

# NATIONAL INSTITUTE OF TECHNOLOGY TIRUCHIRAPPALLI – 15

Department of Civil Engineering

web: [www.nitt.edu](http://www.nitt.edu)

Phone: 0431 - 2503168



## TENDER DOCUMENT

**Tender Notification No.:** NITT/CE/ECC/KMK/2017-05

**Dated:** 28-09-2017

<b>BID SYNOPSIS</b>	
Brief Description of Tender	<b>Sub-contract for drilling and sampling for AAI Trichy project</b>
Tender type	Two bid system
Cost of tender document (Non-refundable)	<b>Rs.150</b> (One Hundred and Fifty Only) payable through DD drawn in favour of the Director, NIT, Tiruchirappalli, Tamilnadu.
Earnest Money Deposit (Refundable)	<b>Rs.8,000</b> (Rupees Eight Thousand Only) payable through DD drawn in favour of The Director, NIT, Tiruchirappalli, Tamilnadu.
Last Date and Time for Receipt of Tender	<b>11.10.2017; 3.00 pm</b>
Mode of submission of Tender	By Speed Post / Registered Post / Courier / through Hand Delivery at the postal section in the NITT, Main Office
Due Date, time & venue of Opening of Tender	<b>11.10.2017; 3.30pm;</b> R&C office, NITT
Date and time of opening of Price bids	After evaluation of technical bids, the date, time and place of opening of the Price bid will be intimated to technically qualified bidders.
Address for submission of Tender	The Director, National Institute of Technology, Tiruchirappalli – 15, Tamilnadu, India. <b>Kind attention: Dr. K. Muthukkumar</b> , Associate Professor, Dept. of Civil Engineering, National Institute of Technology, Tiruchirappalli – 620015.
Contract person for Technical Queries	<b>Dr. K. Muthukkumar</b> , Associate Professor, Dept. of Civil Engineering, National Institute of Technology, Tiruchirappalli – 15, Tamilnadu. Phone: 0431 – 2503168 Email: <a href="mailto:kmk@nitt.edu">kmk@nitt.edu</a>



**NATIONAL INSTITUTE OF TECHNOLOGY  
TIRUCHIRAPPALLI – 15**

**DEPARTMENT OF CIVIL ENGINEERING**

**Tender Notification No.:** NITT/CE/ECC/KMK/2017-05

**Dated:** 28-09-2017

**NOTICE INVITING TENDER**

The National Institute of Technology, Tiruchirappalli (NITT) is an autonomous body under MHRD, GOI, imparting Technical Education and engaged in Research Activities. The department of Civil Engineering has got a consultancy project for Geotechnical Investigation from Airport Authority of India (AAI) Trichy. In order to execute the project, it is proposed to find a suitable drilling agency for drilling and collection of soil samples including SPT Test in the proposed study area at AAI Trichy.

Sealed bids under **two bid system** are invited for the following work subject to the following terms and conditions, from the reputed Contractors. The tender should reach this office on or before scheduled date and time. The technical cover will be opened on the same day in the presence of bidders or their authorized agents who may choose to be present.

**INSTRUCTIONS TO BIDDERS**

1. This document set contains the following:
  - a) Terms and conditions of the Tender
  - b) Details of the Firm offering this Quote
  - c) Technical Compliance Form
  - d) Quotation form (Price Bid)
  - e) NIT-T's check list copy
2. The bidder's copy is for your future records. Please fill in and return only NIT-T's copy.
3. The bidder should give details of their technical soundness and provide list of customers of previous works of similar nature to Universities, Institutes or Government Departments/Undertakings/public sectors with contact details. The details of the agency/profile should be furnished along with the copy of all related documents.
4. Read through the terms and conditions given and affix your signature and seal if you find them acceptable. Any deviations may be recorded. Read carefully list of specifications that we have enclosed.
5. Fill in the questionnaire regarding the Firm.
6. The downloaded documents '**Technical Compliance Form**' and '**Quotation Form (Price Bid)**' should be **TYPE WRITTEN USING CAPITAL LETTERS ONLY**. At the time of filling the "**Quotation Form (Price Bid)**" make sure that you have not missed anything. The form should be filled item-wise. Do not leave blank fields. If you are not quoting for a specific item, you should specify "**NOT QUOTING**".
7. **Do not use** ambiguous terms like "**yes**", "**complied**" or "**available**". Specifically mention the matching specification / terms of the work offered by you. Make sure that you have affixed your signature with date and seal on all the documents.
8. Please send the tenders in a sealed envelope superscribed as "**QUOTATIONS AGAINST TENDER NOTIFICATION NO: NITT/CE/ECC/KMK/2017- 05**" so as to reach "The Director, National Institute of Technology, Tiruchirapalli - 620 015, India" on or before **11-10-2017 up to 3.00 PM**.
9. For any further clarifications, contact by E-Mail: [kmk@nitt.edu](mailto:kmk@nitt.edu) or by written request to "The Registrar, National Institute of Technology, Tiruchirapalli - 620 015, India"

