

FACULTY OF ENGINEERING
UNIVERSITY OF LUCKNOW
Second Campus, Jankipuram, Lucknow-226031 (U.P.)

TENDER NOTICE

The University of Lucknow, Lucknow invites sealed tender from eligible bidders for supply, testing and commissioning of Equipments for **Civil Engineering Laboratories** of Faculty of Engineering, University of Lucknow, Second Campus, Jankipuram, Lucknow-226031 (U.P.). Separate tenders must be submitted at University of Lucknow for each package of the following Civil Engineering Laboratories:

- | | |
|--------------------------|---|
| Package – FOE/CE/01/2019 | - Concrete Laboratory |
| Package – FOE/CE/02/2019 | - Environmental Engineering Laboratory |
| Package – FOE/CE/03/2019 | - Transportation Engineering Laboratory |
| Package – FOE/CE/04/2019 | - Geotechnical Engineering Laboratory |

For Tender Documents, Tender Cost, EMD, Specifications of equipments and other details please visit our website: www.lkouni.ac.in

REGISTRAR
University of Lucknow

FACULTY OF ENGINEERING
UNIVERSITY OF LUCKNOW
Second Campus, Jankipuram, Lucknow-226031 (U.P.)

TENDER DOCUMENT

Tender No. - 04/FOE/LU/2019

Date:

Sealed and separate tenders in two parts i.e. tender bid-I (Technical) and tender bid-II (Financial) are herewith invited for Supply & Commissioning of **Civil Engineering Laboratory** Equipments at **Faculty of Engineering, University of Lucknow, Second Campus, Jankipuram, Lucknow-226031 (U.P.)**, along with Earnest money (Mentioned with package/unit) in the shape of Demand Draft of Nationalized Bank in favour of Finance Officer, University of Lucknow, Lucknow (U.P.). Both envelopes should be kept in one big envelope. The tender should reach to the undersigned latest by **20.06.2019 at 02.00 PM.**

Terms & Conditions

1. Tenders are being invited for purchase and commissioning of equipments to establish various laboratories. Each Laboratory will be treated as one package/unit. It is obligatory that a firm selected for the establishment of a Laboratory shall supply all the equipments of that laboratory. The firm will also complete the work of installation/mounting and commissioning of these equipments.
2. Bid Evaluation Criteria: Bid shall be evaluated for whole package.
3. Details of equipments/materials are as per bill of quantity attached.
4. Tenders should be submitted either in person or by post in sealed envelopes on which name of package/unit, tender number and date along with name and address of the firm will be written.
5. **TENDER BID-I** (Technical) shall contain (i) Tender cost (non refundable) (ii) Earnest Money (iii) Proof of PAN and GST registration documents (iv) Standing of the firm (v) Major supplies executed in recent past (vi) Authorized dealer certificate from OEM & Commercial terms and conditions.
TENDER BID-II (Financial) shall contain rate schedule only. The rates per unit must be quoted both in figures and words. Any overwriting and/or cutting must be duly signed failing which tenders are likely to be rejected.
6. Tenders received after due date and time will not be considered.
7. EMD of all unsuccessful bidders will be refunded after opening of tenders. However, EMD of successful bidder will be refunded only after successful installation and commissioning of equipments and due verification by concerned authority.
8. DD of Rs. 1000/- plus 18% GST being cost of tender per package has to be attached with Tender form in favour of **Finance Officer, University of Lucknow** payable at Lucknow, which is not refundable in any case.
9. Price quoted should be F.O.R. **Faculty of Engineering, University of Lucknow, Second Campus, Jankipuram, Lucknow-226031 (U.P.)**.
10. Minimum turnover of the firm should be one crore per year (enclosed certificate).

