



**NATIONAL CENTRE OF EXCELLENCE IN GEOLOGY  
UNIVERSITY OF PESHAWAR**

Peshawar-25120, NWFP, Pakistan  
Phone: +92-91-9216427; 9216429 Fax: +92-91-9218183  
Web: <http://nceg.upesh.edu.pk/>

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Last date of tender is **June 30, 2014.**  
Opening date of tender is **June 30, 2014 at 12:00 PM**

Price= Rs.2500/-

**(People who downloaded this file from NCEG site will have to deposit an amount of Rs.2500/- as the payment of Tender Document at the time they submit their bids or send a demand draft of Rs.2500/- in the name of Director NCEG, in case of submitting documents through courier/postal mail)**

## **TENDER DOCUMENTS FOR THE PURCHASE OF ITEMS**

**(Note:** Please must provide a soft copy (on a USB/CD drive) of all documents along with hard copy of the offer. Thanks)

**Document Issued By:**

**NCEG Official**

**Dated:    /    / 2014**



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**Terms & Conditions**

**1) INVITATION TO BID**

- The Director National Centre of Excellence in Geology invites bids for the items as per attached list.
- Bids must be submitted in sealed envelopes, including its due date on the face of the envelope.
- Earnest money @ 2% of the total bid cost shall be submitted with the tender without which the quoted bid will not be considered.
- The quoted price shall be inclusive of all duties / taxes.
- The Director, National Centre of Excellence in Geology, reserves the right to add, delete or amend any part of the tender documents during the bidding period.

**INSTRUCTION TO BIDDERS/GENERAL CONDITIONS**

**2) SUBMISSION OF BIDS**

- Bids in sealed envelope should reach the office of the director on or before the due date.
- Bids sent through courier should be delivered at least half an hour before the scheduled time of opening.
- After the bids / quotations are opened, no bidder shall be allowed to revise, propose or request any changes in bid, unless the committee decides to do so.
- The bidder or authorized representative shall sign on each page of the tender document. No corrections and overwriting are allowed.
- Item(s) should be quoted ANNEXURE-wise separately. Preference will be given to the firm(s) quoting maximum number of equipment ANNEXURE wise, along with installation and commissioning/Turnkey solution. However, NCEG reserves the right to opt any item from any bidder for the required items.
- ***Bidders are requested to read carefully the terms and conditions and sign the Tender Form in token of having understood and accepted the same in all respects. All or any of the provisions of the terms and conditions may be changed/altered/modified/deleted/added or amended by the Centre as and when deemed suitable/necessary.***
- While quoting tender rates, the items should be given numbers as are numbered in the Tender Document.
- The tender Rate shall be item wise. And rate will be on both FOR basis in Pak Rupees and C&F basis *Peshawar Air Port. / NCE in Geology premises.*
- Prices of optional accessories should be quoted separately.
- *Taxes levied by the Government and freight charges, if any, shall be paid by the bidder and must be included in the quoted prices.*
- Bidder is responsible for timely delivery of bids. This office will not be responsible for misplacement / tampering / non-attendance delay or any other incident in case the bids are not delivered at the designated place & time.
- The bidders should be either established firm or sole distributor / authorized agent of the manufacturer having after sale service facilities, preferably, in Peshawar and/or Islamabad/Rawalpindi.
- The payment of equipment is coupled with installation / commissioning of equipment; therefore, supplier should make sure that bid is complete in all respects including consumables etc.
- The bidders must enclose original Performa Invoice / Quotation from their Principals or authorization certification of the Principal, failing which their offers will be ignored.
- **Bidders should preferably have office, workshop facilities and after sales services preferably in Peshawar and/or Islamabad/Rawalpindi.**
- Bidders must have trained engineers to provide after sales service. Copy of Training Certificate should be submitted along with their offer.

Note:

- Certificate of the Principle Vender.
- Only those suppliers will be entertained who have previously supplied similar equipments in Pakistan.
- ***Training of Two end users will be the responsibility of the bidder, in case of winning the tender.***

The price is to be quoted, essentially indicating the following:

- a. Original Country of origin.
- b. Estimated gross / net weight, dimension & volume of offered item.
- c. Delivery period.
- d. Original technical literature.
- e. List of Clients to whom the same natures of equipment are supplied in recent two years.



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- f. The supplier must submit a certificate that the equipment supplied are according to international standards at time of delivery, otherwise no supply will be accepted by the client and the call deposit will be forfeited.
- 3) **BID VALIDITY**  
All offers shall remain valid for 180 days from the date of opening of bids, until any further extension required by the client.
- 4) **ACCEPTANCE/REJECTION**  
The Director National Centre of Excellence in Geology reserves the right to accept / reject / modify, any or all bids or parts thereof, without assigning any reason. .
- 5) **RATE ESCALATIONS**  
Quoted price shall remain valid, firm, and irrevocable and fixed till the fulfillment of obligations by the supplier and will not be subject to escalation on any account.
- 6) **TECHNICAL LITERATURE & SAMPLES**  
If applicable/required, the Bidder (s) shall submit the following;  
a. Data/Fact sheets of the equipment.  
b. Original technical literature/Evaluation Software (s)
- 7) **EVALUATION**  
Evaluation will be done on item-wise basis unless specified otherwise. The Director National Centre of Excellence in Geology, for timely delivery or economic reasons/compatibility, may:  
a. Split the tendered items/ quantities among more than one supplier.  
b. Form a package of tendered items/quantities.  
c. Omit, Decrease or increase any item of Bid.
- 8) **PURCHASE ORDER**  
Purchase order of quoted material shall be placed on fulfillment of conditions mentioned at above.
- 9) **DELIVERIES**  
a. Free delivery at the following location is required, unless specified otherwise:  
a) Director National Centre of Excellence in Geology, University of Peshawar, Peshawar, Pakistan  
b. The supplier shall replace defective material/software/hardware at his / her risk and cost. Including transportation duty, taxes etc.  
c. The material shall be in original/sealed packing to ensure delivery without any damages during transit. .  
d. The supplier shall be responsible for and shall provide part of the work and services/functions and equipment related to packing, handling and general transportation requirements.  
e. If any of the software/hardware is discovered to be damaged or unacceptable at the point of embarkation or disembarkation, the supplier shall be responsible for replacement of the software/hardware free of any charges and costs to the buyer / client.  
f. Time of Delivery of all equipment will be Maximum 60 days (FOR) and 90 days (C&F) after the date of issuance of purchase order.  
g. **The equipment should be new and the vendor/supplier will ensure originality of the procurement channel as well as equipment.**  
h. The Equipment shall be supplied in packed form and shall only be opened in the presence of the Purchase Committee/NCEG Official. Working manuals and other related literature shall accompany the equipment in original at the time of delivery.
- 10) **SCOPE OF SUPPLY**  
a. The bidder shall supply/deploy equipment/items, of the specifications given in the attached Annexure-II, III, IV, V, VI, VII, VIII, IX, X, XI, XII.  
b. The bidder shall also be responsible for their installation, calibration, free service and the supplies at least one year from the date the equipment makes warranty functional.  
c. **All equipment should be accompanied by service manuals of the equipment/item separately in English.**  
d. In case installation at the times of supply/delivery is not possible; the vendor/supplier has to fulfill the same on the new installation date, given by Technical/Concerned Person of the NCEG.
- 11) **INSPECTION**  
Pre-delivery inspection may be carried out at the premises of supplier (s) and / or post delivery inspection at office of Director, by the Technical Committee/NCEG official.
- 12) **PAYMENT**  
The supplier, after delivery of goods and its acceptance/satisfactory report shall submit invoice to this office, containing relevant information i.e.