**Last Date for receipt of tender at NIT-T : 11-10-2017 up to 3.00 pm**

**Opening Date for technical bid : 11-10-2017 at 3.30 pm**

<b>CHECKLIST TO BE FILLED IN BY BIDDER</b>	
List of documents to be enclosed	Completed & Signed
1. Terms and Conditions form	YES / NO
2. Details of the Firm offering this Quote	YES / NO
3. NIT-T's Quotation form (Technical & Price Bid)	YES / NO
4. Other technical specifications & pamphlets	YES / NO

- Note:** 1. "Cover" should contain the following:
- a. Form of "**Acceptance of Terms and Conditions**".
  - b. Form of "**Firm details**".
  - d. Quotation Form (Technical, Price Bid and Currency Form)

**Please retain this page with you for your future reference.**

**NIT-T's COPY**

**SECTION: 1 – TWO BID TENDER**

**Cover 1: EMD and Tender cost**

(Should be superscribed as 'EMD and tender cost cover' duly indicating the Tender reference No. and the due date of opening)

Earnest Money Deposit (EMD) and tender cost are to be submitted by way of Demand Draft/FDR drawn on any Nationalized bank in India in favor of "The Director, NIT, Trichy" payable at Trichy. The bids submitted without EMD or tender cost will be treated as non-responsive and will be rejected. EMD shall bear no interest.

**Cover 2: Technical Bid**

(Should be superscribed as 'Technical Bid' duly indicating the Tender reference No. and the due date of opening)

Should contain:

- a. Detailed technical specification
- b. Copy of company's registration certificate
- c. Income Tax PAN Number & GST number.
- d. Last three years balance sheet approved by the CA and the IT clearance certificate.
- e. Duly filled up technical questionnaire, if any
- f. Duly filled up deviation schedules to technical specifications, if any
- g. Copy of work orders completed during the last three years

**Cover 3: Price Bid**

(Should be superscribed as 'Price Bid' duly indicating the Tender reference No. and the due date of opening)

Should contain:

- a. Price bid as per the format in Section-4 of the tender document
- b. Break-up price as per the format in Annexure-A

**Note:**

- a. If the prices are revealed in cover 1 or in cover 2, the offer will be summarily rejected.
- b. Each Cover shall be sent in a double sealed cover. The inner covers (Cover 1, Cover 2 and Cover 3) should be sealed individually with the contractor's distinctive seal and superscribed with the tender reference No. and due date of opening. All inner covers shall be placed in a common outer cover which shall also be sealed with contractor's distinctive seal and superscribed with the tender reference No. and due date of opening.
- c. Mention "Kind Attn: Dr. K.Muthukkumaran, Asso. Professor, Dept. of Civil Engineering, NIT Trichy" and submit at the address given in the Notice Inviting Tender.
- d. Cover 1 & 2 will be opened on the scheduled date and time mentioned in the tender enquiry.
- e. Cover 3 of the technically and commercially suitable offers alone will be opened on a date which will be intimated to the qualified bidders.

