कुलसचिव कार्यालय
लखनऊ विश्वविद्यालय
लखनऊ–226007

संदर्भ संख्या :.....

दिनांक :.....

UNIVERSITY OF LUCKNOW
LUCKNOW

Sealed tenders from eligible bidders are invited for supply and commissioning of Lab Equipments in the Faculty of Engineering, Lucknow University, Second Campus, Jankipuram, Lucknow- 226031, for the laboratories: Electrical Engineering, Mechanical Engineering, Electronics and Communication Engineering and Civil Engineering.

For details visit www.lkouniv.ac.in

Registrar

(Prof. R.K. Singh)
Registrar

No E-5896-9.1 Date..07/03/18

Copy forwarded to the following for information and necessary action:

1. Secretary to Vice-Chancellor for kind information of Hon'ble Vice- Chancellor, University of Lucknow.
2. P.S. to P.V.C. for kind information of Pro- Vice- Chacellor, University of Lucknow.
3. Coordinator, Faculty of Engineering, University of Lucknow with request to kindly arrange four tender boxes at Faculty of Engineering, Sencond Camous, Jankipuram, Lucknow- 226031.
4. Director IPPR, University of Lucknow with request to publish the advertisement in 02 newspapers.
5. Prof. Anil Mishra, Director Data Resource Center, Lucknow University, Lucknow for favour to upload on the University website.
6. P.A. to Registrar, University of Lucknow.

Registrar

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 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 following Civil Engineering Laboratories:

Package – FOE/CE/01	- Fluid Mechanics and Hydraulic Machine Laboratory
Package – FOE/CE/02	- Building Material and Construction Laboratory
Package – FOE/CE/03	- Surveying and Geo-informatics Laboratory
Package – FOE/CE/04	- Structural Analysis Laboratory-I

For Tender Documents, Tender Cost, EMD, Specifications 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/2018 Date: 07.03.2018

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, Luckow (U.P.). Both envelopes should be kept in one big envelope. The tender should reach to the undersigned latest by 05.04.2018 at 02:00 P.M.

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 expected 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. Details of equipments/materials are as per bill of quantity attached.
3. 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.
4. **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 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.
5. Tenders received after due date and time will not be considered.
6. EMD of all unsuccessful bidders will be refunded after opening of tenders. However, EMD of successful bidder will be refunded only after installation and commissioning of equipments and due verification by concerned authority.

Continued……..

7. DD of Rs. 1000-/- being cost of tender 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.
8. Price quoted should be F.O.R. **Faculty of Engineering, University of Lucknow, Second Campus, Jankipuram, Lucknow-226031 (U.P.).**
9. Detailed specifications and make of the equipments/ materials must be given.
10. Quoted items should be strictly in order of merit with serial number and metric unit otherwise the tenders are liable to be ignored.
11. 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.
12. No sales tax form "CZX" or 'D" etc. for concessional rates shall be provided by the University.
13. Quoted rates should be valid for at least **six months** from the date of opening.
14. Tenders without sample wherever required may not be accepted.
15. In case of imported equipments, commission allowed to agents must be specifically mentioned.
16. Free demonstration shall be done in the University premises if required.
17. Insurance shall be done by the suppliers at their own cost.
18. Tenders without mentioned earnest money deposit will not be entertained.
19. Standing of the firm and major supplies in recent past with proof must be attached.
20. In case of dealers, authorized distributors, dealer's certificate from OEM is required
21. Document through bank and advance payment on proforma invoice may not be accepted.
22. The items and quantity mentioned in bill of quantity against each items will be treated as provisional and it may be changed depending on actual requirement.
23. Payment will be made only after successful installation and commissioning of equipments in the concerned Laboratory and due verification by concerned authority.
24. 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.
25. Deduction of TDS as per Govt. Rules.
26. 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.
27. Any dispute will be subject to **Lucknow (U.P.),** Jurisdiction only.
28. Conditional tenders will not be accepted.
29. Authorized signatory has to keep all the original documents at the time of opening of tender.
30. The Registrar has the right to accept or reject any or all tenders without assigning any reason.