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- a. Purchase order number and date
- b. Item number
- c. Quantity
- d. Price
- e. Delivery challan indicating delivery date.
- f. Sales tax return invoices.
- g. No Interim payment will be made.

**13) TAXES**

- a. **Income tax as applicable** under the prevailing Government rules will be deducted at source (except where the supplier provides an income tax exemption certificate).
- b. Quoted price shall be inclusive of all taxes, especially **GST 17%** will be applicable.
- c. Professional tax shall be deducted as applicable.

**14) LIQUIDATED DAMAGES**

- a. If supplier fails to deliver ordered material within the stipulated period / scheduled time specified in purchase order, The Director, without prejudice to any other remedies, shall deduct from the bills or any other due payments / guarantees, as liquidated damages, a sum equivalent to 0.1% per day of the undelivered goods up to maximum 10% of the bid price & forfeit 2% earnest money.
- b. The liquidated damages shall also be applicable for the cancelled quantity of goods.
- c. Whenever liquidated damages become payable, in the event that delivery of all goods and equipment is not made within the time period specified except on account of force majeure, the buyer shall quantify the same and shall serve notice to the supplier requiring payment thereof.
- d. If the supplier fails to remit payment within ten (10) days of receipt of such notice, the buyer shall forth-with become entitled to recover the same.

**15) SECURITY DEPOSIT/RETENTION MONEY/PERFORMANCE SECURITY**

10% Amount of bill price shall be deducted or bank guarantee provided by supplier & the same should be released after the issuance of FAC / Satisfactory report.

**16) MAINTANANCE PERIOD**

Maintenance period is one year from the date of successful installation.

**17) INSTLLATION & COMMISIONING**

- a. **Please note that system/supply should be completed in all respect in terms of hardware, software and accessories/spare parts. Any deficiency in acquisition of desired results at the time of installation and subsequent functioning will be the responsibility of the supplying firm/company, without any additional cost. All the supply should be based on National Centre of Excellence in Geology University of Peshawar.**
- b. The supplier will be responsible for installation, testing Commissioning and one year smooth running of equipment. And also arrange free of cost training for the buyer/client.

**18) CONDITIONAL BIDS**

Conditional, incomplete bid will not be accepted.

**19) BID BOND/ EARNEST MONEY**

- The bidder shall furnish, as part of his bid, earnest money equal to 2% of quoted price with their offer in the form of demand draft/ pay order in favour of Director, National Centre of Excellence in Geology, University of Peshawar, Peshawar.
- The earnest money shall be denominated in Pak rupees and shall be in the form of Demand Draft, Pay Order or Call Deposit issued by a Pakistani scheduled Bank or branch of a Foreign Bank, acceptable in favour of the National Centre of Excellence in Geology, University of Peshawar, Peshawar.
- In case of alternate prices, earnest money will be based on the maximum quoted price of the same item.
- The Demand Draft shall be returned to unsuccessful bidders.
- **The Earnest Money will be forfeited if a bidder withdraws his bid during the period of his bid validity or fails to supply the machinery / equipment ordered by the university.**

**20) SIGNING OF BIDS**

The person signing the bid shall initial all the pages of the bid, where entries are made and attach Tender Document cost receipt in original.

**21) PURCHASER'S RIGHT TO ACCEPT OR REJECT ANY OR ALL BIDS**

The National Centre of Excellence in Geology, University of Peshawar, Peshawar (Purchase Committee) reserves the right to reduce or increase the quantity, accept or reject any bid and to stop the bidding process and reject all bids, at any time prior to award of supply order without incurring any liability to the affected bidder or bidders or any obligation to inform the affected bidders of the ground for such actions.



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**22) CONVENING**

Unsolicited advice/clarification and any personal approaches at any stage of evaluations/purchase process are strictly prohibited and may lead to disqualification.

**23) PERFORMANCE SECURITY**

- Within one week of issuance of the purchase order for C&F equipment only, the successful bidders shall furnish to National Centre of Excellence in Geology, University of Peshawar, the performance security bond as per Annexure-I, equivalent to 10% of the bid price in the form of a bank guarantee, before opening of LC.
- The performance security shall be payable to the National Centre of Excellence in Geology, University of Peshawar, as compensation for any loss resulting from the supplier's failure to complete its obligation.
- The performance security will be discharged by the National Centre of Excellence in Geology, University of Peshawar, and returned to the supplier after completion of the supplier's performance obligations under the contract.
- The security will be retained for one National Centre of Excellence in Geology, University of Peshawar, year starting from the date of successful installation and operation of the machinery / equipment.

**24) CALIBRATION OF EQUIPMENT**

- It will be the responsibility of supplier to arrange standards / consumables required for the calibration of the equipment at the time of installation.
- No TA/DA claim will be entertained by NCEG, in case of after sale services, whenever it requires within the premises.
- *In case of non-conformity with desired specification, the item shall be replaced by the supplier free of cost.*

**25) WARRANTY**

- The supplier shall furnish at least one year after sales service / warranty for successful operation of equipment(s) / item(s) from the date of installation.
- In case of Malfunctioning / defect in any equipment / item, the supplier shall replace them free of cost within 30 days; otherwise the supplier will return the entire paid amount to National Centre of Excellence in Geology, University of Peshawar immediately.

