MIZORAM UNIVERSITY

MIZORAM : AIZAWL

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Website : www.mzu.edu.in

No. 11/5/Adm-II(A-I)/2015 ***Dated Aizawl the 30th November, 2016***

NOTICE INVITING TENDER

(TWO BIDS)

FOR SUPPLY & INSTALLATION OF EQUIPMENTS FOR CONCRETE LABORATORY FOR B.TECH. PROGRAMME (CIVIL ENGINEERING DEPARTMENT) AT MIZORAM UNIVERSITY, AIZAWL

The Vice-Chancellor, Mizoram University invites quotation for supply & Installation of Equipment as per details at **ANNEXURE-IV**, **in Two Bids** to reach the undersigned:

S.No.	Reference No.	Items	Qnty	EMD 2% (`) in the form of DD	Tender Document Fee (`) in the form of DD only.
01.		Supply & Installation of Equipment for Concrete Laboratory to be installed at Department of Civil Engineering, Mizoram University, Tanhril	One Package		₹ 1,000

1. Last date & Time for Submission :**17.01.2017**
2. Date/Time for Opening of Technical Bids :**17.01.2017 (2:00 p.m.)**
3. Date of notifying the Technically qualified bidders in the website :**24.01.2017.**
4. Evaluation of Financial bids for Technically qualified bidders :**01.02.2017.**
5. Venue of Bid Opening at MIZORAM UNIVERSITY, AIZAWL

BID INSTRUCTION:

1. Quotations shall be submitted in **TWO Bids: i) Technical Bids & ii) Financial Bids;** which will be submitted in 2 separate envelopes, super-scribing the nomenclature of bids, with name & address of firms. And these 2 envelopes shall be placed inside a single sealed envelope, and must be prominently super scribed:
QUOTATION FOR SUPPLY & INSTALLATION OF EQUIPMENTS FOR CONCRETE LABORATORY FOR B.TECH. PROGRAMME (CIVIL ENGINEERING DEPARTMENT) AT MIZORAM UNIVERSITY, AIZAWL, REF. NO. *11/5/Adm-II(A-I)/2015* DATE:30th November, *2016*

2. Submission of Compliance Certificate: Duly filled and signed Compliance Certificates (as per formats at **Annexure I (A & B**)are must with the Technical bid.

3. Bid not transferable: The bid documents are not transferable and the seal and signature of the authorized official of the firm's must appear on all the papers and envelopes submitted.

QUALIFICATION REQUIREMENTS

1.The Bidder should be an Original Equipment Manufacturer (OEM) *or* a firm of reputation having sufficient expertise and experience in the subject tender with sound warranty / service support capability and authorization from Manufacturer / Distributor.

2. The Bidder has to quote for all the items and Bidders who do not quote for all the items are subject to be disqualified.

MIZORAM UNIVERSITY TERMS & CONDITIONS:

1. **Rates:** Rates quoted in the **Price Bid** should be **on DOOR DELIVERY Mizoram University basis,** as per details below:

Sl. No.	Particulars	Rate
I	Basic Price (per unit)	
	Total	
	Taxes(pl. give break up)	
	Grand Total for the item on door delivery at Mizoram University	

Bidders shall indicate their rates in clear / visible figures as well as in words and shall not alter/overwrite/make cutting in the quotation. In case of a mismatch, the rates written in words will prevail.

2. **Validity of Quotation:** Quoted rates must be valid for **90 days** from the date of quotation.

3. **Warranty:** The quoted equipment and components must be warranted for a minimum of 1 (One) year after satisfactory installation.

Literature a must: All the quotations must be supported by the printed technical leaflet / literature and the specifications mentioned in the quotation must be reflected / supported by such printed technical leaflet/literature. The model and specifications quoted should **invariably be highlighted** in the leaflet / literature for easy reference. **If supporting documents are not enclosed whether wholly or partly, it will be summarily rejected.**

4. **After Sales Service:** Vendors should clearly state the available nearest after sales service facilities in the region, without which their offers will be rejected.

5. **Dealership Certificate:** Dealers or Agents quoting on behalf of Manufacturer / Distributor must enclose valid dealership certificate.

6. **Earnest Money:** Refundable Earnest Money Deposit (EMD), 2% of the Quoted Value through Demand Draft drawn in favour of *"The Finance Officer, Mizoram University"*, payable at Aizawl, shall accompany the Technical Bid. The EMD of unsuccessful bidders shall be returned after award of supply. EMD of the successful bidder will be released on submission of the Performance Bank Guarantee. Offers received without Earnest Money or valid Certificate shall be summarily rejected.