I/We have read and understand 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	Attach proof
Place of Tender Submission	Office of the Coordinator, Faculty of Engineering, University of Lucknow, Second Campus, Jankipuram, Lucknow- 226031 (U.P.)
Last Date of Tender Submission	Date:- 05.04.2018 Time:- 02.00 PM
Place of Tender Opening	Registrar Office, Committee Room, Lucknow University (Old Camous), Lucknow.
Opening of Tender	Date:- 05.04.2018 Time:- 04.00 PM

Signature and Seal of Bidders

TENDER BID-II (Financial)

Package- FOE/CE/01: Fluid Mechanics & Hydraulic Machine Laboratory

Tender Cost: Rs. 1000/- **EMD: Rs. 33,000/-**

Bill of Quantity

S.No.	Equipment/Item Name	Specification/experiment	Qty.	Rate	Amount
1	IMPACT OF JET APPARATUS	Centrifugal pump 25x25mm with 0.5 H P Motor, Sum Tank : 50lit cap, Nozzle Material: Brass, Floor Area: 1.5 m x 0.75 m. Tanks will be made of Stainless Steel. An ENGLISH instruction manual consisting of experimental procedures, block diagram etc. will be provided along with the Apparatus.	01		
2	ORIFICE & MOUTH PIECE APPARATUS	Set of Orifices : Material Acrylic (2 Nos.) Dia. 10mm and 15 mm Set of Mouthpieces : Material Acrylic (3 Nos.) Dia. 10 mm (L/D = 1) Dia. 10 mm (L/D = 2.5) Dia. 10 mm (L/D = 4) Pointer Gauge : To measure X-Y co-ordinates of Jet. Water Circulation : ½ HP Pump, Crompton make. Constant Head tank : 35 Ltrs. Flow Measurement : Using Measuring Tank with Piezometer, Capacity 25 Ltrs. Sump Tank : Capacity 70 Ltrs. Stop Watch : Electronic An ENGLISH instruction manual consisting of experimental procedures, block diagram etc. will be provided along with the Apparatus	01		
3	FLOW MEASUREMENT APPARATUS VENTURIMETER & ORIFICE METER	Venturimeter : Material Clear Acrylic compatible to 1” Dia. Pipe. Orificemeter : Orifice plate made of Stainless Steel and housing made of Clear Acrylic compatible to 1” Dia. Pipe. Water Circulation : ½ HP Pump, Crompton make . Sump Tank : Capacity 50 Litres. Tanks will be made of Stainless Steel. An ENGLISH instruction manual	01		

		consisting of experimental procedures, block diagram etc. will be provided along with the Apparatus			
4	BEND METER	Bend meter : Material Stainless steel Compatible to 1" Dia. Pipe. Water Circulation : ½ HP Pump, Crompton/Standard make Flow Measurement : Using Measuring Tank, Capacity 25 Ltrs. Sump Tank : Capacity 50 Ltrs. Stop Watch : Electronic Pressure measurement : By differential water manometer Control Panel Comprises of : Tanks will be made of Stainless Steel. An ENGLISH instruction manual consisting of experimental procedures, block diagram etc. will beprovided along with the Apparatus	01		
5	REYNOLDS APPARATUS	Tube : Material Borosilicate Glass (ID 14 mm approx., Length: 600 mm) Dye vessel : Material Stainless Steel, Capacity 1 Ltrs. (approx.) Capillary Tube : Material Copper/Stainless Steel. Constant Head Water Tank: Capacity 40 Ltrs. Water Circulation : ½ HP Pump, Champion/Standard make. Flow Measurement : Using Measuring Cylinder with Electronic stop watch Sump Tank : Capacity 60 Ltrs. Control Panel Comprises of : Standard make On/Off Switch, Mains Indicator, etc. Tanks will be made of Stainless Steel. An ENGLISH instruction manual consisting of experimental procedures, block diagram etc. will be provided along with the Apparatus	01		
6	PITOT STATIC TUBE APPARATUS	Pitot Tube : Material Copper/SS of compatible size fitted with vernies scale. Test Section : Material Clear Acrylic, compatible to 1" Dia. Pipe. Water Circulation : ½ HP Pump, Crompton/Standard make. Flow Measurement : Using Measuring Tank with Piezometer (Capacity 25 Ltrs.)	01		