**SECTION: 2 – TERMS AND CONDITIONS FORM**

**IMPORTANT: READ THE FOLLOWING TERMS AND CONDITIONS AND  
SIGN THE ACCEPTANCE CLAUSE FOLLOWING IT**

1. The offers should be addressed to “The Director, National Institute of Technology, Tiruchirapalli 620015, India” and should be sent in a sealed envelope superscribed **BID AGAINST TENDER NOTIFICATION No.: NITT/CE/ECC/KMK/2017- 05**” so as to reach us **on or before 11-10-2017 up to 3.00 PM**
2. Each offer should be sent in a sealed cover with the tender documents. Tenders received through email or FAX will not be considered.
3. The tenders will be opened on **11-10-2017 at 3.30 PM** in the presence of the contractors present with authorization letter from the respective companies / firms. Contractor intending to attend the tender opening should intimate us in advance.
4. Full technical specifications should be sent along with the tenders. **Offers without proper technical specifications will be rejected.**
5. Boring shall start from existing ground level @ 0.0m
6. All the samples should be handed over to NITT Civil Department for lab test.
7. The field work shall be done under the supervision of Dr. K. Muthukkumaran, Associate Professor, Department of Civil Engineering, NIT, Trichy. For any clarification concern with field work, the drilling agency should contact Dr. K. Muthukkumaran, NIT Trichy.
8. All the field work should be carried out as per ISI code specification and as directed by Dr. K. Muthukkumaran, NIT Trichy.
9. The contractor should arrange the necessary supporting materials for Drilling work (like Water, Electrical power, etc.)
10. All the scheduled works shall be completed within 15 days from the date of receipt of work order. Delay in progress of work, if any, due to extreme uncertainties conditions shall be communicated to the Project coordinator without any delay.
11. The rate quoted should be on unit basis excluding Taxes. Taxes and other charges should be quoted separately, considering exemptions if any.
12. All offers should indicate unit price (excluding taxes and duties applicable), Taxes and other charges should be mentioned separately, if any. Additional charges, if any, should be clearly mentioned.
13. **The payment shall be made for the actual depth of boring. No advance payment will be made.**
14. No revision of the price bid will be allowed once the price bids are opened.
15. No increase in rate will be allowed after our work orders are placed.
16. **Payment of excise duty and GST (on ultimate products)** as applicable on the closing date of tender will be to the supplier’s / contractor’s account. Any statutory variation (both plus and minus) in the rate of GST after closing date of tender/revised price bid but before the expiry of the contractual completion period will be to the account of the office.  
The bidder(s) should indicate, in their bid, the amount with exact rate of the GST on ultimate finished quantity of work, as applicable at tendering stage, separately in the bid. In case the above information subsequently proves wrong, incorrect or misleading (a) this Institute will have no liability to reimburse the excess in the difference in rates of the item under which the tax assessed finally (b) this Institute will have the right to recover the difference in case the rate of tax finally assessed is on the lower side. Any increase in GST during extended period of the contract / work order will be to contractor’s account where such extension in completion of the project was on the request of contractor. However, any decrease in GST during extended period of the contract / work order, will be to the account of this Institute.

17. This institute is exempted from payment of service tax as per Sl.no. 9 of Government notification No25/2012-ST dated 20<sup>th</sup> June, 2012. The tenderer should verify the excise duty exemption certificates of this institution and service tax rules before submission of the Bid. It will be assumed on the submission of bid that excise duty exemption will be provided and no other conditions after the issue of purchase order will be accepted. No service tax will be paid by this institute.
18. All safety measures to be taken to avoid any accident by providing temporary barricades and the Work in progress board / red flag and red light etc., shall be provided at the site and shall take "All risk insurance cover" for machinery, material and workers employed for the work.
19. **Eligibility:** Quotation from registered firms/companies under GST/ other statutory bodies alone will be considered. Any contractor who has been declared ineligible by World Bank/Government of India shall not be eligible to participate in this bid. Any fraudulent practices including concealing of facts at the time of submission of bid and there after shall lead to disqualification. List of beneficiaries especially from Educational Institutions / R & D Institutions should also be enclosed with the quotations.
20. The contractors are informed that they should not call us over phone or contact us in person. All clarifications can be obtained through E-Mail/FAX/Post. Vendors shall not make attempts to establish unsolicited and un-authorized contact with us after the opening of the offers and prior to the notification of the award. Any attempt by any contractor to bring to bear extraneous pressures on us shall be sufficient reason to disqualify the contractor.
21. Delay / loss in postal transit or due to other reasons will not be NIT-T's responsibility.
22. We are not responsible for accidental opening of the covers that are not properly superscribed and sealed before the time scheduled for opening.
23. The tender should be made only on the FORM which is available in our website; otherwise it shall lead to rejection. The FORM should be duly filled up (preferably TYPE WRITTEN IN CAPITAL LETTERS) and should clearly mention the features offered by the bidder against each specification.
24. Authorized signatory should sign on all the pages. Bids without authorized signatures or seal of the firm will be rejected.
25. Liquidated damages: If the bidder/contractor, after accepting the work Order, fails to start the work within the period specified in the Order, NIT-T shall, without prejudice to its other remedies under its Rules, proceed to cancel the order or agree to accept a delayed delivery on the condition of payment of liquidated damages by the bidder / contractor a sum equivalent to 0.50% of the total cost as indicated in the Work Order (which will be deemed as agreed price) for each week or part thereof of delay until actual performance is completed and such penal charges shall be limited to a maximum of 5% of the total cost. Once the maximum is reached NIT-T may proceed on its own to consider the termination / cancellation of the order.
26. Failure to comply with all the terms and conditions mentioned herein would result in the tender being summarily rejected.
27. Contractors are informed that once the companies are shortlisted based on the technical specification, only then the price bids of the firms that meet NIT-T's Technical specification / requirements would be compared.
28. The order will be based on the actual requirement at the time of ordering, optional items may also be ordered based on the actual requirements at the time of ordering. Not quoting for this may result in disqualification.
29. NIT-T reserves the right to modify or alter the specifications after short listing of tenderers.
30. NIT-T reserves the right to change the order quantity or split the orders among multiple contractors without assigning any reason(s) whatsoever.
31. NIT-T reserves the right to reject any or all the tenders without assigning any reasons whatsoever.
32. NIT-T reserves the right to place decreased number of quantity of the work to be performed.
33. The agencies should submit their rate as per the format given in Section 4 of the Notice Inviting Tender in this cover. All the pages of the bid should be signed affixing the seal. All corrections and overwriting should be initialed.
34. The bid shall be in the format of price schedule given in Section 4. The contract form as per format given in section 5 shall be submitted. Incomplete or conditional tender will be rejected.
35. Details of quantity and the specifications are mentioned in Section 3 appended to this Notice Inviting Tender.