**Note:**

***By signing this agreement, you acknowledge that you have read and understood, and agree to be bound by, the terms and conditions as outlined in the agreement and confirming that your company/organization terms and conditions stand eradicated.***

Dated: \_\_\_\_\_

Name: \_\_\_\_\_

Designation: \_\_\_\_\_

Company Name: \_\_\_\_\_

Contact No: \_\_\_\_\_

Mailing Address: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

E-Mail: \_\_\_\_\_

Signature and official Seal: \_\_\_\_\_

**NCEG Official & Signature** \_\_\_\_\_



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**TENDER NOTICE**

Sealed tenders are invited from the reputable firms duly registered with Sales & Income Tax Departments for the purchase of different laboratory equipments for research purpose in connection with Centre's regular budget and Developmental Projects:

S.No	Name of Equipments
<b>1. XRF LAB</b>	
A	XRF Chillers
B	XRD Chillers
<b>2. Geo Technical Engineering Lab:</b>	
A	Rock Share Box Apparatus
B	Compression, Uniaxial and Triaxial
C	Digital Point load Tester
D	Permeability of Rocks with Hoek cells
E	Rock classification hammer
F	Slake durability apparatus for rocks
G	Universal electric core drilling machine
H	Skid resistance and friction tester
I	Barton comb profilometer 150 mm and 300 mm long
J	Determination of potential reactivity of alkali aggregates for use in concrete.
K	Aggregate impact valve apparatus. BS 812
L	Determination of aggregates crushing value
M	Joint roughness coefficient test device
<b>2.1. Soil Mechanics</b>	
O	Auger boring
P	Shelby tubes
Q	Piezometer
R	HYPRO (soil water retention curve apparatus)
S	Inclinometer
<b>2.2. Seismology</b>	
T	Accelograph GMS 18-63
U	Soil spy rosina for MASW measurement
V	Tromino Engy
<b>3. Petroleum Geology/Sedimentology Lab:</b>	
A	Eclipse 50i Pol Microscope
B	Objectives (for the above microscope)
C	Square Stage
D	Digital Camera ( microscope)
E	1 Table Top laboratory centrifuge
F	4 England finder greticule for palynomorph studies
G	Nylon sieve set for sieving samples in palynology preparation
<b>4. Rock Cutter Lab</b>	
A	Automatic thin-section Polisher
<b>5. Radon Lab:</b>	
A	Radon Monitoring System
B	Portable Scintillation Counter
C	Radon gas Detectors with safety siren
D	UV lamps run on battery
<b>6. GIS LAB</b>	
A	ARCGIS
b	IDRISI Selva 17
c	Trimble Juno SA, Mobile GIS/Handheld
d	LT30 GPS/GIS handheld, by CHC
e	A3 color Printer (HP/Epson/dell etc)
<b>7. Computer Lab &amp; others offices</b>	



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S.No	Name of Equipments
a	Computers
b	A3 Printers
c	AO printer and scanner
d	Routers
e	Switches
f	Network Testing Equipments
g	Laptops
h	Digital camera
<b>8. Centre Office</b>	
a	10, 6, 3, 1 KVA UPSs
b	Photostat machine
<b>9. Geochemistry Laboratory</b>	
a	UV-VIS-NIR Spectrophotometer
b	Shakers with NIST Traceable Certificate
c	Heated Ultrasonic Baths, (Digital)
d	Heavy-Duty, Electric Hot Plate
e	Heavy duty water distillation plant for scientific research laboratory instrument
<b>10. Gemology</b>	
a	Microscope with both transmitted and reflected light capability with digital camera system
<b>11. Mineral processing Lab</b>	
a	Metal detector stream sediment (Mainly Au, Ag, Cu)

The detailed specifications/ tender document can be obtained from this office on any working day on payment of Rs.2500/- (two thousands and five hundreds only).

A call deposit at the rate of 2% of the total bid amount in the name of Director NCE Geology, University of Peshawar, should be attached with the bids.

The tenders will be received through courier till 30/06/2014 at 10:00 AM and will be opened on the same day (dated: 30/06/2014 at 12:00 noon) in the presence of the bidders.

The NCEG/Director reserves the rights to accept or reject/modify any tender without assigning a reason.

This Tender Notice is also available at PPR/NCEG website.





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**Note:**

1. Please note that system/supply should be completed in all respect in terms of hardware, software and accessories/spare parts. Any deficiency in acquisition of desired results at the time of installation and subsequent functioning will be the responsibility of the supplying firm/company, without any additional cost. All the supply should be based on National Centre of Excellence in Geology University of Peshawar.
2. Please provide individual item prices (wherever possible) for item-wise comparison
3. The Equipments of which specifications are not given above, the suppliers are requested to quote all the models, which they can supply.
4. Submission of Data/Fact sheets, explaining the function and specification, of each equipment quoted is necessary.
5. The quotes should include all the accessories needed for the proper functioning of each equipment for the given task. The successful tenders will have to accept / abide by all the responsibilities regarding installation and proper functioning of the equipments and training to the end user.
6. Installation, commissioning and training of the end users on these systems will be responsibility of the supplier. The contract shall be liable to be cancellation if the supplier does not meet this condition.
7. The tender Rate shall be item wise. And rate will be on both **FOR basis in Pak Rupees and C&F basis Peshawar Air Port/NCE in Geology Premises.**
8. The bidders shall have to provide a certificate from the principle vendor a certificate that all the equipments are according to ASTM standards.
9. The cost should be inclusive of all the taxes as admissible as per rules.
10. **The specifications of the items where appropriate are given in this tender document. However, firms are encouraged to quote also the better quality items, if available in the market.**





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**ANNEXURE-I**

**PERFORMANCE BOND**

Director  
NCE in Geology  
University of Peshawar, Peshawar

Dear Sir,

RE: AGREEMENT DATE : \_\_\_\_\_ BETWEEN YOURSELVES  
& M/S \_\_\_\_\_ No. \_\_\_\_\_ In consideration of your having concluded a  
CONTRACT evidenced by purchase order No. \_\_\_\_\_ dated \_\_\_\_\_ with  
m/s. \_\_\_\_\_ (SUPPLIER) for \_\_\_\_\_

and in consideration of value received from the SUPPLIER, we agree and undertake as follows:-

1. To make unconditional payment of \_\_\_\_\_ or unconditional payments from time to time as called upon totaling the said sum of \_\_\_\_\_ being 10% (Ten Percent) of the CONTRACT price mentioned in the said Purchase Order/ Agreement upon your written demand(s) without further recourse, question or reference to SUPPLIER the event of Supplier's default in compliance with its obligatory liabilities and responsibilities arising under and in pursuance of the warranties and guarantees committed by it in the said Purchase Order / Agreement.
2. To accept written intimation(s) from you as sufficient evidence of the existence of a default or non-compliance as aforesaid in the part of SUPPLIER and to make payment accordingly within fifteen (15) days of receipt of the written intimations.
3. To keep this guarantee in full force from the date of this guarantee up to two years after the date of installation and successful operation of equipment.
4. No grant of time or other indulgence to or composition or arrangement with SUPPLIER in respect of the performance of its obligations under and in pursuance of the said Agreement / Purchase Order of any Clause thereof, with or without notice to us shall in any manner discharge or otherwise, howsoever, affect this guarantee and out liabilities and commitments hereunder.
5. This guarantee shall also cover obligations of the SUPPLIER so far as liquidated damages is concerned, as provided in Agreement / Purchase Order any recovery on account of liquidated damages shall not reduce the value of 10% (Ten Percent) provided herein.
6. This guarantee shall be binding on us and our successors-in-interest and shall be irrevocable.

