TENDER DOCUMENTS

Civil Lab Equipment

NUTECH / SCM / Civil Lab Eqpt (Ph-IV) 2020 / TD-157

NATIONAL UNIVERSITY OF TECHNOLOGY

TENDER NOTICE

National University of Technology (NUTECH)

NUTECH / SCM / Civil Lab Eqpt (Ph-IV) 2020 / TD-157 & NUTECH / SCM / Electrical Lab Eqpt (Ph-IV) 2020 / TD-158

1. Sealed bids are invited from Government / FBR Registered Firms for the procurement of Lab Equipment for NUTECH on **FOR Basis**.

2. Tender documents containing terms, conditions and detailed specifications of items (including draft contract) can be downloaded from NUTECH website "https://nutech.edu.pk/downloads/procurement/scm-tenders/" w.e.f **25 August 2020**.

3. Quotations shall be submitted as per requirement of the tender documents.

4. Bidders will be required to submit **Bank Draft / CDR** equal to **5%** of quoted value as Bid Bond in favor of National University of Technology (NUTECH).

5. Submit Rs 1500/- as Tender fee in favor of NUTECH HBL Account (**NUTECH Tendering and Contracts, 5037-7000210755).** Please attach bank receipt with technical offer. Offers will not be entertained without payment of processing fee.

6. Details for Submission & Opening of bids for each tender are as under:-

Ser	Description	Submission	Tender Opening	Completion Days
a.	Civil Lab Equipment (TD-157)	1030 hrs on 14 Sep 2020	1100 hrs on 14 Sep 2020	120 Days
b.	Electrical Lab Equipment (TD-158)	1100 hrs on 14 Sep 2020	1130 hrs on 14 Sep 2020	120 Days

Deputy Director (Supply Chain Management)
NATIONAL UNIVERSITY OFTECHNOLOGY, IJPROAD,I-12,ISLAMABAD
Tel: 0092-51-5476768, Ext: 227

NATIONAL UNIVERSITY OF TECHNOLOGY

SUPPLY CHAIN MANAGEMENT

INVITATION TO TENDER

Tender submission time: **1030 hours, 14 Sep 2020**

1. NUTECH desires to procure the list of item(s) / Store(s) on **F O R b a s i s** . as per **Annexure-A**. Interested bidders are requested to send their bids through courier or deliver at NUTECH under "Single Stage – Two Envelopes" (two envelopes placed together in third envelope), marked clearly as **"Technical Offer"** and **"Commercial Offer"** respectively to the undersigned, latest by or before above mentioned due date.

2. **Conditions Governing Contracts.** The contract made as result of this IT will be in accordance with the draft contract published on NUTECH University website and other special conditions (Mentioned in this document) that may be added to given contract for the supply of Lab Equipment.

3. **Delivery of Tender.** The offer is to be submitted as under:-

   a. **Technical Offer.** Technical Offer should contain only Annexure-A, Annexure-A-1 & Annexure B duly filled in (supported with relevant technical literature / details / catalogues etc) and receipt of tender processing fee. Copy of bid bond WITHOUT MENTIONING PRICE should be attached with technical offer. Only relevant technical details i.e literature/brochures) without mentioning the financial aspect of the offer in DUPLICATE should be enclosed in an envelope. In technical proposal, all items must have the brand names, model number, manufacturer's name, country of origin, manufacturer's warranty including parts with complete specs and brochures. Re-conditioned and re-furbished equipment shall not be acceptable. Following information will be clearly marked on the envelope:

      (1) Technical Offer
      (2) Original Performa Invoice (without price)
      (3) Tender number
      (4) Date/ time of opening

   b. **Commercial Offer.** Commercial Offer will contain Annexure-C and bid bond (Dully mentioned and placed in separate envelope. The offer indicating the quoted price FE/Local Currency (in Local Currency for

FOR cases & in FE for FOB cases) in figures as well as in words would be enclosed in an envelope. Following information will be clearly marked on the envelope;

(1) Commercial Offer

(2) Original Performa invoice with price

(3) Tender number

c. Both the envelopes i.e. commercial offer and technical offer would be enclosed in yet another properly sealed envelope that will be marked with address of this office only. There should be clear indication that this envelope contains tender documents.

d. The tender duly sealed will be addressed to the following:-

Deputy Director (Supply Chain Management Office)
NATIONAL UNIVERSITY OF TECHNOLOGY (NUTECH)
IJ P ROAD, I-12, ISLAMABAD
Tel: 0092-51-5476768, Ext: 227

4. **Date and Time for Receipt of Tender.** Sealed bids with detailed specifications should reach SCM office latest by **1030 hours on 14 Sep 2020.** Delay occurring in post shall not be accepted. Tenders received after the appointed / fixed time will NOT be entertained. The appointed time will, however, fall on next working day in case of closed / forced holiday.

5. **Tender opening.** The offers shall be opened **30 minutes** after submission time**.** Commercial offers will be opened at later stage if Technical Offer is found acceptable on examination by technical authorities. Date and time for opening of commercial offer shall intimated later. Only legitimate / registered representatives of firm will be allowed to attend tender opening.

6. **Validity of Offer.** The validity period of quotations must be indicated and should be **90 days** from the date of opening of financial offer.

7. **Documents.** Following information / copy of documents must be provided / attached with offer:-

a. A copy of letter showing firm's financial capability.

b. NTN/GST number be mentioned on the offer and copy of registration Certificate issued by Sales Tax Department, attached.

c. Foreign supplier to provide its Registration Number issued by respective Department of Commerce authorizing export of subject stores **(in FOB cases).**

d. Annexes A, A-1, B and C and special conditions must be signed and stamped. ATTACH ONLY RELEVANT DOCUMENTS.

e. Complete all Annexes as per given format. Do not use your format or letter head. Offer may be rejected if given format is not followed.

f. OEM/principal agency agreement must be provided.

8. **Disqualification.** Offers are liable to be rejected if:-

a. Validity of offer is not quoted as required in IT documents.

b. Any deviation from the General/ Special / Technical Instructions.

c. Offers are found conditional or incomplete in any respect.

d. Copy of EM/Bid Bond & Tender processing fee (with tech offer) and original EM/Bid Bond (with fin offer) are NOT attached.

e. Multiple rates/items are quoted against one item.

f. Manufacturer's relevant brochures and technical details on major equipment assemblies are not attached in support of specifications.

g. Offer received later than appointed / fixed date and time.

h. Subject to restriction of export license.

i. Offers (Commercial / technical) containing non-initialled / unauthenticated amendments / corrections / overwriting. If the validity of the agency agreement has expired. The commercial offer against FOB / CIF / C&F tender quoted in local currency.

j. If the offer is found to be based on cartel action in connivance with other sources/participants of the tender.

9. **Earnest Money / Bid Bond.** Commercial Offer must be accompanied with a Bid Bond (CDR/Pay Order/Bank Draft) in agreement of faithful compliance of the conditions of Contract. This amount will be equivalent to 5% of the total quoted value. The Bid Bond amount submitted by the successful bidder will however be refunded on effective termination of Contract. (The Bid Bond will be forfeited in case of default by the bidder from his commitments made through his offer). Submission of Bid Bond is mandatory; otherwise your offer will be rejected. Bid Bond will be used as performance guarantee till the delivery of stores, otherwise separate performance guarantee valued at 5 % of contract will be submitted by successful firm till stores are delivered and inspected.

10. **Return of Earnest Money/Bid Bond.**

a. Bid Bond to the unsuccessful bidders will be returned on finalization of the lowest evaluated bidder.

b. Bid Bond of the successful bidder/bidders will be returned on submission of Bank Guarantee/Bid bond against warranty period OR Bid bond retained for the warranty period as the case may be.

11. **Terms of Payment/ LC Charges**

(In FOB cases)

a. All categories payment will be made through letter of credit (LC). LC opening charges in Pakistan are to be borne by NUTECH. Payment will be made through irrevocable LC in favour of Manufacturer.

In FOR cases

b. 20% advance payment will be made to the Seller on provision of unconditional Bank Guarantee/ CDR/ DD/ Pay order. Advance BG/CDR/DD/Pay order will be submitted at the time of signing the contract.

c. 80% payment will made to the Seller after receipt and confirming the correctness of ordered specifications, installation, commissioning OR as the case may be i.e through Inland LC.

12. **Bank Guarantee (BG)**. **2 Years** against **5% Bank Guarantee/CDR/Pay Order/Bank Draft** of the store value will be required from the successful bidders from the date of commissioning as performance bond. BG submitted shall remain valid for up to 60 days beyond completion of warranty period.

13. **Taxes/ Duties/ Custom clearance** All taxes /duties /import Licenses Fee as applicable under government laws in Pakistan as well as country of supplier shall be on Seller **(in FOR Case).** NUTECH will provide applicable exemption certificates and documents **(In FOB Cases only)**.

14. **Insurance:-** Insurance will be NUTECH's responsibility through NICL **(in FOB Cases)**.

