EXPRESSION OF INTEREST (EOI)

NAME OF THE WORK:

"EMPANELMENT OF AGENCIESS FOR SOIL EXPLORATION, TESTING AND PREPARATION OF REPORT FOR DIFFERENT ENGINEERING WORKS AT DIFFERENT LOCATIONS UNDER IRRIGATION & WATERWAYS DEPARTMENT, GOVT. OF W.B" for a period of three (3) years.

Released on: 24-04-2025 (Date of Publication)

Office of the Director
River Research Institute
Irrigation & Waterways Directorate,
Government of West Bengal
Mohanpur, West Bengal, Nadia, Pin 741246

e-mail: rri.wbiwd@gmail.com

Web site: www.wbiwd.gov.in

NOTICE FOR EOI

Office of the Director
River Research Institute
Irrigation & Waterways Directorate,
Government of West Bengal
Mohanpur, West Bengal, Nadia, Pin 741246

EOI NO. WBIW/DIR/RRI/EOI-02/2025-26

Memo no. 518 **Date: 22.04.2025**

Encrypted electronic EOI is hereby invited by the Director, River Research Institute, Irrigation & Waterways Directorate on behalf of the Governor of the state of West Bengal through single stage e-procurement system (Part I: Technical bid) for the work given below.

Name of the work: "EMPANELMENT OF AGENCIES FOR SOIL EXPLORATION, TESTING AND PREPARATION OF REPORT FOR DIFFERENT ENGINEERING WORKS AT DIFFERENT LOCATIONS UNDER IRRIGATION AND WATERWAYS DEPARTMENT, GOVT. OF W.B." for a period of three (3) years.

The document containing the scheme and the eligibility criteria of the applicants may be obtained from the web site www.wbiwd.gov.in under the option 'EOI' & https://wbtenders.gov.in.

The last date of receipt of EOI in the prescribed format online, provided in the document for the scheme is 05.05.2025 till 3 p.m.

.....SD/-.....
Director
River Research Institute, West Bengal
Irrigation & Waterways Directorate
Government of West Bengal

BRIEF DESCRIPTION FOR PARTICIPATION IN EOI

Empanelment of Agencies will be done for those who has their own set up of Sub surface exploration and Soil Testing Laboratories for testing of soil samples with accreditation from Govt. of India recognized bodies.

A. TYPE OF SOIL SAMPLE COLLECTIONS AND TESTING:

Sl. No	METHOD OF COLLECTION OF SOIL SAMPLES	TYPE OF SOIL TESTS
1.	**Disturbed sample**	1. AS PER CLAUSE 10.1
2.	**Undisturbed sample**	
3.	**Laboratory Testing and analysis with Prepation of report signed by the competent Geotechnical Engineer (ME-Soil or equivalent).**	

B. CRITICAL DATES

Sl. No.	**Activity**	**Date & Time**	**Remarks**
1.	Publishing Date	24.04.2025	To be made available with the e NIT in the website
2.	Document Download start date	24.04.2025 at 10.15 Hrs	
3.	EOI submission start date	24.04.2025 at 10.15 Hrs	
4.	Document Download end date	02.05.2025 at 15:00 Hrs.	
5.	EOI submission end date	05.05.2025 at 15:00 Hrs.	
6.	Technical Documents opening date with preliminary result (TBO Sheet)	06.05.2025 at 12.00 Hrs.... Or later	
7.	Uploading of the list of Technically qualified final list of Agencies (TBE Sheet)	To be decided by DIR/RRI with at least 4 (Four) clear working days after Technical Documents uploading date in order to enable registering of grievance and decision of Appellate authority, (if any).	To be notified to all Agencies through email & SMS through auto generation in the system.

C. GENERAL GUIDANCE FOR EMPANELMENT OF AGENCIES AND AWARD OF WORK THROUGH LIMITED TENDER INQUIRY (LTI):

Any organization/ agencies willing to take part in the process of EOI will have to be enrolled & registered with the Government e-Procurement System, through logging on to https:// wbtenders.gov.in (the web portal of West Bengal EOIs maintained by NIC). The organization / agencies are required to click on the link for EOI site as given on the web portal.

1. Digital Signature certificate (DSC):

Each organization / agency is required to obtain a Class-II /Class III company Digital Signature Certificate (DSC) for submission of EOIs from the approved AGENCIES of the National Informatics Centre (NIC) on payment of requisite amount.

The organization / agencies can search & download N.I.T. & EOI Document(s) electronically from computer once they log on to the website. This is the only mode of collection of EOI Documents.

2. Selection Process:

A list of eligible Agencies will be finalized through Technical Evaluation process. The Agencies will be empaneled as per their credentials. Work will be awarded to the Empaneled Agencies, by LIMITED TENDER INQUIRY (LTI) process as mentioned in cl. 11.6 of TOR. All other detail may be obtained from 'Terms of Reference' of this document.

2.1. Selection Committee: A committee constituted by the Director, RRI, I&WD will evaluate the documents submitted by the Agencies and will prepare a list of successful Agencies for Empanelment. The decision of the Selection Committee is final for empanelment of agencies.

2.2. Submission of documents for EOI:

Documents for the EOI are to be submitted through online, in the website as stated, in single folder, named Technical Proposal **(DOCUMENTS A)** before the prescribed date & time, using the Digital Signature Certificate (DSC). The documents are to be uploaded virus scanned and copies are duly Digitally Signed. The documents will get encrypted (transformed into non readable formats).

The Agencies are advised to submit the documents well in advance of the deadline as the Department will not be liable or responsible for non-submission of the documents or submission of incomplete documents on account of any technical glitches or any problems in connectivity services used by the Agencies.

2.2.1. Technical Proposal:

The Technical proposal should contain all the required the documents in PDF format named as "DOCUMENTS-A **Technical Documents"**: (All Forms to be properly filled, scanned in readable format, digitally signed and uploaded as mentioned). Details regarding technical proposal may be obtained in clause 10.4 of this document.

2.2.2. Financial Proposal:

a) Empaneled bidders may submit their Financial documents in online mode, through LTI, for any work to be notified later. No Financial Proposal is required to be submitted for empanelment of agencies throygh EOI.
b) It is to be noted that, the rate quoted in the BOQ, for any work, will be treated as final.

2.2.3. EMD for successful participation in tendering process:

Earnest money Deposit for the tender for each work is 2% of the Amount put to Tender only. An empaneled Firm may submit application for more than one work. However, ***the applicant shall have to submit separate application and separate EMD for each individual work.*** However a specific company/ Organization can't submit multiple documents (common interest) for a single work. Submission of multiple documents may result in disqualification of tender and also liable to be blacklisted by the Department. Details regarding process of submission of EMD may be obtained from 'Terms of Reference' of this document.

1. **EMD has to be payable in ONLINE mode as per Finance Department G.O. No 3975 F (Y) dated 28th July 2017**.

2. **The EMD of the selected bidder will be returned through the online payment portal as per guidelines issued by Finance Department G.O. No 3975 F (Y) dated 28th July 2017.**

3. **The EMD of the selected bidder may be forfeited if the organization fails to sign the contract in accordance with the terms and conditions and/or fails to furnish Performance Security as per the terms and conditions.**

4. **In addition to e- submission hard copies of Technical documents needs to be submitted by hand in sealed cover. The application is to be submitted in the prescribed format containing general and technical information along with copy of documents to be submitted. This application is to be sealed and super scribed**:

EMPANELMENT OF AGENCIES FOR SOIL EXPLORATION, TESTING AND PREPARATION OF REPORT FOR DIFFERENT ENGINEERING WORKS AT DIFFERENT LOCATIONS UNDER IRRIGATION AND WATERWAYS DEPARTMENT, Govt. OF W.B. for a period of three (3) years.

From: [Insert Name of the participating organisation]

(General and Technical Information)

The Address for Submission of Technical Documents in Offline Mode:

Office of the Director,
River Research Institute,
Irrigation & Waterways Directorate,
Govt. of West Bengal,
Mohanpur, Nadia
Pin -741246

Complete sets of EOI documents will be available for free download by interested Agencies from https://wbtenders.gov.in & from the website of Irrigation & Waterways Department – www.wbiwd.gov.in under the tender option.

TERMS OF REFERENCE

Name of the work "EMPANELMENT OF AGENCIES FOR SOIL EXPLORATION, TESTING AND PREPARATION OF REPORT FOR DIFFERENT ENGINEERING WORKS AT DIFFERENT LOCATIONS UNDER IRRIGATION AND WATERWAYS DEPARTMENT, GoVT. OF W.B." for a period of three (3) years.

Please read this scheme document carefully before submission of the application.

1) **Complete sets of EOI documents will be available for free download by interested Agencies from web portal of (https://wbtenders.gov.in) & from the State Government website (www.wbiwd.gov.in)mentioned above.**

2) **It will be in the interest of the Agencies to familiarize themselves with the e-Procurement system to ensure smooth preparation and submission of the EOI documents.**

3) **The Agencies are advised to submit the documents well in advance of the deadline as the Department shall be not be liable or responsible for non-submission of the documents or submission of incomplete documents on account of any technical glitches or any problems in connectivity services used by the Agencies.**

4) **Documents can be submitted through the website of (https://wbtenders.gov.in).**

5) An Organization may submit application for more than one work. However, **the applicant shall have to submit separate application and separate EMD for each of them**.