Yours faithfully,

\_\_\_\_\_  
Bank Seal



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ANNEXURE-II

1. XRF LAB

Sr. No	Name of item/equipment	Specification
a.	XRF Chillers	<b>WATER CHILLER WITH RECIPROCATING COMPRESSORS (FOR CIRCULATING WATER)</b> supplied cooling capacity 14 to 16kw compressor absorbed power 4 to 10kw evaporator inlet water temp +20c deg evaporator outlet water temp +15c deg evaporator water flow rate 2,51m3/h available pressure with p3 pump 1,00bar working ambient temperature +22 c deg maximum ambient temperature +30c minimum ambient temperature -5c deg sound pressure level at 10m 53,1 db(A) electrical supply 220V/1PH/60/50HZ refrigerant gas R407C LOCALLY Dimension W660X L 1.310X H 1.400MM
b.	XRD Chillers	



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ANNEXURE-III

2. GEO TECHNICAL ENGINEERING LAB

Sr. No	Name of item/equipment	Specification
a.	Rock Shear Box Apparatus with control unit	<p><b>STANDARDS: ASTM D5607* / ISRM</b> To determine the strength and slope stability of rock size max 115x125 mm or cores max. dia. 102 mm, both in the field and in the laboratory.</p> <ul style="list-style-type: none"> <li>- Pressure transducers for load acquisition, connected to the pumps.</li> <li>- Linear displacement transducer for shear measurement.</li> </ul> <p>“Touch-Screen” for data acquisition, visualization, processing and storing, directly connected to PC or printer. Software for test data processing.</p> <p><b>ACCESSORIES:</b> <b>MOULD FORMER</b>, to prepare the specimen in the dimensions and geometry as requested by the shear box. <b>PRESSURE MAINTAINER</b>, complete with pump, to absorb volume changes of the specimen and to allow a constant load to be maintained during the test. Set of 4 linear displacement transducers, complete with supports, for vertical displacement measure, conforming to ASTM D5607 Standard. British Gypsum Crystacal Plaster, for casting specimens into mould assembly, 25 kg bag</p>
b.	Compression, Uniaxial and Triaxial	<p>a. <b>COMPRESSION TESTING MACHINES 3000kN CAPACITY “TESTED FOR HIGH STABILITY”</b>. Isostatic high stability stiffness frame for extreme performances, for tests on high strength specimens, “explosive samples”, rock and ceramic samples.</p> <p>b. <b>Hoek Cell for Rock Triaxial Tests</b>. For use with pressures up to 70 MPa. To measure the strength of cylindrical rock specimens which are subjected to triaxial compression. Cell body complete with two screwed end caps and two self-sealing couplings, two spherical seats and pistons, hardened and ground, one specimen jacket.</p> <p>c. <b>Strain Reading and Control GEODATALOG</b>, 16 channels Data acquisition system for geotechnical tests.</p>
c.	Digital Point Load Tester.	<p>To determine the strength values of a rock specimen both in the field and in the laboratory. Load frame for applying loads up to 55 kN, on which a manual hydraulic jack is mounted. Core specimens up to 4” (101.6 mm) diameter which are loaded by two coneshaped points. Pressure transducer with a digital display unit range 0-56kN, 65.000 divisions, 0,001 kN resolution, accuracy: ± 1%. Complete with wooden carrying case, goggles, accessories.</p>
e.	Permeability of Rock with Hoek cells	<p>Providing an infinitely variable constant pressure from 0 to 3500 kPa. To be used with the Hoek Cell equipped with Permeability End Caps and Permeability Attachment. The system consists of a motor hydraulic pump, oil/water vessel, piston/spring device, 10 litres of viscosity oil. Complete with precision pressure gauge 0 - 3500 kPa range. End Caps set Specimen dia. 38,10 mm Permeability attachment, mounted on tripod, to be connected to the End</p>



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		Cap of the Hoek Cell. Burette 50 ml capacity and 0,1 ml div. Nylon opaque tubing. Pack of 25 mt
f.	Rock classification hammer.	Impact energy of 0,735 Joule (Nm). Ideal to test small sized, sensitive and thin walled materials. Suitable to test also rock core samples
g	Slake Durability apparatus for Rocks	STANDARD: ASTM D4644 To assess the durability of rock to weakening and disintegration when subjected to the simulated effects of climatic slaking. A motor drive unit mounted on a baseplate to revolve two (or up to four) stainless steel drums manufactured from 2 mm mesh, 140 mm dia. x 100 mm long. Complete with two drums with tanks, and two additional drums (see accessory). ACCESSORY: MESH DRUM, complete with tank, base and accessories, to be connected
h	Universal electric core drilling machine	Universal drilling frame complete ELECTRIC MOTOR COMPLETE: Coring angle: 0 to 360°. The excursion is 550 mm. Electric motor at three speeds: 670, 1140, 1580 rpm with speed reducer. The height of the vertical column = 1000 mm, pre-built for extension column connection ACCESSORY: EXTENSION COLUMN, 1000 mm long, For drillings over 1 meter from the ground. Complete with clamping devices. Cadmium plated for rust protection. Core Bits: To take core dia. mm 50, 75, 100, 150, 200 Suitable core extractors.
i	Skid resistance and friction tester.	Suitable for both site and laboratory applications. - Additional incorporated scale for tests on Polished Stone Value specimens. - Rule, plexiglass made, for sliding length verification. - Thermometer range -10 to +110°C. for surface temperature easurement. - Stool, wash bottle, bristle, tool set for machine use. - Carrying case. - Calibration Certificate conforming. ACCESSORIES: Mounted rubber slider for site use (pavement surface), complete with conformity certificate. Mounted rubber slider for Polished Stone Value tests (laboratory), complete with conformity certificate. Metal base plate for Polished Stone Value tests in laboratory, and for tests on natural stones and concrete block pavers. Clamping device for Polished Stone Value tests in Laboratory. Clamping device for tests on natural stones for concrete block pavers and skidding tests on wooden floor. Pink lapping film (10 sheets) for Skid Calibration.
j	Barton comb profilometer 150 mm and 300 mm long.	Used for the evaluation of the surface roughness of rock samples.