		Sump Tank : Capacity 50 Ltrs. Stop Watch : Electronic Pressure measurement : By differential water manometer Control Panel Comprises of : Standard make On/Off Switch, Mains Indicator, etc. Tanks will be made of Stainless Steel. An ENGLISH instruction manual consisting of experimental procedures, block diagram etc. will beprovided along with the Apparatus			
7	PIPE FRICTION APPRATUS	Pipe Test Section : (i) Dia ½", Length: 1m, Material G.I. (ii) Dia ¾", Length: 1m, Material G.I. Water Circulation : FHP Pump, Crompton make. Sump Tank : Capacity 50 Ltrs. Tanks will be made of Stainless Steel. An ENGLISH instruction manual consisting of experimental procedures, block diagram etc. will be provided along with the Apparatus	01		
8	OPEN CIRCUIT SUB SONIC TUNNEL	Variable Speed : 2HP Crompton make motor with Speed Controller Type : Open Type Wind Tunnel. Test Section : 250 x 250 x 1000 mm. Axial Fan : Compatible Capacity Air Velocity : Maximum 30 m/s (in Test Section). Multiple Manometer : 0-40° inclination with vertical axis. U Tube Manometer : Length 500 mm. Inclined manometer : 300 mm (For cylinder) Pitot Static Tube : For Velocity Measurement Micro-Pitot Tube : For Boundary Layer Experiment An ENGLISH instruction manual consisting of experimental procedures, block diagram etc along with the Apparatus	01		
9	METACENTRIC HEIGHT APPARATUS	Poton:Materail: Arcalic provided with Horizontal Guide bar For Aiding weight and removable strips, Graduated arc with pointer with moveable hanger and set of weights, water Tank:550x500x400mm	01		

		Front Window Tank: made Of Glass & Perpex. A set of weights is supplied with the apparatus. Tanks will be made of Stainless Steel. Pendulum and Graduated arc are for accurate measurement of Tilt angle. An ENGLISH instruction manual consisting of experimental procedures, block diagram etc along with the Apparatus			
10	Bernoulli's Theorem Apparatus	Test Section : Material Acrylic (One Piece). Piezometer Tubes : Material P.U. Tubes (7 Nos.) Water Circulation : ½ HP Pump, Crompton make. Flow Measurement : Using Measuring Tank with Piezometer, Capacity 25 Ltrs. Sump Tank : Capacity 70 Ltrs. Inlet Tank : Capacity 20 Ltrs. Tanks will be made of Stainless Steel. An ENGLISH instruction manual consisting of experimental procedures, block diagram etc. will be provided along with the Apparatus	01		
11	TILTING FUME	Flow channel should be made of Toughened Glass/Stainless Steel having Width of 150 mm, Depth 250mm & Length of 5 m. Water Circulation : Centrifugal Pump, compatible capacity. Flow Regulation Valve : Hand wheel operated butterfly Valve Pointer Gauge : Provided. Sump Tank : Suitable Capacity. Tanks should made of Stainless Steel 304Grade.	01		
12	CENTRIFUGAL PUMP TEST RIG	Pump : Kirloskar Make, Capacity 1 HP Speed 2800 RPM (max.), Head 12 m (max.) Medium Flow : Clear Water Drive : 1 HP DC Motor with Thyristor controlled DC drive for variable speed. Sump Tank : Capacity 110 Ltrs.(approx.) Flow Measurement : Using Measuring Tank with Piezometer, Capacity 70 Ltrs.(approx.) Stop watch : Electronic. Pressure Gauge : Bourdon type	01		

		Control Panel Comprises of: RPM measurement : Digital RPM Indicator with Proximity sensor. Energy measurement : L&T make, Electronic Energy meter. Tanks will be made of Stainless Steel. An ENGLISH instruction manual consisting of experimental procedures, block diagram etc. will be provided along with the Apparatus			
13	FRANCIS TURBINE TEST RIG	Output Power : 1.1 kW light weight high efficiency impeller made of CNC Machined Brass, runner should be completely enclosed in air tight spiral casing made of Aluminium alloy. Provision of guide mechanism to alter the width between the two adjustent veins to be provided. Draft Tube should be made of stainless steel. Water supply pump of 5 H.P. with 200 liters stainless steel tank. Venturimeter with monometer to measure water flow rate. Pressure gauge to measure head, rope break arrangement with spring balances. Able to draw characteristics curves. (i) Speed Vs Discharge, (ii) Power Vs Speed. (iii) Speed Vs overall efficiency and operating curves, (iv) discharge Vs output power, (v) discharge Vs overall efficiency and muscle curve. Minimum efficiency of the turbine should be at least 55%.	01		
14	KAPLAN TURBINE TEST RIG	Output Power : 1 kW high efficiency impeller made of Machined stainless steel, runner should be completely enclosed in air tight spiral casing made of Aluminium alloy. Provision of guide mechanism to alter the width between the two adjustment veins to be provided. Draft Tube should be made of stainless steel. Water supply pump of 7.5 H.P. with 200 liters stainless steel tank. Venturimeter with monometer to measure water flow rate. Pressure gauge to measure head, rope break arrangement with spring balances. Able to draw	01		