15. **Performance Bank Guarantee (PBG):** In case of items with order value of Rupees Five lakhs (₹ 5,00,000/-) and above, the successful bidder shall furnish an unconditional PBG (as per format

at **Annexure II**) for 5% of the Purchase Order value from a scheduled Bank of India, after receiving the purchase/supply order**.** Where the PBG is obtained by a foreign bank, it shall be confirmed by a Schedule Indian bank and shall be governed by Indian Laws and be subject to the jurisdiction of courts at Aizawl. The PBG will be retained in Mizoram University till the Warranty Period and the PBG shall guarantee that,

(a) The Vendor guarantees satisfactory operation of the Equipment & components against poor workmanship, bad quality of materials used, faulty designs and poor performance.

(b) The Vendor shall, at his own cost, rectify the defects/replace the items supplied, for defects identified during the period of guarantee.

(c) This guarantee shall be operative from the date of installation till 120 days after the warranty period.

16. **Delivery:**

a) Time Limit: Maximum within 8 Weeks from the date of issue of the purchase order.

b) Safe Delivery: All aspects of safe delivery shall be the exclusive responsibility of the vendor.At the destination site, the package will be opened only in the presence of Mizoram University representative and vendor's representative. The intact condition of the package and the seal / indicators for not being tempered with, shall form the basis for certifying the receipt in good condition.

c) Insurance: The supplier is to establish 'All Risk Transit Insurance' coverage till door delivery at Mizoram University, Tanhril, Aizawl.

d) Part Delivery: Acceptance of part delivery shall be a prerogative of the University.

e)Penalty for delay in delivery: The date of delivery should be strictly adhered to otherwise; Mizoram University reserves the right not to accept delivery in part or full.

17. **Genuine Pricing**: Vendor is to ensure that quoted price for the particular item is not more than the price quoted to any other customer in India, particularly to Mizoram University, and other Government Organizations.

18. **Conditional tenders not acceptable:** All the terms and conditions mentioned herein must be strictly adhered to by all the vendors. Conditional tenders shall not be accepted on any ground and shall be rejected straightway. Conditions mentioned in the tender bids submitted by vendors will not be binding on Mizoram University.

19. **Road Permit:** Mizoram University will provide Road Permit to the Vendors of outside Mizoram, on demand.

20. **VAT deduction at source:** In case of supply within Mizoram, VAT deduction at source, as per Order / notification of the Govt. of Mizoram will be applicable.

21. **Late and delayed tender**: Late and delayed tender will not be considered. In case any unscheduled holiday occurs on the prescribed closing/opening date the next working day shall be the prescribed date of closing/opening.

22. **Payment**: 100% payment within 30 (thirty) days from the date of delivery, Satisfactory installation, acceptance and Training, where applicable/required.

23. **Payment for Imported Goods:** By an irrevocable Letter of Credit at CIF/CIP Kolkata value negotiable through any overseas branch of State Bank of India / any Schedule Bank of India.

Note: Please note LOC will not be opened unless and until Letter of Acknowledgement in original is received at Mizoram University, Tanhril, Aizawl, directly from the principal (Even in case of firms having subsidiary office in India).

24. ADDITIONAL TERM FOR IMPORTED GOODS

Following terms besides afore mentioned terms will be applicable in case of foreign purchases:

Rates: Prices quoted must be for destination including freight and insurance charges inclusive of free delivery up to the door of department in. Mizoram University premises, as per details below:

S.N.	PARTICULARS	RATE
a		
I	Basic Price (per unit)	
II	Total	
III	Custom Duty (Approximate)	
IV	Grand Total for the item on door delivery at Mizoram University, Tanhril, Aizawl.	

25. **Free Maintenance & Service for 10 Years**: An agreement is to be executed between the University& the **Manufacturer / Distributor / Dealer** for providing **Free Maintenance & Service for 10 Years** after expiry of the Warranty Period of the equipment by the Manufacturer / Distributor / Dealer (Preferably from the Manufacturer) within 30 Days from the day of Complaint. The cost of the Spare parts required for the service and maintenance will be paid by the Institute along with the To & Fro charges (The cheapest mode of Travel).

26. **Enquiry during the course of evaluation not allowed**: No enquiry from the bidder(s) shall be entertained during the course of evaluation of the tender till final decision is conveyed to the successful bidder(s). However, the Purchase Committee or its authorized representative may make enquiries/seek clarification from the bidders. In such a case, the bidder must extend full co-operation. The bidders may also be asked to arrange demonstration of the offered items, in a short period of notice.

27. **Acceptance& Rejection of the quotation:** The acceptance of the quotation will rest solely with the Vice-Chancellor, Mizoram University, who in the interest of the University is not bound to accept the lowest quotation and reserves the right to reject all the quotations received without assigning any reasons.

    If supporting documents and EMD are not enclosed, whether wholly or partly, it will be summarily rejected. At no given time shall the University seek additional information/documents for the purchase items in question. Therefore, the interested firms shall ensure the completeness of the quotation submitted, unless negotiations are call for by the University on need basis.

