ITI LIMITED

Network Systems Unit
(A Govt. of India Undertaking)
Dooravaninagar. P.O. Bengaluru – 560 016
Tel : 080 - 25660613, 25660507, 25660514
www.itiltd.in
civil_nsu@itiltd.co.in

CIVIL ENGINEERING DEPARTMENT

Tender for Soil Investigation Works for Design of Foundations for Buildings & Towers
(Two Bid System)

Tender No. NSU/CIVIL/ASC-4/Soil/01/141 Date: 16.04.2021

The fee for this tender document is Rs. 1,000/- (One thousand Rupees only) [Inclusive of GST] non-refundable.

Sealed tenders will be received up to 11.00 hrs. and opened at 11.30 hrs. on 27-04-2021

at

The Office of Deputy General Manager (Civil)
I T I LIMITED
Network Systems Unit, F-100
Dooravaninagar P.O, Bengaluru - 560 016.

INDEX OF CONTENTS

NOTE: COUNTER/CONDITIONAL OFFERS IF MADE WILL NOT BE ACCEPTED AND WILL BE REJECTED

Tenderer:

Shri./M/s…..……...
……..……

To,
M/s. ITI Limited,
Network Systems Unit,
F-100 Building (GF), Dooravaninagar,
Bangalore - 560 016.

TENDER FOR SOIL INVESTIGATION WORKS FOR DESIGN OF FOUNDATION FOR BUILDINGS &TOWERS

Dear Sir,

I/We have read and examined the following documents relating to the above works for the Communication Project.

a. General notice & intimation to tenderer.

b. Specifications, Bill/Schedule of Quantities, Schedule of rates & Special conditions.

c. Drawings (Indicative for the tender purpose only)

d. General conditions of contract including Contractor's Labour Regulations, Model Rules for Labour Welfare and Safety Code appended to these conditions together with the amendments thereto

I/We hereby tender for execution of the works referred to in the aforesaid document upon the terms and conditions contained or referred to therein and in accordance in all respects with the specifications, designs, drawings and other relevant details at the rates contained in schedule of rates and within the period(s) of completion as stipulated for the total sum of Rs. ----------

In consideration of I/We being invited to tender, I/We agree to keep the tender open for acceptance for 120 days from the date of opening of price bid thereof and not to make any modification in its terms and conditions which are not acceptable to the Company.

A sum of Rs.---------- is hereby forwarded in Bank Draft / Banker's Pay Order as earnest money. If we fail to keep the tender open as aforesaid or make any modifications in the terms and conditions of the tender which are not acceptable to the Company, I/We agree that the Company shall without prejudice to any other right or remedy be at liberty to forfeit the full earnest money absolutely.

Should this tender be accepted, I/We hereby agree to abide by and fulfill all the terms, conditions and provision of the aforesaid documents.

I/We further agree that in case my/our tender is accepted, to deposit the additional Security amount of 3% in the form of Bank Guarantee/Performance Security Deposit in accordance with the general terms and conditions enclosed herewith.

If, after the tender is accepted, I/We fail to commence the execution of the works as provided in the conditions, I/We agree that the Company shall without prejudice to any of their right or remedy be at liberty to forfeit the said total earnest money absolutely i.e. Rs. ----------

I/We attach herewith statement showing the details of works carried out for reference and to substantiate my/our experience and capacity to carry the work on tender.

Our Bankers are**.....**
.....

I/We also undertake to complete all works and handover the same in a satisfactory manner to the Company or their authorized representatives **within the stipulated time stipulated in the NIT** from 15th day of the issue of order to start the works.

I/We understand and note that the decision to entrust the above to the lowest tenderer or otherwise rests with the Company.