		characteristics curves. (i) Speed Vs Discharge, (ii) Power Vs Speed. (iii) Speed Vs overall efficiency and operating curves, (iv) discharge Vs output power, (v) discharge Vs overall efficiency and muscle curve. Minimum efficiency of the turbine should be at least 50%.			
15	PELTON WHEEL TURBINE TEST RIG	Output power : 1.2 kW light weight high efficiency impeller made of Nylon 66 not more than 900 grams and having at least 20 Buckets, stainless steel nozzle for water jet, stainless steel casing with one side of perpex. Water supply pump of 5 H.P. with 200 liters stainless steel tank. Venturimeter with monometer to measure water flow rate. Pressure gauge to measure head, rope break arrangement with spring balances. Able to draw characteristics curves. (i) Speed Vs Discharge, (ii) Power Vs Speed. (iii) Speed Vs overall efficiency and operating curves, (iv) discharge Vs output power, (v) Discharge Vs overall efficiency and muscle curve. Minimum efficiency of the turbine should be at least 70%.	01		

TENDER BID-II (Financial)

Package- FOE/CE/02: Building Material and Construction Laboratory

Tender Cost: Rs. 1000/- **EMD: Rs. 18,000/-**

Bill of Quantity

S. No.	Name of Equipment with specifications	Qty.	Unit Cost	Total Cost
1.	Crushing Value Apparatus 75mm size This apparatus is used for measuring resistance of an aggregate to crushing, as per IS:2386, (Part 4). **Supplied with the following:** • Cylindrical Cell • Plunger • Base Plate • Tamping rod • Metal measure	01		
2.	Crushing Value Apparatus 150mm size This apparatus is used for measuring resistance of an aggregate to crushing, as per IS:2386, (Part 4). **Supplied with the following:** • Cylindrical Cell • Plunger • Base Plate • Tamping rod • Metal measure	01		
3.	Sieve Shaker, Motorised, with Built-in Digital Timer 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. 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. Suitable for operation on 220 V, 50 Hz, Single Phase, AC supply. **Accessories:**	01		
	Adapter for 30cm dia sieves	01		
	Sieve G.I. Frame 30cm dia x 80mm	01		
	Sieve G.I. Frame 30cm dia x 63mm	01		
	Sieve G.I. Frame 30cm dia x 50mm	01		
	Sieve G.I. Frame 30cm dia x 40mm	01		
	Sieve G.I. Frame 30cm dia x 25mm	01		