6) **Financial documents must be submitted in prescribed mode of e-tender process in Bill of Quantity (BOQ) through web portal (**https://wbtenders.gov.in**) in further tendering process under LTI.**

7) The last date for submission of application (hard copy) is the next working day of the e submission till 5.00 p.m.

8) **If any of the documents as asked for are not submitted along with the application, the application form submitted by the applicant may be rejected.**

9) The EMD of the selected applicants may be forfeited if the organization fails to sign the contract in accordance with the terms and conditions and/or fails to furnish Performance Security as per the terms and conditions for any work that may be awarded to the agency in future through LTI.

EOI DOCUMENT

Table of Contents:

Objective

1. OBJECTIVE:

River Research Institute, West Bengal undertakes various soil exploration works which are required by different working divisions of the Irrigation & Waterways Directorate. Collection of soil samples are carried out by engaging different agencies through open tender process. Thereafter, the laboratory testing of the soil samples are conducted at different Quality Control Laboratories of RRI spread at different districts of West Bengal. These soil reports are used for planning and designing of different hydraulic structures and other major engineering works in all over West Bengal.
To obtain good quality of work and to expedite the process of tendering it has been decided to make an empanelment of soil exploration Agencies who has sufficient expertise in collecting soil samples and generation of reports.

Therefore it is proposed that these reports may be collected by Irrigation & Waterways Department from the empaneled Agencies through Limited Tender Inquiry (LTI), in online mode.

Salient Features

2. SALIENT FEATURES:

a) The enlistment will be done for three (3) years for different categories of work with not less than three (3) Agencies in the empanelment.

b) The enlistment Agencies will be allowed to participate in LTI for any work of such type upto any estimated amount.

c) LTI will be held among the empaneled Agencies in online mode.

Obligation of both parties

3. OBLIGATIONS OF BOTH PARTIES:

3.1. FOR AGENCY

3.1.1. Collection, storing, testing and submission of report of soil samples for various works.

3.1.2. The instrument used for the soil exploration will be in full working condition and free from any defect.

3.1.3. The raw data of the soil samples to be submitted through e-mail after the work of each days work.

3.1.4. All the reports should be signed by the competent authority of the agency.

3.1.5. A record of all the soil reports should be maintained by the agency.

3.1.6. The instruments should always bear a certificate of calibration for which calibration should be done at regular interval at the cost of the agency.

3.1.7. The soil exploration works should generally be done during normal working on all working days. Working beyond this hour may require permission from the competent authority.

3.1.8. All the soil exploration and soil sample testing works should be conducted with reference to relevant guidelines of Indian Standard (IS) Codes.

3.1.9. All stationary such as paper, batteries, computers etc. required for preparation of report should be provided by the agency.

3.1.10. All the reports of the soil samples will be the proprietary data of the department and should be made confidential. Data will be uploaded in a designated server of the department. The agency should not divulge any information regarding the reports.

3.1.11. Service standards will be followed by the Private AGENCIES in accordance with the Good Industry practices.

3.2. FOR DEPARTMENT

3.2.1. The department will identify the area required for the soil exploration works.

3.2.2. The department will give the value of the Bench Mark pillars, if available.

3.2.3. The I&WD shall incorporate the Standard Operating Procedures (SOPs) for each of the services to be followed by the concerned Agencies.

3.2.4. For purpose of review of performance of the soil exploration work, Department may cross verify any test reports from any laboratory.

3.2.5. The Firm may initiate proposal for technology upgradation of the soil exploration methods, which will be considered by the concerned authority and will be implemented by the Government, if found suitable.

Monitoring Mechanism

4. MONITORING MECHANISM:

4.1. The competent authority of the I&WD shall monitor the day-to-day operational activities of the services undertaken by the Agencies.

4.2. Performance review will be undertaken by concerned Executive Engineer on quarterly basis. Senior Official from I&WD may be present during Performance Review of the enlisted agencies.

Termination of Empanelment

5. TERMINATION OF EMPANELMENT:

5.1. CAUSES OF TERMINATION: Any of the following events shall constitute an event of default by the Agencies entitling I&WD to terminate this agreement and subsequent forfeiture of Security deposit/performance guarantee by the authority.

5.1.1. Failure to commence services within fifteen days of signing the agreement.

5.1.2. Failure to comply with SOPs for operation and management of the services.

5.1.3. Distribution of data to other parties other than I&WD.

5.1.4. Serious error detected in the data in more than two occasions in any project.

5.1.5. Failure to comply with the Statutory Requirements, Acts, Rules and other applicable norms.

5.1.6. Criminal indictment of the promoters, member/s of the Board of Directors, chief functionaries, key personnel engaged by the Agencies for operation and management of the services.

5.1.7. Engagement of unqualified persons for running of the Services.

5.1.8. If the Agencies fails to provide service as per the norms of the agreement or discontinues service due to any reason what so ever including personal grounds before the contract periods end.

5.1.9. Any other condition mentioned in WB Form No. 2911.

5.2. NOTICE/SHOW CAUSE AND TERMINATION:

5.2.1. Upon occurrence of any of the defaults, I&WD would follow the procedures of issuing time bound (one month) Notice/Show Cause before deciding on termination of the agreement. The decision of I&WD shall be final and binding on the AGENCIES.

5.2.2. If the Firm fails to demonstrate to the I&WD Authority that the default has been cured or fails to satisfy the authority, the authority may terminate this agreement.

5.2.3. The decision of the I&WD authority to terminate the agreement shall be final and binding on the Agencies.

5.3. TERMINATION DUE TO CHANGE IN LAW:

5.3.1. The empaneled Agencies shall have the right to be terminated on account of a “Change in Law”. For the purpose hereunder Change in Law means any of the following events which, as a direct consequence thereof, has a Material Adverse Effect:

a) ADOPTION, PROMULGATION, MODIFICATION, REINTERPRETATION or REPEAL after the date of this agreement by any Government Agency of any applicable law by any Government Authority; or

b) The imposition by any Government Agency of any material condition (other than a condition which has been imposed as a consequence of a violation by the Firm of any Clearance or Applicable Law) in connection with the issuance, renewal or modification of any Clearance after the date of this Agreement; or

c) Any clearance previously granted, ceasing to remain in full force and effect for reasons other than breach/violation by or the negligence of the Firm or if granted for a limited period, being renewed on terms different from those previously stipulated.

5.3.2. Provided nothing contained in this section shall be deemed to mean or construe any increase in taxes, duties, cess and the like effected from time to time by any Government Agency, as Change in Law.

5.4. CONSEQUENCES OF TERMINATION:

5.4.1. Upon Termination of this Agreement for any reason whatsoever, the Firm shall hand over all the data collected by them during that period.

Force Majeure

6. FORCE MAJURE:

If the performance of the agreement by either party is delayed, hindered or prevented or is otherwise frustrated by reason of *force majeure*, which shall mean war, civil commotion, fire, flood, action by any government or any event beyond the reasonable control of the party affected, then the party so affected shall promptly notify the other party in writing specifying the nature of the force majeure and of the anticipated delay in the performance of the agreement and as from the date of that notification I&WD authority may at its discretion either terminate the agreement forthwith or suspend the performance of the agreement for a period not exceeding 6 months. If at the expiry of such period of suspension any of the reasons for the suspension still remain, the I&WD authority and the Agencies may either agree a further period of suspension or treat the agreement as terminated. In the event of the Contract being terminated by reason of *force majeure*, The Agencies shall take such steps as are necessary to bring the services to an end, in a cost effective, timely and orderly manner. The Agencies shall submit an account in writing which shall state the amount claimed taking into account all charges and costs properly incurred or committed by the Agencies in relation to the agreement or its termination which cannot be recovered. Provided that payments are not subject to dispute, the I&WD Authority shall:

a. Arrange to pay through the Executive Engineer all charges and sums due;

b. Arrange to reimburse all reasonable expenses necessarily incurred by the Firm after the Relevant Date in winding up the agreement.

Dispute Resolution

7. DISPUTE RESOLUTION:

7.1. Amicable Resolution

Where a dispute arises under this agreement, the parties shall make all reasonable efforts to resolve the dispute through good faith negotiations failing which they shall attempt at dispute resolution with the intervention of mutually agreed official of the I&WD, GoWB.

7.2. Arbitration

Except for a dispute in connection with Termination, in which respect the decision of the I&WD authority shall be final, any dispute between the Parties arising out of or relating to this Agreement including the meaning or interpretation of any of the terms set out hereto or any other matters which cannot be resolved through good faith negotiations shall be finally referred to an arbitrator appointed by the Secretary, I&WD, GoWB.

7.3. WB Form no.2911

Any other clause as mentioned in WB Form No.2911.

Miscellaneous

8. MISCELLANEOUS:

8.1. Validity

The empanelment will be valid for three (3) years.

8.2. Assignment and Charges

i. The Agencies shall under no circumstances whatsoever create encumbrance over the soil exploration sites. The Firm shall not assign this agreement or the rights, benefits and obligations save and except with prior written consent of the I&WD Authority.

ii. The I&WD Authority shall be free to assign all or a part of its rights, benefits or novate its obligations under this agreement at any time.