28. **Force Majeure**:

    If the performance of the obligation of either party is rendered commercially impossible by any of the events hereafter mentioned that party shall be under no obligation to perform the agreement under order after giving notice of 15 days from the date of such an event in writing to the other party, and the events referred to are as follows:

    i. Any law, statute or ordinance, order action or regulations of the Government of India,
    ii. Any kind of natural disaster, and
    iii. Strikes, acts of the Public enemy, war, insurrections, riots, lockouts, sabotage.

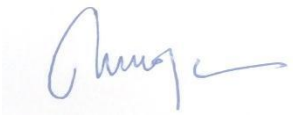
29. **Applicable Law**:

(a) The contract shall be governed by the laws and procedures established by Govt. of India and subject to exclusive jurisdiction of Competent Court and Forum in Aizawl / India only.

(b) Any dispute arising out of this purchase shall be referred to the Vice-Chancellor, Mizoram University, and if either of the parties hereto is dissatisfied with the decision, the dispute shall be referred to the decision of an Arbitrator, who should be acceptable to both the parties, to be appointed by the Head of the Institution. The decision of such Arbitrator shall be final and binding on both the parties.

30. The Financial Bids of the Technically qualified firms shall be opened in the presence of the representatives of the qualified firms' and the University assigned Committee to purchase the supply.

Encl.: ANNEXURE-I, ANNEXURE-II, ANNEXURE-III & ANNEXURE-IV



(DR. K.ZIRNUNSANGA)
DEPUTYREGISTRAR
GENERAL ADMINISTRATION DEPARTMENT
MIZORAM UNIVERSITY
AIZAWL, MIZORAM

Annexure -I

A. COMPLIANCE CERTIFICATE FOR MIZORAM UNIVERSITY TERMS
(To be enclosed in the Technical bid)

Sl. No.	MZU Terms and Conditions	Yes/No
01	**Rate** quoted as per instruction	
02	**AMC rate** after warranty provided	
03	**Validity** of quoted rate for 90 days agreed	
04	**EMD** submitted (appropriate certificate enclosed)	
05	**PBG** term agreed	
06	**Payment** term agreed	
07	**Delivery terms** agreed	
08	**Warranty period** agreed	
09	**Literature:** Printed Literature provided	
10	**Dealership** / distributorship certificate (in case of dealers/agents) provided	
11	**Sales Service**: address of after Sales Service centre in India (for imported goods)/ in the region provided	
12	**Applicable law** terms agreed	
13	**Photocopy of items(equipment/machine)**	

Signature with Seal:..…….

Vendor: M/s……

B. COMPLIANCE CERTIFICATE FOR SPECIFICATIONS
(One for each item must to be enclosed in the Technical bid)

Item Sl. No.		
Specifications as per Annexure-IV	**Quoted Item Specs.***	**Complied (Yes/No)**

Signature with Seal:..…….

Vendor: M/s……

*** Vendor must quote the parameter / specification of the quoted product in this column and not just copy the specification from the tender document. Failure to do so will lead to rejection of the tender.**

Annexure –II

PERFORMANCE BANK GUARANTEE

To:

The Vice-Chancellor
Mizoram University
Tanhril-796004, Mizoram

WHEREAS ..... (Name of Supplier) hereinafter called "the Supplier" has undertaken, in pursuance of Contract No..... dated,..... 20... to supply..... ..... (Description of Goods and Services) hereinafter called "the order".

AND WHEREAS it has been stipulated by you in the said order that the Supplier shall furnish you with a Bank Guarantee by a recognized bank for the sum specified therein as security for compliance with the Supplier's performance obligations in accordance with the order.

AND WHEREAS we have agreed to give the Supplier a Guarantee:
THEREFORE WE hereby affirm that we are Guarantors and responsible to you, on behalf of the Supplier, up to a total of .... (Amount of the Guarantee in Words and Figures) and we undertake to pay you, upon your first written demand declaring the Supplier to be in default under the order and without cavil or argument, any sum or sums within the limit of ..... (Amount of Guarantee) as aforesaid, without your needing to prove or to show grounds or reasons for your demand or the sum specified therein.

This guarantee is valid until the .....day of.....20.....

Signature and Seal of Guarantors
.....
.....
.....
Date.....20....
Address:.....
.....
.....