	Sieve G.I. Frame 30cm dia x 20mm	01		
	Sieve G.I. Frame 30cm dia x 16mm	01		
	Sieve G.I. Frame 30cm dia x 12.5mm	01		
	Sieve G.I. Frame 30cm dia x 10mm	01		
	Sieve G.I. Frame 30cm dia x 8mm	01		
	Sieve G.I. Frame 30cm dia x 6.3mm	01		
	Sieve G.I. Frame 30cm dia x 4.75mm	01		
	Pan and Cover for 30cm dia sieves	01		
	Sieve Brass Frame 20cm dia x 10mm	01		
	Sieve Brass Frame 20cm dia x 5.6mm	01		
	Sieve Brass Frame 20cm dia x 4.75mm	01		
	Sieve Brass Frame 20cm dia x 4mm	01		
	Sieve Brass Frame 20cm dia x 3.35mm	01		
	Sieve Brass Frame 20cm dia x 2.80mm	01		
	Sieve Brass Frame 20cm dia x 2.36mm	01		
	Sieve Brass Frame 20cm dia x 2.00mm	01		
	Sieve Brass Frame 20cm dia x 1.70mm	01		
	Sieve Brass Frame 20c dia x 1.6mm	01		
	Sieve Brass Frame 20cm dia x 1.40mm	01		
	Sieve Brass Frame 20cm dia x 1.18mm	01		
	Sieve Brass Frame 20cm dia x 1.00mm	01		
	Sieve Brass Frame 20cm dia x 850 microns	01		
	Sieve Brass Frame 20cm dia x 710 microns	01		
	Sieve Brass Frame 20cm dia x 600 microns	01		
	Sieve Brass Frame 20cm dia x 500 microns	01		
	Sieve Brass Frame 20cm dia x 425 microns	01		
	Sieve Brass Frame 20cm dia x 355 microns	01		
	Sieve Brass Frame 20cm dia x 300 microns	01		
	Sieve Brass Frame 20cm dia x 250 microns	01		
	Sieve Brass Frame 20cm dia x 212 microns	01		
	Sieve Brass Frame 20cm dia x 180 microns	01		
	Sieve Brass Frame 20cm dia x 160 microns	01		
	Sieve Brass Frame 20cm dia x 150 microns	01		
	Sieve Brass Frame 20cm dia x 125 microns	01		
	Sieve Brass Frame 20cm dia x 106 microns	01		
	Sieve Brass Frame 20cm dia x 90 microns	01		
	Sieve Brass Frame 20cm dia x 80 microns	01		
	Sieve Brass Frame 20cm dia x 75 microns	01		
	Sieve Brass Frame 20cm dia x 63 microns	01		
	Sieve Brass Frame 20cm dia x 53 microns	01		
	Sieve Brass Frame 20cm dia x 45 microns	01		
	Sieve Brass Frame 20cm dia x 38 microns	01		
	Pan and Cover for 20cm dia sieves	01		
4.	Cube Mould, Steel, for 70.6mm cube with ISI Certification Mark	10		
5.	Cube Mould, Cast Iron, for 150mm Cube with ISI Certification	10		

	Mark			
6.	Digital Compression Testing Machine, Capacity 2000kN with in House NABL calibration certificate Digital Compression Testing Machine, Capacity 2000kN **with Pace Rate Indicator and In House NABL Calibration Certificate** **Features:** • Meets the key specifications of IS -516 & IS 14858 • Pace deviation bar graph. • Automatic stress determination and display. • Overload safety protection. • Self aligning platen with fast accessory change capability. • Configurable Engineering Unit for machine selection. • Predefined Machine capacities for each engineering unit. Specific capacity can be selected from the drop down menu. • Flexible Calibration Points. Calibration can be done on 5 to 10 points. • Peak Load, Peak Stress, Unique Record No. is displayed. • EDI has provision to configure more than one Mode. • Mode1-Compression/Mode2-Flexure/Mode3-Prism Testing/Mode4-Tensile Splitting strength. Each mode will have independent calibration points and calibration points are also flexible. • Mode-4 runs with Mode-1 calibration. • Dynamic Calibration • Any Centronics dot matrix Printer. • Menu Driven sample details. • Data storage approx. 2000 records • Data Download thru RS232 in ASCII format. • User can set break point. • Store records can be viewed & print. • Peak stress calculation based on sample type and shape. **Technical Specifications:** Capacity : 2000kN Least Count: 0.1 kN Maximum Clearance Between Platens: 370mm Maximum Distance Between Side Plates: 340mm Platen Size: 222.0mm Piston Dia: 222.2mm Piston Stroke: 50mm Specimen Size to be tested: 100mm & 150mm Cube & 100mm & 150mm Dia Cylinder **Electrical: Works on 220V, AC Single Phase.** **Supplied complete with Spacers and CVT.**	01		
7.	Slump Test Apparatus with testing rod and base plate Ref. Standards IS:7320 with CM/L number, BS:1881, ASTM C 143, AASHTO T119	04		