15. **Freight charges /Misc charges:** All charges such as packing, forwarding, local freight, loading and unloading, installation and commissioning, custom clearance, orientations, on job training or any other will be part of quoted price. Delivery till NUTECH will be seller's responsibility and all associated costs will be part of quotation as well.

16. **Warranty**. All goods /store offered would be brand new, from current year of production and will be governed as per warranty clause. The warranty period may be covered by BG/CDR/Pay Order/ Bank Draft as depending on the value /criticality of the tender equipment.

17. **Delivery Schedule.** Store will be delivered within **120 days** from contract signing date.

18. **Force Majeure.** If non-compliance with the period of delivery or services can be proved to be due to Force Majeure, such as but not limited to mobilization, war, riot, strike, lockout or the occurrence of unforeseen events, the period shall be reasonably extended.

19. **Subletting** Suppliers are not allowed to sublet wholly or part of the contract to any other firm /company without prior permission by NUTECH. Firm found in breach of the clause will be dealt with as per purchaser's right and discretion.

20. **Arbitration.** Will be as under:-

"All Claims ,disputes ,controversies, differences arising out of or in connection with this contract ,including any question regarding its existence, validity, interpretation performance, breach or termination ,shall be referred to and shall finally be solved by binding arbitration. An Arbitration Committee Shall be constituted comprising Rector NUTECH and two Arbitration to be nominated on mutual agreement by each party. The venue of the Arbitration shall be the place of issuance of this contract or as Rector NUTECH may determine. In case of any difference, the clauses of Arbitration Act 1940, Rules and Regulation made thereof for time being enforce shall prevail. The award shall be final and binding on both parties.

a. Provided that written record of any such arbitration and its award shall be arranged properly. An award of such arbitration may be confirmed in a court of competent jurisdiction at Islamabad.
b. Provided further that incase of any other question /dispute not covered under this clause, the decision of Rector NUTECH shall be final."

21. **Redress Of Grievance.** In case of dispute, case shall be reviewed by 'NUTECH Redress of grievance committee and decision of NUTECH shall be final and binding on both parties.

22. **Export License/Permit /End User Cert.** It shall be the responsibility of the Supplier to obtain from the Government concerned all permits and export licenses, etc required to enable each consignment to be shipped immediately as per the delivery schedule. In case the supplier fails to arrange export license within 30 days of signing the contract the purchaser reserves the right to cancel the contract on the risk and expense of the supplier without prior notice. The purchaser will provide End User Certificate for acquisition of export license to the supplier (format to be provided by the supplier for respective country within 10 day of signing of the contract).

23. **Technical Specification:** The supplier will provide OEM certificate, quality certificate /inspection document to the purchaser confirming the quality of the product being supplied under this contract .Store must bear the manufacturer's identification marking /monogram.

24. **Inspection /Testing of Store**: Inspection testing will be carried out at NUTECH by the concerned inspection team as detailed by the respective department in accordance with the laid down Acceptance Criteria. (Acceptance Test Procedure (ATPs)/Drawing /Test standard and specification). The supplier will provide ATPs with technical offer. Mutually agreed/approved ATPs will form part of contract to govern the inspection of store subsequently.

25. **Change In Specification / Mfr / Model.** No alternation marked/brand and quality of store will be entertained after the tender have been opened.

26. **Checking of Store at Consignee/User End.** All stores will be checked at Consignee's end in the presence of the supplier's representative. If for some reason, the supplier decides not to nominate his representative for such checking, an advance written notice to this effect will be given by the supplier to the consignee prior to immediately on shipment of store. In such an event the supplier will clearly undertake that decision of consignee with regard to quantities and description of consignment will be taken as final and discrepancy found will be accordingly made up by supplier. In all other cases the consignee will inform the supplier about arrival of consignment immediately on receipt of store through registered email/letter and telephone. If no response from the supplier is received within 15 days from initiation letter the consignee will have the right to proceed with the checking without supplier's representative. User/Consignee's report on checking of the stores will be binding on the seller in such cases.

27. **Packing /Marking.** The supplier shall be responsible for proper packing of the Store in standard export packing worthy of transportation by sea /air /road rail so as to ensure their content being free from lose or damages due to faulty packing on arrival at the ultimate destination. Packing of stores will be done at the expenses of the supplier. All packing cases, containers and other packing material shall become the property of the NUTECH on receipt. Any loss occurred /demurrage paid due to wrong marking will be made good by the supplier

28. **Original Performa Invoice**: Original Performa invoice must have following components incorporated:-

a. HS Code
b. Incoterm
c. Payment Terms
d. Origin of good
e. Port of shipment
f. Address of OEM
g. Seller acceptance (on Performa Invoice)
h. Invoice Date
i. Latest date of shipment
j. Seller complete bank detail

Note: Performa Invoice in the name of NUTECH in case of FOB cases & in the name of local partner in case of FOR cases.

29. **General Instructions:** Following must be noted:-

a. The firm should provide point to point acceptance of each clause of IT and special instructions attached with IT.
b. Firm will render a certificate with technical offer that firm is neither defaulter nor blacklisted by any Government / semi Government organization directly or indirectly.
c. Rates should be quoted on Free Delivery basis at NUTECH Islamabad.
d. The stipulated delivery period should be strictly adhered to. Any anticipated delay that is beyond the control of Seller will be informed (in writing) well in advance of the expiry of the due date of the activity along with reasons thereof, requesting for the grant of extension in delivery period. If the Seller fails to do so, or the Buyer is not convinced with the rationale provided by the Seller, Liquidated

Damages up to/at 2% per month or part thereof, will be imposed. However, the maximum limit of the Liquidated Damages will not exceed 10% of the delayed store value.

e. If even after applicability of 10% LD, the Seller fails to deliver the required stores, the Buyer will be at liberty to Cancel the contract, and /or procure the stores from an alternate source, on the Seller's "Risk & Cost/Expense". In that case, the Seller will be bound to make payment to the new source through NUTECH. The purchaser's decision under this clause shall NOT be subjected to arbitration.

f. NUTECH reserves the right to cancel the Contract without assigning any reason whatsoever during its currency / execution / after placement, if the firm is found to be involved in any dubious activity, litigation, lacking to meet contractual obligations with the purchaser or is blacklisted with any other Public procurement agency. No claims / loss /damage of whatsoever nature shall be entertained and NUTECH's decision in this regard will be final / binding on the Seller.

g. An appropriate amount may be paid for mobilization against Bank Guarantee/CDR/Demand Draft/Pay Order.

h. Firms with previous pending/outstanding projects/business with NUTECH may not be considered for award of this tender.

Deputy Director
Supply Chain Management Office

Annex-A

Technical Specifications

NUTECH / SCM / Civil Lab Eqpt (Ph-IV) 2020 / TD-157

Ser	Part No	Items	Description	Country of Origin	A/U	Qty Req	Bidder Compliance		Tech Scrutiny to be done by user	
							Yes	No	Accepted	Rejected
									Reason of Rejection	
1.		**Concrete Mixer**	• Forced pan type mixers with vertical axis • For uniform, efficient and fast mixture action • Wear-resistant steel pan • Pan dimension: Ø at least 24 inches dia and min. 12 Inches height of pan. • Safety grid with breaker • Adjustable mixing blade • Manual discharge mouth on the bottom • Should be electric shock proof • Pan capacity min 140 litres • Mixing amount min 80 litres or above • Dimensions: Minimum dimensions should be 26'' x32'' x47'' inches • Accompanied with Wheels and tow bar • Axle with tire wheels and drive drawbar • Power supply: 220 V/ 1 Phase / 50 Hz **Or Equivalent**	Imported	No.	2				
2.		**Air Blower**	• Adjustable volumetric flow of air • Air volume: Mini 3 (cubic / min) controllable • Charging voltage: 220V • speed: 0-19000 r/min • Charging time: about 1.5 hours • Function: Controlled Air blowing • Power Supply: Li-ion Battery	Imported	No.	2				

			• Type: Cordless Blower • High power motor with constant temperature technology • Shell is made of fine quality material • Blowpipe & dust bag included • Handheld design						
3.		**Dissolve oxygen (DO) meter**	• Benchtop Dissolved Oxygen Meter • Dissolved oxygen range : 0.0 to 20.0 mg / L (or ppm) • Dissolved oxygen accuracy : ± 0.5 mg / L • Resolution : 0.1 mg / L • Calibration points : 1 - 2 points • Sensor type : Polarographic DO probe • Temperature compensation range : 0 to 40 °C, 32 to 104 °F • Barometric pressure correction : 60.0 to 112.5 kPa, 450 to 850 mmHg • Salinity correction : 0 - 35 g / L • % of saturation of oxygen range : 0.0 to 200.0 % • % of saturation of oxygen accuracy: ± 10 % F.S. • % of saturation of oxygen resolution : 0.001 • System menu : Allows setting of 6 parameters (minimum) • Data hold function : Manual or automatic endpoint detection • Power off : Manual or automatic • Reset function : Yes • Display : Backlit LCD • Connector : 6 pin mini plug • Power : DC 9 V, AC 220 V / 50 Hz **Or Equivalent**	Europe/USA	No.	3			
4.		**Flow channel with DAQ System and Software**	• Computer Controlled Flow Channel • Minimum section: 80 x 300 mm and length:	Europe/USA	No.	1			