Yours Faithfully,

(CONTRACTOR/S)

Address:

Dated:

Signed in the presence of

1. Witness**.....**

   Address**.....**

   Date:**.....**

2. Witness**.....**

   Address **.....**

   Date:**.....**

LIST OF IMPORTANT DATES

. No.	DESCRIPTION	INFORMATION
1	REFERENCE NO. OF TENDER DOCUMENT	Tender No. NSU/CIVIL/ASC-4/Soil/001/141
2	DATE OF UPLOADING OF TENDER DOCUMENT	16-04-2021
3	LAST DATE & TIME FOR SUBMISSION OF BIDS	27-04-2021 before 11:00AM
4	DATE & TIME OF OPENING OF TECHNICAL BIDS	27-04-2021 at 11:30AM
5	OPENING OF FINANCIAL BIDS	WILL BE INTIMATED LATER
6	COST OF TENDER DOCUMENT	Rs. 1000/-
7	EARNEST MONEY DEPOSIT (EMD) IN THE FORM OF DEMAND DRAFT/ BANKERS CHEQUE.	Refer Price Bid-Part-II
8	PRE-BID MEETING	20-04-2021 from 11 AM to 13 Hrs. at the office of Deputy General-Civil, NS unit F-100, Bengaluru – 560016.
9	FINANCIALTURNOVER	Refer –Price Bid Part-II
10	SECURITY DEPOSIT	10% OF THE CONTRACT VALUE [3% performance guarantee included]
11	PERFORMANCE GUARANTEE	3% OF CONTRACT VALUE
12	SOLVENCY CERTIFICATE VALUE	Refer – Price Bid Part-II
13	ADDRESS FOR BID SUBMISSION	DEPUTY GENERAL MANAGER-CIVIL, F-100 UNIT, DOORVANINAGAR, BENGALURU 560 016
14	VALIDITY	120 DAYS FROM THE DATE OF OPENING PRICE BID
15	ESTIMATED COST OF WORK	Rs.4,35,000.00

Note: The tender documents can be downloaded from Company web site www.itiltd.in and from government portal eprocure.gov.in

Corrigendum: Any corrigendum/addendum/errata in respect of the above tender shall be made available only at our official website www.itiltd.in.No further press advertisement will be given. Hence, all bidders are advised to check ITI ltd website www.itiltd.in regularly.
Documents submitted in connection with Pre-Qualification will be treated confidential and will not be returned.

NOTICE INVITING TENDER

Sealed Offers are invited from Geotechnical/Soil Investigation firms for providing Geotechnical consultation for a proposed Communication Project of the Company which will be spread over Northern India, Western India & North Eastern India.

The tenders are invited in TWO BIDS, consisting of Technical Bid (Part-A) and Price/ Commercial Bid (Part-B).

Part-A. The Technical Bid without the Price/Rate shall contain the following details

a. Bidder's Profile
b. Complete Tender document with acceptance of all the terms & conditions indicated therein
c. Power of attorney in the case an authorized representative has signed the tender.
d. Earnest Money Deposit (EMD) as specified in the Price Bid. No interest shall be allowed on the earnest money deposited by the Tenderer. The Earnest Money of the unsuccessful tenderer will be refunded within a reasonable period of time without interest.
e. The cost of tender document of Rs 1,000/- (Non-refundable) shall be payable by DD/Pay Order. Bidders can download the tender documents from our website **www.itiltd.in**
f. List of completed works as per **Annexure-6**
g. All the required documents in support of the eligibility criteria to be submitted.

Part-B [Commercial bid] Only duly filled up Part-II in a separate sealed cover. The rates quoted should be in figures as well as in words.

Both Part – A & Part – B should be enclosed in a sealed cover and clearly super scribed with the tender and bidder's details.

A- ELIGIBILITY CONDITIONS FOR THE BIDDERS

MINIMUM ELIGIBILITY CRITERIA FOR PARTICIPATION IN THE TENDER

1. **ELIGIBILITY CRITERIAFOR PARTICIPATING IN THE TENDER**: Agencies with relevant experience in the field of Geotechnical/Soil Investigation and having Government approved accredited laboratory facility. Agencies empanelled with ITI/experience of working with CPWD, Railways, MES, Department of Post, State PWDs State/Central PSUs and semi government organizations preferred.Government Engineering Colleges or Institute fulfilling the above criteria are also eligible.