36. In case of dispute, the matter will be subject to Tiruchirapalli, Tamil Nadu Jurisdiction only.

**Validity of bids:** The rate quote should be valid for a minimum of 90 days. No claim for escalation of rate will be considered after opening the Tender.

**Release of EMD:** The EMD will be released after satisfactory completion of work by the successful bidder.

**Clarification of Tender Document:** A prospective bidder requiring any clarification of the Tender document may communicate to the contact person given in this notice inviting tender.

**Amendment of tender document:** At any time prior to the last date of receipt of bids, Institute may for any reason, whether at its own initiative or in response to a clarification requested by prospective bidder, modify the Tender document by an amendment.

*The Institute may at its own discretion extend the last date for the receipt of bids.*

The bids shall be written in English language and any information printed in other language shall be accompanied by an English translation, in which case for the purpose of interpretation of the bid, the English translation shall govern.

The Institute reserves the right of accepting any bid other than the lowest or even rejecting all the bids without assigning any reasons therefor. The decision of the Institute Purchase Committee is final in all matters of tender and purchase.

*The bidder should give the following declaration while submitting the Tender.*

#### ACCEPTANCE

We accept the above terms and conditions and shall comply with them strictly.

NAME OF THE CONTRACTOR:

ADDRESS:

Signature and seal

**“DETAILS OF THE FIRM OFFERING THIS QUOTE”**  
**(Write or print or type in block letters)**

1. Name of the firm: \_\_\_\_\_
2. Date of incorporation: \_\_\_\_\_
2. Nature of the company (tick one): Government / Public / Private Company / Partnership / Proprietorship
3. Specify the number of years in this line of activity by the Company: ..
4. Quantity of work in the last three years for the same work that you have quoted.

2014-2015	2015-2016	2016-2017

5. Turnover in the last three years (Lakh Indian Rupees):

2014-2015	2015-2016	2016-2017

6. Provide the postal address, telephone & fax numbers, and email address of the company and its authorized person.
7. Number of Technical persons in the company for the work quoted along with their educational qualification, certification and designation.
8. Assured response time for calls in hours:
9. Work starting period from the date an official work order placed (in days):
10. Have you worked for the same nature of job to National Institute of Technology, Tiruchirappalli in the last 3 years? If yes, specify the details along with amount in the last 3 years and last WO reference:

Contact Person Name:	
Address:	
E-mail ID:	Telephone / Cell Phone:

**DECLARATION**

I/we have not tampered/modified the tender forms in any manner. In case, if the same is found to be tampered/modified, I/we understand that my/our tender will be summarily rejected and full Earnest Money Deposit (EMD) will be forfeited and I/we am/are liable to be banned from doing business with NIT, Trichy and /or prosecuted.

**Signature of the Bidder** : .....

**Name and Designation** : .....

**Business Address** : .....

.....

**Place :**  
**Date :**

**Seal of the Bidder’s Firm**



<p style="text-align: center;"><b>SECTION: 3 – SCHEDULE OF REQUIREMENTS, SPECIFICATIONS AND ALLIED DETAILS</b></p>
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## **I. DRILLING, SAMPLING AND SPT**

### **1.0 Mobilization**

1.1 The scope of this item includes mobilization of all equipment instruments and personnel (skilled & unskilled) required to carry out the work in accordance with following specifications.