			2.5 m. • Anodized aluminum frame and panels made of painted steel • Main metallic elements made of stainless steel. • Diagram in the front panel with distribution of the elements similar to the real one. • Channel of rectangular section with transparent walls, formed by methacrylate transparent sections. • The channel is assembled on supports, with a system to control the inclination of the channel. • Channel slope adjustable. • Inlet tank (capacity: 38 L.), with stilling of flow and with drain valve. • Reception tank (capacity: 38 L), with drain valve pipes. • Orifice plate flow sensor. • Venturi type flow sensor. • Impulsion pump, with speed regulation, computer controlled: • Single-phase, 220V/50Hz • Safety switch ON/OFF. • Flow control valve. • Flow sensor • SCADA System • Simultaneous visualization in the computer of all parameters involved in the process. • Calibration of all sensors involved in the process. • Real time curves representation about system responses. • All the actuators' values should be changed at any time from the keyboard allowing the analysis about curves and responses of the whole process.						

			• Shield and filtered signals to avoid external interferences. • The Data Acquisition board as part of the SCADA system with PCI Express Data acquisition board (National Instruments) to be placed in a computer slot. • Analog input: Channels= 16 • Sampling rate up to: 250 KS/s (kilo samples per second). • Analog output: Channels=2. • The system has Computer Control +Data Acquisition + Data Management Softwares as part of the SCADA system and are Compatible with the industry standards. • Flexible, open and multicontrol software, developed with actual windows graphic systems, acting simultaneously on all process parameters • Sampling velocity up to 250 KS/s (kilo samples per second) **Note :-** **Equipment must be compatible with existing hydraulic bench FME00 of Edibon Spain available in lab and its DAQ and software, else, DAQ and Hydraulic Bench is to be quoted along with the unit.** **Accessories Required:** • Adjustable Undershot Weir • Vertical Flat Gate and Radial Gate. • Sharp Crested Weir, Broad Crested Weir, Crump Weir and Ogee Type Weir with Pressure Measurement • Energy Dissipation Accessories • Syphon Spillway. - Air Regulated Syphon. • Model of Sill • Models of Piers						

			• Models of Culvert, Culvert Fitting • Set of Vibrating Piles • False Floor Sections • Venturi Flume • Velocity Meter • Differential Pressure Digital Indicator to Measure the Inlet Flow **Note :-Price of the accessories should be quoted separately in financial bid.** **Experimental Capabilities** **These are the required experimental capabilities, however, these may vary depending upon selected accessories** • Measurement of the water height and the velocity along the channel. • Measurement of the flow with weirs of thin wall. • Measurement of flow with changes in the channel section. • Measurement of flow using Venturi flume. • Control of the flow by gates. • Level control using syphons. • Flow on overflow dams. • Flow among the pillars of a bridge. • Characterization of the hydraulic jump. • Profiles of the water free surface. • Investigation of flow and supercritical flow states. • Measurement of water levels. • Discharge processes on an underwater weir. • Amount of energy in flows in open channels. • Function of a syphon weir. • Pipe flows.						

			• Generation of different flow states by damming the downstream water. • Observation of the flow under an undershot weir: • Observation of hydraulic motion on discharge. • Relationship between dam height and discharge. • Observation of discharges under a radial gate and Observation of hydraulic motion on discharge. • Investigations on waves. • Behaviour of structures in rough sea. • Applying and understanding Manning's formula. • Understanding sub- and super-critical flow. •						
5.		**Digital Saybolt viscometer with accessories**	• Confirming to ASTM D88, AASHTO T72 standards. • Stainless steel made, viscometer is supplied complete with • Two interchangeable orifices furol and universal, oil bath, electric heater with digital thermo-regulator, stirrer, cooling coil, viscosity flask. • Viscometer is equipped of a dual safety thermostat to prevent accidental over-heating. • Power supply: 230V, 1ph, 50-60Hz. • Filter funnel complete with wire filter ring mesh. • Withdrawal tube complete and thermometers **Or Equivalent**	Europe/USA	No.	1			
6.		**4" Marshall moulds**	• Heavy duty marshalmould having Inside diameter 4"	Local	No.	8			

			• Steel manufactured, plated against corrosion. • With mould body, filling color and baseplate						
7.		**6" Marshall moulds**	• Heavy duty marshallmould having Inside diameter 6” • Steel manufactured, plated against corrosion. • With mould body, filling color and baseplate	Local	No.	8			
8.		**Pavement coring machine**	• Rugged, compact and wheels mounted machine with vertical rectified screw feed. • The drilling excursion is 550 mm and the machine can drill cores up to 200 mm diameter. • Built in water swivel to cool the diamond bit. • Robust steel base with four leveling and stabilizing feet. • Petrol engine 12.5 HP power 4-stroke Briggs & Stratton model. • Supplied with tank, core drill bits - 100 and 152 mm inside diameter and respective core extractors. • Coring bit for 100 mm dia x 400 mm long cores, with permanently attached head 1 1/4 W. • Core extractor dia 100 mm • Coring bit for 150 mm dia x 400 mm long cores, with permanently attached head 1 1/4 W. • Core extractor dia 150 mm **Or Equivalent**	Europe/USA	No.	1			
9.		**Hand held traffic data collector with software**	• Hand held traffic data collectorto record turning movement data for up to 14 classes of vehicles, roundabout movement data, stop sign delay data, signalized delay data, vehicle classification data, spot speed data, multi-direction gap data, saturation flow rate data and time-stamped raw data.	Europe/USA	No.	4			

			• Complete with software and DAQ. • Case: ABS non-warping plastic. • Power: 4 AA alkaline batteries. Interface: USB 'B' port. • Clock: always active real-time clock. • Display: wide temp, 4-line by 20-characte • LCD display. • Output: ASCII file read by software. **Or Equivalent**						
10.	30-WF6207 30-WF6042 WF0325 WF0335	**Oedometer (without platform)**	• Front loading oedometer with weightsand tightening bolts (without consolidation bench 26-WF0312, available) • Compatible with 26-WF0302 (model available in lab) • Consolidation cell with complete spare parts • Linear transducers with complete accessories (3 x No.) • Permeability attachmentswithburette, clamps, stand and rubber hose for connection to the cell **Equipment must be compatible with existing consolidation bench in lab and 16 channels GEODATA Log**	Europe/USA	No.	2			
11.		**Flakiness and elongation tools for aggregate**	• Flakiness sieve test set including: 4.9x30, 7.2x40, 10.2x50, 14.4x60, 19.7x80, 26.3x90, and 33.9x100 mm slot sieves. • Constructed of heavy gauge stainless steel sheet.	Any	No.	3			
12.		**Blaine apparatus**	• Confirming to EN 196-6, ASTM C204, AASHTO T153, BS 4359:2 standards. • Glass U-tube manometer with valve, steel stand, test cell with disk and plunger (all in stainless steel) • Rubber aspirator bulb, 1000 filter paper	Imported	No.	1			

			disks, manometric liquid, Vaseline grease for better coupling tube/cell, funnel & brush. • Reference cement						
13.		**Heat of hydration calorimeter**	• Apparatus consists of a dewar flask contained in an insulated material and housed in a wooden box which is hinged so that the flask can be easily removed or replaced. • Constant speed electric stirrer and filler glass funnel. • Power supply: 230V 1ph 50Hz. • Digital thermometer, resolution: 0.001°C, memory for 10000 readings, displays, stores and prints: min, max, mean values, delta T, alarm if limit values are exceeded, battery operated • Conforming to ASTM C186 and EN 196-8 specifications.	Imported	No.	2			
14.		**Sieve set (Coarse + Fine)**	• Complete range SIEVE SERIES WOVEN WIRE CLOTH SIEVES As per ASTM E11 • Both for coarse aggregate and fine soil • With Pan and cover • Also required, Wet wash sieve of 200 mm high for 75 micron and 63 micron	Europe/USA	No.	4			
15.		**Cleveland flash tester**	• Used for determining the flash and fire point of petroleum products. • It consists of a brass cup mounted on an electric heater with temperature controller. • Conforming with the CE European directive, is supplied complete with double line-fuse, hot plate control system and thermometer -6 +400°C. • Set of spare reusable cups **Or Equivalent**	Europe/USA	No.	2			
16.		**Standard proctor apparatus with**	Standard proctor mould with hammer.	Local	No.	4			