   Agencies/Contractors have to submit along with the tender, the photocopy of completion certificates issued by the clients in support of having completed similar works during the last five [05] years. Eligible Agencies/contractors can download the tender documents and submit the tender in a hard copy signed on all pages, on or before the time and date specified in the Notice inviting Tender.

2. FINANCIAL STRENGTH:

a) The average annual financial turnover for the last 3 years shall be as specified intender. The requisite Turnover shall be duly certified by a Chartered Accountant with his seal/Signatures and registration number.

b) Net worth of the Company as on 31st March of the Previous Financial year should be positive.

c) Bank Solvency Certificate issued from nationalized or any schedule Bank should be at least of the value specified in the Price Bid. The certificate should have been issued on or after 01.10.2020.

3. Even though the bidders meet the above qualifying criteria, they are subject to be disqualified if they have:

a] Made misleading or false representation in the forms, statements, affidavits, and attachments submitted in proof of the qualification requirements, and or record of submission of any false/fake documents.

b] Record of poor performance such as abandoning the works, not properly completing the contract, inordinate delays in completion, litigation history, or financial failures, etc.,

c] Participated in the previous bidding for the same work and had quoted unreasonably high or low bid prices and could not furnish rational justification for it to the Employer.

4. The bid for the works shall remain open for acceptance for a period **of 120 days** from the date of opening of Price Bid. In case any Tenderer withdraws his bid before the said period or issue of letter of acceptance, whichever is earlier, or makes any modifications in the terms and conditions of the bid which are not acceptable to the ITI Ltd., then the ITI Ltd. shall, without prejudice to any other right or remedy, be at liberty to forfeit the said earnest money as aforesaid. Further, the Tenderers shall not be allowed to participate in the re-bidding process of work.

5. The acceptance of any or all tender(s) will rest with the ITI Ltd. who does not bind itself to accept the lowest tender and reserves to itself the right to reject any or all of the tenders received without assigning any reason thereof.

6. On acceptance of the tender, the name of the accredited representative(s) of the bidder who would be responsible for taking instructions from Engineer-in-Charge or its authorized representative shall be intimated within 07 days of the issue date of the letter of award by ITI.

7. Date of Start of work shall be reckoned from the 15th day after the issue of the Letter of Award by the ITI.

8. Joint venture/Consortia of firms /Companies shall not be allowed and the bidders should meet the criteria themselves.

9. The award of geological survey work, execution and completion of work shall be governed by tender documents consisting of (but not limited to) Letter of Award/ Work Order, Price bid, Special Conditions of Contract, General Conditions of Contract, etc. The Tenderers shall be deemed to have gone through the various conditions while making/preparing their technical & financial proposals & submitting the Bid(s) including site conditions, topography

of the land, accessibility etc. or any other condition which in the opinion of Tenderers will affect his price/rates before quoting their rates.

The offers along with the tender document with terms& conditions duly signed and super scribed with “Tender for Soil Investigation works for design of foundation for buildings and towers” along with Tender Reference should be addressed to the Deputy General Manager-Civil, ITI Limited, NS Unit, F-100, Bengaluru - 560 016 in sealed covers only. The price bids shall be submitted separately as per the format enclosed at **Part – II** of the tender documents**.** The offers received after the due date and offers sent by fax/e-mail will not be entertained and summarily rejected.

