राष्ट्रीय प्रौद्योगिकी संस्थान,मणिपुर
NATIONAL INSTITUTE OF TECHNOLOGY, MANIPUR
Langol Campus, .Ph. (0385) 2445812 / email: - nitmn@nitmanipur.ac.in
An Autonomous Institute under MHRD, Govt. of India

CORRIGENDUM

Imphal, 20th February, 2019

Subject: NIT Manipur TEQIP-III advertisement No.TEQIP-III/2019/nitm/shopping/79 dated 18.02.2019 for the supply of Civil Lab Equipments at NIT Manipur.

NITM.1/(227-TEQIP-III/2019 (PART 1)(Pf)- In partial modification to the above referred Advertisement, it is hereby notified for information to all the prospective/ potential bidders that there is some changes in the specification of items, last date of submission will remained the same and can be obtained from the institute website at www.nitmanipur.ac.in.

Revised Equipment Specification stands as in Annexure I

Other terms and conditions of the tender document will remain unaltered.

(Dr. Kh. Manglem Singh)
Registrar (i/c), NIT Manipur

Copy to:

1. PS to the Director, NIT Manipur
2. TEQIP-III, Nodal Officer (Procurement)
3. Technical Officer, NIT Manipur for uploading in website
4. CF/GF.

ANNEXURE – I

Updated item wise equipment specifications

A. Servo Hydraulic Actuator Loading System

Servo-Hydraulic Actuator:

- ±50kN dynamic capacity double acting, double ended equal area actuator with an integrated manifold.
- It should be of monolithic piston design type.
- Piston rod shall be made from heat-treated alloy steel (EN-24), hard chrome plated.
- For static, quasi static and dynamic test in displacement and load control.
- Actuator frequency range: 0.1 Hz to 50 Hz
- Actuator Displacement: ± 75mm (total 150 mm)
- Stroke Measurement: LVDT or Encoder
- Sensitivity: 0.50 V/V ±10% at full scale, Non-Linearity: ≤ ±0.25% of FS
- Displacement accuracy ± 0.5% of readout
- Actuator manifold with provision to mount servo valve, direction control valve to hold actuator
- 0.5litre accumulators in pressure and return line
- Optimized design for high stiffness and low fluid consumption. Low friction and wear resistant and high side load carrying capabilities.
- Suitable flow rate contamination insensitive direct drive servo valves to meet the performance mentioned below

System Performance Specification:

Frequency (Hz)	No Load Performance (mm)	50% Load Performance (mm)
0.5	±50	± 35
1	±25	±17.5
5	±4	±2
10	±2	±1
20	±0.8	±0.4

Performance curve of the proposed system shall be submitted along with the offer. Performance should be demonstrated as per the above table during Installation and Commissioning

Load cell:

- ± 50kN dynamic capacity load cell
- Safety Overload capacity: 150% of rated capacity
- Precision machined shear web design for protection against side load and high stiffness
- 350 Ohm precision transducer class strain gauges MicroMeasurements (USA) preferred make
- Hysteresis: 0.02% of full scale or better
- Accuracy of ± 0.5% of read out value down to 1/500th of load cell capacity or better(Accuracy of Loadcell as per specifications should be demonstrated at the time of Installation)
- Resolution: 0.02% of Full Scale Reading or better
- Non-linearity ± 0.1% of Full scale or better
- Non-repeatability ± 0.02% of ratedoutput or better
- Zero Balance ± 0.5% of ratedoutput or better
- Side load sensitivity ± 0.08% or better
- Excitation voltage minimum 10V should be there

22/2/19

- Eccentric load sensitivity ± 0.06% or better
- Fatigue life 10^9 Reverse stressed Cycles or better
- Resolution: 0.02% of Full Scale Reading

Hydraulic Power Pack:

- Suitable flow rate Hydraulic Power Pack (minimum 20 LPM) for Constant Pressure (210 bar) Hydraulic Oil Supply to meet the test requirements mentioned above. Supplier shall demonstrate the system performance as mentioned in the above table during installation and commissioning.
- The power pack should have local or remote operation
- Servo Controlled,variable frequency drive pump (Gear pump) for variable flow and constant pressure
- Suitable monitoring interlocks for Oil pressure, Oil level, Oil Temperature,Filter blockage, Power Failure, motor over Load, under/over voltage etc
- Micron level filter with electric interlocks
- It should be supplied complete with suitable cooling unit for hassle free operations in NIT ManipurCollegeenvironment conditions
- The hydraulic system offered should not be sensitive for contaminations
- Three phase power supply is recommended
- Shall be provided with Sufficient Volume of Hydraulic oil of ISO 46-DTE-25 Mobil
- Set of hydraulic hoses of 10mtrs shall be supplied with powerpack

Control Electronics:

- Controller with one station (one load, one displacement) control
- Digital Signal Processor (DSP) based closed loop servo controller. Should be proved during PDI
- Minimum 24-bit Control Electronics
- Minimum 32-bit Data Acquisition on the control and feedback channels. Should bedemonstrated at the time of PDI
- Data acquisition rates of 5kHz or better on primary channels. Should be demonstrated at the time of PDI
- Servo loop update rates of 5kHz or better
- Waveforms: Square, Triangle, Since, Ramp and Random
- Provision for one stroke channels, one load and four strain channels
- Auto Calibration and Digital Auto Zero capability
- Easy Downloadable Firmware for Future Up gradations, without making any changes in the controller
- Controller should be able to run static and fatigue tests as mentioned above
- Should acquire data from all control and feedback channels
- Controller should be placed inside an enclosure with lock and key arrangement

Electrical Cable:

- Electrical cables for drive, LVDT and load cell each 10m long
- Two emergency push button with 15m long cable

Application Software:

- Perform Fatigue Test, Static or Monotonic test, Multistep programming andTime History Playback
- Perform tests in Stroke, Load and Strain control modes
- Display meters for current readouts, max-min, peak valley, set-point, cyclecounter, etc.
- Display time history graph and X-Y plots, (single or multi), etc.
- Option of program safety interlock for load, displacement, strain etc.

20/2/19

- Export data in excel, ASCII, text, and other formats compatible to most ofthe equipment
- Software shall create, edit and run tests with as per user requirements. Also, the interface shall be easy-to-use combined with the ability to modify calculations giving the test creator freedom to design unique tests
- Limit sensing and triggering facilities for recording
- Function generation up to 500 Hz and capable of generating Sine, square, triangle, ramp, hold, profile and custom waveforms
- Facilities of report generation and documentation
- Shall have data reduction options available in real time data logging and during data exporting
- Data acquisition (timed, P/V, level crossing, cyclic/logarithmic)
- Capability of Software to reproduce target time history signals e.g. X-Y plots of Load and Displacement
- Acquire loading data collected from strain gauges/accelerometers
- The softwareshould have capability to generate a drive file through an iterative process toreproduce field data signal on the specimen

Test Workstation and accessories:

- Intel i5 Processor or better
- 500 GB Hard Disk Drive, 4GB RAM, 24" Monitor
- DVD writer, Key board, Mouse
- Windows 10 operating system and MS Office 2016 installed
- Additional Data Acquisition system: Lenovo AIO 300-20ISH

50kN Loading frame to mount the actuator in horizontal position and height of the frame should be 2mtrs, actuator should be vertically adjustable on the frame according to test requirement to suit various specimen heights

Optional Items:

- 50kN Fatigue Rated Swivels assembly, Swivel angle; +100degree, -30 degree and Tilt angle: +/- 12 degrees

B. GPR for deep investigation

- Electronic control unit
- 2D visualization software with the device.
- Devices carry case
- USB cable
- Battery connection cable
- Antenna (integrated with the device). Up to 40 m depth penetration
- Areas of application:
- Used in archaeological application; metal detection etc.
- Investigation of contaminated sites
- Surface exploration work for construction projects should be designed specifically for cable and pipe exploratory assignments
- Mining operations and earth investigations
- Exploration of old underground bunkers, tunnels, old corridors and much more

C. Core cutting machine

- Maximum Drilling Capacity: 300mm
- Optimum Drilling Capacity: 250mm
- Rated input power : 3.5 KW

- Speed : 460 / 900 RPM
- Shaft: 1-1/4" UNC
- With heavy duty drill stand (clamping spindle + clamping nut + setting tool + water pump + drill bit + drop in anchor + 102mm core

D. Rock Bolt Pull Out Test Apparatus

- SIZE: 300 KN (Anchorage Testing Machine)
- Stroke: 102mm
- Cylinder bore dia: 88.9
- Plunger dia: 63.5
- STANDARDS:IS 11309, ASTM D 4435
- The objective of the test method is to measure the working and ultimate capacities of rock bolt anchors. the system comprises of a central hole jack, hand pump with a load gauge, directional control value (only for central hole jacks above the capacity of 300kN), flexible hose pipe 6mts, truss high tensile bolts with coupling. in general, the pull-out force is indicated on the load gauge, however a load cell with digital indicator shall be used to measure the pull-out load. arrangement should be provided for fixing the dial gauge for estimating deflection against the load

E. Rebar Cutting Machine

- Cutting Blade Size: 10 inch
- Power Consumption: 3kw
- No Load Speed: 1440

General Requirements & Qualification Criteria:

- Firm should quote &supply the entire lab equipment listed above as a single package
- Vendors should have Single Source Local Service Support Facility preferably in Kolkata / Manipur and should submit address and contact details
- Firms should give an undertaking for supply of Software upgrades if any, during the warranty period of one year, free of charge

20/2/19