		rammers							
17.		**Modified proctor apparatus with rammers**	Modified proctor mould with hammer.	Local	No.	4			
18.		**Hydraulic Universal Extruder**	• Used to extrude samples having diameter 4" and 6". • Suitable both for asphalt and compacted soil	Local	No.	5			
19.		**Casagrande liquid limit apparatus**	• Confirming to ASTM D4318, AASHTO T89, UNI 10014 standards. • Unit comprises a removable brass cup which through a cam device drops on a hard rubber base. • Hand operated but with right side crank. • Complete with drops counter and grooving tool as per standard ASTM D4318.	Europe/USA	No.	4			
20.		**Electronic auto level with tripod**	• Magnification: 32x • Standard deviation of 1 km (accuracy): 1.5mm • Image: Erect • Tube Length: 215mm • Objective Aperture: 36mm • Field of view: 1°-25' • Minimum Focus: 0.3m • Compensator Range: 15' • Compensator Accuracy: 0.5"/1' • Operating Temperature: -20°c-+50°c • Waterproof/Dustproof: IP66 • Imported Heavy Duty Aluminum Tripod • All other standard accessories (tool kit, carrying case) etc **Or Equivalent**	Imported	No.	2			
21.		**Electronic total station with tripod stand and prism**	• Total station with Imported Heavy Duty Tripod, Single Prism Target Set (2.6m Pole, Prism • With 2x Batteries, 1x Charger, complete	Imported	No.	2			

			with carrying case and all other standard accessories. • Precise, Accurate and Reliable • Angle Accuracy: 2" • Minimum Reading: 1” • Angle Units: Dec/Gon/Mil • Magnification: 30x Minimum • Minimum Focus: 1.0m • Laser Pointer: Red light, coaxial • Reflectorless Range: 600m minimum • Distance with Single Prism: 5 Km • Distance Accuracy: 2mm+2ppm Minimum • Measuring Time (Tracking): 0.4 sec Minimum • Distance Units: m/US ft/INT f • Laser Plummet • In-Built Memory: 120,000 points minimum • Built-in Temperature/Pressure Sensors • Auto: Atmospheric Correction: In Built • Keyboard: Alpha numeric • Interfaces: USB, SD Card • Temperature: -40° c to +70°c • Operating Time: 48 hours Minimum • Dual Display/Alphanumeric Keyboard **Or Equivalent**						
22.		**Compaction factor apparatus**	• The apparatus consists of two conical hoppers mounted on a cylinder. • Each hopper has a hinged flange with quick release mechanism, and everything is mounted on a rigid steel stand. • The compacting factor is the ratio between the weight of the partially compacted concrete and the weight of the fully compacted concrete. • Supplied complete with tamping rod	Local	No.	2			

			diameter mm 16x600 long.						
23.		**Electronic theodolite with tripod and accessories**	• Electronic theodolite with heavy duty tripod, 2x Batteries, 1x Charger, complete with carrying case and all other • For High Precision Works • Uses both Li-ion rechargeable and AA battery • Ergonomic keypad and and backlighted LCD display • Easy to use, most of the functions with one key • Angle Accuracy: 1” • Magnification: 30x minimum • Objective Lens: 45mm • Field of View: 1°30” • Minimum Focus: 1.0m • Absolute Encoding • Dual Face • Laser Plummet • Battery: 6v Li-ion/4 units AA battery • Rechargeable Battery Operating Time: 80 hrs • AA Battery Operating Time: 24 hrs Ø Temperature: -20 to 50-degreecelsius Ø IP 55 water and dust protection **Or Equivalent**	Imported	No.	2			
24.		**Handheld GPS**	• Minimum resolution with 240 x 320 display pixels, 2.2-inch color display • High-sensitivity, WAAS-enabled GPS receiver • Waterproof • 20x Minimum • Minimum 4 GB (expandable) internal memory • USB interface • User Guide	Imported	No.	2			

			Or Equivalent						
25.		**Distance meter**	• Handheld laser distance meter, area calculation. • Easy to use small &hand measuring with laser fast, simple and innovative save time. • Minimum 80 m range **Or Equivalent**	Imported	No.	2			
26.		**Laser Level**	• Laser Level with Transmitter and stand • Accuracy: ±10 arc sec • Rotation Coverage 360 °, Rotating Speed: 600rpm or 1200rpm • Laser beam Type: visible 670 nm • Working Range: 1000m (diameter) • Self-leveling range: Horizontal ±5° • Operating Temperature: -20° to +60°c • Rechargeable Ni-MH battery with charging system. • Operating Time: 65 hours • Tripod Mounting System • Dust and Waterproof IP56 **Or Equivalent**	Imported	No.	1			
27.		**Plastic limit apparatus**	• Soil plastic limit set comprises of: • Glass plate 300x250x10 mm • Rod caliper Ø 3 mm. • Mixing porcelain dish Ø 120 mm. • Flexible spatula, 100 mm. blade • Aluminium moisture tins Ø 55x35 mm. (Q.ty 6)	Local	No.	6			
28.		**Sand cone apparatus**	• 6.5” dia. (165.1 mm) sand density cone apparatus • The set includes the Double cone, two plastic sand jar and metal base plate • Calibrating Container • Complete set of field density tools	Local	No.	6			

29.		**Vicat test**	• As per ASTM C19 • Vicat apparatus with • Metallic frame, graduated scale with index, sliding probe • Consistency plunger Ø 10 mm, glass base plate. • Hardened needle Ø 1 mm ASTM - AASHTO • Hardened needle Ø 5 mm • Conical plastic mould Ø 60/70 h 40 mm (ASTM - AASHTO)	Imported	No.	2			
30.		**Polygon of forces apparatus**	• Self-contained, bench mounted. • Direct measurement of forces. • Adjustable lines of action of forces. • Practical verification of triangle of forces, polygon of forces and link polygon. • Demonstrates equilibrium of forces at a point, applied to various points round a disc or acting on a rectangular lamina. • Concurrent & Non-concurrent coplanar forces. • Calibrated Weights. • User Manual with Sample Readings.	Local	No.	2			
31.		**Work done by variable force apparatus**	• Set of weights • 1m ruler supplied • Table unit for experiments on mechanical work and potential energy. • Lifting a weight using a lever and a dynamometer (spring balance). • Integrated angle measuring scale protractor. • The apparatus consists of the arm, hanger with loads, spring balance and protractor scale attached to the support board. One end of the arm is fixed, and its position is indicated by the protractor. Other end of	Local	No.	2			

			arm carries the load hanger and is restrained by spring balance that is perpendicular to the arm. • The free-standing, bench-top unit consists of a suspension cord carrying a loaded trolley at its mid-span. The cord is clamped at one end, and tensioning effort applied vertically at the other end. • All pulleys feature ball bearings • Instruction manual						
32.		**Inertia in rotational motion apparatus**	• Metal rotating bar, weights with knurled bolts for quick fastening • Solid and hollow test cylinders • Ball bearing mounted rotating drum, anodizedaluminum • Acceleration of system by weight attached to the drum	Local	No.	1			
33.		**Rebar Binder/steel Bar Handheld Tying Machine Construction Machine**	• Rebar tying tool, a hand-held electrical tool, can tie rebarquickly and automatically. • 1 set rebar tier includes: tool box, rebar, charger, batteries;partlist;wire-cutters and minimum four rolls of coils. • Battery type: Li-Ion, above 12000mAH2.8V,Ni-MH • Full charging time not more than 75 minutes • Wraps per knot: 2-3wraps or more • Applicable rebar size: 8mm-34mm or better • Wire diameter: 0.8mm • Length per coil: 110m • Weight per coil: 0.4kg • Wire length per tying: 30-102 • Ties per roll of wire: 100-260knots • Ties per charger: 1300-1800knots • Torque dial	Imported	No.	2			

			• • User Guide • Required Services, Assembly and Installation, Interface and Control Software, Starting-up, Safety, Maintenance, Calibration & Practices Manuals. **Or Equivalent**						
34.		**Bending Moment and Shear Force in a Beam Apparatus with DAQ System and Software**	• The apparatus should comprise of beams with two support reactions for bending moment and shear force analysis **Bending Moment** • Min. Beam Length should be 30 inches • Span length should be at least15 inches • Beam should be graduated • The apparatus must show graphical representation of shear force and bending moment both through DAQand digital force display • Bending moment mechanism should be designed on bottom fiber of the beam • Beam to have minimum 24 loading positions at 20mm intervals • Pivots and mechanisms to be fitted with ball race bearings, allowing rotational movement • One of the supports also allows for horizontal movement • Should be accompanied with experimental unit, set of weight, hangers and set of accessories like o Minimum 5x weight hangers o 150x 10 g masses **Shear Force in a Beam** • Min. Beam Length should be 30 inches • Span length should be at least 15 inches • Beam should be graduated	Europe/USA	No.	1			

