



National Institute of Technology, Mizoram, CHALTLANG, AIZAWL,
MIZORAM-796012

INVITATION LETTER

Package Code: TEQIP-III/2019/nitz/82
Package Name: NITMZ/CIVIL3

Current Date: 20-Dec-2019
Method: Shopping Goods

To,
Vendors's Name & Address

Sub: Invitation for Supply of Geotechnical Laboratory for Department of Civil Engineering, NIT Mizoram

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	Geotechnical Laboratory Equipments	(Refer Annexure I)	National Institute of Technology Mizoram, Chaltlang, Aizawl, Mizoram, 796012	YES REQUIRED

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 **45** 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:

Payment Description	Expected Delivery Period (in Days)	Payment Percentage
Satisfactory Delivery & Installation	30	100

10. Liquidated Damages will be applied as per the below:
Liquidated Damages Per Day Min %: 0.005
Liquidated Damages Max %: 10
11. All supplied items are under warranty of **12** months from the date of successful acceptance of items and AMC/Others is **1 YEAR MINIMUM**.
12. You are requested to provide your offer latest by **16:00** hours on **27-Jan-2020**.
13. Detailed specifications of the items are at **Annexure I**.
14. Training Clause (if any) **YES Required**
15. Testing/Installation Clause (if any) **Yes**
16. Performance Security shall be applicable: **5%**
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,
**The Registrar, National Institute of Technology, Mizoram, CHALTLANG,
AIZAWL, MIZORAM-796012**

19. We look forward to receiving your quotation and thank you for your interest in this project.



(Dr. Lalthanchami Sailo)

Registrar

NIT Mizoram
कुलसचिव/Registrar
रा. प्रौ. सं. मिजोरम
NIT Mizoram

Annexure I

TECHNICAL SPECIFICATION FOR GEOTECHNICAL ENGINEERING LABORATORY

Sl. No.	Item Description	Qty.
01.	Pycnometer Confirming to IS:2720 (Part-III) Technical Specification: Suitable for determination of specific gravity of sand and fine gravel. The apparatus consists of a glass jar of 1 kg capacity, complete with brass cone, rubber seal and screwed cap. Accessories: Brass cone and rubber seals (pack of 10)	10

02.	Standard Test Sieves 1. 200 mm dia, Spun Brass Frames Size 4.75 mm, 2.36 mm, 2.00 mm, 1.18 mm, 600 micron, 425 micron, 300 micron, 150 micron, 75 micron & lid & pan 2. 300 mm dia, Spun Brass Frames Size 9.50 mm, 4.75 mm, 2.36 mm, 2.00 mm, 1.18 mm, 600 micron	02 02 02 02 02 02 02 02 02 02 02 02
03.	Density Bottle Confirming to IS:2720 (Part-I) Technical Specification: Density bottle of 100 ml with capillary vent leak-proof stopper	02 15
04.	Wet Sieve Shaker (Motorised) Technical Specification: It should accommodate seven sieves of 150 or 200 mm diameter. The salient features of this sieve shaker are programmable: - a) Frequency b) Amplitude	01

	c) Run time Sieve shaker operates on 220 Volts 50Hz AC supply. It should accommodate four sets of seven sieves each simultaneously for wet sieving. Supplied without sieves, and lid & receiver. Suitable for operation on 220 V, 50 Hz, Single phase supply.	05
05.	Liquid Limit Device (Hand Operated with Counter) Technical Specification: The apparatus should consist of a brass cup, a crank and cam mechanism, mounted on a rubber base of a specified hardness. A brass pin having a knurled end for easy removal holds the brass cup. The height of fall of the cup has adjusted by a horizontal lead screw. Fitted with a drop counter to automatically record number of drops of the cup. Supplied complete with grooving tool (Type 'A', 'B', 'C') and gauging block as per IS:9259, IS:2720 (Part V).	05
06.	Plastic Limit Apparatus Conforming to IS:2720 (Part-V) Technical Specification: The apparatus should consist of: - Glass plate 200 mm x 150 mm x 3 mm thick - Porcelain evaporating dish 120 mm dia - Brass rod 3 mm dia, 100 mm long - Flexible spatula with 80 mm long, 20 mm wide blade - Moisture cans 50 mm dia, 15 Nos.	02
07.	Shrinkage Limit Apparatus Conforming to IS:10077, IS:2720 (Part-VI) Technical Specification: The set should consists of:- 75 mm square prong plate made of 3 mm thick acrylic sheet with three metal prongs 75 mm square plain plate made of 3 mm thick acrylic sheet BRASS shrinkage dish 45 mm in dia, 15 mm deep - Glass cup with ground edge, 50 mm to 55 mm dia, 25 mm deep - Flexible spatula with 80 mm long, 20 mm wide blade - Straight edge Accessories: Purified mercury 250 gm	02
08.	Glass Thermometer 0 - 150°C	05

