

 <p>IIT PALAKKAD</p>	<p>भारतीयप्रौद्योगिकीसंस्थानपालक्काड Indian Institute of Technology Palakkad अहलिआ एकीकृत कैम्पस, कोज़िहपारा Ahalia Integrated Campus, Kozhipara पालक्काड- 678557 Palakkad – 678 557</p>	<p>दूरभाषसंख्या/ Phone no: 04923 – 226 586/561 ईमेल/ Email : purchase@iitpkd.ac.in</p>
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Prof. Job Kurian
Registrar i/c

Date : 24.04.2018

Open Tender No: IITPKD/CIE/AK/06/2018

Due Date: 23.05.2018 @ 3.00 PM

Dear Sir/Madam,

On behalf of the **Indian Institute of Technology, Temporary campus, Palakkad, Quotations are invited for “Servo Hydraulic System for Static and Low Frequency Cyclic Tests on Materials”**. The Specifications are given in the Annexure.

Pre Bid Meeting	02.05.2018 at 2.00 PM	Conference Room (Room No. 102)
Technical bid Opening	23.05.2018 at 3.00 PM	Conference Room (Room No. 102)

Instructions to the Bidder

- (i) **Preparation of Bids:** - The tenders should be submitted **under two-bid system (i.e.) Technical bid and Financial bid in separate envelopes**. The technical bid should consist of all technical details along with commercial terms and conditions. No prices should be included in technical bid. Financial Bid should indicate item – wise prices for the items mentioned in the technical bid. The technical and the financial bids should be put in separate covers and sealed. Both sealed covers should be put into a bigger cover. **Bids must either be spiral bound / stapled together. No loose sheets will be accepted. All pages must be numbered.**
- (ii) The Quotations duly sealed and superscribed on the envelope **with the reference No. and due date, should be addressed to the undersigned so as to reach on or before the due date stipulated above.**
- (iii) **Delivery of the tender:** - The tender shall be sent to the below-mentioned address either by post or by courier so as to reach this office before the due date and time specified in the Schedule. The offer/bid can also be dropped in the tender box on or before the due date and time specified in the schedule. **The tender box is kept in the office of the Academic Block, IIT Palakkad, Ahalia Integrated Campus, Kozhipara, Palakkad-678 557.**

- (iv) **Opening of the tender:** - The offer/Bids will be opened by a committee duly constituted for this purpose. The technical bids will be opened first and will be examined by a technical committee which will decide the suitability of the bid as per our specifications and requirements. The bidders will be invited for opening of Technical bids. **The Bidder's representative should carry authorization letter from their company empowering them to participate in the Pre-bid and tender opening meetings.** In respect of opening of financial bid, those bidders who are technically qualified only will be called.
- (v) **Prices:** - The price should be quoted in nett per unit (after breakup) and must include all packing and delivery charges indicated separately for each item. **The price indicated should be CIF/CIP Kochi. The Clearance and transportation of all the equipment to IIT Palakkad is the responsibility of the bidder or its agencies. The associated cost should be quoted separately in the financial bid.** The offer/bid should be exclusive of taxes and duties, which will be paid by the purchaser as applicable. The price should be quoted without custom duty. **The custom duty will be paid at concessional rate against duty exemption certificate.**
- (vi) **Agency Commission:** - Agency commission, if any, will be paid to the Indian agents in Rupees on receipt of the equipment and after satisfactory installation. Agency Commission will not be paid in foreign currency under any circumstances. The details should be explicitly shown in Tender even in the case of 'Nil' commission. The tenderer should indicate the percentage of agency commission to be paid to the Indian agent. **Terms of Delivery:** - The item should be supplied to our Institute as per Purchase order. The installation and commissioning should be completed as specified by us in the attached schedule.
- (vii) **Acceptance & Rejection:** IIT Palakkad reserves the full right to accept / reject any tender at any stage without assigning any reason.

Yours sincerely,

Registrar, IIT Palakkad

SCHEDULE

Important Conditions:

- 1) The due date for the submission of the tender is **23.05.2018 at 3.00 PM**
- 2) The offers / bids should be submitted in two-bids systems (i.e.) Technical bid and financial bid. The Technical bid should consist of all technical details / specifications only. The Financial bid should indicate item-wise price for each item and it should contain all Commercial Terms and Conditions including Taxes (separately), transportation, packing & forwarding charges, installation, guarantee, payment terms, pricing terms etc. The Technical bid and financial bid should be put in separate covers **superscribed clearly as "Technical Bid" and "Financial bid"** and sealed. Both the sealed covers should be put in a bigger cover. Open Tender for **"Servo Hydraulic System for Static and Low Frequency Cyclic Tests on Materials"** should be written on the left side of the Outer bigger cover and sealed.
- 3) **EMD: -EMD should be at 2% (two percent) of the tender value quoted by the bidder.** The EMD should be enclosed with the financial bid which will not be opened for Technical evaluation. **Enclosing the EMD in the Technical bid will automatically DISQUALIFY the tenderer.** EMD should be in the form of DD in favour of **"Indian Institute of Technology Palakkad" and payable at Palakkad"**. The tender without EMD would be considered as UNSOLICITED and will be REJECTED. Photo/FAX copies of the Demand Draft/Banker's pay orders will not be accepted. No interest will be paid for the EMD and the EMD will be refunded to the successful bidder on receipt of Performance Security.
- 4) **Performance Security:-** The successful bidder will be asked to submit Performance Security for an amount of 5% of the value of the contract/supply. The Performance Security may be furnished in the form of an Account Payee DD or FD Receipt from the commercial bank or Bank Guarantee from any nationalized bank of India. **Only after submission of Performance Security, Purchase Order/Work Order will be released / L.C will be opened.**
- 5) **Performance Security in the form of Bank Guarantee:-** In case the successful bidder is a foreign company and wishes to submit Performance Security in the form of Bank Guarantee, the Bank Guarantee should be routed through the Beneficiary Bank to the end user bank. Otherwise, the Indian Agent of the foreign vendor has to submit a Bank Guarantee from a Nationalized Bank of India.
- 6) The Bank Guarantee should remain valid for a period of sixty days beyond the date of completion of all contractual obligations of the supplier including the warranty obligations.

If an Indian agent is involved, the following documents must be enclosed:

- Foreign principal's proforma invoice indicating the commission payable to the Indian Agent and nature of after-sales service to be rendered by the Indian Agent.
 - Copy of the agency agreement with the foreign principal and the precise relationship between them and their mutual interest in the business.
- 7) The offer/bids should be sent only for a system or equipment that is available in the market and supplied to a number of customers. A list of customers in India and abroad with details must accompany the quotations. Quotations for a prototype machine will not be accepted.
 - 8) Original catalogue (not any photocopy) of the quoted model duly signed by the principals must accompany the quotation in the Technical bid. No prices should ever be included in the Technical bid.
 - 9) Compliance or Confirmation report with reference to the specifications and other terms & conditions should also be obtained from the principal.
- 10) Validity:** Validity of Quotation not less than 90 days from the due date of tender.
- 11) Delivery Schedule:-** The tenderer should indicate clearly the time required for delivery of the item. In case there is any deviation in the delivery schedule, liquidated damages clause will be enforced or penalty for the delayed supply period will be levied.
- 12) Risk Purchase Clause:-** In the event of failure of supply of the item/equipment within the stipulated delivery schedule, the purchaser has all the right to purchase the item/equipment from other sources on the total risk of the supplier under risk purchase clause.
- 13) Payment:-** No Advance payment will be made for Indigenous purchase. 100% Payment after supply and successful installation and commissioning and certification by the end user. In case of import supplies the payment will be made only through **100% Letter of Credit i.e. (50% payment will be released against shipping documents and 50% after successful installation and meeting acceptance criteria wherever the installation is being done).**
- 14) On-site Installation:** - The equipment or machinery has to be installed and commissioned by the successful bidder within one week from the date of receipt of the **item at site of IIT Palakkad.**

15) Warranty/Guarantee: - The offer should clearly specify the warranty or guarantee period for the machinery/equipment. Any extended warranty offered for the same has to be mentioned separately. (For more details please refer our Technical Specifications).

16) Late offer: - The offers received after the due date and time will not be considered. The Institute shall not be responsible for the late receipt of Tender on account of Postal, Courier or any other delay.

17) Loading and unloading charges will be borne by the bidder/Supplier.

18) Acceptance and Rejection: - IIT Palakkad has the right to accept the whole or any part of the Tender or portion of the quantity offered or reject it in full without assigning any reason.

19) Do not quote the optional items or additional items unless otherwise mentioned in the Tender documents / Specifications.

20) Disputes and Jurisdiction: - Any legal disputes arising out of any breach of contract pertaining to this tender shall be settled in the court of competent jurisdiction located within the city of Palakkad in Kerala.

21) All Amendments, time extension, clarifications etc., will be uploaded on the institute website only and will not be published in newspapers. Bidders should regularly visit the above website to keep themselves updated. No extension in the bid due date/ time shall be considered on account of delay in receipt of any document by mail.