11. The firm should have wide experience of similar work executed during last three years in academic institutions. The proof for the same should be attached.
12. Detailed specifications and make of the equipments/ materials must be given.
13. All available technical literature, catalogues and other data sheets in support of the Specifications and details of the items should be furnished along with the technical bid.
14. All the supplied equipment must have minimum warranty of one year on site from the date of installation and acceptance by Faculty of Engineering, University of Lucknow.
15. Quoted items should be strictly in order of merit with serial number and metric unit otherwise the tenders are liable to be ignored.
16. Conditions regarding validity of tenders, delivery period, payment discount, warrantee and guarantee period, GST, custom duty and insurance etc. should be mentioned clearly. Net prices should be quoted.
17. No sales tax form "CZX" or 'D" etc. for concessional rates shall be provided by the University.
18. Quoted rates should be valid for at least **six months** from the date of opening of tender.
19. Tenders without sample wherever required may not be accepted.
20. In case of imported equipments, commission allowed to agents must be specifically mentioned.
21. The equipments manufactured in China will not be accepted.
22. Free demonstration shall be done in the University premises if required.
23. Insurance during transport shall be done by the suppliers at their own cost.
24. Tenders without mentioned earnest money deposit will not be entertained.
25. Standing of the firm and major supplies carried out in recent past with proof must be attached.
26. In case of dealers, authorized distributors, dealer's certificate from OEM is required
27. Document through bank and advance payment on proforma invoice shall not be accepted.
28. The items and quantity mentioned in bill of quantity against each item will be treated as provisional and it may be changed depending on actual requirement.
29. Payment will be made only after successful installation and commissioning of equipments in the concerned Laboratory and due verification by concerned authority.
30. If the supply is not made within one month, the firm shall be liable to pay a penalty equal to 0.10% of value of purchase order per day. However this can be waved off by the Hon'ble Vice Chancellor under special circumstances. If the firm fails to supply the equipments the earnest money deposit will be forfeited.
31. Deduction of TDS as per Govt. Rules.
32. Tenders will be opened in the presence of Tender Committee and bidders or their authorized representatives who wish to be present on the date of opening.
33. Any dispute will be subject to **Lucknow (U.P.)**, Jurisdiction only.
34. Conditional tenders will not be accepted.
35. Authorized signatory has to keep all the original documents at the time of opening of tender.
36. The Vice-Chancellor has the right to accept or reject any or all tenders without assigning any reason.

I/We have read and understood the above conditions and agree to abide by them.

Authorized Signatory & Seal of the Bidder/Proprietor

FACULTY OF ENGINEERING
UNIVERSITY OF LUCKNOW
Second Campus, Jankipuram, Lucknow-226031 (U.P.)

TENDER BID-I (Technical)

Tender	Purchase and Commissioning of Equipments for Civil Engineering Laboratories
Package No.	
Name of the firm with full address and contact number	
For	Faculty of Engineering, University of Lucknow, Second Campus, Jankipuram, Lucknow-226031 (U.P.)
Cost of Tender Document	DD No: Amount: Bank: Date: Drawn in favour of Finance Officer, University of Lucknow, payable at Luckow (U.P.).
Earnest Money Deposit	DD No: Amount: Bank: Date: Drawn in favour of Finance Officer, University of Lucknow, payable at Luckow (U.P.).
PAN/GST No	PAN GST (Attach proof)
Income Tax Return of last three years	Attach Copy
Original Equipment Manufacturers/Authorization Letter from O.E.M.	Attach proof
Turnover in the last three years	Attach proof
Details of Similar Work Executed during last Three years in academic institutions	Attach proof
Place of Tender Submission	Proctor Office, University of Lucknow, Old Campus, Lucknow- 226 007 (U.P.)
Last Date of Tender Submission	Date:- 20.06.2019 Time:- 02.00 PM
Place of Tender Opening	Registrar Office, Committee Room, Lucknow University (Old Campus), Lucknow.
Opening of Tender	Date:- 21 .06.2019 Time:- 02.00 PM

Signature and Seal of Bidders

TENDER BID-II (Financial)

Package FOE/CE/01: Concrete Laboratory

Tender Cost: Rs. 1000/-+ Rs. 180/- (GST)

EMD: Rs. 8000=00

Bill of Quantity

S. No.	Name of item & Specifications	Qty	Unit Cost	Total Cost
1	Concrete test Hammer with NCCBM Calibrated Ref. Std. : BIS 1311 - 1992 (Part 2) and ASTM C805, D5873. Measuring Range :10 to 70 N/mm Impact energy = 2.207Nm.	01		
2	100kN Flexure Testing Machine Electrically Operated in House NABL Calibration Certificate Ref. Std. : IS:516, BS:1881 and ASTM C78. Features: • Light weight, rugged high strength frame • Double action hydraulic pump • Self-aligning roller assembly Hydraulic jack provided with retraction spring • For testing beams of 100X100X500mm and 150X150X 700mm. A spacer is provided for testing different size of beams. The load is indicated on a calibrated bourdon tube type load gauge of range : 0 -100 kN x 0.5 kN The load gauge is calibrated against National Physical Laboratory / National Council for Cement and Building Materials certified proving ring. Suitable for operation on 220V, 50Hz, Single Phase, AC Least Count : 0.5kN Technical Specifications: Capacity : 100kNLeast Count: 0.01 kN Type of loading: Third Point Loading Maximum Distance Between Supporting Rollers for Beam Size (mm) 150 x 150 x 700mm : 600mm 100 x 100 x 500mm : 400mm Maximum Distance Between Loading Rollers for Beam Size (mm) 150 x 150 x 700mm : 200mm 100 x 100 x 500mm : 133mm	01		