All correspondence with reference to this guarantee shall be made at the following address:

Mizoram University
P.O. Box. 190
Tanhril -796004,
Mizoram

Annexure -III

MANUFACTURERS'/ DISTRIBUTOR'S AUTHORIZATION FORM

No. Dated _____

The Vice-Chancellor
Mizoram University
Tanhril-796004, Mizoram

Dear Sir:
We…… who are established and reputable Manufacturers/distributors of ……having factories/office at----------
---
(address of factory/office) do hereby certify that……
……
……(Name of the Authorised Dealer)is our authorized dealer to quote against your tender enquiry no
……..
,Last Date of Submission is:

Yours faithfully,

(Name)
(Name of Manufacturer/Distributor)

ANNEXURE-IV

TECHNICAL SPECIFICATIONS FOR CONCRETE LABORATORY EQUIPMENT, CIVIL ENGINERING, MIZORAM UNIVERSITY.

Sl.no	Technical Specification	Qty.
1.	**Variable Flow Type Air Permeability Apparatus (Blaine Type) IS : 5516-1969.** The apparatus should comprise of the following :- i) Standard permeability cell made of brass, 12.5 mm inside dia with one perforated metal disc and one plunger. ii) A U-Tube glass manometer with rubber coupling for permeability cell, mounted on a wooden stand. iii) Latex rubber tubing, 30 cm long. iv) 10 filter paper discs, No. 40 whatman. v) 250 ml Dibutylphthalate liquid.	03
2.	**Cement Autoclave IS : 4031-1968** The equipment should comprise of :- i) One high pressure steam chamber approximately 150 mm ID x600 mm long, made of seamless stainless steel tube with bolted steel cover, which should be enclosed in heat insulated metal housing. ii) Strip heaters with thermostat regulator and two heat-switch to regulate rate of heating. iii) Preset pressure switch to control and maintain preset steam pressure in the chamber. iv) Spring loaded safety valve incorporated in the unit with valve adjusted to work at 23 kg/sq. cm pressure approximately. v) Steam Pressure Gauge with maximum capacity of 42 kg/sq.cm. vi) A blower for accelerated cooling of the unit at the end of a test. vii) One test bar holder for holding eight test specimens inside the steam chamber in vertical position. **Accessories** **Shrinkage Bar Mould (Single)** **IS : 4031-1968, 2386 (Part VII) 1963, IS : 10086-1982, ASTM C-151** **Length Comparator IS:4031-1968, IS : 9459-1980** The apparatus should comprise of the following :- i) One frame consisting of one base plate, two pillars and a cross-bar. The cross bar should be adjustable up and down on the threaded pillars. ii) One dial gauge, least count 0.002 mm, travel 5 mm which can be fixed to the cross bar. The plunger of the dial gauge has a concave spherical seating which sits over the reference studs of specimen bars while taking observation. iii) One reference bar of stainless steel with insulated handle	1 01 01
3.	**Vibration Machine:** As per IS-10080. Vibrator is mounted over coiled springs. Vibrations are by means of a revolving shaft with an eccentric. Frequency 12000±400vibration per minute. Centre of gravity of the vibrator, including the cube and mould is either at the centre of the eccentric shaft or within 25mm below it. Easy assembling and dismantling of cube mould. Provided with the belt-guard and a Digital Timer. Suitable for operation in 230volts, 50cycles single phase A.C. supply. Vibration machine is supplied with one cube mould. Complete unit with cord & plug.	02
4.	**Equipment for Test on Aggregates** **A) Thickness Gauge IS: 2386(part 1)- 1963** **B) Length Gauge IS: 2386 (part - 1) 1963** **C) Los Angeles Abrasion Testing Machine` IS: 10070-1982**	 10 10 01

	The machine should comprise of the following:- i) A hollow steel cylinder mounted on a sturdy frame on ball bearings capable of rotating about its axis in a horizontal position. ii) A detachable shelf fitted inside the cylinder at a distance of 1250 mm from the opening measured along the circumstance in the direction of rotation. iii) A motor with reduction gear which runs the drum at 30-33 rpm. iv) A tray. v) A revolution counter. vi) Abrasive charge consisting of 12 steel ball approximately 48 mm dia and each weighing between 390 and 445 g. Suitable for operation on 440 v, 50 Hz, 3 phase supply.	
5.	**Aggregate Impact Test Apparatus with counter** **IS: 9377-1979** It should consist of the following :- i) A heavy circular base with two vertical guides fitted with a crossbar at the top. ii) A hammer of 13.75 kg mass which can be raised and allowed to fall freely through 380 + 5 mm with locking arrangement. iii) A cylindrical cup, a metal measure and a tamping rod 10 mm dia x 230 mm long.	03
6.	**Density Basket** **IS: 2386 (Part III) – 1963**For determination of the specific gravity and water absorption of aggregate. It is made of G.I. wire-mesh or punch approx 20cm diameter x 20cm high. Complete with handle.	05
7.	**Vicat Apparatus, With Dashpot** **Confirming to IS : 5513-1976** The equipment should comprise of the following :- i) A frame with a vertically movable rod having a cap at the top. ii) Vicat mould in the form of frustum of a cone with internal diameter of 60 mm at the top, 70 mm at the bottom and a height of 40 mm. iii) Glass base plate for the mould. iv) Initial Setting Time Needle. v) Final Setting Time Needle. vi) Consistency plunger.	05
8.	**Gauging Trowel BS:12, IS:4031, IS : 10086-1982** Weight 210 ± 10g.	20
9.	**Trowel IS:4031 - 1968, IS : 10086-1982** The trowel blade of thickness 1.5 mm and 100 to 150 mm long with straight edges and a wooden handle.	20
10.	**Steel Bowl (Medium)**	20
11.	**Plastic Tray Medium Size**	10
12.	**Plastic Measuring Jar 10 ml.**	10
13.	**Plastic Measuring Jar 25 ml.**	10
14.	**Plastic Measuring Jar 50 ml.**	10
15.	**Plastic Measuring Jar 100 ml.**	10
16.	**Plastic Measuring Jar 1000 ml.**	10
17.	**Density Bottle** It should be performed as per IS:2720 (Part-I). Density bottle of 100 ml with capillary vent leak proof stopper.	10
18.	**Le-Chatelier Flask 1000 ml.**	05
19.	**Le ChatelierMould, conforming IS : 5514-1969** The apparatus should consist of the following :- i) One split cylinder 30 mm dia x 30 mm high made of spring brass with two indicator	10