			• The apparatus must show graphical representation of shear force and bending moment both through DAQ and digital force display
			• Beam to have 23 loading positions at 20mm intervals
			• Pivots and mechanisms to be fitted with ball race bearings,allowing rotational movement
			• One of the supports also allows for horizontal movement
			• Should be accompanied with experimental unit, set of weight, hangers and set of accessories like
			  ○ Minimum 5x weight hangers
			  ○ 150x 10 g masses
			• Automatic Data Acquisition
			
			Or Equivalent						

35.		**Standard Jar Tester Apparatus with accessories**	• Standard test jar apparatus with accessories • Frame / chassis made of powder-coated steel • 6 jar apparatus tubes in the bottom platform: • Testing jars (minimum 2 L) • Stainless steel paddles, 1” x 3” • Paddle speeds from 5 to300 rpm in 1 rpm increments and run times from 1 second to60 minutes in 1 second increments or better • Six-paddle programmable model with four programmable memorybanks • Automatictransitioning from a fast mix/short run to a slow mix/long run,or any combination of speeds and times desired to replicateactual plant conditions and	Europe/USA	No.	2			

			operation • Six round, glass, 1 liter beakers or Six B-KER 2 square,acrylic, 2-liter lab jars • LED floc illuminator • Dust cover • As per ASTM: D2035 - 19 "Standard Practice for Coagulation-Flocculation Jar Test of Water" **Or Equivalent**						
36.		**Pipe surge and water hammer with Software**	• Constant level deposit, in methacrylate • Unload deposit, in methacrylate. • Pipe circuits in PVC. • Valves to select the circuit. • 2 adjustable equilibrium chimneys and subjection clips. • Connections system to the Hydraulics Bench (FME00, already available) with fast plugs. • Easy and quick coupling system built-in. • Anodized aluminum structure **Experimental Capabilities** • Subduing of the water hammer effects. • Study of the subduing depending on the diameter of the chimney. • Calculations of the energy losses in pipes **Note :-** **Equipment must be compatible with existing hydraulic bench FME00 of Edibon Spain available in lab and its DAQ and software, else, DAQ and Hydraulic Bench is to be quoted along with the unit.**	Europe/USA	No.	2			

Special Instructions

Description	Bidder		Tech Scrutiny to be done by User		
	Yes	No	Accepted	Rejected	Reasons of Rejection
Environment Conditions (a) Temperature range: 05°C to +60°C (b) Relative humidity: 0-70% non-condensing					
Warranty period In addition to IT Document Clause 12, A warranty sticker is to be pasted on each imported item by the Supplier / OEM highlighting Name of Firm, Contract No and date, Description of Store and Warranty validity					
Training Notes Supplier will provide a set of handouts for training on operation and maintenance of the equipment					
Publications Supplier is to provide hard and soft copies (CD) of following manuals. (a) **Operational / Maintenance manual**: - Qty 01 with Equipment and additional Qty 02 for record purposes and should consist of following sections:- (1)**Equipment Description /Operation**:- (a)Specifications (b)Description (c)Operation (2)**Servicing**:- (a)Maintenance Schedule (b)Adjustment / test (c)Removal / Installation procedure (3) Trouble shooting guide (4) Cleaning requirements (5) Storage requirements (b) **IPB** should have full parts description along with detailed diagrams (exploded view). (c) **Experimental manuals** which must contain the list and procedure of the experiments that equipment can perform. (d) Recorded video lectures of the equipment explaining use / functions / experiments.					
Spares / Technical Support					

(a) Supplier to have in-country spares / technical support and ensure spares and technical support / assistance for next 10 years (b) Comprehensive list of spares required for scheduled maintenance of Equipment is to be provided (c) Any software provided must have its license (d) Software upgrade support must be provided free of cost for 10 x years with renewed license at every upgrade (e) Supplier must also provide calibration service for at least 5 x years after commissioning					
Additional Spare / Replaceable parts. (a) Replaceable spare / parts during scheduled inspections are to be identified and provided as per requirement along with equipment sufficient to cater five years consumption. (b) All specialized / standard tools required for inspection / repair / servicing must be supplied along with equipment.					
Physical Inspection Criteria: 100% physical inspection of store will be carried out before commissioning of the equipment for following details:- (a) For physical damage, scratches and deformity. (b) Accessories /components as per contractual specifications. (c) Technical Manuals (Operation manual, user guide, IPBs). (d) Quality certificate and calibration certificate by the OEM (e) OEM certificate and verifiable documents by the supplier that store has been procured from certified					

source and is factory new and from latest production. (f) Brand name and country of origin.					
Commissioning (a) Commissioning of the equipment will be carried out by OEM rep at his own cost and risk at designated place at NUTECH. (b) Any special requirement for installation, operation and commissioning must be specified in the offer by the supplier.					
Training: 01 week OEM operational/ maintenance training at NUTECH					
Improvement and Safety Measures: Any improvement and safety measures suggested by NUTECH during commissioning are to be resolved by the supplier / manufacturer at no extra cost.					
Liability of Supplier (a) OEM certificate of authorized dealership Supplier is to provide original OEM certificate of subject equipment bought directly from the manufacturer and being an authorized dealer. (b) In case the equipment supplied is not compatible with specifications, the supplier will be obliged to call his representatives at his own cost for consultation and corrective action					

Special Notes (a) Additional requirements for the maintenance of equipment (if any) must be intimated by the supplier in technical offer. (b) Supplier must provide the list of organizations using same equipment in Pakistan (if any). (c) Equipment must be a standard product of OEM available at web address of OEM. (d) In case of premature failure of the equipment, OEM has to replace / rectify the item free of cost. Required transportation charges would be borne by the supplier.					

Firm Name_____

Signature_____

Name_____

Designation_____

Annex-B

TECHNICAL OFFER

NUTECH / SCM / Civil Lab Eqpt (Ph-IV) 2020 / TD-157

Fill in following essential parameters:-

1. Validity of Offer: _____Days (Should not be less than **90 days**)
2. Delivery period: _____Days (After placement of order)
3. Country of Origin: _____
4. Warranty Period: _____

General

1. GST Number: _____(Enclose Copy)
2. NTN / CNIC: _____(if exempted, provide valid exemption certificate)

Payment Terms (In continuation of IT Document clause 11)

In FOR Cases
20% advance payment against BG/CDR/Pay Order/DD
80% payment after delivery, installation / commissioning /user satisfaction certificate

Details of Foreign Principal Information with account details)

1. Name / Title: _____
2. Address: _____

OEM Name:	Firm Name:	Signature:
OEM Focal Person:	Firm Focal Person:	Official Seal:
OEM Phone Number:	Firm Phone Number:	Name & CNIC:
OEM Email Id:	Firm Email Id:	Designation:

Annex C

FINANCIAL OFFER

NUTECH / SCM / Civil Lab Eqpt (Ph-IV) 2020 / TD-157

Ser	Part No	Item Name/Size	Specification	A/U	Qty Req	Unit Price PKR (Including Tax)	Total Price PKR (Including Tax)
1.		**Concrete Mixer**	• Forced pan type mixers with vertical axis • For uniform, efficient and fast mixture action • Wear-resistant steel pan • Pan dimension: Ø at least 24 inches dia and min. 12 Inches height of pan. • Safety grid with breaker • Adjustable mixing blade • Manual discharge mouth on the bottom • Should be electric shock proof • Pan capacity min 140 litres • Mixing amount min 80 litres or above • Dimensions: Minimum dimensions should be 26'' x32'' x47'' inches • Accompanied with Wheels and tow bar • Axle with tire wheels and drive drawbar • Power supply: 220 V/ 1 Phase / 50 Hz **Or Equivalent**	No.	2		
2.		**Air Blower**	• Adjustable volumetric flow of air • Air volume: Mini 3 (cubic / min) controllable • Charging voltage: 220V • speed: 0-19000 r/min • Charging time: about 1.5 hours • Function: Controlled Air blowing • Power Supply: Li-ion Battery • Type: Cordless Blower • High power motor with constant temperature technology	No.	2		

			• Shell is made of fine quality material • Blowpipe & dust bag included • Handheld design				
3.		**Dissolve oxygen (DO) meter**	• Benchtop Dissolved Oxygen Meter • Dissolved oxygen range : 0.0 to 20.0 mg / L (or ppm) • Dissolved oxygen accuracy : ± 0.5 mg / L • Resolution : 0.1 mg / L • Calibration points : 1 - 2 points • Sensor type : Polarographic DO probe • Temperature compensation range : 0 to 40 °C, 32 to 104 °F • Barometric pressure correction : 60.0 to 112.5 kPa, 450 to 850 mmHg • Salinity correction : 0 - 35 g / L • % of saturation of oxygen range : 0.0 to 200.0 % • % of saturation of oxygen accuracy: ± 10 % F.S. • % of saturation of oxygen resolution : 0.001 • System menu : Allows setting of 6 parameters (minimum) • Data hold function : Manual or automatic endpoint detection • Power off : Manual or automatic • Reset function : Yes • Display : Backlit LCD • Connector : 6 pin mini plug • Power : DC 9 V, AC 220 V / 50 Hz **Or Equivalent**	No.	3		
4.		**Flow channel with DAQ System and Software**	• Computer Controlled Flow Channel • Minimum section: 80 x 300 mm and length: 2.5 m. • Anodized aluminum frame and panels made of painted steel • Main metallic elements made of stainless steel. • Diagram in the front panel with distribution of the elements similar to the real one. • Channel of rectangular section with transparent walls, formed by methacrylate transparent sections. • The channel is assembled on supports, with a system to control the inclination of the channel. • Channel slope adjustable.	No.	1		