09.	Electronic Balance Technical Specification: 1. 600 gm capacity with 0.01 gm readability, pan size: 116 mm dia 2. 6 kg. capacity with accuracy 0.5 gm 3. 20 kg capacity with 1 gm readability, pan size: 290 x 210 mm dia	01
10.	Hot Air Oven Size: 3ft x 3ft x 3ft (Internal Dimension) Technical Specification: Inside chamber stainless steel with digital temperature controller and air circulating fan.	02
11.	Spatula 1. 150 mm blade with wooden handle	03
12.	Stop Watch (Digital) 2. 200 mm blade with wooden handle	02
13.	Scoop ½ kg Capacity	10
14.	Rubber Mallet 100 gm	02
15.	Ball Pen Hammer 1 kg	01
16.	Sand Pouring Cylinder (Large) Technical Specification: The apparatus should be suitable for estimation of field density of fine, medium and coarse-grained soils, as per IS:2720 (Part-XXVIII) and consists of :- a) Sand pouring cylinder, 215 mm internal dia, with conical funnel and shutter b) Calibrating container 200 mm inner dia x 250 mm high with 75 mm wide flange c) Metal tray 450 mm square x 50 mm deep with a 200 mm dia hole at the center Accessories: Scraper, Dibber, Glass plate 600 mm square x 10 mm thick.	01

17.	Proctor Compaction Test Confirming to IS:2720 (Part-VII) 1.Compaction Mould Technical Specification: Compaction mould 100 mm internal dia x 127.3 mm height, 1000 ml volume complete with collar and base plate, all made of mild steel, fixing tie rods of mild steel and wing nuts for clamping. 2.Compaction Rammer (Light) Compaction rammer, light, made of mild steel 2.6 kg weight, 50 mm dia compaction face, 310 mm controlled free vertical fall. 3.Compaction Mould Compaction mould 150 mm internal dia x 127.3 mm height, 2250 ml volume, complete with collar and base plate all made of mild steel, fixing tie rods of mild steel with wing nuts for clamping. 4.Compaction Rammer (Heavy) Compaction rammer, heavy, made of mild steel 4.89 kg weight, 50 mm dia compacting face, 450 mm controlled free vertical fall. 04 02 03 02 01
18.	Core Cutter Technical Specification: Field density kit confirming to IS:2720 (Part-XXIX) The kit should consists of:- a) Cylindrical core cutter 100 mm inner dia x 130 mm long with bevelled cutting edge and having wall thickness of 3 mm b) Steel dolley 100 mm inner dia x 25 mm high <i>c). Rammer with steel rod for driving the core cutter</i>
19.	Direct Shear Apparatus (Motorized) Technical Specification: The unit is provided with a turret type gear box to get 12 different constant rates of strain i.e 1.25, 0.625, 0.25, 0.125, 0.05, 0.025, 0.01, 0.005, 0.002, 0.001, 0.0004, and 0.0002 mm/min. and arrangements to carry out residual shear strength tests. Suitable for operation with 220V, 50 Hz, Single phase supply. It Should Comprises:- a) Shear box assembly, 60 mm square, complete with a U-bracket, guide pins and spacing screws, made of brass 01