	arms. ii) Two glass plates. iii) One lead weight approximately 100 g.	
20.	**Le Chatelier Water Bath.**	01
21.	**Hot Plate**	02
22.	**Steel Vessel 250 mm dia.**	10
23.	**Cube Mould** **(70.6 mm) With I.S.I Mark IS: 10080-1982**	15
24.	**Sieves 200 mm dia (8" dia) Spun Brass frame Sieve** Sizes : 4.75 mm, 2.36 mm, 1.18 mm, 600 Mic, 300 Mic, 150 Mic, 75 Mic, lid and pan.	05
25.	**Sieves 200 mm dia (8" dia) Spun Brass frame Sieve** Size: 90 Mic.	03
26.	**Sieves 450 mm dia (" dia) Galvanised Iron frame Sieve** Sizes:63mm,50mm,40mm,25mm,20mm,16mm,12.5mm,10mm,6.3mm,4.75mm,2.36mm, lid and pan.	05
27.	**Electronic Weighing balance 50 kg, 2 gm. Accuracy**	02
28.	**Hanging balance 15 kg capacity, 1 gm least count**	01
29.	**Platform balance 150 kg capacity,** **0.02 kg (20 gm) least count**	02
30.	**100 kN Flexure Testing Machine Motorised**	01
31.	**Slump Test Apparatus** **IS: 7320-1974** It should comprise of the following:- i) A slump cone 100 mm dia at the top, 200 mm dia at the bottom, and 300 mm high with two cleats and lifting handles. ii) A base plate with clamping arrangement for the slump cone and a swivel handle which also serves as the datum for measuring the slump. iii) A tamping rod 1.6 cm dia and 60 cm long with one end rounded and graduated from 0 to 15 cm in 0.5 cm spacing to measure the slump.	05
32.	**Vee-Bee Consistometer IS : 10510-1983** The apparatus should consist of the following: - i) A slump cone 100 mm inside dia at top, 200 mm inside diaatbase and 300 mm high. ii) One container for the slump cone with two clamps and liftinghandles. iii) A vibrating table mounted on rubber shock absorbers and having a swivel arm attached on one side. The swivel arm carries a funnel on one side and a graduated rod with a Perspex disc on the other side. The rod should be graduated in centimeters to measure the slump and volume in the cylinder after vibration	1
33.	**Compaction Factor Apparatus** **IS: 5515-1983** It should comprise of the following: i) Two conical hoppers with trap doors. ii) One cylindrical receiver 0.005 cu m volume. iii) A welded steel stand for mounting the hoppers and the receiver co-axially at specified distances. iv) Two trowels. v) One hand scoop. vi) One standard tamping rod 16 mm dia x 600 mm long.	2
34.	**Digital balance 600 gm capacity x 0.01 gm. Readability**	1
35.	**Cube Mould** (150 mm) With I.S.I Mark, IS: 10086-1982	30
36.	**Cube Mould (100 mm) Non ISI Mark**	5

