Table should be designed for horizontal acceleration of 1g max ☐ Table must be designed for operating Peak velocity: 1m/s, Sustain velocity: 0.6m/s ☐ It should be designed for high stiffness with minimum value of 100kN/mm and operating frequencies up to 50Hz. ☐ Table shall have facility to mount actuator with rigid connection to table and chassis. ☐ Horizontal movement of the table shall be provided with linear guide ways(Preferred make Hiwin) having low coefficient of friction with multiple bearing blocks capable to withstand the payload of 1000kg. ☐ Reaction frame has to be grouted on seismic mass for vibration isolation ☐ Mounting holes provision -M12 STD thread on the table at 100mm pitch should be there for installing test components on the table ☐ The vendor should design the table with natural frequency at mode 1 more than 80Hz. 2. Servo hydraulic actuator: ☐ Suitable load capacity (25KN or above) servo actuator of fatigue rated double acting, double ended equal area type ☐ Actuators should be provided with all required clamping devices to connect to the reaction table ☐ $\pm 150\text{mm}$ (total 300mm) displacement with built in digital stroke measurement with resolution of 0.01mm or better and accuracy of $\pm 0.5\%$ or better, preferred make Newall. ☐ High side load carrying capabilities with hydraulic cushions at both ends ☐ Should able to achieve test frequencies up to 50Hz ☐ Actuator should be designed to deliver peak velocity of 1m/s of 6 cycles and sustain velocity of 0.3m/s. ☐ Suitable flow rated (minimum 21LPM) direct drive servo valves for contamination insensitivity operation, preferred make Rexroth Bosch to conducting seismic study tests at frequencies from 0.01 to 50 Hz 3. Servo Hydraulic Power pack:

		☐ Hydraulic power; maximum operating power of 210 bar, flow of 21 LPM(minimum) and the power pack operating on three phase AC supply. ☐ Variable frequency drive pump -servo control type. ☐ Gear pump make of BOSCH or equivalent. ☐ Relief valve to electronically adjustable regulator (0-210bar) ☐ Safety features with necessary sensor to trip at Over Temperature, over pressure, Low Oil Level, Filter Clogging, Power Failure, Motor over load etc., ☐ Operation power pack remote as well as local. ☐ Return line 10micron with electric interlocks. ☐ Frequency response of the system shall be demonstrated before dispatch. ☐ Cooling unit for power pack; minimum 15TR including mounting stand, water pump assembly and 30 feet water hose. ☐ Accumulators 10L capacity charged with nitrogen gas at 100bar to store pressurized oil to meet the instantaneous demand of dynamic actuator. It should include safety discharge valves. ☐ Set of Hydraulic hoses between powerpack and actuator manifold (each) 10m long should be provided i.e. for pressure line, return line and drain line. Minimum criteria operating pressure 200Bar and above, burst pressure 350Bar and above. ☐ Required MOBIL DTE 25 or 46 for first filling should be supply by vendor. 4. Accelerometer: 02 No's ☐ Max acceleration 2 g ☐ Compatible with offered controls and shake table system ☐ D-Type Connector ☐ With required Lap cables. 5. Control Electronics: ☐ Digital Signal Processor (DSP) based closed loop servo controller with capability to control shake table ☐ 24 bit Control Electronics with 32 bit Data Acquisition are minimum requirements ☐ Data sampling rates of 6kHz or better ☐ Data loop update frequency 6 kHz or better ☐ Digital Input and Output lines min. 8 Nos. ☐ Minimum provision for 2 Analog Output channels to deliver $\pm$ 10VDC ☐ Minimum provision for 2 Analog Input channels to accept $\pm$ 10VDC ☐ Enclosure with wheels to house controller and PC should be
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provided

- ☐ Provision for 4 DIOs and two numbers of analogue outputs to transfer data to other data acquisition systems
- ☐ Auto Calibration and Digital Auto Zero capability
- ☐ Easy Downloadable Firmware for Future Up gradations, without making any changes in the controller
- ☐ Controller should be able to conduct seismic simulation tests as mentioned above
- ☐ Electrical cables for one displacement transducer, two accelerometers, one servo valve, each 5m long should be provided as minimum requirement.
- ☐ One emergency push button with 10m long cable should be provided.

6. System Software:

- ☐ Windows 7.0 based Software, facilitating basic operation of the system
- ☐ Software should be capable of conducting tuning of all control channels with PID gain control adjustment
- ☐ Should be capable of acquiring data from all channels
- ☐ Servo Loop Update and Simultaneous data sampling rate of min 6 KHz

- ☐ Automatic and Manual Settable Data Acquisition rates for different test applications
- ☐ Electronic Safety Limit (user settable) Interlocks on all control channels to protect Transducers and system from over loading and over travelling
- ☐ Safety interlock like, Over Temp of Oil, over and Under Pressure of oil, Emergency Stop, Filter Clog Indication, Power Failure Indication, Motor over load to be monitored by the software and should be displayed accordingly

- ☐ Should be capable of applying cyclic loads in different waveforms

like Harmonic ,Sine Sweep, Sine on Sine, Random

- ☐ Advanced graphics to view all feedback and set points on single

and multiple graphs

7. Seismic Software:

- ☐ The application software should be able to Simulate the following waveforms:

1. Harmonic (Sine, Ramp, and Pulse)
2. Sine Sweep (Increasing, Decreasing)

3. Sine on Sine

4. Random (Natural: Recorded, User-defined)

- ☐ Automatic Adaptive control to be provided, if required

		stroke movement is not achieved ☐ Amplitude and mean input in terms of displacement ☐ Frequency input in terms of 'Hz' ☐ On-line cycle count computation ☐ Resonance search ☐ Plot of Amplitude and Phase spectrum ☐ Test termination conditions include limits on number of cycles to stop ☐ Online graphics include choices of plots amongst actuators feedback Acceleration feedback and all Log Channels selected ☐ If Data Recording option is selected data will be logged for every specified interval in terms of cycles ☐ Test Data from Log channels can be exported to MS-Excel as spreadsheet
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FORMAT FOR QUOTATION SUBMISSION
(In letterhead of the supplier with seal)

Date: _____

To: _____

Sl. No.	Description of goods \ (with full Specifications)	Qty.	Unit	Quoted Unit rate in Rs. (Including Ex-Factory price, excise duty, packing and forwarding, transportation, insurance, other local costs incidental to delivery and warranty/ guaranty commitments)	Total Price (A)	Sales tax and other taxes payable	
						In %	In figures (B)
Total Cost							

We agree to supply the above goods in accordance with the technical specifications for a total contract price of Rs. _____ (Rupees _____ amount in words) within the period specified in the Invitation for Quotations. Gross Total Cost (A+B): Rs. _____ (Amount in figures)

We confirm that the normal commercial warranty/ guarantee of _____ months shall apply to the offered items and we also confirm to agree with terms and conditions as mentioned in the Invitation Letter.

We hereby certify that we have taken steps to ensure that no person acting for us or on our behalf will engage in bribery.

Signature of Supplier

Name: _____

Address: _____

Contact No. _____