			• Inlet tank (capacity: 38 L.), with stilling of flow and with drain valve. • Reception tank (capacity: 38 L), with drain valve pipes. • Orifice plate flow sensor. • Venturi type flow sensor. • Impulsion pump, with speed regulation, computer controlled: • Single-phase, 220V/50Hz • Safety switch ON/OFF. • Flow control valve. • Flow sensor • SCADA System • Simultaneous visualization in the computer of all parameters involved in the process. • Calibration of all sensors involved in the process. • Real time curves representation about system responses. • All the actuators' values should be changed at any time from the keyboard allowing the analysis about curves and responses of the whole process. • Shield and filtered signals to avoid external interferences. • The Data Acquisition board as part of the SCADA system with PCI Express Data acquisition board (National Instruments) to be placed in a computer slot. • Analog input: Channels= 16 • Sampling rate up to: 250 KS/s (kilo samples per second). • Analog output: Channels=2. • The system has Computer Control +Data Acquisition + Data Management Softwares as part of the SCADA system and are Compatible with the industry standards. • Flexible, open and multicontrol software, developed with actual windows graphic systems, acting simultaneously on all process parameters • Sampling velocity up to 250 KS/s (kilo samples per second) **Note :-** **Equipment must be compatible with existing hydraulic bench FME00 of Edibon Spain available in lab and its DAQ and software, else, DAQ and Hydraulic Bench is to be quoted along with the unit.**				

			Accessories Required: • Adjustable Undershot Weir • Vertical Flat Gate and Radial Gate. • Sharp Crested Weir, Broad Crested Weir, Crump Weir and Ogee Type Weir with Pressure Measurement • Energy Dissipation Accessories • Syphon Spillway. - Air Regulated Syphon. • Model of Sill • Models of Piers • Models of Culvert, Culvert Fitting • Set of Vibrating Piles • False Floor Sections • Venturi Flume • Velocity Meter • Differential Pressure Digital Indicator to Measure the Inlet Flow **Note :-Price of the accessories should be quoted separately in financial bid.** **Experimental Capabilities** **These are the required experimental capabilities, however, these may vary depending upon selected accessories** • Measurement of the water height and the velocity along the channel. • Measurement of the flow with weirs of thin wall. • Measurement of flow with changes in the channel section. • Measurement of flow using Venturi flume. • Control of the flow by gates. • Level control using syphons. • Flow on overflow dams. • Flow among the pillars of a bridge. • Characterization of the hydraulic jump. • Profiles of the water free surface. • Investigation of flow and supercritical flow states. • Measurement of water levels.				

			• Discharge processes on an underwater weir. • Amount of energy in flows in open channels. • Function of a syphon weir. • Pipe flows. • Generation of different flow states by damming the downstream water. • Observation of the flow under an undershot weir: • Observation of hydraulic motion on discharge. • Relationship between dam height and discharge. • Observation of discharges under a radial gate and Observation of hydraulic motion on discharge. • Investigations on waves. • Behaviour of structures in rough sea. • Applying and understanding Manning's formula. • Understanding sub- and super-critical flow. •				
5.		**Digital Saybolt viscometer with accessories**	• Confirming to ASTM D88, AASHTO T72 standards. • Stainless steel made, viscometer is supplied complete with • Two interchangeable orifices furol and universal, oil bath, electric heater with digital thermo-regulator, stirrer, cooling coil, viscosity flask. • Viscometer is equipped of a dual safety thermostat to prevent accidental over-heating. • Power supply: 230V, 1ph, 50-60Hz. • Filter funnel complete with wire filter ring mesh. • Withdrawal tube complete and thermometers **Or Equivalent**	No.	1		
6.		**4" Marshall moulds**	• Heavy duty marshalmould having Inside diameter 4" • Steel manufactured, plated against corrosion. • With mould body, filling color and baseplate	No.	8		
7.		**6" Marshall moulds**	• Heavy duty marshallmould having Inside diameter 6" • Steel manufactured, plated against corrosion. • With mould body, filling color and baseplate	No.	8		
8.		**Pavement coring machine**	• Rugged, compact and wheels mounted machine with vertical rectified screw feed.	No.	1		

			• The drilling excursion is 550 mm and the machine can drill cores up to 200 mm diameter. • Built in water swivel to cool the diamond bit. • Robust steel base with four leveling and stabilizing feet. • Petrol engine 12.5 HP power 4-stroke Briggs & Stratton model. • Supplied with tank, core drill bits - 100 and 152 mm inside diameter and respective core extractors. • Coring bit for 100 mm dia x 400 mm long cores, with permanently attached head 1 1/4 W. • Core extractor dia 100 mm • Coring bit for 150 mm dia x 400 mm long cores, with permanently attached head 1 1/4 W. • Core extractor dia 150 mm **Or Equivalent**				
9.		**Hand held traffic data collector with software**	• Hand held traffic data collectorto record turning movement data for up to 14 classes of vehicles, roundabout movement data, stop sign delay data, signalized delay data, vehicle classification data, spot speed data, multi-direction gap data, saturation flow rate data and time-stamped raw data. • Complete with software and DAQ. • Case: ABS non-warping plastic. • Power: 4 AA alkaline batteries. Interface: USB 'B' port. • Clock: always active real-time clock. • Display: wide temp, 4-line by 20-characte • LCD display. • Output: ASCII file read by software. **Or Equivalent**	No.	4		
10.	30-WF6207 30-WF6042 WF0325 WF0335	**Oedometer (without platform)**	• Front loading oedometer with weightsand tightening bolts (without consolidation bench 26-WF0312, available) • Compatible with 26-WF0302 (model available in lab) • Consolidation cell with complete spare parts • Linear transducers with complete accessories (3 x No.) • Permeability attachmentswithburette, clamps, stand and rubber hose for connection to the cell **Equipment must be compatible with existing consolidation bench**	No.	2		

			in lab and 16 channels GEODATA Log				
11.		**Flakiness and elongation tools for aggregate**	• Flakiness sieve test set including: 4.9x30, 7.2x40, 10.2x50, 14.4x60, 19.7x80, 26.3x90, and 33.9x100 mm slot sieves. • Constructed of heavy gauge stainless steel sheet.	No.	3		
12.		**Blaine apparatus**	• Confirming to EN 196-6, ASTM C204, AASHTO T153, BS 4359:2 standards. • Glass U-tube manometer with valve, steel stand, test cell with disk and plunger (all in stainless steel) • Rubber aspirator bulb, 1000 filter paper disks, manometric liquid, Vaseline grease for better coupling tube/cell, funnel & brush. • Reference cement	No.	1		
13.		**Heat of hydration calorimeter**	• Apparatus consists of a dewar flask contained in an insulated material and housed in a wooden box which is hinged so that the flask can be easily removed or replaced. • Constant speed electric stirrer and filler glass funnel. • Power supply: 230V 1ph 50Hz. • Digital thermometer, resolution: 0.001°C, memory for 10000 readings, displays, stores and prints: min, max, mean values, delta T, alarm if limit values are exceeded, battery operated • Conforming to ASTM C186 and EN 196-8 specifications.	No.	2		
14.		**Sieve set (Coarse + Fine)**	• Complete range SIEVE SERIES WOVEN WIRE CLOTH SIEVES As per ASTM E11 • Both for coarse aggregate and fine soil • With Pan and cover • Also required, Wet wash sieve of 200 mm high for 75 micron and 63 micron	No.	4		
15.		**Cleveland flash tester**	• Used for determining the flash and fire point of petroleum products. • It consists of a brass cup mounted on an electric heater with temperature controller. • Conforming with the CE European directive, is supplied complete with double line-fuse, hot plate control system and thermometer -6 +400°C. • Set of spare reusable cups	No.	2		