Acknowledgement:- It is hereby acknowledged that the tenderer has gone through all the conditions mentioned above and agrees to abide by them.

**SIGNATURE OF TENDERER
ALONG WITH SEAL OF THE
COMPANYWITHDATE**

**SERVO-HYDRAULIC SYSTEM FOR STATIC
AND LOW FREQUENCY CYCLIC TESTS
ON MATERIALS**

VENDOR QUALIFICATION REQUIREMENTS

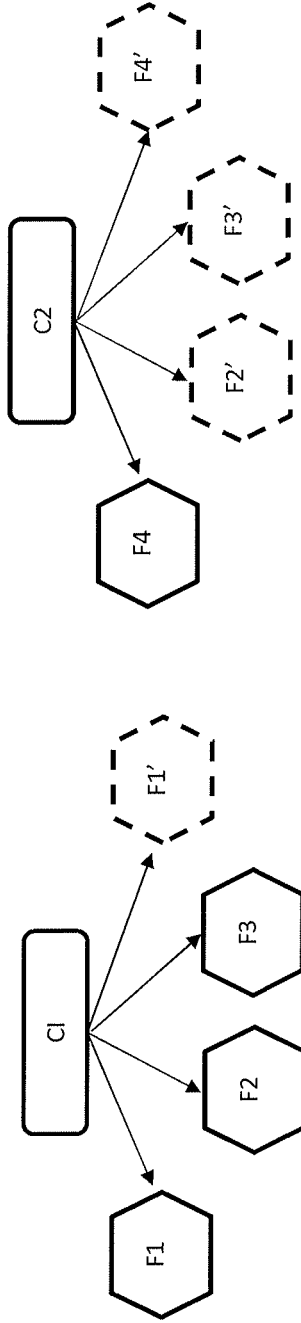
1. The equipment should be supplied by the original equipment manufacturer or their authorised dealer. In case of authorised dealer, the authorization letter/document from the original equipment manufacturer should be submitted along with the technical bid.
2. The vendor should submit the catalogue showing the full technical specifications of the equipment along with the technical bid, and this will be used for verification of the technical bid.
3. The technical bid shall be evaluated for acceptability by the technical committee. Before issuing the purchase order, the eligible vendor should be prepared to make a technical presentation within 15 days from the date of notification, if required. If the manufacturer is using any components manufactured by another manufacturer (whichever are allowed as per the technical specification), the vendor should clearly specify the make, brand, and name of the manufacturer.
4. The vendor should have supplied equipment matching the technical specifications of the submitted catalogue to IITs, NITs, DRDO, ISRO, or CSIR labs within the past five financial years (2014-15 to 2018-19) and currently operational, with a net value on a single purchase order exceeding 40 lakhs (proof to be enclosed). The vendor should provide the details of such customers (complete address, email ID, telephone no., contact person etc.) along with the technical bid.
5. IIT Palakkad may seek a feedback about the performance of the equipment and after sales service of the vendor from such users, before shortlisting the technical bid. Feedback about the vendor and after sales support may also be sought from users having similar equipment, who are not listed by the vendor.
6. If required by IIT Palakkad, the vendor should arrange for demonstration and performance test of the operational equipment already installed in another facility.
7. The vendor should have competent and reliable service personnel in India. The details of the service provider should be provided along with the technical bid. In case of breakdown of the equipment, the vendor/authorized service provider should have the capability to arrange for the required service within 48 hours.
8. The installation, testing and commissioning of the system should be done within one week from the date of delivery of the equipment to IIT Palakkad, by trained and experienced service

engineers from the manufacturer/vendor. The performance of the system should be demonstrated to the satisfaction of the faculty/staff of IIT Palakkad.

9. The bid should include a declaration for one year warranty, followed by the terms of extended warranty for another two years for the system hardware and firmware.
10. The vendor should clearly specify all the infrastructure facility and site preparation required for installation and operation of the equipment along with the technical bid.
11. The minimum requirements (such as processor, RAM, disc space, graphic card, version of operating system, etc.) for the personal computer compatible with the interface software should be clearly mentioned in the technical bid.
12. The vendor is responsible for all cost related to insurance, freight and transport of the equipment to IIT Palakkad's facility.

Technical specifications-cum-compliance table for Servo-hydraulic system for static and low frequency cyclic tests on materials

Brief Description: The system shall be used for basic and advanced testing of concrete and other construction materials under load/stress or displacement/strain control. The planned layout of the testing system catering to various tests to be conducted on materials is given in figure below.