The schedule of important events is as under:

1. Tender will be available in Company web site from 20.04-2021 to 30.04-2021 up to 11.00 hrs.:

2. Pre bid meeting: 26-04-2021 from 11 AM to 13 Hrs. at the office of

Deputy General-Civil, NS unit F-100, Bengaluru - 560016

3. Last date/time of receipt of bids: 30-04-2021 -11.00 hrs.

4. Opening of the Technical Bid: 30-04-2021 At 11.30 hrs.

5. Opening of Price Bid will be intimated later to all the technically suitable bidder(s)

6. Tender opening venue: Office of Deputy General Manager-Civil, N.S Unit F-100, Doorvaninagar, Bengaluru 560 016

Thanking you

Yours faithfully

For ITI Limited

Deputy General Manager-Civil

INFORMATIONS TO BIDDERS REGARDING ELIGIBILITY
Bidder has to submit the bids in two envelope system

Part - A the Technical Bid without the Price/Rate shall contain the following details

a. Bidder's Profile
b. Complete Tender document with acceptance of all the terms & conditions indicated therein.
c. Power of attorney in the case an authorized representative has signed the tender.
d. Earnest Money Deposit (EMD) as specified in the Price Bid. No interest shall be allowed on the earnest money deposited by the Tenderer. The Earnest Money of the unsuccessful tenderer will be refunded within a reasonable period of time without interest.
e. The cost of tender document of Rs 1,000/- (Non-refundable) inclusive of GST shall be payable by DD/Pay Order. Bidders can download the tender documents from our website **www.itiltd.in**
f. List of completed works as per **Annexure-6**
g. All the required documents in support of the eligibility criteria to be submitted.

Part - B [Commercial bid] Only duly filled up Part-II in a separate sealed cover. The rates quoted should be in figures as well as in words.

Both Part – A & Part – B should be enclosed in a sealed cover and clearly super scribed with the tender and bidder's details.

A - ELIGIBILITY CONDITIONS FOR THE BIDDERS

MINIMUM ELIGIBILITY CRITERIA FOR PARTICIPATION IN THE TENDER

ELIGIBILITY CRITERIA FOR PARTICIPATING IN THE TENDER: Agencies with relevant experience in the field of Geotechnical/Soil Investigation and having Government approved accredited laboratory facility. Agencies empanelled with ITI/experience of working with CPWD, Railways, MES, Department of Post, State PWDs State/Central PSUs and semi government organizations preferred.Government Engineering Colleges or Institute fulfilling the above criteria are also eligible.

Agencies/Contractors have to submit along with the tender, the photocopy of completion certificates issued by the clients in support of having completed similar works[Similar Works means works of Geotechnical/Soil investigation works] during the last five[05] years. Eligible Agencies/contractors can download the tender documents and submit the tender in a hard copy signed on all pages, on or before the time and date specified in the Notice inviting Tender.

FINANCIAL STRENGTH:

a. The average annual financial turnover for the last 3 years shall be as specified in tender. The requisite Turnover shall be duly certified by a Chartered Accountant with his seal/Signatures and registration number.

b. Net worth of the Company as on 31st March of the Previous Financial year should be positive.
c. Bank Solvency Certificate issued from nationalized or any schedule Bank should be at least of the value specified in the Price Bid. The certificate should have been issued on or after 01.10.2019.

INFORMATIONS TO BIDDERS-GENERAL

1. The intending tenderer (s) must read the terms and conditions of this GCC carefully. He should only submit his bid if eligible and in possession of all the documents required.

2. The tenderer(s) if required, may submit questions/Clarifications in writing/E-Mailed to the Deputy General Manager-[Civil] to seek clarifications **within seven days** of uploading of the tender in the website. Corrigendum to tender document if any, will be uploaded in ITI website / CPP. No individual advice will be sent to any bidder.