	Supplied with the following: • Slump Cone • Base plate with swivel handle • Tamping rod steel, 10 mm dia x 600 mm length with ISI certification mark IS : 10086			
8.	Cylindrical Mould, Cast Iron, Split Lengthwise 150mm dia x 300mm high with ISI certification mark IS:10086	04		
9.	Vicat Apparatus with ISI Certification Mark, IS:5513 **CM/L number**, fitted in Aluminium Box **Supplied with the following:** • Permeability Cell. • 'U' Tube Manometer, mounted on stand. • Perforated Metal Disc. • Plunger. • Rubber Stopper. • Rubber Tube, 20 cm long. • Filter Paper Discs (Twelve Nos.). • Dibutylphthalate Liquid, 100 ml bottle. • Punch. • Non Perforated Disc. • Suction Bulb.	03		
10.	Density Basket Ref. Standard - IS:2386 (Part 3) Ruggedly constructed from galvanised wire mesh, 20 cm dia x 20 cm high (approx.).	02		
11.	Le-Chatelier Mould, with ISI Certification Mark IS:5514, set of six	03		
12.	Sample Tray (Enamel Tray), Size 300x250x40mm	05		
13.	Sample Tray (Enamel Tray), Size 200x150x30mm	05		
14.	Vibration Machine, with built-in Digital Timer Ref. Standard - IS:4031, IS:10080, EN 196-1 413-2, EN 13454-2 **The equipment consist of the following:** Mould Steel, for 70.6 mm Cube with ISI Certification Mark as per IS:10080 – 1 No. Side Spring Supporting Springs (Set of four) Springs, for Fitting Mould (Set of two) Endless Belt Belt Guard Eccentric Shafts with bearing	01		
15.	Immersion Type Needle Vibrator, Electrically Operated, Motor-Single Phase 2 HP, Needle Dia-40mm Length (including Needle)4-5 Mtrs.	01		
16.	Compaction Factor Apparatus, Ref. Standard IS:5515 A useful tool for determination of workability determination of concrete mixes of very low workability such as those normally	01		

	used with concrete, compacted by vibration. Concrete mix having maximum size of aggregate not exceeding 38 mm, can be tested for workability. Compaction Factor Apparatus is complete with hoppers and receiver assembly, Tamping Rod of 16 mm dia x 60 cm long having a Hooper and two trowels.			
17.	Beam Mould, 100mm x 100mm x 500mm with tamping bar	02		
18.	Electronic Balance, Capacity 220 g x 0.001g	01		
19.	Air Permeability Apparatus (Blaine type) with ISI Certification mark IS;5516, fitted in Aluminium Box **Supplied with the following:** Permeability Cell. 'U' Tube Manometer, mounted on stand. Perforated Metal Disc. Plunger. Rubber Stopper. Rubber Tube, 20 cm long. Filter Paper Discs (Twelve Nos.). Dibutylphthalate Liquid, 100 ml bottle. Punch. Non Perforated Disc. Suction Bulb	02		
20.	Sample Tray (Enamel Tray), Size 650x500x50mm	05		
21.	Laboratory Electric Oven, with Digital Indicator Cum Controller with Safety Alarm, range 50° to 250°C +/-1°C with Air Circulating Fan, S.S. Inside Size 600 x 600 x 600mm,	01		
22.	Sedimentation Analysis Ref. Standards IS:2720 (Part II), BS:1377 **Supplied with the following:** Andreasen Pipette, Glass, 10ml. capacity Sedimentation tube, Glass, 500ml. capacity	01		
23.	Electronic Balance, Capacity 20kg x 2g, Make	01		
24.	Vernier Caliper Digital Resolution 0.0005"/0.01mm, Range: 0-6"/150mm	01		

TENDER BID-II (Financial)

Package- FOE/CE/03: Surveying & Geo-informatics Laboratory

Tender Cost: Rs. 1000/- **EMD: Rs. 22,000/-**

Bill of Quantity

S.No.	Equipment/Item Name	Specification/experiment	Qty.	Rate	Amount
1.	Theodolite	1. 20 seconds least count 2. with Tubular Magnetic Compass 3. with Optical Plumbing Arrangement complete in Teak Wood box 4. Telescopic Stand of extruded aluminum section with water proof cover 5. complete with all accessories	04		
2.	IOP Level	1. Size 228mm, 2. I.F. with tilting arrangement 3. drum graduated to read 1:5000 4. detachable compass to read 30 minutes 5. Made of Full Brass 6. Complete with accessories and adjusting tools packed in wooden box with open frame wooden tripod stand. 7. complete with all accessories	04		
3.	Dumpy Level	Telescopic Length Size 12", Erect Image. Internal Focusing, Fitted with compass. Supplied along with all standard accessories and adjusting tools in a highly polished wooden box. complete with all accessories	02		
4.	Auto Level	Telescope: 1. Image : erect 2. magnification $\geq$ 31 x 3. aperture of objective $\geq$ 40 mm 4. field of view : 1°20’ 5. shortest focusing distance : 0.5m 6. Multiplication factor : 100 m 7 Waterproof :Yes	04		