3	Vibrating Table, 50 x 50cm for 4 moulds of 150mm cube Ref. : EN 12350-6, 7, 12390-2, 13286-50 The table top should be suitable to hold cube moulds and has stops along its edges to prevent moulds from sliding off the table during operation. The specially designed vibro motor for operating the vibretor. Suitable for operation on 220 V, 50 Hz, Single Phase, AC supply	01		
4	Flow Table, Motorised Ref. Standard - IS:1199, AASHTO T126 The Flow Table top is 76.2 cm dia, finely machined from a solid brass casting. The integrally cast ribs are designed for support and strength. The stand is fabricated of cast iron and is of sturdy construction. Holes for mounting on foundations are drilled in the base plate. The ground and hardened steel cam is designed to drop the table by 12.5 mm with an electric geared motor. The equipment is supplied along with flow mould. suitable for operation with 220 volts, 50 Hz, single phase, AC Supply	01		
5	Vee bee consistometer Ref. Standards - IS:10510, IS:1199, BS 1881 (Part 104), AASHTO T126, EN. 12350-3 Consists of a vibrating table, specimen pot, slump cone, graduated rod and acrylic plate. Suitable for operation on 415 V, 3 phase, 50 Hz, AC Supply.	01		
6	Plastic Measuring cylinder flask Capacity:1000 ml	05		
7	Gauging Trowel, Ref Standard IS:4031, 100 to 150mm long blade with straight edge. Weight 210 ± 10g	10		
8	G.I. Concrete mixing tray	04		
9	Water bath double wall 6 holes	01		
10	LE Chatelier Flask As per IS 4031-1968	01		
11	Cement sampler	05		
12	Concrete Mixer, Drum Type, Capacity 1 Cubic Feet The mixer consists of a steel vessel of 30litres, mounted on a frame. The vessel is rotated at 20-24 RPM with the help of a motor and a pulling. The vessel can be tilted to any angle by a handle. This facilitates mixing and discharge. Blades are provided inside the vessel to mix the material thoroughly. The large handle strip facilitates manual rotation of the drum during power failure. The drum, handle and motor etc. are mounted on a steel frame. This model is provided with two large wheels for carting away. Supplied complete, with motor of 1 HP along with lead wire. Suitable for operation on 220V, 50Hz, Single Phase, AC supply	01		

13	Shrinkage Bar Mould, single compartment with knurled and threaded reference point Ref. Standard - IS:10086, IS:4031 ASTM C 151. Each mould is supplied complete with base plate and two reference points per compartment of mould. Mould size : 25 x 25 mm section and 250 mm effective length (Distance between two inner-most reference points)	02		
14	Hydraulic Jack 1000kN Capacity with Gauge & Hand Pump with calibration certificate The jacks are supplied complete with manually operated pumping units fitted with bourdon tube type load gauge and high pressure flexible hose pipe. Least Count : 5kN Piston Dia : 157mm Piston Stroke: 50mm	01		
15	Rebound hammer as per IS:13311 (Part 2) and IS: 456-2000	01		

TENDER BID-II (Financial)

Package FOE/CE/02: Environmental Engineering Laboratory

Tender Cost: Rs. 1000/-+ Rs. 180/- (GST)