C – Servo-hydraulic power and control system including hydraulic power unit (HPU), servo valve, controller and associated hardware.

F – Test frame of various capacities and test configurations as discussed below in technical details

F' – Additional testing frames that maybe added to the system in future.

NOTE: For each specification, please enter “YES” or “NO” in the second column of this table. If a cell in the second column is left blank, then it will be assumed that the technical specifications does not comply with the respective specification/requirement. Provide catalogues, data sheets and/or other documentation to support the compliance of your equipment to the given specifications

Required Specification	Can the quoted system meet the required specification [YES/NO]? If "YES", provide item number and page number in the manufacturers catalogue	REMARKS (If the answer in the 2 nd column is "NO", then provide the available specifications and other remarks etc.)
2 nos. Servo hydraulic power and control systems		
1.	Complying with recognized national and international standards such as BIS, ASTM, EN wherever applicable.	
2.	Specification for the hydraulic power unit: (a) Oil flow control through servo control valve (b) Demand-dependent flow-rate control (variable pressure) (c) Minimum operating pressure of 200 bar	
3.	Specification for the control system (a) Multifunctional P.I.D. closed loop controller (b) Capable of performing tests under load/stress, displacement/strain control. (c) Loop-closure rate of at least 120 Hz. (d) Rate of loading - Load control – 100 N/s, Displacement control – 0.1 µm/s. (e) Capable of performing low frequency dynamic/cyclic tests (f) Minimum required frequency for cyclic loading is 0.1 Hz	
4.	(a) System hardware should be able to connect up to 4 different testing frames simultaneously (i.e., at least 4 separate channels for connecting load transducers) of various capacities ranging from 15 to 5000 kN. (b) User interface to select and operate the frame used for testing.	

	(c) System hardware should be integrated internally to the control unit.		
5.	(a) System hardware should have minimum 6 additional channels, for connecting compatible external displacement transducers such as LVDT, CMOD, compressometers, strain gauges etc. (b) It should be possible to select the test control parameter, from among the different load and displacement transducers connected during the test, with provision to switch control parameter dynamically during testing.		
6.	Should be suitable for operation on 230 V single phase AC or 415 V three phase AC, 50 Hz, power supply without any additional cooling requirements, and should be operational under ambient temperature of up to 40°C.		
3000 - 5000 kN capacity testing frame for compression tests			
7.	(a) 3000 - 5000 kN capacity compression frame with pre-tensioned column supports. (b) Should conform to IS 516, EN 12390-4, ASTM C39 and AASHTO T22 (c) Should have heavy duty spherical seat at the top. (d) Compression platens should be at least 300 mm diameter with hardness in the range 53-60 HRC (e) Minimum daylight: horizontal 350 mm and vertical 350 mm. (f) Allowable piston travel of at least 50 mm with provision for limiting piston travel (g) Front door and rear guard for safety during testing		
8.	Calibrated distance pieces, suitable for testing cubes of dimensions ranging from 50 mm – 200 mm and cylinders of 100 mm –		

	300 mm height, compatible with the piston travel limit should be provided.		
9.	Piston mounted strain gauge load cell having accuracy within the range of $\pm 0.1\%$ to $\pm 1\%$ of the read out value throughout the measurement range is required.		
10.	(a) Calibration certificate for load transducer should be provided (b) Accessibility to the user to feed-in calibration data, of any compatible external transducer should be provided.		
15-25 kN flexure/compression frame			
11.	(a) 15-25 kN low capacity frame (b) Capable of testing mortars, cement paste and very low strength materials (b) Should conform to requirements of testing as per EN 196-1, ASTM C348, C349, C109. (c) Platens with spherical seats at the top, with at least 165 mm dia. with hardness values in the range 53-60 HRC. (d) Vertical daylight without accessories of 200 mm. (e) Vertical daylight should be adjustable, to test specimen of minimum 40 mm height, using suitable distance pieces or accessories.		
12.	Compression and flexure testing jigs with high stiffness for measurements at low load ranges (matching with item 11(e)) for testing prism specimens of minimum cross section of 40 mm with length varying between 150 – 200 mm and cubes of 40 mm (conforming to EN 196 and ASTM C109) should be required.		