	b) Gripper assembly consisting of two plain grid plates, two perforated grid plates, one base plate and one loading pad, all made of brass c) Two porous stones, each 6 mm thick, fitting the shear box d) Shear box housing of brass, complete with two ball roller strips e) Loading unit with normal loading of 8 kg/cm² on 60 mm square specimen f) Specimen cutter for a specimen size of 60 mm x 60 mm x 25 mm g) Set of weights to give a normal stress upto 3 kg/cm² through lever, comprising 4 of 0.05 kg/cm², 1 of 0.1 kg/cm², 1 of 0.2 kg/cm², 3 of 0.5 kg/cm² and 1 of 1 kg/cm² Accessories: Proving ring (Integral) capacity 200 kg (2 kN) (Tension/Compression), Dial gauge 0.01 mm x 25 mm range for measuring strain and consolidation (Two gauges are required). It should be supplied complete with proving ring and two numbers of dial gauge of 0.01 x 25 mm.	
20.	Soil Trimmer (Motorised) Technical Specification: For preparation of undisturbed samples varying from 38 to 100 mm dia of different dimensions for triaxial tests. The equipment should be supplied along with 38, 50, 75 and 100 mm dia specimen rings (1 no. of each) and a hardened steel trimming knife. Suitable for 220 V, 50 Hz, Single phase supply.	01
21.	Constant Volume Mould 38 mm Dia x 126 mm Long (Brass) Suitable for 38 mm dia x 76 mm long specimen. The mould should be supplied complete with two 38 mm dia x 25 mm long plugs, split collar and 126 mm long ejecting plunger.	01
22.	Constant Volume Mould 50 mm Dia x 180 mm Long (Brass) Suitable for a 50 mm dia x 100 mm long specimen. The mould should be supplied with two 50 mm dia x 40 mm long end plugs, split collar and a 180 mm long ejecting plunger.	01
23.	Constant Volume Mould 100 mm Dia x 350 mm Long (Brass) Suitable for 100 mm dia x 200 mm long specimen. The mould should be supplied with two 100 mm dia x 75 mm long end plugs, split collar and a 350 mm long ejecting plunger.	01
24.	Laboratory Vane Shear Apparatus (Motorized) Technical Specification: IS:2720(Part-XXX) The apparatus should comprises of the following:-	01

	a) A torque applicator having a base with a hole for holding the specimen mould in position, supporting frame carrying torque head adjustable in height and a graduated drum to measure the deformation of springs b) A set of four springs, one each of 2 kg cm, 4 kg cm, 6 kg cm and 8 kg cm c) A vane of size 12.0 x 24.0 mm long with a vane rod d) Specimen container to take a specimen of 50 mm dia x 75 mm high e) Wooden carrying case for the complete apparatus But torque head is electrically driven by a small reduction geared motor with a strain rate of 6th per minute approximately.	02
25.	Accessories: Stand with fixtures suitable for 38 mm, 50 mm dia tubes. Laboratory Permeability Apparatus Confirming to IS:2720 (Part-XVII), IS: 11209 Technical Specification: It should comprises:- a) Compaction permeameter mould 1000 ml capacity, clamped between top and bottom drainage plates having recess for porous stones. Supplied along with a false bottom plate for use during compaction of soil in the permeameter and extension collar b) Stand pipe panel, with three glass tubes of 6 mm, 10 mm and 20 mm dia, one meter long, supplied with wooden meter scale and 3 meter rubber tubing c) Steel overhead tank, 400 mm diameter x 1000 mm height with one inlet and five outlet valves d) Porous stones set for top and bottom drainage	02
26.	Rapid Moisture Meter Confirming to IS:2720 (Part-II), IS:12175 Technical Specification: Moisture content determination of soil is an important part of listing in the field of agriculture, civil engineering, pharmaceutical industry etc. Test is based on the chemical reaction between calcium carbide and moisture in the soil. The amount of gas formed is directly proportional to the moisture content which is indicated in terms of percentage on the pressure gauge. The units should have following features: a) Fast accurate and reliable b) No electricity required c) Moisture range 0 – 50% d) Standard weight on balance – 6 gm e) Gauge division – 0.50	

27.	Sampling Tube (Brass): 1. 38 mm diameter x 150 mm long 2. 38 mm diameter x 200 mm long 3. 38 mm diameter x 300 mm long	03
28.	Hydrometer Technical Specification: Test should be performed as per IS:2720 (Part-IV). Used for particle size analysis of soil in suspension when it has more than 10% of 75 micron IS sieve passing material. The scale on the hydrometer should be marked from 0.995 to 1.030 in terms of density (g/ml) of suspension at 27°C. 1. Hydrometer Glass Jar Technical Specification: Test should be performed as per IS:2720 (Part-IV). It is single marked 1000 ml glass cylinder without pour out, used to prepare the soil suspension for the determination of density by using hydrometer. Supplied complete with the rubber bung. 2. High Speed Stirrer Technical Specification: Test should be performed as per IS:2720 (Part-IV). The unit comprises of:- a) A mechanical stirring device, fitted with a motor which rotates at vertical shaft having a stirring pedal at a speed of 8000 to 10000 r.p.m. b) Dispersion cup made of brass c) Baffle for use with dispersion cup	03 03 03 02
29.	Automatic Consolidation Testing Apparatus Technical Specification: The complete system should consist of followings- Loading Frame (1 No) It should be a standalone table top, motorized driven by stepper/servo motor corrosion protected frame and is suitable for incremental consolidation test. Suitable arrangement should be provided in the frame to fit external load cell (20kN) and displacement transducer (20mm) for measurement of applied load and deformation respectively.	01