8.3. Indemnity

The Firm shall indemnify, defend and hold the I&WD Authority harmless against any and all proceedings, actions and third party claims arising out of a breach by the Firm of any of its obligations under this Agreement.

8.4. Governing Law and Jurisdiction

The tendering process, the EOI Documents shall be governed by, and construed in accordance with, the laws of India and the competent courts at the State capital shall have exclusive jurisdiction over all disputes arising under, pursuant to and/or in connection with the tendering process.

8.5. Redressal of Grievance

The Firm shall promptly redress the grievances, if any, reported by any parties, competent authority etc. on account of deficiencies in services provided and shall be liable for any deficiency in service committed to its any person under the prevailing law.

8.6. Supersession & Order of Priority

This Agreement constitutes the entire understanding between the parties hereof with and supersedes any previous expressions of intent, correspondence, understandings or agreement in respect of the Project.

Without prejudicing the aforesaid, the Parties hereby agree that in case of any inconsistency between the provisions of this Agreement and the Scheme, the provisions of the Scheme shall prevail.

8.7. Amendments

This Agreement and the Schedules together constitute a complete and exclusive understanding of the terms of the Agreement between the Parties on the subject hereof and no amendment or modification hereto shall be valid and effective unless agreed to by all the Parties hereto and evidenced in writing.

8.8. Notices

Unless otherwise stated, notices to be given under this Agreement including but not limited to a notice of waiver of any term, breach of any term of this Agreement and termination of this Agreement, shall be in writing and shall be given by hand delivery, Speed Post, recognised national/international courier, or by email with scanned documents, or facsimile transmission and delivered or transmitted to the Parties at their respective addresses set forth below:

Director,
River Research Institute, WB
I&WD, GoWB, Mohanpur,Nadia
Pin- 741246.

Or such address or facsimile number as may be duly notified by the respective Parties from time to time, and shall be deemed to have been made or delivered:

(i) in the case of any communication made by letter, when delivered by hand, by Speed Post, by recognized national/international courier or by mail (registered, return receipt requested) at that address and

(ii) in the case of any communication made by facsimile, when transmitted properly addressed to such facsimile number.

8.9. Severability

If for any reason whatsoever any provision of this Agreement is or becomes invalid, illegal or unenforceable or is declared by any court of competent jurisdiction or any other instrumentality to be invalid, illegal or unenforceable, the validity, legality or enforceability of the remaining provisions shall not be affected in any manner, and the Parties shall negotiate in good faith with a view to agreeing upon one or more provisions which may be substituted for such invalid, unenforceable or illegal provisions, as nearly as is practicable, provided failure to agree upon any such provisions shall not be subject to dispute resolution under this Agreement or otherwise.

8.10. No Partnership

Nothing contained in this Agreement shall be construed or interpreted as constituting a partnership between the Parties. Neither Party shall have any authority to bind the other in any manner whatsoever.

Condition Precedent

9. CONDITION PRECEDENT

9.1. The agency has to visit the site after getting work order for a particular work and satisfy himself regarding the site condition for taking data from field.

Selection Process for Empanelment

10. SELECTION PROCESS FOR EMPANELMENT:

10.1. SELECTION COMMITTEE

The Director, River Research Institute shall form a Selection Committee (SC), to undertake selection for empanelment of the AGENCIESs.

10.2. GENERAL ELEGIBILITY CRITERION

10.2.1. All bonafide Indian contractors/ agencies/ organisations including registered partnership Agencies, proprietorship farms, registered consortiums and valid 'Joint Ventures' and of equivalent grade or class who are the owner of Soil exploration and testing laboratories companies and having an experience of doing such works for at least five years.

10.2.2. The Agencies shall be located in anywhere in India.

10.2.3. Should have valid Trade license, valid PAN card, I. Tax return document, GSTIN number.

10.2.4. The Agencies should have required technical manpower in their pay roll for soil exploration.

10.2.5. No litigation is pending on date and no penal measures were taken against the applicant under applicable Acts and laws (the applicant is required to provide a Notarized document to this effect).

10.2.6. The Agencies should not be blacklisted /debarred by any State Government agency/Central Government agency/State Departments/Central Department.

10.3. FINANCIAL ELIGIBILITY CRITERIA

10.3.1. Any contractor/Agencies may apply for empanelment , subject to fulfilment of the following conditions:

a) For empanelment in soil exploration and testing - Average of gross Annual Turnover has no lower limit as per clause 11.5.4 of TOR.

b) The Agencies should be solvent and should not go into financial liquidity and bankruptcy.

10.4. TECHNICAL ELIGIBILITY CRITERIA

10.4.1. INSTRUMENTS

The following set of instruments are required to be in possession of the Agencies. (Purchase voucher, in the name of the Firm, in original, is required to be produced).

a) SOIL EXCLUDER WITH STANDARD MOULD
b) REMOLDED SOIL SPECIMEN PREPARATION APPARATUS (3 SET)
c) TRIAXIAL SHEAR TEST APPARATUS (1 SET)
d) DIRECT SHEAR TEST APPARATUS (1 SET)
e) THREE GANG BENCH TUPE CONSOLIDOMETER (1 SET)
f) PERMEABILITY TEST APPARATUS (1 SET, FALLING HEAD & CONSTANT HEAD).
g) LABORATORY HOT AIR OVEN, THERMOSTATICALLY CONTROLLED (1 SET).
h) LIQUID LIMIT & PLASTIC LIMIT DEVICE (1 SET, CASAGRANDE DEVICES).
i) SEIVE SET, 2 SET (20cm DIAMETER SIEVE SET), of 4.75mm, 2.36mm, 2.0mm, 1.18mm, 1.0mm, 0.600mm, 0.425mm, 0.300mm, .150mm and 0.075mm WITH SIEVE SHAKER.
j) INSTRUMENTS & ACCESSORY ITEMS FOR GRAIN SIZE ANALYSIS BY WET METHOD (PIPETTE / HYDROMETER METHOD)
k) ELECTRONIC BALANCES (SENSITIVITY 0.001 gm, 1 gm, 100 gm one SET EACH).
l) DRILLING EQUIPMENT, DRIVE WEIGHT ASSEMBLY, LIFTING BAIL ETC. FOR SPT TEST. (2 SETS).
m) IN-SITU PERMEABILITY TEST.
n) DETERMINATION OF WATER LEVEL IN BORE HOLES.
o) CALIFORNIA BEARING RATIO TESTS (I SET).
p) PROCTOR TEST APPARATUS FOR OPTIMUM MOISTURE CONTENT & MAXIMUM DRY DENSITY (1 SET)
q) RELATIVE DENSITY APPARATUS
r) SWELLING INDEX MEASURING APPARATUS
s) ANY OTHER ANCILLIARY GLASSWARE, CHEMICALS ETC.

10.4.2. SPECIFICATION OF THE INSTRUMENTS

The instruments should be of make of any standard company as per market survey and with IS specification. Details given under SOP of Soil Testing.

10.4.3. TECHNICAL MANPOWER

The following technical person should be in the pay roll of the agencies.

1. Engineer (Degree or Diploma in Civil Engineering or equivalent from any Govt. recognized institute having an experience of 2 and 5 years in soil exploration and testing respectively) - One (1) no.

2. Laboratory assistant (Graduate from any Govt. recognized institute having an experience of 5 years in soil testing laboratory or 12th pass (science) with an experience of 10).-Two(2) nos.

10.4.4. LIST OF WORKS COMPLETED IN THE LAST FIVE YEARS.

The Firm has to submit a list of works along with the Completion Certificate from the concerned authority for the similar nature of work as required for Irrigation & Waterways Department, for

which he is intending to be empaneled, during the last five years.

Applicant failing to fulfil any of the above-mentioned Eligibility Criteria will not be considered for empanelment.

10.5. SHORT LISTING OF APPLICATIONS

Empanelment process would involve short-listing of applicants based on the Eligibility Criteria as mentioned under sl no. 10.4.1 to 10.4.4 above. The decision of the committee for empanelment of the agencies will be final without any binding.

10.6. PROCESS OF FINAL EMPANELMENT

Selection of the Agencies will be finalized after verification of the all the relevant documents in original by a committee to be constituted by the Director, River Research Institute. The committee will also examine the technical knowledge of the Engineers/Laboratory Assistant engaged by the Agencies by appearing in person at RRI on a date to be notified later to the Short Listed Agencies. After that the selected empanelment will be sent to the I&WD for further necessary action.

10.7. ELIGIBILITY TO DIFFERENT VALUES OF WORK

The estimated value of the work will be decided depending on the volume of work as per case to case basis.

10.8. OTHER INFORMATION

10.8.1. Canvassing

If the Agencies undertakes any canvassing in any manner to influence the process of selection of the successful Agencies or the issuance of the NOA, such Agencies shall be disqualified.

10.8.2. Misrepresentation by the Agencies

The “Selection Committee” reserves the right to reject any documents if:

At any time, a material misrepresentation is made by the Agencies; or The Agencies does not provide, within the time specified by the Selection Committee, the supplemental information sought by the Department for evaluation of the documents.