### **2.0 Drilling exploratory holes in soil.**

2.1 Setting up and shifting of boring/drilling rigs prior to start of boring is included in the scope of this item.

2.2 The work of drilling in soils shall be carried out in such a manner that penetration tests can be carried out as required and collection of undisturbed samples of 75/100 mm dia. would be possible. The choice of method of drilling is left to the contractors, but preference shall be given to a method, which permits continuous SPT of the soil layers. The size of boreholes shall not be greater than 150 mm diameter. The boreholes shall be thoroughly cleaned by the contractor as and when required. For removing particles larger than silt size, the contractor may have to use drilling mud of the required consistency and flush the hole with mud at the requisite pressure.

2.3 The clearance between the split spoon sampling tube (SPT) and the boreholes shall be as directed by the Consultant. Usually holes of very large size would not be preferred. The Contractor shall take reduced levels of the borehole locations with reference to a benchmark approved by Engineer-in- Charge/Architects and shall include the same in his report.

2.4 The drilling operations may be interrupted for collecting UDS or for conducting penetration tests etc. The rate for the drilling work is inclusive of all such interruptions and delays. The casing pipes where used shall not be removed unless directed by the consultant. Even after removal of the casing, a pipe should be left in the borehole to identify the location.

2.5 The contractor shall ensure that sand-blow conditions do not develop while boring/drilling. Sufficient surcharge of water or drilling mud should be maintained all through the operation.

2.6 The boring and/or drilling for a complete bore hole up to required level shall be paid on per meter depth basis. No additional payment will be given if the same rig or a different type of rig is brought to the location of the hole for completing either bed rock drilling or any other balance activity stipulated in that borehole.

2.7 The ground water level shall be recorded every day morning before start of work.

2.8 On completion of work, the bore hole to be refilled and the top 45 cm shall be concreted with lean cement concrete and finished smoothly.

2.9 Mode of measurement & payment: The total depth of boring in soil or weathered rock or hard rock will be determined by measuring or computing the difference in the elevations of the top of the existing soil surface prior to construction of working platform and the deeper of the following:

- i) Lower edge of the casing pipe.
- ii) Elevation of the lowest point of penetration of the sampling tube spoon or lower tip of the dynamic probing cone, whichever is lower.
- iii) Soil - Where SPT "N" equal or less than 50 and Core recovery <10%.

- iv) Soft rock - Soft rock shall be defined SPT "N" equal or more than 50 and Core Recovery more than 10 %.
- v) Hard rock is defined as rock with compressive strength more than 50MPa (or) Core recovery more than 60%.
- vi) The payment shall be done per meter of drilling as per actual.

### **3.0 Conducting Standard Penetration Tests (SPT)**

3.1 For details of sampling tube (spoon), equipment and procedure for conducting a penetration test, the IS Code, IS 2131 shall apply. The driving monkey should be provided with suitable arrangement for controlling the height of fall. It should be ensured that "Sand-blow" in of fine sands is avoided while conducting penetration tests. For this purpose it may be necessary to use mud (Bentonite) circulation or create surcharge pressure. If desired and so directed by the Consultant, cone penetration test may be used in lieu of standard penetration tests conducted with split spoon sampler. In such cases, the contractor shall be paid at the same rate as standard penetration test.

3.2 For Standard Penetration Test, the blow count shall be recorded at intervals of 15 cms for a total penetration of 60 cms. The SPT blow count shall be reckoned as the total number of blows for the second and third penetration increments of 15 cms. In exceptional cases penetration upto 90 cms may be required. No separate payment would be made for this. In case, blow counts exceed 50 for 15 cm or less penetration then terminate the test and note the penetration for 50 blows. Solid cone tests shall be used where directed by the Consultants In lieu of the SPT without any extra payment for change of the drive point (from the SPT spoon to the cone.)

3.3 All attempts shall be made to recover the full sample of the standard split spoon sampler. The sampler must have a ball valve at the top of the sampler for minimizing loss of sample, where sample recovery is poor or nil; a representative sample obtained from the sludge pump/bailer shall be preserved.

3.4 Wherever a sample is recovered, the following details shall be noted along with usual record of blow counts. This must be recorded for very stiff clays.

- a) Penetration (meters) and blow counts.
- b) Recovery (percentage)
- c) Logging of silt/fine sand seam if any.
- d) Visual classification of soil sample.
- e) Modulus of Sub-grade reaction of soils (For all types of soil)

The above information shall be recorded for each hole, in the specified format given by the Consultant.

3.5 In the case of stiff to medium clay where a sample is recovered in the form of 'cake' a suitable length of cake shall be wrapped with polythene and further by a layer of bandage cloth.

3.6 Mode measurement & payment: The measurement for this item shall be as per completed tests which have been carried out as per specifications to the satisfaction of the Consulting Engineer. The payment shall be done per number of the completed tests. No payment shall be admissible for tests, which are not as per specifications or are incomplete. The opinion of the Consultant in this respect shall be final and binding on the Contractor. Related drilling is payable under item 2.0.