		8. additive factor : 0 9.Working range ±15' 10. setting accuracy : ±0.3'' 11. sensitivity of bubble: 8'/2 mm 12. Circle Graduation: 1 gon or 1° 13. leveling accuracy in 1 km of double leveling : ± 1 mm in 1 km 14. Centre size of tripod: M16 or 5/8" 15. complete with all accessories			
5.	Leveling Staff	1. 4m telescopic, 2. made of Aluminum, 3. with water proof cover 4. complete with all accessories	10		
6.	Prismatic Compass	1. Made of Brass, Size 100mm dia. 2. Fitted with quality agate stone. 3. Aluminum floating circle 4. graduated to read 30 minutes (0.5 degree). 5. Automatic lifter 6. Reflecting mirror fitted on the sight vane. 7. Slow motion type Prism reader fitted with colored glasses green and red. 8. Packed in PVC case. 9. Supplied with Aluminum Tripod 10. complete with all accessories	10		
7.	Surveyor Compass	1. Made of Brass, Size 100mm dia. 2. with metal circle graduated to full degree with two bubble and with bar needle fitted with real agate stone to give high accuracy precision bearing reading, 3. Supplied in PVC case. 4. Supplied with Aluminum Stand 5. complete with all accessories	10		
8.	Planimeter	Sliding bar pattern for measuring areas from drawings and maps Complete in case with instructions	01		
9.	Cross staff	Size 4", Open Type having four	06		

		vanes at right angles, Complete in wooden box with metallic pole.			
10.	Optical Square	Circular type, made of brass, fitted with double reflecting mirror right and lift to 90 degree, complete in box.	05		
11.	Subtense Bar	Complete set with all accessories	01		
12.	Plane Table complete set with alidade ,U-fork, Trough compass ,hand level etc.	1.750mm X 600mm made of seasoned fire wood 2. fitted with brass screws and brass washers 3. provided with seasoned teak wood battens and gun metal round plate 4. provided with metal head wooden stand and water proof cover 5. complete with all accessories	05		
13.	Measuring chain	30 m	10		
14.	Measuring Tape Fibre	30 m	10		
15.	Ranging Rods	Aluminum 3 m (collapsible) 3 fold with heavy iron shoe	20		
16.	Electronic theodolite	**1. Telescope** Image :Erect Magnification :30x Objective Aperture :45 mm Minimum focusing dist. 1.35m Stadia Ratio :100 Resolving Power: 3” Length:155mm **2. Angle Measurement** Encoder System Absolute Encoding Display Resolution 1” or 5” Accuracy(1) : 2”/5”/10” Circle Diameter:79mm Tilt Compensator range: ±3’ **3. Display :LED Double Side** **4. Optical Plummet** Magnification: 3x Field View:5° Focus Range:0.5m- **5. laser Plummet & Pointer** Wave Length:630-670mm Power:5mW Laser range: 180m	02		

		Laser Spot Diameter: <2mm **6. Bubble** Plate Level:30”/2mm Circle Bubble:8’/2mm **7. Power** Rechargeable Battery: Ni-MH 6V 1200mAH			
17.	Micro optic theodolite	Erect Image Angle Measurement accuracy 1” Digital reading **Complete with all accessories**	01		
18.	Total station with Software	**Angular Measurement:** Sensor Type: Absolute encoders Angular Accuracy: 5"or better Least Count: 1" **Compensator :** Type: Liquid electric detection Range: ± 3' or more **Prism Mode:** Distance Accuracy: ±(2+2 ppm × D) mm Distance Least Count: 0.1mm Measuring Time: 1 sec or less Distance range with single prism: at least 5000m or more Shortest measurement Range: <1.5m **Direct Reflex Mode** **(Non Prism/Without Prism)** Distance Accuracy: ±(3+2 ppm x D) mm Distance Least Count: 0.1mm Measuring Time: 1 - 10 sec or less (depending on the distance & surface) Distance measurement Range (Kodak Grey Card with 90% Reflectance): Up to 800m or more Shortest measurement Range: 1.5m **Laser Classification** Prism mode: Class 1 Direct Reflex Mode (Non Prism/Without Prism): Class 1 Laser Pointer: Co-axial Red light; Class 2 **Drives**	01		