3. Integrity Pact duly signed by the tenderer shall be submitted. Any bid without a signed Integrity Pact shall be rejected **[Annexure-3]**

4. EARNEST MONEY DEPOSIT:

Earnest Money Deposit of an amount as mentioned in NIT is required to be submitted along with the tender and shall be in the form of Demand Draft payable in favor of ITI Limited.

a. The EMD shall be payable to the ITI without any condition(s), recourse or reservations.

b. The Bid will be rejected by the ITI as non-responsive and shall not be considered in case EMD is not received in physical form.

c. The EMD of unsuccessful bidders will be returned within 15 days on their request after issuance of LOA to the successful bidder.

d. The EMD of the successful bidder will be retained by the Company till submission of a 3% performance guarantee which shall be submitted within 15 days of issue of Letter of Intent.

e. If bidder submits bid declaration form then EMD will be exempted. **[Annexure-10]**

f. The EMD may be forfeited

i. If a bidder withdraws the bid after bid opening during the period of validity;
ii. In the case of a successful bidder; if the agency fails to sign the Agreement within the 15 days from the date of issue of LOA or furnish the required performance security or fail to commence the work within the stipulated time period prescribed in the contract.

5. ORDER OF PRECEDENCE OF DOCUMENTS:

In case of difference, contradiction, discrepancy, with regard to General Conditions of Contract, Special Conditions, Specifications, Corrigendum/Clarification(s) issued, Drawings, Bill of quantities, etc. forming part of the contract, the following shall prevail in order of precedence.

a. Letter of Award, along with the statement of agreed variations and its enclosures, if any.
b. Corrigendum, Addendum, Clarifications etc.
c. Special Condition of Contract.

d. Description of Bill of Quantity / Schedule of Quantities.

e. General Conditions of Contract.

f. Drawings

g. CPWD specifications (as specified in Technical Specification of the Tender) updated with correction slips issued up to the last date of receipt of tenders.

h. Relevant B.I.S. codes. /National Building Code-2016

6. The Tenderer shall quote rates both in figures as well as in words. In case the tenderer has quoted Two different rates in word and figures the lower of the two will be considered valid and binding on the tenderer. All the corrections and alterations made in the entries by the tenderer must be attested with his full signatures and date. Erasures and overwriting are not permissible and may disqualify the Tender.

7. The Tender shall contain the name, address, and place of business of or persons making the tender and shall be signed by the tenderer with his usual signature. Partnership firm shall furnish the full name of all partners in the tender. It may, however, be signed in the partnership name by one of the partners or duly authorized representative, followed by the name and designation of the person signing the tender. Tenders by the corporation by a person be signed in the name of the corporation by a person duly authorized to do so. Incase it is signed by an authorised representative, a power of attorney in that behalf shall accompany the tender. A copy of the constitution of the firm with the names of the partner shall be furnished.

8. When the tenderer signs a tender in a language other than English, the total amount of tendered should also be written in the same language. The signature should be attested by at least one witness.

9. Witnesses and sureties shall be persons of status and property and the names, occupations, and addresses shall be stated below the signature.

10. All the signatures in the tender document shall be at the lower right-hand corner or where ever required in the tender document by the tenderer or his authorized representatives.

11. The acceptance of the tender will rest with the accepting authority who does not bind himself to accept the lowest or any other tender and reserves the right to reject any or all the tenders without assigning any reason whatsoever.

12. Tenders in which any particulars and prescribed information is missing or in completion any respect are liable to be rejected.

13. Canvassing of any kind is strictly prohibited and the tender submitted by the tenderer who resorts to canvassing is liable to be rejected.

14. The tender containing uncalled remarks or any conditions are liable to be rejected.

15. No Page of the tender documents shall be removed or altered and the whole set must be submitted after being duly filled in and signed. Failure to comply with these instructions may result in the rejection of their tender.

16. The Company reserves the right (i) to reject any or all the tenders without assigning any reasons, thereof in (ii) to distribute the work between more than one contractor. The whole work may be split up and accepted in parts entirely at the sole discretion of

the Company. The tenderer should specifically state in case he would be unwilling to accept a part of the work.

17. The Company reserves the right to call off tender process at any stage without assigning any reason.

18. Should tenderer have relative or relatives or in the case of a firm or private limited Company one or more of its partner or relatives of the partners employed in the capacity of the Company, the tenderer should furnish complete information to that effect at the time of submission of the tender.