#### **4.0 Collection of disturbed soil sample in tubes (TDS)/plastic Jars**

4.1 Disturbed samples are required to be collected from holes. Depending on the type of soil, the method of collection of disturbed samples would differ.

4.2 The samples shall be collected in non-returnable 50mm diameter 'C' class M.S. Pipe of suitable length not exceeding 75 cms/where soil type ranges between plastic silt to clay. The sample tube should have a level edge at the bottom and holes on top for draining trapped water. The sample should be sealed at both ends of the pipe by a double layer of cotton waste and wax. Every care shall be taken to preserve the natural moisture content. If required, continuous sampling should be carried out to identify the presence of lenses and seams of fine sand.

4.3 While conducting sampling operations in sand or silty sand, the sample is likely to slip out during extraction of a sample from the borehole or trial pit. A flap valve bailer or auger may be used and representative samples shall be collected without appreciable loss of fines and preserved in screw top plastic jars and containers. 20 Kg. samples shall be collected in bags whenever Proctor tests are required or whenever instructed.

4.4 If the contractor is instructed to use a suitable type of piston sampler for conducting sampling in non-cohesive soil, such sampling would be paid at the rate of undisturbed sampling in soil. The contractor shall include the cost of providing such tubes in his unit rate.

4.5 Wherever the sample is collected in tube, the tube shall have a proper identification mark (bore hole No., depth, location, arrow mark indicating bottom end of the sample tube etc.) Rate for this item shall be per no. of sample collected, and shall include providing necessary equipment.

4.6 Mode of measurement and payment: The payment shall be per number of sample, provided that the samples recovered are accepted by the Consulting Engineer. Any unsatisfactory samples or any sampling work, which is not as per the specification shall not be paid for.

#### **5.0 Collection of Undisturbed sample (UDS)**

5.1 Undisturbed samples shall be collected at intervals of 2 m. or at changes of stratum whichever occurs earlier in returnable tubes of 100 mm diameter (internal diameter of the sample tube) and not more than 50 cms long. Samples of smaller size shall not be collected unless specifically approved by the consultant. In hard clay, soil and weathered rock suitable techniques and proper sampler shall be used for obtaining undisturbed samples. The area ratio shall be less than 20% for stiff formations and not greater than 10% for soft sensitive clays (as per IS: 1892 - (1987)). The details and design of the sampler should be approved by the consultant prior to start of the work. Manual methods shall be adopted for the collection of undisturbed block or cylindrical samples as per United States Bureau of Reclamation Earth Manual. (Designation E-2 for undisturbed sampling in trial Pits).

5.2 The moisture in undisturbed samples shall be carefully preserved by sealing both ends of the sample tube by applying a double cast of cotton waste and paraffin wax.

5.3 If the sample slips out due to the natural condition of soil the contractor shall collect representative sample by using a flap valve bailer or auger without appreciable loss of fines. The representative sample shall be preserved in a screwed top plastic jar (4" 0 x 6 " height). In such event the contractor shall be paid at 50 % of the unit rate quoted for collecting undisturbed sample.

5.4 The sample tube shall have a proper identification mark painted on it (e. g. bore hole No, depth, location arrow mark indicating bottom end of the sample tube etc.).

5.5 The undisturbed sampling tube and method of undisturbed sampling shall be made to prevent the sample from slipping. This provision shall be subject to scrutiny and approval by the consultants.

5.6 Undisturbed block samples in trial pit shall be collected by hand out method. The sample thus collected shall be properly protected and sealed for preserving the natural moisture content as mentioned in Earth Manual vide Designation E-2, page 346 to 349.

5.6 Mode of measurement and payment: The payment shall be per number of samples provided that the samples recovered are accepted by the Consulting Engineer. Any unsatisfactory samples or paid for.

## **6.0 Collection of soil and water samples for chemical analysis**

6.1 Wherever a water sample is required to be collected, the contractor shall not use drilling mud for boring the hole. The sample shall be collected from a case bore hole and only after flushing out entire contents of the bore hole by means of air flushing or a percussion bailer or any other method approved by the Consultant. The samples shall be collected from the boreholes at depth selected by the Consultant.

6.2 The water samples shall be collected in airtight amber glass containers (two containers of one litre capacity each for each sample). The contractor shall store such samples in a covered shed.

6.3 The contractor shall reach the samples to the approved laboratory within five days of their collection and secure a proper receipt to the consultant.