If it is found during the evaluation or at any time before signing of the Contract or after its execution and during the period of subsistence thereof, the Agencies in the opinion of the Department has made a material misrepresentation or has given any materially incorrect or false information, the Agencies shall be disqualified forthwith, if not yet selected as the Successful Agencies by issuance of the LOA. If the Agencies, has already been issued the LOA or it has entered into the Contract, as the case may be, the same shall, notwithstanding anything to the contrary contained therein or in these EOI Documents, be liable to be terminated, by a communication in writing by the department to the Agencies, without the Department being liable in any manner whatsoever to the Agencies.

Process of participation in EOI

11. PROCESS OF PARTICIPATION IN EOI:

11.1. General procedure for submission of Documents.

Documents are to be submitted electronically in the on-line mode through the e-Procurement portal www.wbtenders.gov.in. All documents uploaded by the EOI Inviting Authority forms an integral part of the works contract/Agreement. Contractors/Agencies are required to upload the entire EOI documents along with all other relevant PQ credential documents as asked for in the EOI, electronically, through the above portal within the stipulated date and time as notified in the EOI. Documents are to be submitted in only one part/folder, only being 'Technical Proposal'. 'Financial Proposal' to be submitted through LIMITED EOI ENQUIRY (LTI). The Firm should carefully go through all the documents of the EOI and upload the scanned copies of his/her/their original documents in 'Portable Document Format' (PDF) files in the designated links in the web portal as their 'Technical Documents'. Documents uploaded are to be scanned for virus and required to be digitally signed using their 'Digital Signature Certificates' (DSC). Agencies should especially take note of all the Addenda or Corrigenda notices related to the EOI and upload all of these documents forming a part of their application as EOI document. Documents digitally signed and uploaded in the EOI portal by the Agencies containing requisite information comprising 'Technical documents', which cannot be changed after end date and time fixed for submission of the EOI. Extension of last date for application submission or insertion of any of Addendum/Corrigendum, if unavoidable is to be notified as per Finance Department guidelines in the e-Procurement Portal, Departmental website, Newspapers and in Notice boards. Whenever any corrigendum is issued irrespective of the content (date corrigendum or otherwise), due date of submission of documents will be extended by 7 (seven) calendar days to be published before expiry of the last date for original validity period of documents submission. Extension of last date and time for documents submission by issuance of a Corrigendum shall not be treated as 2nd Call.

11.2. Technical Proposal

The Technical Proposal should contain scanned PDF files of all documents in the following standardised formats in one part covers or folders.

Cover No	Cover	Document Type	Descriptions
1	Technical (Pre-Qual)	.pdf	NIT_Corrigendum
		.pdf	Agreement_2911
		.pdf	Forms & Annexures

11.3. Descriptions of Technical (Pre-Qual) Covers

i. 'NIT_Corrigendum' folder: e-Notice Inviting EOI is to be downloaded in entirely, digitally signed and uploaded during application submission in "NIT_Corrigendum" folder. 'Corrigenda/Addenda' if published in connection with the EOI is to be digitally signed and uploaded in the 'NIT_Corrigendum' folder merged with e-NIT documents during application submission.

ii. 'Agreement_2911' folder: Contract /Agreement in WB Form No. 2911(i) published in the EOI is to be downloaded digitally signed and uploaded during application submission in Agreement_2911 folder.

iii. 'Forms' folder: Applications for EOI, vide self-declaration format in specimen Annexure-1, self-declaration that no litigation is pending in specimen Annexure-II, self-declaration to compliance with terms of service in specimen Annexure-III, self-declaration to use qualified manpower in spacimen Annexure-IV, self-declaration of documents not having common interest as a different organisation vide specimen Annexure-V (Form-2 of 2911), and self-declaration on antecedents and performance of the Firm in specimen Annexure-VI(Form-4 of 2911). All above are to be filled up completely, digitally signed and uploaded during documents submission in "Forms" folder.

NOTE:

i. Agencies are required to keep track in the e-Procurement website www.wbtenders.gov.in for all the Addenda or Corrigenda notices and documents published in connection with a particular EOI within the period and upload the same, digitally signed by him/her along with their e- documents. EOIs submitted without Addendum/Corrigendum are liable to be treated as incomplete and thereby liable for disqualification or rejection.

ii. Form 1, Form 2, Form 3 (for companies etc.) and Form 4 are taken from Agencies by TIA as Firm's self-declaration or undertakings. These formats are specimens or samples only, which are to be firstly downloaded by the Agencies from the NIT in e-Procurement portal, filled up completely and again uploaded with their electronic documents.

11.4. My Document [OID* Cover] containing: It is desired that PDF files of all other original documents in support of their eligibility and PQ credential shall have to be submitted under the OID cover folders as detailed below:

My Document Format for uploading in the OID folder:-

Sl. No.	Category	Sub-category	Sub-category description	Remarks if any
I	Certificates	1. certificates.pdf 2.GST_registration_ certificates.pdf	1 Latest Professional Tax Payment Certificate (PTPC) or, PT deposit challan for current financial year or Government Order for exemption in other States where ever applicable. 2 Valid PAN Card in the name of Agencies/organisation 3 Income Tax Return of current Assessment year or, IT Return of immediate preceding Assessment year whichever is ;attest available 4 Valid GSTIN under GST Act & Rules	Refer to Clause 3.2C(I) for details
II	Company Details	companydetails.pdf 1 companydetails.pdf 2	1 For Proprietorship Agencies, Partnership Agencies, Registered Companies, Registered Co-operative Societies for Valid Trade License/	Refer to Clause

			acknowledgement or Receipt of application for Trade License/ Revalidation OTHER REQUIREMENTS:- 2 For Partnership Agencies: Legally valid Partnership Deed, Form-VIII/ Memorandum of Registration of Registrar of Agencies 3 For Companies: Incorporation Certificate, Memorandum of Articles of ROC, List of current owners/ Directors/Board Members 4 For State Registered Co-operative Societies: Society Registration certificate from ARCS of the State, Society by-Laws, latest available Auditor's Report of Directorate of Co-operative Audit within proceeding five years as per Societies Act & Rules	3.2C(II) details
III	Credential of works	1. Credential pdf 1. 2. Credential pdf 2	1 Work Order/ Award of Contract or LOA/LOI duly authenticated by issuing authority. 2. Pre-Qualification (PQ) Work credential of one 100% completed work as desired in the NIT as the Completion Certificate (CC) duly authenticated by competent authority.	Refer to Clause 3.2C(III) for details
IV	Financial credential	Payment certificate.pdf	All 100% Payment Certificates of competent authorities during preceding Five FY. IT Return of Agencies in three FY, or Audited Profit & Loss Accounts statement of any three financial years within the zone of preceding five financial years whichever is available.	Refer to Clause 3.2C(IV) for details

* OID denotes Other Important Documents.

Note:

i. It is desirable though not mandatory that all documents stated above in PDF files shall be uploaded by Agencies only in specified designated folders. No off-line document will be accepted and considered during EOI evaluation stage from Agencies before publishing of final empanelled Agencies by TEC may be undertaken directly from PQ Credential issuing authority.

ii. Validity of documents submitted by Agencies shall be stand determined on the date of publication of EOI notice (e-Notice Inviting EOI)

11.5.

11.5.1. Certificate/s: The documents mentioned below under Sl. i, ii & iii are to be uploaded as 'PDF' files in Certificate.pdf1 (name of the file should be "certificates.pdf").The document mentioned under Sl. iv below is to be uploaded in GST Registration Certificate.pdf2 file.

i. Latest available Professional Tax Payment Certificate (PTPC) or the PT payment challan/ receipt for current financial year/Waiver Order of competent authority in other States if applicable.

ii. Valid PAN Card of the Agencies/s are required;

iii. Income Tax Return of current Assessment Year or, IT Return of immediate preceding Assessment year under IT Act & Rules, whichever latest available with the Agencies.

iv. Valid 15 digit Goods and Service Tax payer Identification Number (GSTIN) as per GST Act, 2017 & Rules of the Agencies to be uploaded in 'GST registration certificate pdf'.

11.5.2. All documents mentioned in tabular format under Clause 3.2.2 and also explained below should be uploaded during electronic documents submission in PDF files with the name of file should be "companydetails.pdf".

i. For Partnership Agencies: Documents of Registration of Partnership Agencies in the certified copy of 'Form No. VIII,' issued under Indian Partnership Act, 1932 (Act-IX of 1932) by the Registrar of Agencies. In case a Partnership Firm is yet to receive Form No. VIII, a "Memorandum" issued by the Registrar of Agencies may also be accepted.

ii. For Companies: Incorporation Certificate, valid Trade License or acknowledgement of issuing authority of receipt of application for Trade License / renewal, 'Memorandum of Articles' registered under the Registrar of Companies (ROC) under the Indian Companies Act, List of owners/ Directors/Board Members are to be uploaded with the application.

iii. For State Registered Co-operative Societies:

a. Society Registration certificate from ARCS (Assistant Registrar of Co-operative Societies, GoWB) and By-Laws for Cooperative Societies under West Bengal Co-operative Societies Act, 2006 and Rules, 2011 and all amendments.

b. Latest Auditor's Report of Directorate of Co-operative Audit under Department of Co-operative, Government of West Bengal within preceding five financial years as per Societies Act & Rules.

11.5.3. Eligibility criteria based on Credential of work/Prequalification Work Credential "credential.pdf".

i. Work Order/Award of Contract or the Letter of Acceptance (LoA) duly authenticated by the competent issuing authority is to be submitted under Technical cover (name of file should be "credential.pdf 1).

ii. Pre-Qualification (PQ) credential of one 100% completed work of Gross Notional Value as desired in the NIT as the Credential Certificate (CC) duly authenticated by competent authority. (Name of file should be "credential.pdf 2).