13.	Piston mounted strain gauge load cell having accuracy within the range of $\pm 0.1\%$ to $\pm 1\%$ of the read out value throughout the measurement range is required.		
14.	(a) Calibration certificate for load transducer should be provided. (b) Accessibility to the user to feed-in calibration data, of any compatible external transducer should be provided.		
200 - 300 kN compression frame for mortars, cement paste and low strength materials			
15.	(a) 200 - 300 kN capacity frame. (b) Should conform to requirements of testing as per EN 196-1, ASTM C348, C349, C109. (c) Platens with spherical seats of at least 165 mm dia. with hardness values in the range 53-60 HRC. (d) Vertical daylight without accessories of 200 mm. (e) Vertical daylight should be adjustable, to test specimen of minimum 50 mm height, using suitable distance pieces or accessories.		
16.	Compression testing jigs with high stiffness (matching with item 15(e)) for testing cubes of minimum cross section of 40 mm (conforming to EN 196 and ASTM C109).		
17.	Piston mounted strain gauge load cell having accuracy within the range of $\pm 0.1\%$ to $\pm 1\%$ of the read out value throughout the measurement range is required.		
18.	(a) Calibration certificate for load transducer should be provided.		

	(b) Accessibility should be provided to the user to feed-in calibration data, of any compatible external transducer.		
300kN high stiffness flexure frame			
19.	<p>(a) 300 kN capacity frame with high stiffness of at least 120 kN/mm</p> <p>(b) Capable of conducting flexural toughness tests on strain softening materials as per ASTM 1609, ACI 544, EN 14651, ASTM 1550 and IRC SP46 and regular flexural strength tests as per IS 516.</p> <p>(c) Capable of testing flexural prism specimen of length ranging from 300 mm – 1500 mm.</p> <p>(d) Minimum vertical daylight of 200 mm.</p>		
20.	Piston mounted strain gauge load cell having accuracy within the range of $\pm 0.1\%$ to $\pm 1\%$ of the read out value throughout the measurement range is required.		
21.	<p>(a) Accessories for loading and supporting the specimen should suit the modes of testing conforming to various standards such as IS 516, ASTM 1609, ACI 544, EN 14651, ASTM 1550 and IRC SP46.</p> <p>(b) The support rollers should ensure simply supported condition.</p> <p>(c) While testing under two-point loading, the loading head should swivel, along the axis parallel to the longitudinal axis of the rollers, to ensure complete contact with the specimen surface throughout the loading period.</p>		

	(d) During testing under single-point loading configuration, the arrangement should allow locking the loading head in position arresting the swivelling motion.		
22.	Capability to measure piston travel internally or externally using *electronic transducers, and should be possible to be used as a control parameter.		
23.	Safety mechanism to ensure that the test can be conducted only after the specimen is properly mounted should be provided.		
Accessories suitable to measure flexural strength/ toughness of fibre reinforced concrete/shotcrete			
24.	Yoke arrangement including other accessories needed for measurement of deflection of FRC beams with respect to the vertical face (neutral axis) under four-point bending conditions conforming to ASTM 1609, IRC SP 46, JSCE SF4, EN 14488-3 and IRC SP 46.		
25.	Suitable fixing frame for measurement of lower face displacement under conditions of three-point bending conforming to EN 14651 and EN14488-3.		
26.	*3 nos. high precision LVDT type displacement transducers with 10 mm travel allowing measurement in the range 0-10 mm and ± 5 mm		
27.	*Crack mouth opening displacement for a measuring range of 3-8 mm, sensitivity 2.5 mV/V should to be provided with fixing jigs (50 pcs.)		

Accessories for performing energy absorption tests for concrete	
28.	<p>(a) Square frame to support slab, and spherically seated loading element to enable single point loading at the centre of the slab to conduct energy absorption tests conforming to EN 14488-5 and UNI 10834</p> <p>(b) *LVDT type displacement transducers with 50 mm travel and adequate mounting fixtures to measure the centre displacement.</p>
Accessories for testing modulus of elasticity of cylindrical concrete specimens	
29.	<p>(a) 3 nos. Electronic universal extensometer/compressometer for cylinders, prisms and cubes with short distance piece for use with prisms 40×40×160 mm size.</p> <p>(b) Adjustable template and sufficient fixtures to secure the jigs in position during testing, complete with connection wires and calibration/zero correction sets to be included.</p>
User interface and other support systems	
30.	<p>(a) User interface software for the DAQ should be licensed software and should be provided with the system.</p> <p>(b) All measurements, calculations and data storage functions should be automatic and controlled with a PC having minimal operator involvement.</p> <p>(c) PID control to be automated with minimal manual intervention</p>

*In case the accessory has been procured from some other supplier, the same should be clearly stated and the OEM should be clearly identified in the technical specifications. In such cases, the compatibility of the accessory with the supplied equipment should be satisfactorily demonstrated at the time of calibration and installation.

** OEM – Original equipment manufacturer