



Government College of Engineering

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INVITATION FOR QUOTATION

TEQIP-II/2017/MH2G07/Shopping/269

31-Jan-2017

To,
GECA Web Site

Sub: Invitation for Quotations for supply of Goods

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	Brief Description	Quantity	Delivery Period(In days)	Place of Delivery	Installation Requirement (if any)
1	Computer Controlled Automatic Servo Controlled Universal Testing Machine (Capacity-100kN)	1	15	Government College of Engineering, Aurangabad	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 II** 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, initialing, 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 55 days 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:
Delivery and Installation - 90% of total cost
Satisfactory Acceptance - 10% of total cost
10. All supplied items are under warranty of **12** months from the date of successful acceptance of items.
11. You are requested to provide your offer latest by **16:00** hours on **14-Feb-2017** .
12. Detailed specifications of the items are at Annexure I.
13. Training Clause (if any) **3 Days Training to Staff members and faculty members**
14. Testing/Installation Clause (if any) **As per Satisfaction of Concern Faculty Member**
15. Information brochures/ Product catalogue, if any must be accompanied with the quotation clearly indicating the model quoted for.
16. Sealed quotation to be submitted/ delivered at the address mentioned below,
The Principal Government College Of Engineering, Railway Station Road, Osmanpura Aurangabad.
Aurangabad Maharashtra, India 431005 Quotation should be subscribed as Quotation for TEQIP Dept.
Invitation No. **TEQIP-II/2017/MH2G07/Shopping/269 Dt.31-Jan-2017 Due Date 14.02.2017**
17. We look forward to receiving your quotation and thank you for your interest in this project.


(Authorized Signatory)
Name & Designation

Annexure I

Computer Controlled Automatic Servo Controlled Universal Testing Machine (Capacity-100kN) (Load and Displacement/Stroke Controlled) consisting of

1. Loading Frame
2. Hydraulic Power Pack with necessary cooling system
3. PC based Control system and Control Software

ACCESSORIES

1. Hydraulic-Pneumatic operated Grips with complete hydraulic & Pneumatic controls for Wide width Tensile Strength Test as per ASTM D4595 & ISO 10319 for Geo-textile (Capacity- 20kN)
2. CBR Puncture Test Attachment as per ISO 12236

DETAILED SPECIFICATIONS

A. COMPUTER CONTROLLED AUTOMATIC SERVO HYDRAULIC UNIVERSAL TESTING MACHINE (CAPACITY-100KN)

Automatic Servo controlled Universal Testing Machine is capable of conducting compression and tension tests on wide variety of material and machines are state of the art machines based on the principal of *CLOSE LOOP*. The system can be loaded in load, and displacement control basis. The system accuracy is better than $\pm 1\%$.

The system has an arrangement for automatic pacing system, which is achieved by the combination of advance hydraulic and electronic system. Control signal from the electronic system is passed on to the servo valve through **P.I.D. Controller** which in turns control the flow to the hydraulic ram thereby keeping the pace rate within permissible limit of the pre programmed value.

NOTE-The machine is supplied with windows based user friendly for Data acquisition and analysis. It has the features for on line graphical presentation in addition to the numerical test results.

Salient Features:-

- ↓ Based on **SERVO HYDRAULIC CLOSED LOOP FEEDBACK** control mechanism
- ↓ Fully Computer Controlled operation with User friendly Software
- ↓ Suitable to conduct Tensile/ Compression/ Bend/ Flexure test on different materials such as Metals, Rubbers, Cables, Fabrics, Tapes, Thread, Plastic, Geo-synthetic (Geotextile, Geomembrane, Geogrid, Geonet etc.) etc. conforming to testing procedure laid down in ASTM, BS, EN, ISO standards (Note- Grips for holding different samples to be procured separately)
- ↓ Controlling on **Load or Displacement** control basis
- ↓ High stiffness two column loading frame with movable crosshead (manually)
- ↓ High speed Data Acquisition card with 100 kHz sampling rate
- ↓ Programmable Rate of Loading (Pace Rate) in all control modes, for loading/hold/unloading applications
- ↓ Facility to change the parameter like rate of load or rate of displacement during testing
- ↓ Facility for setup and execution of monotonic and user defined test procedures
- ↓ Windows based user friendly Application Software for controlling and data acquisition
- ↓ Start, Stop, Hold operation through computer
- ↓ Inching/Release operation to set Sample
- ↓ Auto release facility after specimen failure

- ✦ Facility in the software to study **Post failure behaviors** of specimens
- ✦ Online Plotting of Graphs (Load v/s Displacement, Load v/s Time, Displacement v/s Time) with display of data
- ✦ Advance Statistical Analysis
- ✦ Safety Limits for Over Load, over travel etc.

The system has following main components-

1. Loading Frame
2. Hydraulic Power Pack
3. PC Based Control System and Application Software.

1. LOADING FRAME

Load Frame is free standing units with two columns. It has a fixed bottom bed and a Cross head that can be moved manually along the two columns. Manual Locking is provided to fix the crosshead at desired position. Bottom bed of the frame has T-slots to place the various fixtures. Hydraulic Actuator with mounted servo valve along with integral displacement sensor is fixed on the crosshead. A strain gage Load cell is coaxially fitted on the actuator. Spacers are provided to be fixed at the lower ends of the load cell for adjusting the height of the ram to suit the specimen.