	100 mm x 100 mm x 100 mm.	
37.	**Cylindrical Mould** 150 mm dia x 300 mm high, Cast Iron.	10
38.	**Beam Mould** 150 mm x 150 mm x 700 mm made of Cast Iron.	10
39.	**Beam Mould** 100 mm x 100 mm x 500 mm made of Cast Iron.	5
40.	**Lab Concrete Mixer Motorized 150 Ltr. Capacity**	1
41.	**Moisture Cup Medium size**	30
42.	**G.I. Tray 2' x 2'**	15
43.	**Hot Air Oven (Inside Chamber stainless Steel)** **With digital temperature controller and air** **Circulating fan. Size : 18" x 18" x 18"**	02
44.	**Sieve Shaker – Motorised** Having a sturdy can iron body, the sieve shaker has an inclined sieve table which can accommodate a maximum of seven sieves of 150 mm or 200 mm diameter. **300mm dia adopter for the above Sieve Shaker** **Timer for above Sieve Shaker**	01 1 1
45.	**Flow table** (Hand Operated) IS: 5512-1983 Used for making flow tests for consistency of mortars in tests of hydraulic cements and pozzolanic materials. It comprises the following:- i) A machined table top 250 mm dia of Gun metal fitted with a vertical shaft. Total weight 4.00 ± 0.05 kg. ii) A cast iron frame with a machined base and a smooth vertical hole at the top for the table shaft. It has a horizontal shaft carrying a cam at one end and a hand wheel at the other. The cam allows 12 mm free drop of the table. iii) A conical mould 100 mm inside dia at bottom, 70 mm inside dia at top and 50 mm high.	01
46.	**Standard Sand (minimum 25 kg. bag)** **Grade I** **Grade II** **Grade III**	 10 10 10
47.	**Vibrating Table**: As per IS-2514. Proper compaction of cement concrete while casting specimens for compression testing is desirable to achieve a better and more consistent mixture. Vibrating table is ideally suited for this purpose. The table top is 500mm x 500mm and has stops along its edges to prevent moulds from sliding off the table during operation. The maximum load capacity is 140 kg. The variable pitch pulley arrangement permit the frequency to be varied step-lessly between 600cycles/sec. and 430cycles/sec. Suitable for operation 415volts, 3phase 50 Hz A.C. supply.	01
48.	**<u>Ultrasonic Thickness Gauge</u>** **<u>Technical Specifications:</u>** 1. Thickness range from 0.5 mm to 635 mm in steel 2. Material velocity range - 0.508 mm/μs to 18.699 mm/μs 3. Transducer frequency range - 2.25 MHz to 30 MHz (–3 dB) 4. Accuracy of thickness measurement in ambient temperature after 2 point calibration : ± 0.05 mm 5. Ultrasonic Transducer details:-	01

a. High Temperature Ultrasonic Transducer which should up to 500 °C and Range in Steel from 1 to 500 mm, Tip diameter 11 mm, Frequency 5 MHz
b. Regular Ultrasonic Transducer which should work up to 150°C and Range in Steel from 0.71 to 100mm, Tip diameter 7.2 mm, Frequency 7.5 MHz
c. Thru-coat Ultrasonic Transducer – Frequency 5 MHz, Range in Steel from 1 to 50 mm and Paint Coating range from 0.125 mm to 2 mm.

6. Dimensions (W x H x D) : 125 mm x 211 mm x 46 mm
7. Weight : 814 g
8. Power supply : AC/DC adaptor, 24 V; lithium-ion battery 23.760 Wh; or 4 AA auxiliary batteries
9. Battery life, lithium-ion: Operating time: minimum 12.6 h, 14 h typical, 14.7 h maximumFast charge: 2 h to 3 h
10. Standards : Ultrasonic Thickness guage should bed designed for EN15317
11. Display: ColortransflectiveVGA display - Liquid crystal display, display area 56.16 mm x 74.88 mm
12. Rectification : Full wave, RF, half-wave positive, or half-wave negative
13. Data logger: The Thickness Gage should identify, store, recall, clear, and transmit thickness readings,waveform images, and gage configuration information through USB or MicroSD.
14. Data logger Capacity: 475,000 thickness measurements or 20,000 waveforms with thickness measurements
15. File names, IDs, and comments : 32-character file names and 20-character alphanumeric location codes with four comments per location
16. Ingress Protection : IP 67 i.e. Water and Dust Proof
17. Explosive Atmosphere: Safe operation as defined by Class I, Division 2, Group D, as found in the National Fire Protection Association Code (NFPA 70), Article 500, and tested using MIL-STD-810F, Method 511.4, Procedure I.
18. Vibration tested using MIL-STD-810F, Method 514.5, Procedure I, Annex C, Figure 6, general exposure: 1 hour each axis.
19. Shock tested using MIL-STD-810F, Method 516.5, Procedure I, 6 cycles each axis, 15 g, 11 msec Half sine.
20. Rubber boot with gage stand
21. The following modes to be present in the thickness gages:-
    a. Min./Max. mode
    b. Two Alarm modes
    c. Differential Mode
    d. Reduction Rate
22. Timed based B Scan and optional Encoded B Scan:- The thickness gage B-scan feature should convert live thickness readings into cross-sectional images drawn on the display
23. Live A-scan with Waveform Adjust: The Live A-scan mode should allow users to view the ultrasound waveform (or A-scan) directly on the gage's display, verify the thickness measurement, and make manual adjustments to gain and blanking settings to maximize measurement performance in challenging applications. This should also have the option features like Manual Gain Adjust, Extended Blanking, First Echo Blank, Range, and Delay.
24. High Temperature Operation: The thickness gage should be ideally suited for making stable thickness measurements on hot material surfaces (up to 500 °C or 932 °C) with the ultrasonic transducers
25. Temperature Compensation: The temperature compensation feature should allow you to manually enter the calibration block's temperature and the current (high) temperature at the measurement points. The thickness gageshould automatically