6.4 The contractor shall allow for sand blow while quoting a unit rate for this item. The unit rate should include the cost of all operations such as flushing and cleaning for advancing the borehole deeper.

6.5 Mode of measurement and payment: The payment shall be per number of sample, provided that the samples recovered are accepted by the Consulting Engineer. Any unsatisfactory samples or any sampling work, which is not as per the specification, shall not be paid for.

## **7.0 Drilling exploratory holes in rock**

7.1 Providing all drilling equipment and carrying out NX size core drilling using double tube core barrel is included in the scope of this item.

7.2 The maximum lengths of drilling in bedrock overlain by over burden shall generally not exceed 5.0 m measured in rock.

7.3 The work shall comply with IS 1982 and/or as directed by the consultant. The format as approved by the consultant shall be used for recording the rock-drilling data. The data shall include rate of drilling, colour of wash water, nature of sediments in the wash water, loss or gain of drilling water, core run length, core recovery & RQD (Rock Quality Designation). The length for payment under this item shall be measured in rock.

7.4 Cores shall be kept in wooden boxes with compartments of exact size of the rock cores. While placing the core samples in wooden boxes, it should be ensured that the direction and sequence of core placement is not altered. The core run shall be restricted to the length as directed by the consultant and generally not more than 1.5 m. In weak and friable rock core run shall be reduced.

### **7.5 Core Box:**

7.5.1 The core boxes shall be provided by the contractor and should be made of good quality timber. Each core box shall house samples not more than 6 m (six metre) long. The contractor shall include in his rate the cost of providing such core boxes.

7.5.2 The depth of cores-below ground level shall be indicated at about every 1.5 metres interval by writing the depth in inalienable ink on wooden spacers, which shall be inserted in their

correct position in the box. Similarly the exact depth of any change in stratum, and failure to recover the core, etc., shall be recorded.

7.5.3 The labeling of core samples of rock shall be done in accordance with Appendix D of IS 1892.

7.5.4 All the core boxes shall be marked with details such as the bore hole number, the length of cores it contains, the name of work etc. in paint or in indelible ink on the top face and then handed over to the owner.

7.6 The double tube core barrel shall be used.

7.7 An arrangement should be made for collection of wash water by installing a top socket with a cross pipe at the top of the casing before the start of rock drilling. The side of casing should be well packed near bottom and top of the hole to prevent leakage. Wash water should be collected in buckets and allowed to settle. A record of wash water shall be maintained indicating the colour, change in colour and type of wash water (i.e. thick slurry, lean slurry or clean water).

7.8 The number of revolutions per minute for the rock drilling shall be constant throughout the complete drilling operation. The rate of penetration for every 250 mm shall be observed during rock drilling and recorded.

7.9 Whenever the field permeability tests are required to be conducted in the underlying bed rock during intermediate stages of drilling, the contractor shall fix a suitable M. S. pipe as stipulated in the relevant specifications for conducting field permeability test in underlying bed rock.

7.10 The contractor shall carry out stage grouting during course of drilling, whenever water loss conditions are met with. The contractor shall allow for such stage grouting and delays while quoting the unit rate for drilling in rock. The contractor should separately quote unit rate of grouting on the basis per bag of cement.

7.11 The depth of re-drilling which is measured and paid for in the event of stage grouting, shall in no case exceed the total length of hole irrespective of the number of times the hole/stage is grouted and re-drilling for extending the hole to the required depth. The contractor shall provide for all such contingencies in his quoted rate for re-drilling. Payment shall be made only once, for measurement in running meters of the depth of bore.

7.12 Mode of measurement and payment: The total depth of drilling in rock will be determined by measuring or computing the difference in the elevations where SPT > 50 was encountered and the elevation of the lowest point of core barrel. The total length of payment shall not be more than total length of boring in soil and rock minus length payable as drilling in soil. The payment shall be done per meter of drilling.

## **8.0 Handling and transporting soil, rock and water samples to the approved laboratory**

8.1 The samples shall be suitably packed and transported safely so that they reach the NITT laboratory within five days of their collection. The samples shall be dispatched in a batch of samples not exceeding 50 (Fifty) numbers.

8.2 The contractor shall secure a proper receipt for its safe delivery to the approved laboratory and present the receipt to the Engineer of Consultant.

8.3 The samples collected at site shall be stored properly in a covered shed till the time of their dispatch.

8.4 Mode of measurement and payment: The payment towards this Item shall be made on the basis of batches of samples dispatched from site and received in the testing laboratories. The number of batches will be decided by the Consulting Engineer.