EMD: Rs. 6000=00

Bill of Quantity

S. No.	Name of item	Specifications	Qty	Unit Cost	Total Cost
1	Nephlo Turbidity Meter (Automatic) microcontroller based	0 - 1000 NT, Accuracy $\pm 2\%$ or better, Detection photo Diode LCD Display, Repeatability $\pm 1\%$ of FS (Std.) Calibration by Formazine Standard Solution, should have data storage in memory, Complete in all respect	01		
2	Micro Controller Based Conductivity-TDS Meter With cells (1.0CC & 0.1CC) with Temp. Probe	Auto Ranging, microprocessor Conductivity TDS / meter for measurement of conductivity and Total Dissolved Solids of liquids. Frequency: 100 Hz or 1 KHz Automatic, Conductivity: Range : 0.1us to 100mS (6 decadic ranges) Accuracy : $\pm 1\%$ of F.S. ± 1 Digit Resolution : 0.001 μ s TDS Range : 0.1 ppm to 100 ppt. (6 decadic ranges) Accuracy : $\pm 1\%$ of F.S. ± 1 digit TEMPERATURE: Range : 0°C to 100°C (Auto / manual) Resolution : 0.1°C Accuracy : ± 0.2 °C ± 1 Digit	01		
3	Micro Controller Based pH System with electrode & Temp. probe (Auto Temp. Compensation, 2 point calibration, Resol. 0.01 pH), 7 Digits 7 Segment LED	SPECIFICATIONS:- pH Range : 0 to 14.00 pH Resolution : 0.01 pH Stability : 0.01 pH per hour Relative Accuracy : ± 0.02 pH ± 1 Digit Slope : 85% to 115% Calibration : 2 / 3 points Standard Buffers : 7.000, 4.004 or 9.183	01		

	(3 for Temp. 4 for pH)	<p>Buffer Deviation : \pm 0.5 pH</p> <p>mV</p> <p>Range : 0 to \pm 1999 mV</p> <p>Resolution : 1 mV</p> <p>Accuracy : \pm 1 mV \pm 1 Digit</p> <p>Temperature Compensation: Auto/Manual</p> <p>Range: 0 to 99.9 °C</p> <p>Resolution: 0.1 °C</p> <p>Accuracy: \pm 0.5 °C \pm 1 Digit</p> <p>Display: 7 Digits; 7 segment LED (3 digits for temp. and 4 digits for pH)</p> <p>With auto-polarity and decimal point</p> <p>Annunciation: Mode annunciation by LED</p> <p>Print port: Epson compatible 80 column Dot Matrix</p>			
4	High Volume Air sampler	Flow rate 1 - 1.5m ³ /min Sampling Time 24 hours or more with Sampling Time Recorder & Automatic Sampling, Complete in all respect, Confirming to the relevant IS Specifications	01		
5	Multiparameter	<p>pH range : -20 to 20pH, Resolution:.001, .01,.1pH selectable, Accuracy:0.002pH, upto 5 point calibration,</p> <p>ORP range: 0-+-19999.9mV / 1 pont, Resolution: 0.1/ 1 mV, Accracy: +- .2mV</p> <p>Conductivity range :0-200mS/cm, Resolution:0.01/.1/1, Accuracu:+- .05% full scale</p> <p>TDS range : 0-10ppt (Max 200 ppt Depending on factor setting), Resolution:0.01/0.1/1, Accuracy: +-1% Full scale</p> <p>salinity range: 0-80 ppt</p> <p>Resistivity range: 0-100Mohm</p> <p>Temp range : 0-105C</p>	01		
6	B O D	Automatic,Low Temperature incubator fitted with CFC free Refrigeration System, Temp range 5-50C controled with Microprissesor based PID Digital Temp. Indicator cum controller. Double walled, Iner Chamber SS : Size 830x505x415. CE Certified 830x505x415mm chamber size	01		

7	C O D	It Contains block heating unit with provision for sample to be digested in 38 mm dia reaction vesel. Temp. range : Ambient to 150C controlled with Digital Temp controller. CE Certified Provision for 15 samples complete with glass reaction vessel and air condensers. Fitted with 0-2 hrs timer	01		
8	Kjeldahl Appratus	Universal Combined Kjeldhal Digestion & Distillation Unit "Electrically heated, comprising of one single mild steel tubular stand provided with two shelves one above the other. A specially designed glass fume duct with B 24) Cone openings (suitable for flasks having 24/29 socket) having such provision so that no leakage of fumes takes place. One heater box having individual energy regulators for 500 watts heaters are supplied in digestion part at the lower side. One heater box of above design is supplied in distillation part at the upper side. Distillation part is also provided with brass condenser rack with water circulation systems and clamps. The whole unit is operated on 220 volts AC mains." Complete unit without glass parts for 6 tests	01		
9	Sound Level meter	Frequency Range:31.5Hz ~8kHz, Accuracy:1.4dB, Resolution:0.1dB, Dynamic Range:50dB, Level Range:Low:30dB~80dB Medium:50dB~100dB, High:80dB~130dB Auto: 30dB~130dB, Time Wiegthing:FAST (125mS),SLOW (1s), Microphone:½ inch electric condenser microphone, Display Update: 2 times/sec, Datalogger function,Adjustable Alarm Levels, Backlight, USB Computer Interface (advanced Software program for all Windows	01		
10	Jar Test appratus	With illuminated basr having Flourescent tube fitted below translucent plastic plate. Geared 1/20 HP Motor,variable speed from 10 to 100 RPM with spedd controler without glass parts with 2 Stirrers , CE Cetified	01		
11	Digital Balance	High-precision Electro-magnetic Balances, Capacity: 220Gm., Minimum	01		