		Drives: Manual Clamps: Tangent Clamps **Telescope** Telescope Magnification: 30x Focusing: Manual & Auto Focus Shortest focusing distance: 1.5m Field of view at 100 m: 1° 25’ (2.5m at 100m) **Plummet: Built-in Optical / Laser Plummet** **Environmental Endurance** Operating temperature: –20°C to +50°C Dust and water proofing: IP66 **Interface** Display: Back-lit, graphic LCD (128 x 64 pixels) Keyboard: Full alpha numeric hard key pad. Operating system: Menu driven GUI. Position: Both sides Identical Memory: 50,000 points Communication: USB, Serial & Bluetooth **Power supply** Internal Li-ion battery with Battery operating time of at least 6 hrs on each battery **Security** PIN/Password protection **Controller On-Board Software** ***Following features are desired in the onboard software:*** *Electronic graphic Level* *Atmospheric Corrections* *Station Setup* *Stake out* *Topo* *Traverse* *Quick-coding for convenient one-button data collection of point features and your raw targ data* *A complete set of CoGo functions*			

		Simple data management of files *Separate measurement key for Prism & Non Prism measurement.* ***Complete Supply (Per set):*** *Main Instrument with detachable Tribrach (01)* *Rechargeable Batteries (02) with Dual Charger (01)* *Heavy Duty Wooden Telescopic Tripod (01)* *Prism with holder (01)* *Telescopic Range pole (01)*			
19.	Mirror Stereoscope with parallax bar	Most Improved quality, with coated lenses and Silver plated mirrors, light weight, precision built, which gives excellent results, very superior. Supplied in case. **Complete with all accessories**	02		
20.	Pocket Stereoscope Along with all accessories	Fitted with Brass slides and superior lenses. Complete within canvas cover. **Complete with all accessories**	05		
21.	GPS (Hand Held)	GPS+GLONASS support, WAAS enabled, 24 Channels, HAccuracy upto 3m(s), V-Accuracy upto 5m(s), 25 hours battery life, USB interface, 1.7GB internal memory GPS and GLONASS satellites for faster positioning 3-axis electronic compass and barometric altimeter 24 Channels Upto 2m(s) RMS accuracy Worldwide basemap Internal memory and microSD card slot 2.2" 65K color, sunlight-readable display Paperless geocaching 25-hour battery life with 2 AA batteries Along-with standard accessories:- 1. USB cable 1 Nos. 2. Quickstart Guide 1 Nos.	01		

TENDER BID-II (Financial)

Package- FOE/CE/04: Structural Analysis Laboratory- I

Tender Cost: Rs. 1000/- **EMD: Rs. 5,000/-**

Bill of Quantity

S. No.	Name of Equipment with specifications	Qty.	Unit Cost	Total Cost
1.	**Complete setup with Weights, Dial gauges & magnetic bases** Flexure Rigidity of a given Beam.	01		
2.	**Complete setup with Weights, Dial gauges & magnetic bases** Maxwell Reciprocal Theorem.	01		
3.	**Complete setup with Weights, Dial gauges & magnetic bases** Three Hinged arch.	01		
4.	**Complete setup with Weights, Dial gauges & magnetic bases** Two Hinged arch.	01		
5.	**Complete setup with Weights, Dial gauges & magnetic bases** Deflection of curved members.	01		
6.	**Complete setup with Weights, Dial gauges & magnetic bases** Bar Forces in a three members structural frame with pin joint bar.	01		
7.	**Complete setup with Weights, Dial gauges & magnetic bases** Critical load in struts with different end conditions.	01		
8.	**Complete setup with Weights, Dial gauges & magnetic bases** Deflection of Beam having unsymmetrical Bending.	01		