11.5.4. PQ Financial credential: In 'payment certificate.pdf' folder under OID cover.

i. Disqualification during PQ evaluation of financial capability of Agencies shall not be decided during technical documents evaluation by TEC up to work of Rs 45 lakh, as no minimum financial capacity is fixed, except if reveals from documents beyond any doubt of the financial liquidity & bankruptcy of the Agencies, determining absolute incapacity to execute the work.

ii. But, i. 'Payment certificate' of works authenticated by appropriate authority for preceding three Financial Years, or, ii. Valid Income Tax Returns for preceding three FY, or, iii. Audited Profit & Loss Accounts statements of three FY, any one of i, ii, or iii as a complete set for three FY within zone of immediate preceding five FY is to be uploaded in 'payment certificate.pdf' folder under OID cover, else the Agencies may be disqualified. Name, address, contact no. and registration no.

of auditor Firm is desirable for Profit & Loss accounts statement, if submitted.

Note:

a. If the Agencies Company/Firm was set up less than three years ago, audited balance sheets and P/L Accounts for the number of years since inception are to be submitted under Technical cover and the average value would be evaluated only for the period since inception and not three years. Credential Certificate (CC) given as PQ Work Credential may also contain payment certificate and in those cases separate payment certificate is not required.

b. No file in Technical / Pre-Qual cover or OID cover folder is allowed by the system to be kept blank/empty. Where ever the forms and documents are uploaded by the EOI Inviting Authority, the same is to be downloaded, duly filled up, converted to pdf file, and again uploaded after digital signing, forming a part of EOI document. These formats are specimens or samples only and deviation from specimen format is not a sufficient ground for rejection of the documents. Relevant blank Forms are to be firstly downloaded by the Agencies from the NIT in e-Procurement portal, filled up completely and again uploaded with their electronic documents. No offline document is acceptable from Agencies by TEC during evaluation stage.

11.6. Financial proposal / documents under Financial cover:-

To be submitted during LIMITED TENDER INQUIRY (LTI).

11.6.1. Work will be awarded from the empanelled AGENCIESs through LIMITED EOI INQUIRY (LTI).

SOP for Testing of soil samples in Laboratory

(1)

Standard Operating Procedure (SOP) of Soil Mechanics Laboratory

1. Objective:

To ensure safe, accurate, and consistent procedures for testing the engineering properties of soil in the laboratory.

2. Scope: This SOP applies to all personnel performing soil mechanics tests such as:

(i)Moisture content
(ii) Atterberg limits (Liquid Limit, Plastic Limit)
(iii)Grain size analysis
(iv)Proctor compaction test
(v)Permeability test
(vi)Shear strength tests (Direct shear, Triaxial, Unconfined compression)
(vii)Consolidation test

3. Responsibilities:

Lab Instructor/Technician: Ensure equipment calibration, maintenance, and supervision.
Students/Operators: Follow safety guidelines and testing procedures strictly.
Lab Assistant: Assist with equipment setup and sample preparation.

4. Safety Precautions:

- Always wear PPE (lab coat, gloves, safety goggles).
- Handle soil and chemicals (if used) with care.
- Clean up spills immediately.
- Report damaged equipment to the supervisor.
- Wash hands after testing.

5. General Procedure:

(i). Sample Collection and Preparation

- Collect soil sample using standardized methods.
- Store in sealed containers to avoid moisture loss.
- Label samples clearly.

(ii). Equipment Check

- Ensure all equipment is clean and calibrated.
- Check for mechanical or electrical faults.

(iii) Conduct Test

- Follow the specific procedure for each soil test (refer to individual SOPs for each test).
- Record observations and measurements accurately.

(iv) Post-Test Procedure

- Clean all equipment used.
- Store tools and samples properly.

- Dispose of waste materials according to lab rules.

(v) Data Analysis and Reporting

- Analyze the data as per relevant IS (Indian Standards) /ASTM standards (American Society for Testing and Materials)
- Prepare test reports with observations, calculations, and conclusions.

(vi) Documentation:

- Test Data Sheets
- Calibration Records
- Test Reports
- Maintenance Logs

Moisture Content Determination as per IS: 2720 (Part 2)

Moisture Content Determination (Oven Drying Method)

- Objective: To determine the natural moisture content of a soil sample using the oven-drying method.

- Scope: This procedure is applicable to all types of soil samples and is crucial for geotechnical engineering analyses such as compaction, consistency, and classification.

- Apparatus Required:

weighing balance (accuracy 0.01g)
Oven (maintains temperature at 105°C to 110°C)
Moisture content containers with lids
Desiccators
Spatula or scoop
Gloves and safety equipment

- Procedure:

Preparation:

1. Clean and dry the moisture container and weigh it with the lid (W1).
2. Place a representative sample of moist soil into the container.
3. Weigh the container with wet soil and lid (W2).

Drying:

1. Place the container (with soil and lid removed) in a hot air oven at 105°C–110°C.
2. Dry for at least 24 hours (or until a constant weight is achieved).
3. Remove from oven, cover with lid, and cool in a desiccator.

Final Weighing:

Weigh the container with dried soil and lid (W3).

- Calculations:

Moisture content (w), expressed as a percentage, is calculated using:

$w = [(W2 - W3) / (W3 - W1)] \times 100\%$

Where:

W1 = Weight of empty container

W2 = Weight of container + wet soil
W3 = Weight of container + dry soil

- Reporting:

  # Report the moisture content to the nearest 0.1%.
  # Include container number, all weights (W1, W2, W3), and the calculated moisture content.

- References:
  #– Method of Test for Soils

Determination of Atterberg Limits as per IS: 2720 (Part 5)

- Objective: To determine the Liquid Limit (LL) and Plastic Limit (PL) of fine-grained soil for classification and evaluation of its engineering properties.
- Apparatus Required:
  # Casagrande Liquid Limit Device
  # Moisture Containers
  # Grooving Tool (Casagrande type)
  # Desiccator
  # Glass Plate (for rolling threads)
  # Sieve (425 µm)
  # Oven (105°C to 110°C)
  # Balance (accuracy 0.01 g)
  # Spatula

- Sample Preparation:
  1. Take a representative soil sample and air-dry it.
  2. Sieve the sample through a 425 µm IS sieve.
  3. Take about 200 gm of the soil passing through the sieve.
  4. Mix it with distilled water to make a uniform paste.

- **Liquid Limit (LL) Test Procedure:**
  1. Place a portion of the soil paste into the cup of the Liquid Limit device.
  2. Level the surface and cut a groove using the standard grooving tool.
  3. Turn the handle at a rate of 2 revolutions per second.
  4. Count the number of blows until the groove closes over a distance of 10 mm.
  5. Collect a sample from near the closed groove and determine its moisture content.
  6. Repeat the procedure for 3 to 5 trials with varying moisture contents to obtain groove closure between 15 and 35 blows.
- Reporting:

  # Plot a flow curve: Moisture content vs. log(Number of Blows).
  # Determine the Liquid Limit corresponding to 25 blows from the graph.

- **Plastic Limit (PL) Test Procedure:**
  1. Take about 20 gm of the prepared soil paste.
  2. Roll the soil on a glass plate into threads of about 3 mm diameter.
  3. If the thread crumbles at 3 mm, stop rolling and collect the crumbled pieces.
  4. If not, continue drying the soil slightly and repeat.
  5. Determine the moisture content of the crumbled threads.
  6. Repeat for two more portions and take the average.

- Calculations:
  # Liquid Limit (LL): Moisture content corresponding to 25 blows.
  # Plastic Limit (PL): Average moisture content of crumbled threads.
  # Plasticity Index (PI): LL - PL

Grain Size Analysis of Soils as per IS: 2720 (Part 4) :

- Objective: To determine the grain size distribution of soil by sieve analysis (for coarse and medium- grained soils) and hydrometer analysis (for fine-grained soils)

- Apparatus Required:

For Sieve Analysis:
Set of IS Sieves (4.75 mm to 75 μm)
Mechanical sieve shaker
Weighing balance (accurate to 0.01 g)
Oven (105°C to 110°C)
Brushes
Mortar and rubber pestle (if needed)
Sample trays

For Hydrometer Analysis:
Hydrometer (Bouyoucos type)
Sedimentation cylinder (1-liter capacity)
Dispersing agent (sodium hexametaphosphate) # Stirring apparatus
Thermometer

- Sample Preparation:
Obtain a representative soil sample.
Oven-dry the sample at 105–110°C.
Break lumps without crushing individual particles.
Weigh approximately 500 g of soil for sieve analysis and 50 g for hydrometer analysis.

- Sieve Analysis Procedure (for particles > 75 μm):
Stack sieves in decreasing order of size with a pan at the bottom.
Place the oven-dried soil in the top sieve.
Shake the stack mechanically for 10-15 minutes.
Weigh the amount of soil retained on each sieve.
Calculate the percentage passing and retained on each sieve.

Plot grain size distribution curve (particle size vs % finer).