## **9.0 Water table**

9.1 The depth of stabilized ground water table from the ground level to be ascertained and recorded.

## **10.0 Indicative values of N & CR**

In view to differentiate various layers of strata broadly into soil / sand OR Weathered rock OR Hard rock following indicative values of SPT (N) & CR shall be considered.

- i) Hard rock :- Core Recovery more than 60%
- ii) Soft rock:- Core Recovery more than 10 % and SPT more than 50 and
- ii) Soil: - Values lesser than indicated for soft rock shall be classified as soil.

## **II. COLLECTION OF BULK SAMPLES**

1. Bulk samples shall be collected from the prescribed location / depth and the same shall be transported to the NITT Civil department for the laboratory tests.
2. The sample bags shall be packed along with a tag describing the details of the sample such as location, depth, date of collection and signature of the Consultant or Engineer in-charge.

## **III. ARRANGEMENTS FOR PLATE LOAD TEST**

1. The contractor shall make necessary arrangements for the plate load test for the determination of modulus of subgrade reaction (K – Value).
2. The contractor has to provide kentledges arrangements in order to provide reaction to the plate load test. The contractor scope is only to provide kentledges arrangements. The test will be done by NIT Trichy.
3. The Plate load test apparatus with all accessories (excluding reaction frame) shall be transported by the contractor from the NITT Civil department to the site and vice versa.

**SECTION: 4 – PRICE SCHEDULE**

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**To be used by the bidder for submission of the price bid**

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1. Component Name:
2. Specifications (confirming to Section 3 of Tender document-enclose additional sheets if necessary):
3. Currency and Unit cost (excluding Taxes):
4. Quantity:
5. Item cost (Sl.No.3 \* Sl.No.4) (in Indian Rupee):
6. Taxes and other charges:
  - (i) Specify the type of taxes and duties in percentages and also in figures
  - (ii) Specify other charges in figures
7. Total cost (Inclusive of all taxes) :
8. Work commencement Schedule (confirming to the Section 3 of Tender document):
9. Name and address of the firm for placing Work Order:

**Signature of the Bidder** : .....

**Name and Designation** : .....

**Business Address** : .....

**Place:**

**Date :**

**Seal of the Bidder's Firm**

(Note: All columns should be filled. No column should be left blank. If any column is not filled-in properly or left empty then the bid will be rejected.)

**SECTION: 5 – CONTRACT FORM**

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**To be provided by the bidder in their business letter head**

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[Name of the Supplier’s Firm] hereby abide to drilling and sampling sub-contract work schedule mentioned in the Section 3 of the Tender document for carrying out the works if the work order is awarded.

All the field work will be carried out as per ISI code specification and as directed by Dr. K. Muthukkumaran, NIT Trichy without any delay and deviations.

[Name of the Supplier’s Firm] hereby abide to terms and conditions mentioned in the tender document and service will be rendered to the satisfaction of NIT, Trichy during this period.

**Signature of the Bidder** : .....

**Name and Designation** : .....

**Business Address** : .....

**Place :**

**Date :**

**Seal of the Bidder’s Firm**



**NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPALLI**  
**Annexure-A**

**MODEL PRICE BID FORMAT FOR INDIAN BIDDERS**

Tender No. & Date:

Bidder's Offer No. & Date:

Sl. No.	Description	Unit	Qty	Rate / Qty	Total Cost in Rs.
1	Drilling exploratory bore holes of not more than 150 mm diameter, in all types of soil, as per specification, (soil where SPT "N" equal or less than 50). Conducting standard penetration test (SPT) at every 1.0m interval and collecting / preserving SPT samples, as per specifications. Rate including mobilization of all required equipment, plant, instruments and its subsequent demobilization, setting & shifting of rig at bore hole / test location including 1 <sup>st</sup> one, collection of disturbed soil samples and UDS, groundwater, etc. Complete on satisfactory completion of the soil investigation jobs.	Rm	75		
2	Drilling NX size exploratory bore holes in weathered rock/Hard rock with T.C./ with diamond drill bit with core run not more than 1.5 m & collecting rock samples using double tube core barrels, preserving rock samples in wooden core boxes, all as per the specifications including gravity grouting if necessary, in water loss zones & providing cement (Soft rock is defined SPT "N" equal or more than 50).	Rm	50		
3	Collecting bulk soil samples from trial pits for laboratory tests and chemical analysis.	No	5		
4	Arrangements for Plate load Test using kentledges	No	3		
	Tax amount ____% GST				
	<b>Gross Amount (including taxes)</b>				

**Signature & Seal of Vendor**

**Note: The price bid should be submitted only as per the above format. No row shall be left blank. Please indicate NA, in case the item is "Not applicable". If this format is not used or any column is left blank, then the bid will be rejected.**