Technical Specifications-

Capacity	:100kN
Horizontal clearance	:600mm
Vertical clearance	:800mm(With piston of actuator retracted inside)
Bottom bed length	:1000mm
Travel of the Ram	:100mm (+/-50mm)

2. HYDRAULIC POWER PACK

Hydraulic power supplies are compact in design and are suitable for the supply of required flow and pressure for the movement of the actuator. It has an oil tank of adequate capacity, vane type pump powered by a three phase motor. All the electrical controls including the temperature controller are fixed on one side of the tank. It includes all the accessories like pressure line filter, return line filter, oil level, relief valve, pressure gauge, digital temperature indicator and air cooled heat exchanger. Anti vibration mountings are provided as standard along with the HPS.

Technical specifications:-

Flow of the pump	:	5LPM
Motor capacity	:	2.5H.P.
Capacity of the tank	:	50litres
Max. Operating pressure:		210 bars

System will be supplied with necessary cable and fittings for the operation of the machine. Total machine operates on 220VAC, 50Hz, Single phase or 440VAC 3 phase supply.

3. PC BASED CONTROL SYSTEM AND APPLICATION SOFTWARE

Control system provides the digital servo control, Ramp generation for the machine actuator, data acquisition, etc. for the continuous operation of the system.

(a) Signal Conditioning & Controlling Unit

Servo controller basically consists of signal conditioning unit and controlling unit. Signal conditioning unit receives the output signal from the various transducers (Load cell/Pressure Transducers, LVDT etc.) and amplifies and process that signal as per the requirement and transfer it to computer through connecting cables where it is accepted by the data acquisition system. The output from the signal conditioning unit for each transducers ranges from 0-5V.

Control is on **Load/ Stress or Displacement/ Strain** basis. It consists of dedicated servo-controller card that gives the desired processed signal through the P.I.D controller to the servo valve to operate in selected control mode. It also sends the signal to computer and accepts the command from the software to operate in desired manner. The parameters like rate of loading, safety limits for load can initially be programmed through the software. The facility is given to program the rate of loading from 0.01kN/sec-10kN/sec in Load control and 0.01mm/sec-1mm/sec in displacement control.

Specifications of Controller

- Auto PID operation with Closed loop update rate of 10 kHz to control Pace rate automatically as programmed in the software
- No. of control channels- 2 (**Load/Displacement Control**)
- High speed Data Acquisition card with 100 kHz sampling rate
- Computerized control operation to Start, Stop & Hold the test system
- **Resolution- Load** : 0.01kN
- System accuracy- Load accuracy : $< \pm 0.5\%$ of indicated value of load
Displacement accuracy: $\pm 0.5\%$ of indicated value of displacement
- **Displacement Measurement-** Through Displacement Transducer
- **Displacement Range-** 100mm
- **Displacement Resolution-** 0.01mm
- **Rate of Loading- Load control** – 0.01kN/sec. to 10kN/sec
Displacement control- 0.01mm/sec to 1mm/sec
- **Supply Input-** 220-240 VAC, 50 Hz

(b) Computer for Controlling and Data acquisition

System is provided with dedicated computer of following or better configuration at the time of supply with built in data acquisition card.

Computer (Make- HP/Lenovo)

Intel i5 processor, 320 GB HDD, 4GB RAM, DVD R/W drive, Key Board, Optical Mouse, 6USB Ports, 19" LCD Monitor, Deskjet Colored Printer (Make- HP), UPS (Make- APC)

Application Software

Application software is the integral part of the system for precise operation, Data Acquisition, storage, processing, analysis and reporting.

Test Software- Salient Features

- Windows based user friendly software with easy graphical user interface
- Programmable rate of loading/displacement in load and displacement control i.e. kN/sec. or mm/sec and sample parameters (Shape, Dimension, weight etc.)
- Suitable to conduct Wide width tensile, Grab, Trapezoidal tear strength, CBR Push through, Puncture test on Geosynthetic material
- Also suitable for Simple Tension, Compression & Flexural test in static mode
- Facility to create Test Profiles for different samples
- Facility to change the rate of loading or rate of displacement during the test
- Auto Fast lift operation to adjust the gap
- Auto zeroing/ Independent Tarring of each channel
- Auto release of machine after sample failure
- Computer/Software programmable Safety Limits for Load and Displacement
- Facility to hold load at desired point and restart the loading during the test.

- Online display of numerical values of Load, Stress and Displacement simultaneously with peak hold facility
- Online plotting of data of Load v/s Time, Displacement v/s time, Load v/s Displacement, Stress v/s Strain graphs
- Real time clock for tracking date, time and runs
- Facility to save test data along with order information about the specimen such as age, specimen no., size, dimensions etc. in user defined file/directory
- Facility to avoid unauthorized use by creating users password

Analysis Software

- Plotting of following graphs-
 - a) Load v/s Time
 - b) Displacement v/s Time
 - c) Load v/s Displacement
 - d) Stress v/s Strain
 - e) Stress v/s Time
- Calculation of various results (Young's modulus, Maximum strain, Compressive Strength, Tensile Strength, Flexural Strength, etc.)
- Facility to plot the data for a selected run
- Comparative analysis using multi graphs
- Statistical analysis of the test results
- Batch Summary Report Generation
- Detailed Summary Report Generation
- Facility to print Test Reports

ACCESSORIES

	Grips/Fixtures for Geotextile testing	Set
1	Hydraulic-Pneumatic operated Grips with complete hydraulic & Pneumatic controls for Wide width Tensile Strength Test as per ASTM D4595 & ISO 10319 for Geo-textile (Capacity-20kN)	1
2	CBR Puncture Test Attachment as per ISO 12236	1