Specification

- a) Max. load capacity - 20 kN
- b) Platen travel - 100 mm
- c) Specimen size - upto 100 mm

Consolidation Cell with Accessories(1 No)

It should be a standard size cell suitable for 60mm diameter x 20mm height specimen and is supplied complete with a fixed ring & porous stone of 60mm diameter and top loading pad. The cell holds the specimen in a confinement ring to a rigid base, with porous disks on each face of the specimen and applies a back pressure to the specimen. The top platen is rigid enough to uniformly distribute the load to the top stone. The bottom of the confinement ring forms a leak proof seal with the rigid base.

Electronic Control and Data Acquisition System with Software(1No)

Control system provides the digital control of load frame for incremental consolidation and data acquisition for the continuous operation of the system.

Signal Conditioning and Control Unit with Transducers

The controller basically consists of signal conditioning and controlling unit and operates on closed loop control principle for incremental loading. Signal conditioning unit provides excitation to all transducers (load cell, displacement transducer, etc.) and receives the output signal from the all transducers, amplifies and process that signal as per the requirement and transfer it to data acquisition card. The readings of axial load, vertical deformation are directly indicated on the front panel display and computer software. The load is displayed in terms of 'kN/kg'; and deformation in terms of 'mm'.

The following transducers with necessary cables and connections are supplied with the system for the accurate measurement of various parameters:

Load Cell - 20kN (0.01kN)

Displacement Transducer: $\pm 10\text{mm}$ (0.001mm)

Control Unit

Control panel is the integral part of the system for precise controlling & data acquisition and analysis.

Salient Features:

- a) Programmable stress levels for incremental consolidation
- b) Sample parameter and data saving interval

- c) Independent taring of each channel
- d) Facility to load and unload the specimen
- e) Facility for inching and release for adjustment of the gap
- f) On-line display of readings of load, normal stress, deformation, time, etc. on front panel display
- g) Facility to save the data after the test

Computer with Application Software

System is provided with computer for data acquisition and analysis of test results-

Computer

Intel Core i5, 500GB HDD, 4GB RAM, DVD R/W Drive, 4USB Ports, Key Board, Optical Mouse, 17" TFT LCD Monitor, LaserJet Printer, UPS 1KVA. (**Note-** Latest available model of the computer and printer should be supplied at the time of delivery)

Application Software

Application software is the integral part of the system for data acquisition and analysis.

Salient Features

- a) Windows based user friendly software provides flexibility to control all three stations independently and simultaneously
- b) On-line data acquisition from signal conditioning unit to computer
- c) Programmable sample parameters with data saving interval
- d) Facility to calibrate each channel
- e) Programmable delay for each channel
- f) Automatic start and stop test conditions
- g) Independent taring of each channel
- h) On-line display of readings of load, normal stress, deformation, time and sample height
- i) Real time plots of $\sqrt{t}$ vs. deformation curves for current stress level as well as for all stress level
- j) Facility to save the data after the test
- k) Analysis module that does all the calculations of consolidation test
- l) Calculates dry density, initial void ratio and moisture content of specimen
- m) Display the following plots (Graphical)
 - a. Sq. root time vs deformation readings and gives the value of t_{90}
 - b. Void ratio vs effective stress and also gives the values in the tabular form
 - c. Calculates c_c , a_v , m_v and c_v values for all stress increments
 - d. Also gives the past consolidation pressure for the soil

FORMAT FOR QUOTATION SUBMISSION
(In letterhead of the supplier with seal)

Date: _____ Quotation no.: _____

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							

Gross Total Cost (A+B): Rs. _____

We agree to supply the above goods in accordance with the technical specifications for a total contract price of Rs. _____
(Amount in figures) (Rupees _____ amount in words) within the period specified in the Invitation for Quotations.
We confirm that the normal commercial warranty/ guaratee 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. _____