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k	Determination of potential reactivity of alkali in aggregates for use in concrete.	PRISM MOULD, 25 x 25 x 280 mm, three gang, complete with six steel inserts to determine the dimensional variations of the specimen. Steel made, Vickers hardness HV 400 approx.
l	Aggregate impact value apparatus. BS 812 Consisting of:- A080-04 TEST FRAME ASSEMBLY	A080-02 CYLINDRICAL MOULD, dia. 102x50 mm, cylindrical measure dia. 75x50 mm, tamping rod
m	Determination of aggregates crushing value	Comprising 150 mm nominal diameter steel cylinder, plunger, base plate, tamping rod and measure 115 mm diameter x 180 mm deep.
n	Joint roughness coefficient test device	Inclination angle: 0 to 50°.

**2.1 SOIL MECHANICS**

Sr. No	Name of item/equipment	Specification
o	Auger boring	Auger power head, 4,5 HP Honda 4-strokes engine, heavy duty reduction gear, complete with reversing gear, for holes up to 400 mm dia.
p	Shelby tubes	Shelby Tubes, Steel - 2" dia x 30" long Shelby Tubes, Steel - 3" dia x 12" long Shelby Tubes, Steel - 3" dia x 24" long Shelby Tubes, Steel - 3.5" dia x 30" long Shelby Tubes Drive Heads Sealing Wax for Shelby Tubes Shelby Tube Expansion Packers
q	Piezometer	The standard borehole piezometer The push-in type piezometer Cable & Reader Data logger (VW MiniLogger) costs
r	HYPROP (Soil Water Retention Curve Apparatus)	Sensor unit Sensor unit connecting cable Soil sampling ring, 250 ml Silicone gasket Tensiometer shafts 12.5 mm and 37 mm Auger positioning tool Tensiometer auger Saturation bowl Refill set in carrying case Fibrous web, 15 cm x 15 cm Hammering holder for sampling rings Extra Sampling Rings HyProp Vacuum Refilling Unit



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s	Inclinometer	To monitor subsurface movements and deformations. a) Portable measurement system. • including a probe, cable, and readout. b) Inclinometer casing.
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2.2 SEISMOLOGY

Sr. No	Name of item/equipment	Specification
t	Components Accelograph GMS-18-63 (Three)	NetQuakes Seismic Recorder, 3 Channel -Int. Triaxial Accelerometer AC-63i -Full Scale Range $\pm 2$ g std. ( $\pm 0.5, 1, 3$ g optional) -Wired Ethernet incl. Cable and Connector
u	Soil spy rosina for MASW measurement	89 kHz per channel in continuous mode Max Channel No. 255 (nominal) Output Frequency (fs) 128-32768 Hz
v	TrominoEngy	3 Velocimetric channels 3 accelerometric channels 1 analog channel, built-in GPS Built-in radio transmitter/reciver Built-in calibration and check-up system Operating range [0.1, 1024]Hz on all channels



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ANNEXURE-IV

3. PETROLEUM GEOLOGY/SEDIMENTOLOGY LAB

Sr. No	Name of item/equipment	Specifications
a.	Eclipse 50i Pol Microscope	<p>Optical system : infinity optical system  Magnification: 50-1000X for observation  Eyepiece lens: Standard set 10X (F.O.V 22mm). CM type  With 90 crosshair and micrometer scale  Eyepiece tube: Tinocular  Intermediate Tube: Built in focusable Bertrand lens removable  From optical path; Built in analyzer removable  From optical path; conoscopic/ orthoscopic observation  Analyzer Switch able, with plate/compensator slot  360 rotary dial; Minimum reading angle 0.1  Nosepiece Sextuple nosepiece attachable to main body  Coarse/fine Fine 0.2mm per rotation. Coarse 37.7mm per rotation. Minimum Focusing reading: 2 microns on left- side fine control knob; coarse motion torque adjustable; Refocusing system incorporate in stage  Stage 160mm Circular graduated stage with clips  Along with Square Stage: Left and right and up and down movement; Cross travel 78 mm(X) x 54 mm(Y)  Illumination With Right handle stage with two slides holder  Built-in 30W halogen lamp per centered and refocused; continuously variable intensity control.  Objective lens With universal objectives to be used for diascopic/ epi-scopic microscopy p 5X, 10X, 20X, 50X, 100X  Condenser Achromat strain-free condenser N.A 0.9 with iris diaphragm  Episcopic Illumination system in 50Watts OR LED  Polarizer Attachable to bottom of condenser  Compensator Standard ¼ Lambda plate; can be inserted into intermediate tube slot  P-CS Senarmont Compensator  P-CQ Quartz Wedge Compensator  ATTACHED WITH</p>
c.	Square Stage	
d.	Eclipse 50i Pol Microscope with stand alone Digital Camera system	<p>PROFESSIONAL DIGITAL HIGH RESOLUTION CAMERA ABOVE (5.00 EFFECTIVE M PIXELS) AND LATEST IN-BUILT APPLICATION SOFTWARE WITH (BRANDED) STATE OF THE ART COMPUTER SYSTEM INCLUDES:-</p> <ul style="list-style-type: none"> <li>• Large 8.4" LCD screen with on Screen menus ,Touch / mouse operation</li> </ul>





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		<ul style="list-style-type: none"> <li>• USB Mouse with real time marking</li> <li>• Two USB ports</li> <li>• Two options of internal &amp; External Key pads for the inputs</li> <li>• RGB Output port for multi-media or a variety of external monitors</li> <li>• Ethernet port (100Base-Tx) to share research online world wide</li> <li>• Direct Printing port</li> <li>• CF Memory Card</li> </ul> <p>pencil drawing, Real time Internet facility, differential cell counting, and a variety of measurements like scale display, distance measurement, point to line distance, X-Y Scale display, Cross hairs, Grid lines, circular measurement, area measurements, between two points, point to line distance , distance between circle to circle distance, pitch, super impose, angle intersection, Bright field, Phase Contrast and Dark field observations, two Screen split display, data entry , direct print function without using extra computer, two USB ports, and many more. Capable to directly attach with Multimedia projector &amp; external PC monitor</p>
e.	1 Table Top laboratory centrifuge	5000 to 6000 Max RPM holding 15 to 20 ML solution
f.	4 England finder greticule for palynomorph studies	
g.	Nylon sieve set for sieving samples in palynology preparation	10, 60 and 250 micron meter



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ANNEXURE-V

4. ROCK CUTTING LAB

Sr. No	Name of item/equipment	Specifications
a.	Automatic thin-section Polisher	Dual wheel units (300mm wheel size) Specimen holder/mover that can hold at least six thin sections at a time of 1inch x 3inch size. A complete set of grinding papers. Compressor Variable speed of 50-100rpm.