- Hydrometer Analysis Procedure (for particles < 75 μm):

Soak 50 g of soil in water with 5 mL dispersing agent for 12-16 hours.
Transfer to a sedimentation cylinder and make up to 1 liter.
Stir the suspension thoroughly using a mechanical stirrer.
Record hydrometer readings and temperature at regular intervals (e.g., 0.5, 1, 2, 4, 8, 15, 30, 60, 120 minutes).
Apply corrections for meniscus, temperature, and dispersing agent.
Calculate particle sizes and % finer using standard formulae.

- Calculations:

% Retained = (Weight retained / Total sample weight) x 100
% Finer = 100 - Cumulative % Retained
Use hydrometer equations for fine particles (based on Stokes' Law).

- Results Presentation:

Plot grain size distribution curve (log scale for particle size vs % finer).
Identify D_{10}, D_{30}, D_{60} for classification.
Compute Uniformity Coefficient (*Cu*) and Coefficient of Curvature (*Cc*).

Proctor Compaction Test (Light and Heavy) as per IS: 2720 (Part 7 & 8) :

- Objective: To determine the Optimum Moisture Content (OMC) and Maximum Dry Density (MDD) of soil by conducting the Proctor Compaction Test using light and heavy compaction methods

- Apparatus Required:

Proctor Compaction Mould (1000 cc capacity with collar and base plate)
Rammer (2.6 kg for light; 4.9 kg for heavy compaction)
Drop height (310 mm for light; 450 mm for heavy compaction)
Oven (105–110°C)
Weighing balance (accuracy 1 g)
Straight edge
Spatula
Mixing tray
Moisture content containers

- Sample Preparation:

Take around 3 to 5 kg of air-dried soil.
Pulverize and sieve through 4.75 mm IS sieve.
Divide into five portions and mix each with increasing water content (around 2-3% increment).

- Test Procedure:

Grease the inside of the mould and assemble it with the base plate and collar.
Fill the mould in three equal layers (for light) or five layers (for heavy), compacting each layer with 25 blows using the appropriate rammer.

Remove collar and trim excess soil to level with mould top.
Weigh the mould with compacted soil.
Remove soil and take a sample for moisture content.
Repeat the procedure for other moisture contents.

- Calculations:
  # Bulk Density (g/cc) = (Weight of compacted soil - Weight of mould) / Volume of mould
  # Moisture Content (%) = (Weight of water / Weight of dry soil) x 100
  # Dry Density (g/cc) = Bulk Density / (1 + Moisture Content)

- Result Interpretation:
  # Plot Moisture Content vs Dry Density curve.
  # Identify the peak point as Maximum Dry Density (MDD) and corresponding moisture as Optimum Moisture Content (OMC).

Permeability Test as per(IS: 2720 Part 17 - 1986)

- Objective: To determine the coefficient of permeability of a soil sample using Constant head & Falling head methods
- Apparatus Required:
  For Constant Head Method (Coarse-Grained Soils):
  # Permeameter apparatus
  # Constant head water reservoir
  # Measuring flask
  # Stopwatch
  # Balance
  # Thermometer
  # Thermostatically controlled water bath (if needed)
  # Soil sample and compaction tools (for remoulded samples)

- For Falling Head Method (Fine-Grained Soils):
  # Standpipe with graduated scale
  # Permeameter cylinder
  # Connecting rubber tubing
  # Thermometer
  # Stopwatch
  # Measuring scale

- Sample Preparation:
  # Undisturbed Samples: Extract sample carefully using cutting rings to maintain structure.
  #Remoulded Samples: Prepare the soil at required moisture content and density (as per IS: 2720 Part 7 or 8), and compact in layers inside the permeameter mould.

- Saturation: Saturate the sample by applying back pressure or letting water percolate through the sample over time, ensuring removal of entrapped air.

- Test Procedure:

Constant Head Method (For $k > 10^{-3}$ cm/s; usually sands and gravels)

1. Connect the permeameter to a constant head reservoir.
2. Open the outlet and allow water to flow through until steady flow is established.

Measure:

(i) Volume of water collected (Q)
(ii) Time (t)
(iii) Length of sample (L)
(iv) Head difference (h)
(v) Cross-sectional area of soil sample (A)
Repeat readings for consistency.

Falling Head Method (For $k < 10^{-3}$ cm/s; usually silts and clays)

1. Connect the standpipe to the permeameter and fill with water to initial head (h_1).
2. Allow water to flow through the sample and start the stopwatch.
3. Record time taken for head to fall to final head (h_2).

Measure:

(i) Cross-sectional area of the standpipe (a)
(ii) (ii) Cross-sectional area of the soil sample (A)
(iii) Length of the soil sample (L)
(iv) (iv) Time interval (t)

Calculations:

Constant Head Method:

$$k = \frac{Q.L}{A.h.t}$$

Falling Head Method:

$$k = \frac{a.L}{A.t} \log_e \frac{h1}{h2}$$

Where: k = Coefficient of permeability (cm/s); Q = Volume of water collected (cm^3)
L = Length of soil sample (cm); A = Cross-sectional area of the sample (cm^2)
A = Cross-sectional area of the standpipe (cm^2); t = Time (s)
h_1= Hydraulic head (cm) (initial) and h_2= Hydraulic head (cm) (final)

- Reporting:

(i) Report method used (constant/falling head)
(ii) Soil description (grain size, dry density, moisture content)
(iii) Test temperature
(iv) Average permeability coefficient
(v) Corrections if required for temperature (reference temp: 27°C)

-

Shear Strength Test of Soil (As per IS: 2720)

Applicable IS Codes:
IS: 2720 (Part 13) – 1986: Direct Shear Test
IS: 2720 (Part 10) – 1991: Unconfined Compression Test
IS: 2720 (Part 11) – 1993: Triaxial Compression Test (optional)

- Objective: To determine the shear strength parameters (cohesion C and angle of internal friction φ) of a soil sample using laboratory methods in accordance with IS: 2720 standards.

- Apparatus Required:

For Direct Shear Test:

Direct shear box apparatus
#Proving ring/load cell
Dial gauges (vertical and horizontal)
Weights for normal load
Soil sample (undisturbed or remoulded)
Water supply (for saturated tests)

For Unconfined Compression Test:

Unconfined compression machine (with proving ring or load cell)
Dial gauge for deformation
Sample trimming tools
Vernier calliper
Balance
Soil sample (cohesive soils only)

- Sample Preparation:

1. Undisturbed Sample: Extract using core cutter or sampling tube.
2. Remoulded Sample: Prepare at required moisture content and density as per IS: 2720 Part 7 or 8.
3. Trimming: Ensure correct dimensions—e.g., for UCC test, height to diameter ratio of 2:1.

- Test Procedure:

Direct Shear Test (IS: 2720 Part 13 – 1986):

1. Place the soil sample in the shear box (usually 60 mm x 60 mm x 25 mm).
2. Apply the required normal load using weights.
3. Allow consolidation (if needed).
4. Apply horizontal shear load at constant strain rate (typically 1.25 mm/min).
5. Record shear force and horizontal displacement until failure.
6. Repeat for at least three different normal stresses.

Unconfined Compression Test (IS: 2720 Part 10 – 1991):

1. Measure initial dimensions and weight of the cylindrical specimen.
2. Place the specimen in the loading device.

3. Apply axial load at a constant strain rate (typically 0.5–2%/min).
4. Record load and deformation at regular intervals until failure.
5. Note peak load and corresponding strain.

- Calculations:

Direct Shear Test:

Shear stress, $T = \frac{Shear\ force\ at\ failure}{Area\ of\ shaer\ box}$

$$\sigma = \frac{Normal\ load}{Area\ of\ shear\ box}$$

Unconfined Compression Test:

Axial strain (%), $\varepsilon = \frac{\Delta L}{L0} \times 100$

$$q_u = \frac{P}{A} \quad \text{where} \quad A = \frac{A0}{1-\varepsilon}$$

Shear strength (S) = $\frac{qu}{2}$

- Reporting:

(i) Test type and IS reference
(ii) Soil type and preparation method
(iii) Sample dimensions
(iv) Applied loads and corresponding stresses
(v) Shear strength values (c and φ for DST; qu and S for UCC)
(vi) Moisture content and dry density of sample
(vi) Stress-strain or shear stress-normal stress graphs

Triaxial Compression Test (As per IS: 2720 Part 11 – 1993)

- Objective:To determine the shear strength parameters (cohesion c and angle of internal friction φ) of soil under controlled drainage and loading conditions using a triaxial compression test.
- Types of Triaxial Tests:
  (i) Unconsolidated Undrained (UU): No drainage, no consolidation
  (ii)Consolidated Undrained (CU): Consolidation allowed, no drainage during shear
  (iii) Consolidated Drained (CD): Consolidation and drainage allowed
- Apparatus Required:
  # Triaxial compression cell with loading frame
  # Specimen mould (typically 38 mm diameter, 76 mm height)
  # Porous stones, filter paper, rubber membrane
  # De-airing system and vacuum pump
  # Pressure panel (for cell pressure and back pressure)
  # Dial gauges or LVDTs
  # Proving ring or load cell
  # Stopwatch
  # Thermometer
  # Water bath (for temperature control)
- Sample Preparation:
  1. Undisturbed Sample: Carefully trim to cylindrical shape using a sampler or cutting

tool.