	220gm - 1mg	display: 0.001g, Repeatability (standard deviation): $\sigma \leq 0.001g$, Display :LCD "Response time :1.0–1.2 sec. , Linearity: $\pm 0.002g$, Ambient temperature: 5–40°C, Temperature coefficient of sensitivity (10–35°C): $\pm 3ppm/^{\circ}C$ "			
12	Water Distillation Apparatus	Manesty type wall mounting single wealled, made of SS. Fitted with kettle element. Electrically operated, suitable to work on 220/230V . CE Certified	01		
13	Hot air oven	Internal chamber size 14 x 14 x 14 inch	01		

TENDER BID-II (Financial)

Package FOE/CE/03: Transportation Engineering Laboratory

Tender Cost: Rs. 1000/-+ Rs. 180/- (GST)

EMD: Rs. 12000=00

Bill of Quantity

S. No.	Name of item & Specifications	Qty	Unit Cost	Total Cost
1	<p>Aggregate crushing value apparatus Ref. Standards : IS:2386 (Part 4), 9377, BS:812, ASTM C131, C535, AASHTO T96 Supplied with the following:</p> <ul style="list-style-type: none"> □ Cylindrical Cell □ Plunger □ Base Plate □ Tamping rod <p style="text-align: center;">Metal measure</p>	01		
2	<p>Aggregate impact tester Ref. Standard - IS:9377 It should be sturdy construction consists of a base and support columns to form a rigid frame work around the quick release trigger mechanism to ensure an effective free fall of the hammer during test. The free fall can be adjusted through 380 ± 5 mm. The hammer is provided with a locking arrangement. Supplied with the following:</p> <ul style="list-style-type: none"> □ Cylindrical Cup □ Metal Measure □ Tamping Rod ISI Marked <p style="text-align: center;">Automatic Blow Counter</p>	01		
3	<p>Los Angeles Abrasion testing machine with Digital Counter Ref. Standards - IS:2386 (Part 4), BS:812, ASTM C-131, C535, D2, AASHTO T96 The machine consists of a hollow cylinder, mounted on a sturdy frame on ball bearings. A detachable shelf which extends throughout the inside length of the drum catches the abrasive charge and does not allow it to fall on the cover. The drum is rotated at a speed of 30-33 rpm by an electric motor through a heavy duty reduction gear. Supplied complete with a tray for collection of the material. Supplied with the following:</p> <ul style="list-style-type: none"> □ Abrasive charge, consisting of a set of 12 hardened steel balls of 48 mm dia □ Digital controller box <p>Suitable for operation on 415V, 3 phase, 50Hz, AC Supply.</p>	01		
4	<p>Deval Abrasion Tester Ref: Std. IS:2386 Part 4), BS:812, ASTM C 131, D2 AASHTO T 96</p>	01		