ANNEXURE-VI

5. RADON LAB

Sr. No	Name of item/equipment	Specifications
a.	Portable gamma-rays Scintillation Counter	this instrument should be used in uranium assay and exploration applications as well as in environmental monitoring and health physics dosimetry. The equipment should be complete in all respects including all the necessary attachments, spares and accessories.
b.	Radon Gas Detector	This instrument should have built in Safety Siren for measuring radon gas in rooms and houses complete in every respect
c.	Portable battery operated UV-Lamp	This instrument should be used for the identification of minerals, and should be run by the batteries and must be complete in every respect.
d.	Radon Monitoring System	An equipment capable of measuring Radon and Thoron in water, soil and air complete in all respect including all the attachments, spares and accessories.



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ANNEXURE-VII

6. GIS LAB

Sr. No	Name of item/equipment	Specifications
a.	ARCGIS	ArcGIS Desktop(Basic), Old Name: Arc View ver. 10.1, Including Spatial Analyst and 3D Analyst extension, Single Use License
b.	IDRISI Selva 17	A Geospatial software for monitoring & modeling the Earth system, with Land Change Modeler and earth trend Modeler included, GIS analysis package for basic and advanced spatial analysis, including tools for surface and statistical analysis, decision support, and change and time series analysis. Required with all the Extensions for Single/multi Seat license
c.	Trimble Juno SA, Mobile GIS/Handheld	Window 6.1 mobile or later, Integrated high sensitivity GPS receiver antenna, 128MB RAM or better, High resolution (240*320 pixel or better) display readable in outdoor conditions, at least 500 Mhz or better Processor, onboard storage of at least 128MB with expandability and integrated SD/SDHC card slot, integrated speaker and microphone, real time accuracy 2 to 5 meter or better, 8 hours or better Battery backup in the field, USB data transfer, full warranty and training provision with after sale service. Accessories Included: ESRI ArcPAD software, Trimble "GPScorrect" extension for Esri ArcPAD software, Terra sync software, GPS pathfinder office software, Trimble GPS analyst extension for Esri ArcGIS Desktop software. AC power supply with international adaptor kit, Vehicle power adaptor, External GPS patch antenna, Replacement Li-ion battery
d.	LT30 GPS/GIS handheld, by CHC	GIS data collation and maintenance, agriculture field measurement, environmental control, High-sensitivity SiRF III chipset, 20-channel GPS L1, including 2xSBAS. Stand-alone GPS: < 2.5 m RMS <ul style="list-style-type: none"> <li>· With SBAS : &lt; 2 m RMS, Windows Mobile 6.1 operating systems</li> <li>· 3.7" VGA sunlight readable screen, 624 MHz processor, Internal memory</li> <li>· 256 MB internal flash storage, Micro SD card slot up to 16 GB, 3.2 megapixel camera with autofocus, GSM/GPRS (850/900/1800/1900 MHz) phone and data transmission, Bluetooth V2.1 Class 3, 802.11 b/g wireless LAN, Mini-USB client, Built-in microphone and speaker, NMEA 0183 protocol support, Li-ion battery capacity: 3000 mAh, Battery life: up to 10 hours with GPS activated. Provision of training for the usage of the instrument and after sale service.</li> </ul> Accessories included: Li-Ion battery, 16 GB Micro SD card, USB data cable, AC adapter, Hand strap with stylus, data processing software.



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ANNEXURE-VIII

7. COMPUTER LAB AND OTHER OFFICES

a. COMPUTERS (bidders will be required to provide a demo of the selected item inside NCEG premises)

1. Generalized Specs (no LCD/LED)	
Motherboard	Intel Q Series mother board
Processor	Minimum Intel Core i5 processor
RAM	8 GB DDR-III
Hard Disk	Minimum 500GB SATA-II 7200 RPM
Optical Drive	DVD RW±
Chassis	Professional Quality Chassis and 450W power supply
Keyboard+Mouse	USB Keyboard and USB Mouse
OR	
2. DELL/HP branded desktop computers with Intel Core i5 processor, 8GB RAM, 500 GB HDD, DVD RW± with branded chassis and power supply	
OR	
3. Intel Core i5 based ALL-IN-ONE machines from DELL/HP/SONY/IBM LENOVO	

b. A3 PRINTERS

Item	Specifications
Colored A3 Printer	<p>Ink-Jet based A3 Color printer with support for availability of ink bottles, print heads, and other parts.</p> <p>Printer must support printing of maps at A3 paper with adequate speed.</p> <p>USB 3.0 enabled</p> <p>Network Printing Support (optional)</p> <p>Local warranty of Printer and parts</p> <p>Provision of printer components for about 3-5 years (HP/DELL/EPSON/PANASONIC/XEROX etc)</p>

c. A0 PRINTER AND SCANNER

Sr. no	Item	Specifications
a.	A0 Printer and Scanner	<p>Wide format (36"/40"/42") Scanner along with printer and attached computer/pc terminal (storage be at about 1TB or more)</p> <p>Capable of scanning about 10-20meters of paper sheets</p> <p>USB 3.0 enabled</p> <p>Network Printing and scanning support</p> <p>Standard 1440 x 1440 dpi printing support at max.</p> <p>600 dpi support for scanning</p> <p>Local warranty of Printer, scanner and parts</p> <p>Provision of printer components (pull down levers, feed sources, ink cartridges, different printing paper types etc) for about 7-10</p>