2. Remoulded Sample: Compact soil at desired moisture content and density.
3. Place specimen between porous stones and enclose it in a rubber membrane using a membrane stretcher.
4. Mount the sample in the triaxial cell.

- Test Procedure (General Steps):

A) Saturation:

1. Apply back pressure and cell pressure gradually to ensure full saturation.
2. Confirm saturation by measuring B-value (>0.95 preferred).

B) Consolidation:

1) Apply the required confining pressure (σ_3) and allow sample to consolidate (only in CU/CD tests).
2) Wait until volume change or pore pressure stabilizes.

- Shearing:

Apply axial load at a constant rate of strain (typically 0.5–2%/min).
Record:
(i) Axial load
(ii) Axial deformation
(iii) Pore water pressure (if measured)

- Continue until sample fails or 20% axial strain is reached.
- Calculations:

Total Stresses:

Deviator stress: $\sigma_d = \sigma_1 - \sigma_3$

$\sigma_1 = \sigma_3 + P/A$

Corrected Area: $A = = \frac{A0}{1-\varepsilon}$

Effective Stresses (for CU/CD tests):

Effective stress:

$\sigma'_1 = \sigma_1 - u$, $\sigma'_3 = \sigma_3 - u$

- Shear Strength Parameters:

Plot Mohr's circles for failure
Draw best-fit line (Mohr-Coulomb envelope)
Determine cohesion (c) and angle of internal friction (φ)

7. Reporting:

Soil type and condition (undisturbed/remoulded)
Type of triaxial test (UU, CU, CD)
Dimensions and water content of sample
Confining pressure, deviator stress, pore pressure (if applicable)
#Stress-strain and pore pressure graphs
Mohr's circles and shear strength parameters (c, φ)
Mode of failure (brittle, ductile)

Consolidation Test (As per IS: 2720 Part 15 – 1986):

- Objective: To determine the rate and magnitude of consolidation of a saturated soil sample under controlled loading conditions and obtain parameters like coefficient of consolidation (Cv), compression index (Cc), and coefficient of volume compressibility (mv).

- Apparatus Required:
  # Consolidation apparatus with loading frame
  # Consolidation cell with fixed or floating ring
  # Porous stones
  # Dial gauge (least count 0.01 mm)
  # Water reservoir
  # Weighing balance
  # Stopwatch
  #Oven
  # Soil trimming tools
  # Filter papers
  # Sample extractor

- Sample Preparation:
  Undisturbed Sample: Extract using a thin-walled sampler and trim to fit the consolidation ring (typical size: 60 mm diameter, 20 mm height).
  Remoulded Sample:
  (i) Compact soil in ring at required moisture content and density.
  (ii) Ensure sample is flush with both faces of the ring.
  (iii) Place filter papers and porous stones above and below the sample.

- Test Procedure:

A) Assembly and Saturation:

1. Assemble the consolidation cell with the sample, porous stones, and filter papers.
2. Immerse the cell in water and allow saturation (typically 24 hours).

B) Loading:

1. Place the assembly in the loading frame.
2. Apply a seating load (typically 5 kPa) for 5–10 minutes.
3. Apply load in geometric progression (e.g., 5, 10, 20, 40, 80, 160, 320 kPa).
4. For each load increment: Record deformation readings with time (e.g., at 0, 0.25, 1, 2.25, 4, 6.25, 9, 12.25, 16, 25, 36, 49, 64, 81, 100 minutes). Continue until primary consolidation is complete (typically 24 hours).
5. Reduce load in similar steps and observe rebound for 24 hours.

C. Post-Test:

1. Carefully remove the specimen.
2. Determine the final water content by oven drying.

- Calculations:

A. Settlement:

Plot compression (dial reading or strain) vs. log time and square root of time.
Determine initial height, final height, and consolidation settlement (ΔH).

B. Void Ratio (e):

$$e = \frac{H.w.G}{100}$$

C. Compression Index (Cc):

$$C_c = \frac{\Delta e}{\log(\frac{\sigma 2}{\sigma 1})}$$

D. Coefficient of Volume Compressibility (mv):

$$m_v = \frac{\Delta e}{(1+e_0).\Delta\sigma}$$

E. Coefficient of Consolidation (Cv):

From square root of time plot:

$$C_v = \frac{T_{v.}\ H_d^2}{t}$$

where, T_v = time factor (≈ 0.197 for 50% consolidation); H_d = drainage path (typically H/2 for double drainage); t = time for 50% consolidation

- Reporting:

1) Soil description
2) Sample dimensions
3) Initial and final water content
4) Load vs. settlement data
5) e-log σ plot
6) Cc, mv, Cv values
7) Consolidation settlement curve

Detailed list of common instruments used in a Soil Mechanics Laboratory along with their standard specifications (as per IS: 2720 series and typical field labs):

1. Core Cutter:

Use: For in-situ bulk density determination
IS Code: IS: 2720 (Part 29)
Material: Mild steel or galvanized iron
Dimensions: 100 mm internal diameter, 130 mm length
Accessories: Dolly, steel rammer (2.5 kg)

2. Proctor Compaction Apparatus:

Use: To determine optimum moisture content and maximum dry density
IS Code: IS: 2720 (Part 7 & 8)
Compaction Moulds: 1000 cm³ or 2250 cm³ volume
Light Compaction: 2.6 kg rammer, 310 mm drop
Heavy Compaction: 4.89 kg rammer, 450 mm drop
Material: Gunmetal mold with detachable collar

3. Liquid Limit Device (Casagrande Apparatus) :

Use: To determine liquid limit
IS Code: IS: 2720 (Part 5)
Cup Material: Brass or hard rubber
Grooving Tools: Standard and ASTM type
Drop Height: 10 mm (adjustable crank)

4. Plastic Limit Apparatus:

Use: For plastic limit determination
IS Code: IS: 2720 (Part 5)
Components: Glass plate (300 × 300 mm), spatula, moisture containers, oven

6. Direct Shear Test Apparatus:

IS Code: IS: 2720 (Part 13)
Shear Box Size: 60 mm × 60 mm × 25 mm (standard)
Proving Ring: 0.1 – 2 kN capacity
Dial Gauges: 0.01 mm least count
Motorized strain rate: 1.25 mm/min (typical)

7. Triaxial Shear Test Apparatus :

IS Code: IS: 2720 (Part 11)
Specimen Size: 38 mm dia × 76 mm height (standard), larger sizes optional
Cell Pressure Range: 0 – 10 kg/cm²
Axial Load Capacity: Up to 5 kN or 50 kN
Pore Pressure Measurement: Bourdon gauge or pressure transducer

8. Unconfined Compression Test Apparatus:

IS Code: IS: 2720 (Part 10)
Loading Frame: Manual or motorized
Dial Gauge: 0.01 mm least count
Load Measuring: Proving ring or load cell
Specimen Size: 38 mm dia × 76 mm height

9. Permeability Apparatus:

IS Code: IS: 2720 (Part 17)
For Coarse Soils: Constant Head Permeameter
For Fine Soils: Falling Head Permeameter
Specimen Molds: 100 mm height × 100 mm dia or standard compaction molds
Standpipes: Graduated, 6–10 mm diameter

10. Consolidation Apparatus:

IS Code: IS: 2720 (Part 15)
Specimen Size: 60 mm dia × 20 mm height
Load Frame: Up to 10 kg/cm²
Dial Gauge: 0.01 mm least count

Accessories: Water reservoir, filter papers, porous stones

11. Sieve Analysis Set:

IS Code: IS: 2720 (Part 4)
Sieves: 4.75 mm to 75 micron (IS sieves)
Shaker: Motorized with timer
Pan and Lid: Stainless steel

12. Hydrometer Analysis Set :

IS Code: IS: 2720 (Part 4)
Hydrometers: ASTM 152H type
Sedimentation Cylinder: 1-liter capacity, graduated
Thermometer: 0–50°C
Dispersing Agent: Sodium hexametaphosphate

13. Pycnometer :

Use: Specific gravity determination
IS Code: IS: 2720 (Part 3)
Capacity: 1 liter for coarse soils; 50–100 ml for fine soils
Material: Borosilicate glass or plastic

14. Oven:

Use: Drying samples
Temperature Range: Ambient to 110°C
Capacity: 50–200 liters (lab scale)
Type: Thermostatically controlled

15. Electronic/Analytical Balance:

Capacity: Up to 5 kg
Accuracy: 0.01 g or better
Pan Material: Stainless steel

Forms

[On letterhead of the Agencies]

Annexure-I

From

[Name of Agencies]

[Address of Agencies]

Date: [insert date], 2025

To

The Director,
River Research Institute,
Irrigation & Waterways Directorate, GoWB,
Mohanpur, Nadia.
e-mail: dir.rri@gmail.com

Sub: Application Form for empanelment of the **"EMPANELMENT OF AGENCIES FOR SOIL EXPLORATION, TESTING AND PREPARATION OF REPORT FOR DIFFERENT ENGINEERING WORKS AT DIFFERENT LOCATIONS UNDER IRRIGATION AND WATERWAYS DEPARTMENT, Govt. OF W.B."** for a period of three (3) years.