			Or Equivalent				
16.		**Standard proctor apparatus with rammers**	Standard proctor mould with hammer.	No.	4		
17.		**Modified proctor apparatus with rammers**	Modified proctor mould with hammer.	No.	4		
18.		**Hydraulic Universal Extruder**	• Used to extrude samples having diameter 4" and 6". • Suitable both for asphalt and compacted soil	No.	5		
19.		**Casagrande liquid limit apparatus**	• Confirming to ASTM D4318, AASHTO T89, UNI 10014 standards. • Unit comprises a removable brass cup which through a cam device drops on a hard rubber base. • Hand operated but with right side crank. • Complete with drops counter and grooving tool as per standard ASTM D4318.	No.	4		
20.		**Electronic auto level with tripod**	• Magnification: 32x • Standard deviation of 1 km (accuracy): 1.5mm • Image: Erect • Tube Length: 215mm • Objective Aperture: 36mm • Field of view: 1°-25' • Minimum Focus: 0.3m • Compensator Range: 15' • Compensator Accuracy: 0.5"/1' • Operating Temperature: -20°c-+50°c • Waterproof/Dustproof: IP66 • Imported Heavy Duty Aluminum Tripod • All other standard accessories (tool kit, carrying case) etc **Or Equivalent**	No.	2		
21.		**Electronic total station with**	• Total station with Imported Heavy Duty Tripod, Single Prism Target Set (2.6m Pole, Prism	No.	2		

		tripod stand and prism	• With 2x Batteries, 1x Charger, complete with carrying case and all other standard accessories. • Precise, Accurate and Reliable • Angle Accuracy: 2" • Minimum Reading: 1” • Angle Units: Dec/Gon/Mil • Magnification: 30x Minimum • Minimum Focus: 1.0m • Laser Pointer: Red light, coaxial • Reflectorless Range: 600m minimum • Distance with Single Prism: 5 Km • Distance Accuracy: 2mm+2ppm Minimum • Measuring Time (Tracking): 0.4 sec Minimum • Distance Units: m/US ft/INT f • Laser Plummet • In-Built Memory: 120,000 points minimum • Built-in Temperature/Pressure Sensors • Auto: Atmospheric Correction: In Built • Keyboard: Alpha numeric • Interfaces: USB, SD Card • Temperature: -40° c to +70°c • Operating Time: 48 hours Minimum • Dual Display/Alphanumeric Keyboard **Or Equivalent**				
22.		**Compaction factor apparatus**	• The apparatus consists of two conical hoppers mounted on a cylinder. • Each hopper has a hinged flange with quick release mechanism, and everything is mounted on a rigid steel stand. • The compacting factor is the ratio between the weight of the partially compacted concrete and the weight of the fully compacted concrete. • Supplied complete with tamping rod diameter mm 16x600 long.	No.	2		
23.		**Electronic theodolite with**	• Electronic theodolite with heavy duty tripod, 2x Batteries, 1x Charger, complete with carrying case and all other	No.	2		

		tripod and accessories	• For High Precision Works • Uses both Li-ion rechargeable and AA battery • Ergonomic keypad and and backlighted LCD display • Easy to use, most of the functions with one key • Angle Accuracy: 1” • Magnification: 30x minimum • Objective Lens: 45mm • Field of View: 1°30” • Minimum Focus: 1.0m • Absolute Encoding • Dual Face • Laser Plummet • Battery: 6v Li-ion/4 units AA battery • Rechargeable Battery Operating Time: 80 hrs • AA Battery Operating Time: 24 hrs Ø Temperature: -20 to 50-degreecelsius Ø IP 55 water and dust protection **Or Equivalent**				
24.		**Handheld GPS**	• Minimum resolution with 240 x 320 display pixels, 2.2-inch color display • High-sensitivity, WAAS-enabled GPS receiver • Waterproof • 20x Minimum • Minimum 4 GB (expandable) internal memory • USB interface • User Guide **Or Equivalent**	No.	2		
25.		**Distance meter**	• Handheld laser distance meter, area calculation. • Easy to use small &hand measuring with laser fast, simple and innovative save time. • Minimum 80 m range **Or Equivalent**	No.	2		
26.		**Laser Level**	• Laser Level with Transmitter and stand	No.	1		

			• Accuracy: ±10 arc sec • Rotation Coverage 360 °, Rotating Speed: 600rpm or 1200rpm • Laser beam Type: visible 670 nm • Working Range: 1000m (diameter) • Self-leveling range: Horizontal ±5° • Operating Temperature: -20° to +60°c • Rechargeable Ni-MH battery with charging system. • Operating Time: 65 hours • Tripod Mounting System • Dust and Waterproof IP56 **Or Equivalent**				
27.		**Plastic limit apparatus**	• Soil plastic limit set comprises of: • Glass plate 300x250x10 mm • Rod caliper Ø 3 mm. • Mixing porcelain dish Ø 120 mm. • Flexible spatula, 100 mm. blade • Aluminium moisture tins Ø 55x35 mm. (Q.ty 6)	No.	6		
28.		**Sand cone apparatus**	• 6.5” dia. (165.1 mm) sand density cone apparatus • The set includes the Double cone, two plastic sand jar and metal base plate • Calibrating Container • Complete set of field density tools	No.	6		
29.		**Vicat test**	• As per ASTM C19 • Vicat apparatus with • Metallic frame, graduated scale with index, sliding probe • Consistency plunger Ø 10 mm, glass base plate. • Hardened needle Ø 1 mm ASTM - AASHTO • Hardened needle Ø 5 mm • Conical plastic mould Ø 60/70 h 40 mm (ASTM - AASHTO)	No.	2		
30.		**Polygon of forces apparatus**	• Self-contained, bench mounted. • Direct measurement of forces. • Adjustable lines of action of forces. • Practical verification of triangle of forces, polygon of forces and link polygon. • Demonstrates equilibrium of forces at a point, applied to	No.	2		

			various points round a disc or acting on a rectangular lamina. • Concurrent & Non-concurrent coplanar forces. • Calibrated Weights. • User Manual with Sample Readings.				
31.		**Work done by variable force apparatus**	• Set of weights • 1m ruler supplied • Table unit for experiments on mechanical work and potential energy. • Lifting a weight using a lever and a dynamometer (spring balance). • Integrated angle measuring scale protractor. • The apparatus consists of the arm, hanger with loads, spring balance and protractor scale attached to the support board. One end of the arm is fixed, and its position is indicated by the protractor. Other end of arm carries the load hanger and is restrained by spring balance that is perpendicular to the arm. • The free-standing, bench-top unit consists of a suspension cord carrying a loaded trolley at its mid-span. The cord is clamped at one end, and tensioning effort applied vertically at the other end. • All pulleys feature ball bearings • Instruction manual	No.	2		
32.		**Inertia in rotational motion apparatus**	• Metal rotating bar, weights with knurled bolts for quick fastening • Solid and hollow test cylinders • Ball bearing mounted rotating drum, anodizedaluminum • Acceleration of system by weight attached to the drum	No.	1		
33.		**Rebar Binder/steel Bar Handheld Tying Machine Construction Machine**	• Rebar tying tool, a hand-held electrical tool, can tie rebarquickly and automatically. • 1 set rebar tier includes: tool box, rebar, charger, batteries;partlist;wire-cutters and minimum four rolls of coils. • Battery type: Li-Ion, above 12000mAH2.8V,Ni-MH • Full charging time not more than 75 minutes • Wraps per knot: 2-3wraps or more	No.	2		

			• Applicable rebar size: 8mm-34mm or better • Wire diameter: 0.8mm • Length per coil: 110m • Weight per coil: 0.4kg • Wire length per tying: 30-102 • Ties per roll of wire: 100-260knots • Ties per charger: 1300-1800knots • Torque dial • • User Guide • Required Services, Assembly and Installation, Interface and Control Software, Starting-up, Safety, Maintenance, Calibration & Practices Manuals. **Or Equivalent**				
34.		**Bending Moment and Shear Force in a Beam Apparatus with DAQ System and Software**	• The apparatus should comprise of beams with two support reactions for bending moment and shear force analysis **Bending Moment** • Min. Beam Length should be 30 inches • Span length should be at least15 inches • Beam should be graduated • The apparatus must show graphical representation of shear force and bending moment both through DAQand digital force display • Bending moment mechanism should be designed on bottom fiber of the beam • Beam to have minimum 24 loading positions at 20mm intervals • Pivots and mechanisms to be fitted with ball race bearings, allowing rotational movement • One of the supports also allows for horizontal movement • Should be accompanied with experimental unit, set of weight, hangers and set of accessories like o Minimum 5x weight hangers o 150x 10 g masses **Shear Force in a Beam** • Min. Beam Length should be 30 inches	No.	1		

			• Span length should be at least 15 inches
			• Beam should be graduated
			• The apparatus must show graphical representation of shear force and bending moment both through DAQ and digital force display
			• Beam to have 23 loading positions at 20mm intervals
			• Pivots and mechanisms to be fitted with ball race bearings,allowing rotational movement
			• One of the supports also allows for horizontal movement
			• Should be accompanied with experimental unit, set of weight, hangers and set of accessories like
			  ○ Minimum 5x weight hangers
			  ○ 150x 10 g masses
			• Automatic Data Acquisition
			