	<p>It should be used to determine the aggregate value of coarse aggregates as per IS 22386 Part 4. The machine consists of the two hollow cylinders, closed at one end and provided with tight fitting covers at the other end, mounted on a shaft at an angle of 30 Deg. To the axis of rotation. The shaft rotates 30-33 rpm through a reeducation gearbox coupled to a motor. Supplied complete with a revolution counter.</p> <p>Suitable for operation of a 415V, 3 phase, 50Hz, AC Supply.</p>			
5	<p>Thickness Gauge with ISI Certification Mark IS:2386 (Part I) Constructed from heavy gauge sheet steel.</p>	04		
6	<p>Length Gauge with ISI Certification Mark IS:2386 (Part I) Constructed from steel, mounted on a hardwood base.</p>	04		
7	<p>Cylindrical Metal Measures 3, 15 and 30 ltrs Cylindrical Metal Measures with ISI Certification Mark, IS:2386 (Part 3) Supplied Complete with Tamping Rod of 16mm dia x 60 cm long having ISI Certification Mark IS:1008</p>	01		
8	<p>Bulk Density, 10 and 20 Ltrs Ref. Standard - IS:1199, IS:10079, BS:1881, EN1097-3, 12350-6</p>	01		
9	<p>Universal Penetrometer Ref. Standards - IS:1448 (Part 60), IS:1203, ASTM D 5, IP 49, ASTM D1321, ASTM D 2884, ASTM D1403, IP 310, BS:1377, BS:2000- (Part 49), BS:4691, BS:4698, ASTM D 937, ISO 2137, IP 50, IP 179, ASTM D 217, AASHTO T49, EN DDENV 1991-2</p> <p>An accurately fabricated steel base has been designed to facilitate penetration tests to be made over a wide surface area of sample. Adjustable feet are provided in the base for levelling. Upright may be rotated to permit the testing of samples immersed in a thermostat bath. Each penetrometer is supplied with a plunger weighing 47.5 g for testing bituminous product, and one each of 50g and 100 g weights, including cone and Penetration Unit.</p> <p>Accessories:</p> <ol style="list-style-type: none"> 1. Penetration Cone Ref. Standards IS:1448 (Part 60), ASTM D 937, IP 179, BS:4698, ASTM D217, IP 50, ISO 2137. Made of brass with a hardened steel tip. The stem of the cone is interchangeable with all types of Penetrometers manufactured to close tolerances, providing a unified cone and ensuring that there is no shoulder between the tip and the body. Weight : 102.5 ± 0.05g 2. Bitumen Penetration Kit Ref 1426,13179-2 Supplied with the following: Penetration Needle Transfer Dish made of copper. Aluminium Sample Containers, Set of two. 	01		

10	<p>Ring and Ball Apparatus Ref. Standards - IS:1205, ASTM D 36, E 28, IP 198, IP 58, STPTC PT 3, AASHTO T53, BS:2000, EN 1427</p> <p>It has magnetic stirrer with heating facility and digital display of temperature, the heating can be adjusted through knob. Suitable for operation on 220 V, 50 Hz, single phase, AC supply. Each unit is supplied with a bath of heat resistant glass and the following :</p> <ul style="list-style-type: none"> ▫ Tapered Rings 2 Nos. ▫ Ball Centering Guide 2 Nos. ▫ Steel Balls of 9.5 mm dia 2 Nos. ▫ Ring holder <p>1 No. Electric Heater (Hot Plate) 1 No.</p>	01		
11	<p>Flash Point (Open) and Fire Point Cleveland, Electrical Heating Ref. Standards - IS:1448 (Part 69), ASTM D 92, IP 36, BS:4689, ISO 2592</p> <p>Supplied with the following:</p> <ul style="list-style-type: none"> ▫ Cleveland Flash Cup Brass, with an Insulated Handle. ▫ Gas Test-Jet Assembly Correctly positioned and pivoted from a cast cup platform which is fixed to a heating bath. <p>Energy Regulator, To regulate the rate of rise in temperature 220 V, 50 Hz, Single Phase, AC Supply. Accessories Thermometer IP 28C, range -6°C to +110°C</p>	01		
12	<p>Ductility Testing Machine with Digital Temp Indicator Ref. Standards IS:1208, ASTM D113, AASHTO T 51</p> <p>The machine consists of a carriage moving over a lead screw. An electric motor driven reduction gear unit ensures smooth constant speed and continuous operation. The entire assembly is mounted with water bath completely encased in metal bound hardwood. It is equipped with an electric pump circulator and heater. The temperature is controlled by digital temperature controller. Two rates of travel i.e. 5 cm/min and 1cm/min are provided. Suitable for operation on 220 V, 50 Hz, Single Phase, AC supply. Supplied with Ductility Mould, with Base Plate 3 Nos.</p>	01		