	displays the temperature-corrected thickness. 26. Automatic Probe Recognition for dual element Ultrasonic Transducers. 27. Compatibility with EMAT probe for measuring thickness of pipes where external oxide layer is formed. 28. The guage has to measure internal oxide layer thickness measurement from 250 micron to 1.25 mm with longitudinal ultrasonic probe. 29. Calibration Doubling warning when echo doubling may occur during calibration 30. Echo-to-Echo : The gage should display the true metal thickness and ignore the thickness of the coating layer, using multiple back-wall echoes 31. Thru-Coat Technology: The thickness Gage should use a single back-wall echo to measure true metal thickness. The thickness gage can display the metal and coating thicknesses, each adjusted for their correct material sound velocities so that there is no need to remove paint and coatings from surfaces. Software Interface Program: The Windows-based application collects, creates, prints, and manages data from the thickness guage. Printing reports such as Thickness, Setup Table, statistics, and Color Grid. Collecting snapshot screens. View dataset and survey files; including thickness readings, gage setup values, and transducer setup values	
49.	**Mortar Penetrometer IS : 8142-1976** The equipment should comprise of the following : i) A barrel enclosing a calibrated spring and a plunger with a stem graduated from 0-60 kgf in 1 kgf division. A handle should be fixed to the stem at the top. ii) Two needle shanks marked at 1.25 cm intervals. iii) Six needle points with cross sectional areas 645, 323, 161, 65, 32 and 16 sq.mm.	01
50.	**Air Entrainment Meter:** As per IS: 9799 Capacity – 0.005 cum. For concrete containing nominal maximum size of aggregate of 38 mm. The apparatus consists of a measuring bowl of 0.005 cm capacity. A flanged conical cover assembly fits over the bowl and can be sealed with clamps keeping a rubber gasket in between. A water inlet valve with a spray tube and an air bleed valve are fitted on the conical cover assembly. A14erspex cylindrical graduated stand pipe is fitted on the conical cover assembly. A pressure gauge is mounted on the top of the stand pipe. A hand pump is provided for the application of pressure. Supplied complete with a calibrating cylinder, a rubber mallet, a measure and a tamping rod.	01
51.	**Vicat Needle Apparatus:** As per IS: 4031, IS: 5513. For determining the normal consistency and the setting times of cements and the setting times of Class A lines. Complete with one each of vicatmould, glass plate, Initial Needle, Final Needle and Consistency plunger. Complete unit fitted with dash-pot .	02
52.	**Digital High Precision Balance** Capacity 120gms , Readability 0.001g, Repeatability (+/-) 0.001g , Linearity (+/-) 0.011g Pan size 100mm Appx.	01
53.	**Standard Spatula:** As per IS-4031. Made of steel finished in dull chrome with wooden handle.	02
54.	**Cylindrical Measures:** As per IS: 2386. For determination of bulk density of unit weight of aggregates. Consists of 3 measures of 3litre, 15litre and 30litre capacity.	05
55.	**Aggregate Crushing Value Apparatus** **(150 mm) IS: 9376-1979** • Consists of Case hardened Mild steel cylindrical container of 150 mm dia 0.5 mm x 130 mm to 140mm high with base plate 200 to 230 mm square x 6mm thick.	02