			Or Equivalent				

35.		**Standard Jar Tester Apparatus with accessories**	• Standard test jar apparatus with accessories • Frame / chassis made of powder-coated steel • 6 jar apparatus tubes in the bottom platform: • Testing jars (minimum 2 L) • Stainless steel paddles, 1” x 3” • Paddle speeds from 5 to300 rpm in 1 rpm increments and run times from 1 second to60 minutes in 1 second increments or better • Six-paddle programmable model with four programmable memorybanks • Automatictransitioning from a fast mix/short run to a slow mix/long run,or any combination of speeds and times desired to replicateactual plant conditions and operation • Six round, glass, 1 liter beakers or Six B-KER 2 square,acrylic, 2-liter lab jars • LED floc illuminator • Dust cover • As per ASTM: D2035 - 19 "Standard Practice for Coagulation-Flocculation Jar Test of Water"	No.	2		

			Or Equivalent				
36.		**Pipe surge and water hammer with Software**	• Constant level deposit, in methacrylate • Unload deposit, in methacrylate. • Pipe circuits in PVC. • Valves to select the circuit. • 2 adjustable equilibrium chimneys and subjection clips. • Connections system to the Hydraulics Bench (FME00, already available) with fast plugs. • Easy and quick coupling system built-in. • Anodized aluminum structure **Experimental Capabilities** • Subduing of the water hammer effects. • Study of the subduing depending on the diameter of the chimney. • Calculations of the energy losses in pipes **Note :-** **Equipment must be compatible with existing hydraulic bench FME00 of Edibon Spain available in lab and its DAQ and software, else, DAQ and Hydraulic Bench is to be quoted along with the unit.**	No.	2		
		<u>Total</u>					

Firm Name: _____

Signature: _____

Name: _____

Designation: _____

Tender No_____
Name of the Firm _____
Firm Address_____
Date_____
Telephone No_____
E-Mail_____

To,

DD SCM Office
NUTECH University
I-12, Main IJP Road,
Islamabad.

Dear Sir

1. I / We hereby offer to supply to the NUTECH University the stores detailed in schedule to the tender inquiry or such portion thereof as you may specify in the acceptance of tender at the price offered against the said schedule and further agree that this offer will remain valid up to 90 days after opening of Financial offer and will not be withdrawn or altered in terms of rates quoted and the conditions already stated therein or on before this date. I / we shall be bound by a communication of acceptance to be dispatched within he prescribed time.

2. I / we have understood the instructions to Tenders and General Conditions Governing Contract available at NUTECH website and have thoroughly examined the specifications / drawing and / or patterns quoted in the schedule here to and am/are fully aware of the nature of the stores required and my/ our offer is to supply stores strictly in accordance with the requirements.

Yours Faithfully.

(Signature of Tenderer)
Designation
Date:

Individual signing tender and / or other documents connected with a contract must be signed by principal authorized rep/ OEM rep/ Authorized partner firm rep.

SPECIMEN FOR "ADVANCE PAYMENT BANK GUARANTEE"

Guarantee No: _____Date_____ Amount:_____ Valid upto:_____

In Favour of:

National University of Technology (NUTECH), IJP Road, I-12, Islamabad

Subject: **Advance Payment Bank Guarantee**

Contract No: _____DATED._____

Dear Sir,

1. We [Name of Guarantor] understand that you have entered into contract with M/S [Name of Firm] (hereinafter called Our Client), for provision of [Name of Stores]. And as per the above mentioned Contract, you are liable to pay to Our Client an amount of [Amount of Guarantee] in advance, which shall be released against a Bank Guarantee. 2. Bank & seller firm shall inform your office regarding termination of the validity of this bank Guarantee one clear month before the actual expiry date of this Bank Guarantee.

3. Now, we hereby irrevocably undertake to immediately make payment on to your orders, merely upon receipt of your first written notice, an amount not exceeding [Amount of Guarantee] that may be claimed by you at your own discretion without it being necessary for you to prove or even assert to the Bank any default whatsoever of Our Client under the Contract.

4. Claims against this Guarantee shall be lodged on us through written request/s on your proper Letter Head. Unless claims are not presented on or before the Validity Date, all rights and benefits under this guarantee shall be forfeited and we shall be released from all claims, demands or liabilities of any kind whatsoever.

5. This Guarantee shall remain in force up to the above mentioned Validity Date which can however, be extended upon request of Our Client.

Yours faithfully,

Signature:_____

Name:_____

Designation:_____

Bank Stamp:

"SPECIMEN FOR BANK GUARANTEE AGAINST PERFORMANCE/WARRANTY GUARANTEE"

Guarantee No: _____Date_____ Amount:_____ Valid upto:_____

In Favour of: National University of Technology (NUTECH), IJP Road, I-12, Islamabad

Subject: **In compliance with terms of Performance/Warranty Guarantee Bank Guarantee**

Contract No: _____ dated_____

Dear Sir,

1. Whereas your good-self have entered into Contract No__ dated_with M/s [Firm Name] Located at [Firm Address], Herein after referred to as our customer and that one of the conditions of the Contract is submission of Bank Guarantee by our customer to your good-self for a sum of [Amount].
2. Incompliance with this stipulation of subj contract, we hereby agree and undertake as under:-
    a. To pay to you unconditionally on demand and / or without any reference to our Customer an amount not exceeding the sum of [Amount] as would be mentioned in your written Demand Notice.
    b. To keep this Guarantee in force till [Validity Date].
    c. That the validity of this Bank guarantee shall be kept two clear year ahead of the original / extended delivery period or the warrantee of the stores which so ever is later in duration on receipt of information from your office. Our liability under this Bank Guarantee shall cease on the closing of banking hours on the last date of validity of this Bank Guarantee. Claim received there after shall not been entertained by us whether you suffer a loss or not. On receipt of payment under this Guarantee, this documents i.e., Bank Guarantee must be clearly cancelled, discharged and returned to us.
    d. That we shall inform your office regarding termination of the validity of this bank Guarantee on clear month before the actual expiry date of this Bank Guarantee.
    e. That with the consent of our customer you may amend / alter any term / cause of the contractor add / delete any term / clause to / from this contract without making any reference to us. We do not reserve any right to receive any such amendment / alternation or addition / deletion provided such like actions do not

increase our monetary liability under this Bank Guarantee which shall be limited only [Amount .....].

f. That the bank guarantee herein before given shall not be affected by any change in the constitution of the Bank or Customer / Supplier or Vendor.

g. That this is an unconditional Bank guarantee, which shall been cashed on sight on presentation without any reference to our Customer / Supplier or Vendor.

Signature_____

Name_____

Desig_____

Bank Stamp_____

Note: No changes in the above given BG format shall be accepted.

"SELLER'S WARRANTY CERTIFICATE"

(To be provided on stamp paper)

Contract No: _____ Dated:

Validity ____ years from the date of final acceptance of the Stores.

We hereby guarantee that we are the genuine and original Source of provisioning the Stores to our Buyer. We also undertake that nothing in the manufacturing of these Stores has been obtained through unauthorized means.

1. We hereby warrant and undertake that the Stores and all the associated spares/ accessories supplied under the terms and conditions of the above Contract, are:

   a. brand new, complete in all respects, possessing good quality and standard workmanship; and

   b. liable for replacement/rectification free of charge, if during the Warranty period the same are found defective before or under normal use or these do not remain within the limits and tolerances stated under the specifications or in any way not in accordance with the terms of this Contract. All expenses incurred in removal, re-provisioning and reinstallation of such defective Stores or their parts shall also be borne by us.

2. The Warranty shall remain valid for a period of ____ years from the date of final acceptance of the Stores.

Signature & Stamp _____

_____

Name & CNIC _____

Designation: _____

Date: _____

**Sellers warranty must be provided by the Seller (firm) on Rs 100 stamp paper along with bank guarantee/CDR/Pay Order without changing a word. BG with additional clauses will be rejected.

CHECK LIST

(This checked list must be attached with your technical offer, duly filled and Signed by authorized signatory)

Tender No_____ **Date**_____

1	Tender Processing Fee	a. Tender processing fee ref no_____ b. Bank_____ c. Amount_____		
2	EM/ Bid Bond	a. EM/ Bid Bond ref no_____ b. Bank _____		
3	Form Annex A, A-1, B and C signed by Authorized Signatory		**Yes**	**No**
4	Offering specification of items as per IT		**Yes**	**No**
5	Quoted Currency as per IT		**Yes**	**No**
6	Accounting unit/Qty as per IT		**Yes**	**No**
7	Delivery Schedule as per IT		**Yes**	**No**
8	Country of origin of store_____			
9	Name of OEM:-_____			
10	Original Performa invoice (Mandatory)		**Yes**	**No**
11	Certified that there is no Deviation from IT conditions/ there is deviation from IT condition as per fol details		**Yes**	**No**
12	Blacklisting certificate.		**Yes**	**No**
13	Verifiable OEM Certificate		**Yes**	**No**
14	Warranty Period as per IT		**Yes**	**No**
15	ATPs provided		**Yes**	**No**

Note: Fill and/or mark Yes/No where required

_____

Signature of Firm Auth Signatory