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		<p>years</p> <p>Provide separate list of optional accessories and parts</p> <p><i>When quoting for this item it is requested to kindly work around every possible option of the quoted product and provide a quotation full in every technical and components, so the NCEG may decide on what's best suited for their requirements.</i></p> <p>(HP/DELL/EPSON/PANASONIC/XEROX/CANNON etc)</p>
b.	A3/Legal Scanner	<ol style="list-style-type: none"> <li>1. A3 sized scanner with USB 3.0 support particularly suitable for scanning A3 sized maps/images with 600dpi and high quality lamp (from any reputed scanner manufacturer)</li> <li>2. Legal sized scanner with USB 3.0 support, 600 dpi and high quality lamp (from any reputed manufacturer)</li> </ol>

d. .e. f. ROUTER, SWITCHES, NETWORK TESTING EQUIPMENT

Sr no	IT Equipment	
1	Server/IT/Telecom Rack	42U Standard Rack (with cooling and cable management options) Prices be quoted separately for 42u rack and its components HP/Dell/IBM or other reputed manufacturer
		6U standard rack (Wall Mount) (Custom Made)
2	Router/Layer 3 switch*	<p>Gigabit Ethernet L3 fixed configuration chassis in a 1U form factor with 22 SFP GigE ports (multimode)+associated multimode short-haul LCs, 2 combo ports (10/100/1000 BaseT or 1000 BaseX), 2 SFP+ 10GigE ports, and 2 CX-4 ports. The 2 CX-4 ports can be used as stacking purpose, includes Advanced Routing software. Includes support for IPv4 Routing protocols OSPFv2, BGPv4, PIM-SM/DM and DVMRP. Includes support for IPv6 Routing protocol OSPFv3.</p> <p>5 years warranty (Cisco/Alcatel/Huawei or any reputed network equipment manufacturer)</p>
3	Firewall*	<p>Firewall with including software &amp; hardware UTM warranty Console Port, USB Management Port 2 x USB Ports, 14 x GE RJ45 Switch Ports / 10 x GE RJ45 Switch and 4 x RJ45 PoE Ports on POE Models, 2 x GE RJ45 WAN Ports , Firewall Throughput 3.5Gbps, IPSec VPN Throughput 1Gbps, IPS Throughput 275Mbps (Cisco/FortiGate/Huawei or any reputed network equipment manufacturer) Preferrably from Cisco</p>
4	Communication	a. Wall Mounted 48 port ODFs loaded with FC connectors (multimode)
		b. Wall Mounted 12 port Odfs loaded with FC connectors (multimode)
		c. PigTail Multimode (FC) - 3m



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		<p>d. LC/FC patch cord (multimode) - 5m</p> <p>e. LC/FC Patch cord (multimode) - 20m</p> <p>f. D-Link DEM-311GT SFP 1000Base-SX Multi-mode Fibre Transceiver (850nm)*</p> <p>g. 12/8 core multimode indoor optical fibre cable (3M, Systimax, ampnet connect or any other reputed fibre manufacturer)</p> <p>h. Fibre Splicing for ODF</p> <p>i. Fiber Optic Cable laying with 2inch PVC &amp; steel corrugated pipe and all needed accessories</p> <p>j. CABLE LADDER FOR LAYING OF OPTICLE FIBRE</p>
5	Access point Specifications and Wireless Antennas	<p><b>ACCESS POINT</b></p> <p>OPERATING MODES: 802.11a/b/g/n (ruba Instant AP) 802.11a/b/g/n (Mobility Controller-managed AP) Air monitor (AM) Secure enterprise mesh Remote AP (RAP) when used with a Mobility Controller</p> <p>RADIO SPECIFICATIONS: AP type: Dual-radio, dual-band 802.11n indoor Software-configurable dual radio supports 2.4 GHz and 5 GHz 2x2 MIMO 802.11n with two spatial streams and up to 300 Mbps per radio (Included POE Adapter) (any reputed Access point manufacturer, preferably Cisco/Aruba)</p> <p>a. d'link DAP-1360 Wireless N Range Extender (or any wireless range extender compatible with existing WiFi Aps (DIR-655, DAP-1360)</p> <p>b. 3/6/9 meter HDF-400 extension cable. N-male to N-female (ANT24-CB09N)</p> <p>c. Xtreme N 2.4GHz Antenna (ANT24-0230)</p> <p>d. 6dBi Directional Antenna with H-68°/V-80° Spread Spectrum, 1.5 meter Extension Cable (ANT24-0600)</p> <p>e. 8dBi 2.4/5Ghz Dual Band Omni Directional Antenna (ANT70-0800)</p> <p>f. AirPremier AC1750 Concurrent Dual Band PoE Access Point (DAP-2695)</p> <p>g. Xtreme N Dual Band Gigabit Router (DIR-825)</p> <p>h. 5dbi Indoor Omni Directional Antenna (ANT24-0502)</p> <p>i. 12dBi Wireless 2.4GHz omni-directional Indoor/Outdoor Antenna (ANT24-1202)</p>
6	Network Testing Equipment (Fluke Networks)*	<p><b>a. Fluke Networks : CIQ-100-1</b> Cable IQ Qualification Tester: CableIQ Qualification Tester Includes CableIQ with remote adapter, CableIQ Reporter software CD, (2) RJ45-RJ45 patch cord, USB cable,</p>



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		<p>coax F push-on adapter, owners CD and quick start guide, (4) AA batteries, soft carry case</p>
		<p><b>b. IT-2000</b> Network Assistant with Copper/Fiber LAN and Wi-Fi options, includes module and test frame, frame carry strap, AC adapter and line cord, wiremap adapter #1, RJ45 coupler, RJ45 patch cable, external directional antenna with mounting clip, accessories pouch, carrying case, getting started guide, and resource CD with user manual (or Ethernet Wiring Testing Equipment from reputed manufacturer)</p>
		<p><b>c. Fluke Network : Fiber OneShot™ Optical Test Set</b> Pocket-sized optical tester of single-mode fiber : test capability will quickly and accurately verify if a fiber is active and find the distance to a break or end, dirty end face or reflective event—going from zero to 9,999 feet (note* 0 - 6,000 meters displayed in metric mode) with no dead zone. Measure the length of your fiber quickly and accurately Alerts you if an optical signal is on the fiber Instant-on—no boot/load time Test fast—expedite fiber testing with one button in a few seconds No dead zone—locate fiber faults at one meter (or Fibre Testing Device from reputed manufacturer for Fibre Testing and fault detection)</p>

**g. LAPTOPS**

Sr. No	Name of item/equipment	Specifications
a.	Laptop (bidders will be required to provide a demo of the selected item inside NCEG premises)	<p>15.6" Professional Series Laptop Intel Core i5/i7 4<sup>th</sup> generation processor 8GB RAM 750GB/1TB 7200 RPM Harddisk DVD RW± USB 3.0 ports 9 Cell Battery Original Company Manufactured Carrying case Local Warranty No Operating System Preferably models with front panel LEDs for HDD, Power, WiFi, charger etc. <i>Separate prices be quoted for laptops with and without graphics card (min. 1GB)</i> <i>It is advised not to quote laptops of ordinary user class level. Bidders are advised to work around their options and come with different alternatives.</i> <i>Laptops with backlit keyboard and touch screen should also be quoted.</i></p>