13	<p>Marshall Apparatus, 50kN Single speed , New Model for 4" dia sample Ref. Standards - ASTM D1559 BS:598-197, EN-12697-34</p> <p>Features:</p> <ul style="list-style-type: none"> ▫ Single Speed, Bench top load frame ▫ Max. loading capacity, 50 KN ▫ Geared Screw jack and Motor Drive, ▫ Precise speed <p>Technical Specification's:</p> <p>Maximum Vertical Clearance = 470mm (Platen Down, Cross-head up) Minimum Vertical Clearance = 250mm (Platen up, Cross-head down) Horizontal Clearance = 265mm Platen Diameter = 133mm Platen Travel = 25mm Platen Speed = 50.8mm/min Rated Power = 375W Dimension (I x w x h) = 550×400×870mm Weight = 60kg</p> <p>Supplied with the following:</p> <ul style="list-style-type: none"> ▫ Marshall Load Frame Cap 50kN speed-50.8mm/min 1 No. ▫ Breaking Head Stability Mould 1 No. ▫ Compaction Mould Steel, cylindrical 3 Nos. ▫ Base Plate 3 Nos. ▫ Extension Collar 3 Nos. ▫ Compaction Pedestal, 1 No. Manual Operation, comprising a Steel Plate capped on a wooden post. <p>A Mould Clamp is fitted to the top of the plate</p> <ul style="list-style-type: none"> ▫ Compaction Hammer 2 Nos. for use with Compaction Pedestal and Mould, weight 4.5 kg with a free fall of 457 mm ▫ Load Transfer Bar 1 No. ▫ Sample Eject for 4" dia Sample 1 No. ▫ Dial Gauge 25mm travel, 0.01mm least count 1 No. ▫ Proving Ring capacity 25 kN. 1 No. <p>Accessories/Spares Compaction Mould Steel, Cylindrical Base Plate Extension Collar</p>	01		
14	<p>45cm. dia. Sieves in G.I. Frame with pan and cover</p> <p>S.S.Mesh:-Size:- 80mm, 63mm, 50mm, 40mm, 37.5mm, 31.5mm, 26.5mm, 25mm, 22.4mm, 20mm, 16mm, 13.2mm, 12.5mm, 11.2mm, 10mm, 6.3mm, 4.75mm, 3.35mm, 2.36mm.</p>	02		
15	<p>20cm. dia. Sieves in brass Frame with pan and cover</p> <p>S.S.Mesh:-Size:- 5.6 mm, 4.75mm, 3.35mm,</p>	02		

	2.8mm, 2.36mm, 1.70mm, 1.18 mm, 850 micn., 600micn., 425micn., 300micn., 150 micn., 90micn., 75micn.			
16	<p>Sieve Shaker, Motorised, with Built-in Digital Timer</p> <p>It should be compact design and light weight and mounted on a bench top. This eliminates the use of concrete foundation. Noise has been reduced considerably in the new model. A digital timer adjustable from 0-99 minutes is incorporated as an integral part of the equipment.</p> <p>The Sieve Shaker can carry upto 8 sieves of 20cm dia. It is driven by a ¼ HP geared motor. The Sieve Table is inclined from the vertical axis and the direction of inclination changes progressively in the clockwise direction. In addition to the gyratory motion of the table, there is a tapping motion as well.</p> <p>Suitable for operation on 220 V, 50 Hz, Single Phase, AC supply.</p>	01		
17	Balance 20 Kg/1gm	01		
18	Balance 5 Kg/0.1gm	01		
19	Universal Oven 50-300C, SS chamber size 450x450x450	01		

20	<p>Laboratory California Bearing Ratio Test Apparatus, Motorised, Three Speed Ref: Standards: IS : 2720 (Part XVI), BS 1377; 1924; EN 13286-47/ ASTM D 1883; AASTHO T 193</p> <p>Features:</p> <ul style="list-style-type: none"> □ Compact, bench top design □ Rapid Platen Adjustment □ Complete with stabilizing bar □ Options for mechanical or electronic measurement <p>Supplied complete with the following:</p> <ul style="list-style-type: none"> □ Load Frame, 50 kN Capacity, Three Speed 1.5, 1.25 & 2.5 mm/min □ Mould - Gun Metal 150mm ID x 175 mm H Perforated Base Plate - Gun Metal, □ Extension Collar - Gun Metal 150 mm ID x 50 mm high □ Penetration Piston 50 mm face dia □ Adjustable Bracket for Penetration Dial Gauge Circular Metal Spacer Disc, with detachable handle, 148 mm dia x 47.7 mm high □ Annular Metal Weight 2.5 kg, 147 mm dia with 53 mm dia central hole □ Slotted Metal Weight 2.5 kg, 147 mm dia, with 53 mm dia slot □ Perforated Plate 148 mm dia, with adjustable stem and lock nut □ Metal Tripod for Dial Gauge □ Cutting Collar □ Rammer 2.6 kg, 310 mm controlled drop □ Rammer 4.9 kg, 450 mm controlled drop □ Proving Ring Capacity 50 kN Dial Gauge 25 mm travel, 0.01 mm least count <p>Suitable for operation on 220V, 50Hz, single phase, AC supply.</p> <p>Accessories/spares</p> <p>Mild Steel, Zinc Plated Mould, 150mm ID x 175mm Mild Steel, Zinc Plated Perforated Base Plate for MS mould</p> <p>Mild Steel Zinc Plated Extension Collar 150mm ID x 50mm high</p>	01		
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TENDER BID-II (Financial)