	• A plunger of 148 mm 0.5 mm dia x 100 to 115 mm high. • All parts directly coming in to contact with the specimen during the test are made of mild steel duly case hardened. • Supplied complete with tamping rod, 16 mm dia x 600 mm long, one end rounded.	
56.	**Digital Compression Testing Machine, Capacity 3000kN with touch screen display** Least count:- 0.1KN Maximum Clearance Between Platens:-400mm Maximum Distance Between Side Plates:-400mm Platen Size:-320 Square Piston Dia:-272.2mm Piston Stroke:-50mm Material of Construction: Special quality low carbon mild steel (Carbon-16%-17%) Weight of the Load Frame:1100kg Hardness of material(platen): 60 RHC **Hydraulic System:** With 15 liters, hydraulic oil(gradeServo 68) feed and fuel pump separately ,0.5 hp, 1 Ph, 220V AC motor driven two-speed hydraulic pump Control System: - Microprocessor based, auto pace rate control option must be incorporated. **Sensor:-** Bonded strain gauge based Pressure transducer, accuracy of +/- 1% or better. Motor Specification:- 0.5 hp, 1 Ph, 220V AC motor driven two-speed hydraulic pump, with Crompton Greaves motor. **Safety system:-**Auto stop and emergency stop knob facility, jack overload safety limit switch option. Auto shut down facility. Should consist of parfex glass fixed safety door on the front and back. **Paint quality:-**Powder coating 70-80 micron thick Calibration & validation:- machine must be with NCCBM calibration certificated with traceability certificate. **Standard** confirm to:- Conforms to IS 516 and IS :14858,• Machines conforming to ASTM C39, Micro processor details:-8085 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-PrismTesting/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 bi-directional RS232 in ASCII format. • User can set break point. • Store records can be viewed & print. • Peak stress calculation based on sample type and shape.• Easy to operate. • Password protection for system & calibration setup. • 2% overload facility to calibrate the machine upto full capacity. • Start, Stop,	01

	Pause & Reset. • Multifunction Keyboard. • Automatic Pace rate control to set value • Pace rate can be changed during test also. • Auto close / release of Dump Valve. • Communication with software thru Serial Port (Rs232). • Machine can be operated with software through computer,• CVT supplied to ensure constant voltage to digital indicator	
57	**Hydraulic Jack 1000kN** capacity with gauge & hand pump	1 No
58	**Self Compacting Concrete Flowability** **L Box** The equipment consist of the following replaceable 1. L-Box with three smooth bars parts: equally spaced and a gate 1 No. 2. Bucket capacity of 14 litre 1 No. 3. Measuring scale 0-600mm 1No. 4. Spirit level 1 No. 5. Stop watch with accuracy of 0.1 second:1 No.	1 No
59	**Portable Compression Testing Machine Capacity 1000kN** The equipment consists of a Loading Unit, an integral double acting manually operated pumping unit fitted to the base of the machine and a calibrated Load Gauge fitted on the top. It has a detachable Handle. The hydraulic cylinder is placed on the base of the Loading Unit.	1 No
60	**Heat of Hydration Apparatus** Ref.Std.ASTM C-186,IS4031:Part9,IS11262:1995 Contant-speed stirrer maintains uniform temperature throughout liquid and supplies sufficient agitation to keep solid reactant suspended in the acid mixture. This equipment consists case, vacuum jar with stopper; thermometer plus holder, glass funnel; stirring paddle of insulated wood and chuck.	1
61	**California Bearing Ratio Test Apparatus:** Laboratory Type: As per IS-2720 Part-XVI. The apparatus consists of the following: **Load Frame:** 50kN capacity – Electric-cum-Hand Operated with single speed of 1.25mm/min. **CBR Mould:** 150mm internal diameter x 175mm height, with collar 150mm dia x 50mm height complete with perforated base plate all steel construction. **Cutting Collar.** **Circular Metal Spacer Disc:** with detachable handle, 148mm dia x 47.7mm high. **Annular Metal Weight:** 2.5kg x 147mm dia with 53mm central hole. **Annular Metal Weight:** 5kg x 147mm dia with 53mm central hole. **Penetration Piston:** 50mm face diameter. **Perforated Brass Plate**:148mm diameter with locknut & stem. **Metal Tripod Stand:** for dial gauge. **Proving Ring:** Capacity 10kN complete fitted with dial gauge, duly calibrated from Test House, with Calibration Chart. **Dial Gauge:** least count 0.01mm. **Rammer:** 2.6kg with 310mm controlled fall. **Rammer:** 4.89kg with 450mm controlled fall	1

62	**Unconfined Compression Tester:** **(Proving Ring Type)** Electrically Operated with three speeds of 1.25, 1.5 and 2.5 mm/min. Suitable for operation on 230 volts, 50 cycles single phase. A.C. Supply. Proving Ring: Capacity 2kN for use with above. Dial Gauge .01 mmx25 mm for use with above. Conning Tool Set: for 38mm & 50mm diameter specimen**.**	1 sets
63	**Core Cutting Machine:** The Pavement Core Cutting Machine, Motorized powered road building drill has been designed specifically for the purpose of drilling test cores from or holes in roads, airport runways, bridges etc. The machine comprises of two vertical support columns which carry the drill head/engine assembly accurately with the help of screwed spindle. The Electric motor with pulley mechanism works with minimum vibrations. The double precision bit advances with screwed spindle which provides a constant, accurate drill pressure, minimum core chipping & long bit life. Complete unit suitable for 100mm diameter x 200mm length specimen, complete with one diamond bit with barrel.	3