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g. DIGITAL CAMERA

Sr. No	Name of item/equipment	Specifications
a.	Professional Digital DSLR/Alpha Camera	<p>Following list depicts general high level specs expected in the Camera</p> <ul style="list-style-type: none"> <li>• 20+ effective mega pixels</li> <li>• 23.5 mm x 15.6 mm sensor size</li> <li>• ISO 100 -12,800 sensitivity</li> <li>• Rechargeable Li-ion Battery</li> <li>• SD/SDHC/SDXC storage media support</li> <li>• Support for different focus modes</li> <li>• Different flash modes</li> <li>• White balance features</li> <li>• Wifi functionality</li> <li>• GPS support</li> <li>• Image stabilization</li> <li>• Sweep panorama</li> <li>• 16-50mm zoom lens</li> <li>• Carrying case</li> <li>• Shoulder strap</li> </ul> <p>Additional accessories Lens, Flashlight, battery may be quoted separately. <i>The basic intended use of this camera will be indoor/outdoor photography of official events both in day and night.</i></p>

Regarding IT equipment, please pay attention to following points

1. **\* Important:** Router/Layer 3 Switch and Firewall must match with D-Link DEM-311GT SFP module for proper communication from distribution layer to access layer. The current infrastructure is based on D-Link DGS3200 series managed switches. In case of non-compliance of components from distribution to access layer, bidders are requested to provide their bid for access layer switch from (Cisco/Huawei/Alcatel/ZTE or any other reputed manufacturer) in compliance to their bid of router/layer 3 switch and firewall.
2. Bidders are requested to consult NCEG IT personnel regarding any queries and site visiting.
3. **Important.** For IT equipment bidders are required to provide details of different warranty options and provide rate information for each warranty option against the bid item. Particularly highlighting the warranty period and on-site replacement of faulty module/component without causing delays to normal operations of the organization.
4. Bidders are required to furnish sole distribution certificate for bid items, if applicable.
5. Bidders are required to provide complete Technical specifications of their quoted items along with Data sheets. Quotations should be complete in all terms of specifications of items and potential accessories required for components to operate properly.
6. **Important.** Bidders are required to provide separate prices of different components/parts/accessories/options in their financial bids for details analysis of bid and selection of best components for IT needs of NCEG



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ANNEXURE-IX

8. CENTRE OFFICE

Sr. No	Name of item/equipment	Specifications
a.	UPS (bidders will be required to provide a demo of the selected item inside NCEG premises)	1kVA/0.7kW UPS 1 ph input /1 ph output , rated voltage 220/230/240 Vac , input frequency 45-66Hz, output voltage 220/230/240Vac, battery voltage 36vdc, wave form Sine wave, THDv<3% , battery pack 36V/7Ah, power factor of 0.8-0.9 (any reputed UPS manufacturer, preferably Huawei)
		3kVA/2.1kW 1 ph input /1 ph output , rated voltage 220/230/240 Vac , input frequency 45-66Hz, output voltage 220/230/240Vac, battery voltage 96 vdc, wave form Sine wave, THDv<3% , battery pack 96V/7Ah, power factor of 0.8-0.9 (any reputed UPS manufacturer, preferably Huawei)
		6kVA/5.4kW 1 ph input /1 ph output , rated voltage 220/230/240 Vac , input frequency 40-70Hz, output voltage 220/230/240Vac, battery voltage 192-240Vdc, max charging current 4±0.5A, wave form Sine wave, THDv<2% , battery pack 240V/9AH, power factor of 0.8-0.9 (any reputed UPS manufacturer, preferably Huawei)
		10kVA/9kW 3/1 ph input /1 ph output , rated voltage 220/230/240 Vac , input frequency 40-70Hz, output voltage 220/230/240Vac, battery voltage 192-240Vdc, max charging current 4±0.5A, wave form Sine wave, THDv<2% ,battery pack 240V/9AH, power factor of 0.8-0.9 (any reputed UPS manufacturer, preferably Huawei)
b.	Photostat Machine	25/30/35/cpm 600x600dpi scanning resolution A3 paper size support 1GB RAM Preferably large storage device/HDD Duplex unit USB support Network support with network card <i>Separate rates be quoted for models</i> <i>Accessories list please be attached and rate be provided</i>
c.	Generator	3phase 150kva Diesel/Gas Generator Network Monitoring Provision Automatic Transfer Switch (ATS) Canopy  (preferably American Brand)



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ANNEXURE-X

9. GEOCHEMISTRY LABORATORY

Sr. No	Name of item/equipment	Specifications
a.	UV-VIS-NIR Spectrophotometer	Wavelength range should be 185nm-3300 nm, Spectral Bandwidth 8 steps in ultraviolet/visible region 0.1, 0.2, 0.5, 1, 2, 3, 5, 8 nm and 10 steps in near-infrared region 0.2, 0.5, 1, 2, 3, 5, 8, 12, 20, 32 nm also with double beam Photometric System or of any best quality.
b.	Shakers with NIST Traceable Certificate	Advanced orbital shaker having 15-500 rpm speed range and the orbit size 25.4 mm (1") and 15-300 rpm speed range and the orbit size 50.8 mm (2"). Or best quality
c.	Heated Ultrasonic Baths, (Digital)	The digital ultrasonic bath should have 20L (5 gal) capacity, 120V, 50/60 Hz. Or best quality
d.	Heavy-Duty, Electric Hot Plate	Electric hot plate having Cast aluminum top plate with integral ribs. Perforated stainless steel case which can support heavy loads and should have variable temperature control from ambient to 700°F (400°C). Or best quality
e.	Heavy duty water distillation plant for scientific research laboratory instrument	Electric Water Distillation plant should have capacity of 5L/h or 10L/h or 20L/h. Or best quality

ANNEXURE-XI

10. GEMOLOGY

Sr. No	Name of item/equipment	Specifications
a.	Microscope with both transmitted and reflected light capability with digital camera system	For Advanced Research Purposes and not the student lab microscopes

ANNEXURE-XII

11. MINERAL PROCESSING LAB

Sr. No	Name of item/equipment	Specifications
a.	Metal detector stream sediment (Mainly Au, Ag, Cu)	For Advanced Research Purposes and not from the student research perspectives