Dear Sir,

I, [insert name] as [insert designated title] of [insert name of organisation] at [insert location of business] and being the authorized signatory of the Firm, do hereby declare and undertake that I have read the EOI Documents for empanelment for the work of **"EMPANELMENT OF AGENCIES FOR SOIL EXPLORATION, TESTING AND PREPARATION OF REPORT FOR DIFFERENT ENGINEERING WORKS AT DIFFERENT LOCATIONS UNDER IRRIGATION AND WATERWAYS DEPARTMENT, Govt. OF W.B."** for a period of three (3) years.

I hereby submit detailed information regarding eligibility of my organisation to run the service.

1. Name of the Organization:
2. Status of the Organization: Limited Co./Private Limited Co./ Partnership Firm/Proprietorship Firm /NGO /Trust/Others (specify):
3. Nature of Business/Activities of the Applicant:
   a.
   b.
   c.
   d.
4. Complete address:
5. Phone & Fax number:
6. E-Mail ID:
7. Web site (if any):

8. Registration details of the Organization: (Registered under the Company's act/ Society act etc.)
9. Number of years of experience in collection of Soil sample data:
10. Date of validity of Trade Licence (From the state of West Bengal only):
11. Average Annual turnover of the Organization for the last five financial years (Average of any three year during the last five year ending March 2025.
12. Make and model of the instruments used for collection of Soil sample data (As per Sl. No. 1, for which this application is being made):
13. Man Power of the organisation (Mention the date of appointment and EPF registration number of each employee).
    a. Engineer (Minimum Qualification is Graduation in Civil Engineering from any recognised institute).
    b. Laboratory Assistant (Minimum Qualification is Diploma in Civil Engineering or equivalent).
    c. Other Technical Staff
    d. Total
14. Experience in soil exploration work (in years) of each Engineer, or Other Technical staff. (Experience certificate from any gazetted or Group A officer for one or more works is to be produced, which were undertaken in the past five years in any Govt. organisation).
15. Completion Certificate of all works executed during the last five years (As per Sl. No. 1, for which this application is being made).

(All the documents in support of this application must be uploaded in the specified space of NIC.).

[Signature]

Dated this day of……, 2025
In the capacity of [Position]

Duly authorized to sign this document for and on behalf of [Name of Firm].

(DIGITAL SIGNATURE OF BIDDER)

[On the letter head of the Organization]

Annexure II

From [Name of Agencies]

[Address of Agencies]

Date: [insert date], 2025

To

The Director,
River Research Institute,
Irrigation & Waterways Directorate, GoWB,
Mohanpur, Nadia.
e-mail: dir.rri@gmail.com

Declaration

This is to confirm that no litigation is pending on date and no penal measures were taken against the Organization or their CEOs/Partners/managers under applicable Acts and laws'.

[Signature]

Dated this day of……, 2025
In the capacity of [Position]

Duly authorized to sign this document for and on behalf of [Name of Firm].

(DIGITAL SIGNATURE OF BIDDER)

[On letterhead of the Organisation]

Annexure III

(Format for Undertaking regarding compliance with Terms of Service)

From [Name of Agencies]

[Address of Agencies]

Date: [insert date], 2025

To

The Director,
River Research Institute,
Irrigation & Waterways Directorate, GoWB,
Mohanpur, Nadia.
e-mail: dir.rri@gmail.com

Dear Sir,

Sub: Undertaking Regarding Compliance with Terms of Service.

I, [insert name] designated as [insert designated title] of [insert name of the Firm] at [insert location of business] and being the authorized signatory of the Firm, do hereby declare and undertake that I have read the EOI Documents for empanelment for the work of **"EMPANELMENT OF AGENCIES FOR SOIL EXPLORATION, TESTING AND PREPARATION OF REPORT FOR DIFFERENT ENGINEERING WORKS AT DIFFERENT LOCATIONS UNDER IRRIGATION AND WATERWAYS DEPARTMENT, Govt. OF W.B."** for a period of three (3) years.

I hereby undertake and explicitly agree that if we are empanelled as a successful Firm, we shall adhere to and comply with the terms of the Service as set out in the EOI Documents and the Contract.

[Signature]

Dated this day of …….. , 2025
In the capacity of [Position]

Duly authorized to sign this document for and on behalf of [Name of Firm]

(DIGITAL SIGNATURE OF BIDDER)

[On letterhead of the Agencies]

Annexure IV

(Format for Undertaking regarding use of qualified Manpower for the Service)

From [Name of Agencies]

[Address of Agencies]

Date: [insert date], 2025

To

The Director,
River Research Institute,
Irrigation & Waterways Directorate, GoWB,
Mohanpur, Nadia.
e-mail: dir.rri@gmail.com

Dear Sir,

Sub: Undertaking Regarding use of qualified Manpower for the Service.

I, [insert name] designated as [insert designated title] of [insert name of Organisation] at [insert location of business] and being the authorized signatory of the Agencies, do hereby declare and undertake that I have read the EOI Documents for empanelment of the work of **"EMPANELMENT OF AGENCIES FOR SOIL EXPLORATION, TESTING AND PREPARATION OF REPORT FOR DIFFERENT ENGINEERING WORKS AT DIFFERENT LOCATIONS UNDER IRRIGATION AND WATERWAYS DEPARTMENT, Govt. OF W.B."** for a period of three (3) years.

I hereby undertake and explicitly agree that if we are selected as a successful Firm, we shall only appoint those manpower that meet the criteria specified in the EOI Documents.

[Signature]
Dated this day of …….., 2025.

In the capacity of [Position]

Duly authorized to sign this document for and on behalf of [Name of Agencies].

(DIGITAL SIGNATURE OF BIDDER)

[On letterhead of the Agencies]

Annexure V (Form – 2 of 2911)

(Format for undertaking Declaration against Common Interest)

From [Name of Agencies]

[Address of Agencies]

Date: [insert date], 2025

To

The Director,
River Research Institute,
Irrigation & Waterways Directorate, GoWB,
Mohanpur, Nadia.
e-mail: dir.rri@gmail.com

Dear Sir,

Sub: Declaration against common interest.

I/We, Sri/Smt. _____ , the authorized signatory on behalf of ..... do hereby affirm that I/We/any of the member of..... bidding for the EOI do not have any common interest either as a partner in any other partnership firm /consortium/Joint Venture or as Proprietor / Principal Share Holder of any other Firm/Company in the same serial for the work I / we want to participate.

Dated this _____ day of _____ 20___

Full name of Bidder / Contractor: _____

Authorised Signatory: _____

In the capacity of: _____

Duly authorized to sign bid

for & on behalf of (Name of Firm): _____

(In block Capital letters or typed)

Office address with seal: .....

Telephone no(s) (office): _____

Mobile No: _____

Fax No: _____

E mail ID: _____

*In case of Joint Venture & Consortium the Lead Member to submit this format.

(DIGITAL SIGNATURE OF BIDDER)

[On letterhead of the Agencies]

Annexure VI (Form – 4 of 2911)

(Declaration on antecedents and performance)

From [Name of Agencies]

[Address of Agencies]

Date: [insert date], 2025

To

The Director,
River Research Institute,
Irrigation & Waterways Directorate, GoWB,
Mohanpur, Nadia.
e-mail: dir.rri@gmail.com

Dear Sir,

I/We, Sri/Smt. _____ , the authorized signatory on behalf of ..... do hereby affirm that I/We/any of the member of..... bidding against EOI are not black listed suspended or debarred from participation in State Government procurements and tenders in the Irrigation & Waterways Directorate, Government of West Bengal, other Departments of the State Government and Government of India on the date of publication of this Notice Inviting Tender (NIT).

If at a later stage this submission (undertaking) is found incorrect, the bidder company along with all its constituent members/owners/partners would be liable to penal actions as decided by the Government under the law.

Dated this _____ day of _____ 20___

Full name of Bidder / Contractor: _____

Authorised Signatory: _____

In the capacity of: _____

Duly authorized to sign bid

for & on behalf of (Name of Firm): _____

(In block Capital letters or typed)

Office address with seal: .....

Telephone no(s) (office): _____

Mobile No: _____

Fax No: _____

E mail ID: _____

(DIGITAL SIGNATURE OF BIDDER)

Memo No: 518 /1(12) ***Date: 22.04.2025***

Copy for information & wide Circulation to the:-

1. The Chief Engineer (D & R), I & W Directorate, Govt. of WB, Jalasampad Bhawan, Salt Lake, Kolkata-91.
2. Executive Engineer (SDP), RRI, HCL, Mohanpur, Nadia, WB.
3. Deputy Director (Hyd.), RRI, HCL, Mohanpur, Nadia, WB.
4. Deputy Director (Engg.), RRI, HCL, Mohanpur, Nadia, WB.
5. Sub-Divisional Officer, Sub-Division No.-I, RRI, HCL, Mohanpur, Nadia, WB.
6. Sub-Divisional Officer, Sub-Division No.-II, RRI, HCL, Mohanpur, Nadia, WB.
7. Assistant Engineer/SDP, RRI, HCL, Mohanpur, Nadia, WB.
8. Assistant Engineer/BR, RRI, HCL, Mohanpur, Nadia, WB.
9. Divisional Accountant, R.R.I., HCL, Nadia.
10. Divisional Estimator, R.R.I., HCL, Nadia.
11. Notice Board, R.R.I., HCL.
12. Office Copy.

SD/-
Director
River Research Institute, WB
Irrigation & Waterways Directorate
Government of West Bengal