Package FOE/CE/04: Geotechnical Engineering Laboratory

Tender Cost: Rs. 1000/-+ Rs. 180/-(GST)

EMD: Rs. 6000=00

Bill of Quantity

Sr. No.	Name of article	Specifications	Qty.	Unit Cost	Total Cost
1	Balance	Digital with sensitivity 20Kg 1gms	01		
2	Balance	Digital with sensitivity 3Kg 0.1gms	01		
3	Balance	Digital with sensitivity 600/0.01gms	01		
4	Hydrometer	Conforming to IS:2720 (Part IV) Graduated Scale of 0.995 g/ml to 1.030 g/ml at 27° C	10		
5	Measuring cylinder (borosil) 1000 ml	Conforming to IS:2720 (Part IV) To be supplied complete with rubber bung	10		
6	Liquid limit apparatus	Conforming to IS:2720 (Part V) Fitted with brass cup, crank and cam mechanism mounted on rubber base Fitted with drop counter Fitted with a F.H.P. motor to drive the operating mechanism of cup at 120 rpm Cane with Lid made of Copper Size – 100ml Mercury	02 (Hand operated) 02 (motorized) 30 500 g.		
7	Porcelain dish		10		
8	Granite (2" X 2")		01		

9	Shrinkage limit apparatus	Conforming to IS:10077 and IS:2720 (Part VI) Complete set including square prong plate, square plain plate, stainless steel shrinkage dish, glass cup with ground edge and flexible spatula	05		
10	Proctor Compaction test app.	Indian Light compaction Equipment as per IS:2720 (Part VII) should include standard mould, collar, base plate and rammer	03		
11	Relative density app.	Conforming to IS:2720 (Part XIV), IS: 10837 should include vibrating table suitable to work with 440v, 50 Hz of size 750 square mm, cylindrical unit weight mould, guide sleeve, surcharge weight, etc.	01		
12	Core cutter with hammer	Conforming to IS:2720 (Part XXIX), consisting of cylindrical core cutter 100 mm X 130 mm and rammer	06		
13	Sand replacement apparatus	Conforming to IS:2720 (Part XXVIII), consisting of sand pouring cylinder, calibration container, metal tray, etc.	06		
14	Permeability test apparatus	Conforming to IS:2720 (Part XXVII), IS: 11209 consisting of permeameter mould 1 l capacity stand pipes, stilo overhead tank and light and heavy rammers with appropriate mounting for stand pipes Pressure block Weight : 720 gm. (Porous Stone) Dia : internal dia of mould Filter Paper (Grade SS)	01 02 200		

15	Direct shear test app.	Conforming to IS:2720 (Part XIII), consisting of hand operated/ motorized horizontal loading system. Should include shear box assembly 60 square mm, set of weights complete with all accessories	01		
16	Static cone penetration test app .(with accessories)	Conforming to requirements of IS: 4968 (Part III) 1976 Consisting of gear drive assembly with winch and pinion mechanism The unit should be complete with screw type anchors, mantle tubes, sounding rods, cone with friction jacket, pressure gauges and automatic cut-off device for pressure gauge, complete with all accessories	01		
17	SPT & DCPT Apparatus (with accessories)	<ol style="list-style-type: none"> 1. The equipment should fulfill the requirements of IS:2131 1981. The equipment should be consisting of standard tripod stand with 5m long mild steel legs, pulley, drop hammer, drill rods and split spoon sampler. The equipment should be complete with all accessories 2. The equipment should fulfill the requirements of IS:2131 1981. The equipment should be consisting of standard tripod stand with 5m long mild steel legs, pulley, drop hammer, drill rods and cone (50 mm dia and 60° apex. The equipment should be complete with all Accessories 3. Sodium Oxilate 500 gm. 4. Sodium Hexametaphosphate 500 gm. 	01		

18	Post hole auger with handle	Post hole auger outfit having 50 mm/75 mm/100 mm auger heads with 1 m long extension rods.	02		
19	Split spoon sampler	As per IS: 9640 should consist of split barrel 35 mm id 50.8 mm od and 500 mm long, complete with driving shoe and cutting edge	01		
20	Liner	Brass liners for split spoon samplers having od 35 mm	10		
21	S.P.T. Drill Rod	As per IS: 9640	25		
	Total				