19. Before tendering, the tenderer is advised to visit the site (with prior arrangement with the officer issuing the tender)and inspect the site of work and its environments, and be well acquainted with the actual working and other prevalent conditions and fluctuations thereof and to quote his rates accordingly after taking all the factors into account. It shall be deemedthat the tenderer has visited the site, whether he actually does it or not and have taken all the aforesaid factors into account while quoting his rates and no claim whatsoever shall be entertained on this account at a later date.

20. The successful tenderer shall be required to execute an agreement in duplicate in the proforma attached with the tender documents as **Annexure**-I in the event of failure of the tenderer to sign the agreement within 15 days from the date issue of the notice of acceptance of the tender, the amount of Earnest money shall be forfeited to the Company and acceptance of the tender shall be considered as withdrawn.

21. **PERFORMANCE SECURITY**: The successful bidder/contractor shall provide to the employer a total performance security of three percent [03%] of the Contract price covering initially the time period of completion of construction work plus 60 days within 15 days after issue of Letter of acceptance but before signing the contract. In case the time for completion of work gets extended, the contractor shall get the validity of performance Guarantee extended to cover such enlarged time for completion of work**. [As per the format Annexure-8]**

A) Performance security three percent to be submitted by the successful bidder after the receipt of the letter of acceptance shall be either in the form of Bank Guarantee or Fixed deposit receipts in the name of ITI from a scheduled commercial bank or demand draft in favour of ITI Limited, payable at Bengaluru.

B) Failure of the successful bidder to comply with the requirement of submission of Performance Security as per provisions of the tender clause shall constitute sufficient ground for cancellation of award and forfeiture of the Earnest Money. Such a successful bidder who fails to comply with the above requirement is liable to be debarred from participating in bids under ITI Limited for a period of one year.

C) For delay in submission of Performance of guarantee more than 15 days from the date of issue of LOA penal interest of 18% per annum to be charged on the amount of performance guarantee.

22. **Escalation in Price:** No escalation will be paid on account of any increase in the price index in the price of material labour. No price escalation shall be applicable even during the extended period for completing the works.

Taxes and Duties: On implementation of GST many of the previously existing taxes have been subsumed in the same. However, taxes, duties, cess royalty, if any still remaining in vogue which a bearing on the rates should be considered while submitting a tender. In the event of non-payment/default in payment of any tax or any labour dues, EPF,ESIC etc., by the contractor or in case of any financial implication on ITI Limited the ITI reserves the right to withhold the dues/payment of contractor and make payment to local/State/Central government authorities or to labours as may applicable including penalty thereof.

23. **Payments and SecurityDeposit**: Running bills @ 80% of gross value of work done will be paid only on submission of final soil investigation report. Balance 20% will be paid along with the final bill.

7% of the gross amount payable to the successful tenderer will be retained from each running bill as a Security deposit in addition to the performance guarantee of 3%.[Total security deposit will be 10% of the contract value]. The Security Deposit will be released to the bidders after successful completion of the project at site and submission of completion certificate to ITI.

24. ITI reserves the right to forfeiture of the Performance guarantee in additions to other claims and penalties in the event of the tenderer's failure any of the contractual obligations or in the event of termination of the contract as per terms and conditions of the contract.

25. **Policy for Micro and Small Enterprises [MSE's]**

The MSE's who intend to claim benefits under MSE's act shall fulfil the following,otherwise, they run the risk of their bids being passed over as " INELIGIBLE" for the benefits applicable to MSE's and their bid will not be considered for evaluation.

a) MSE's which are specified by the Ministry of Micro, Small and Medium Enterprises under MSED Act.2006 and Public Procurement Policy 2012 as Manufacturing/Services Enterprises should have registered with NSIC/MSME.

b) Tenderers seeking exemption should enclose a photocopy of valid registration Certificate giving details such as product/Services and Monetary limits failing which they run the risk of their tenders being passed over as ineligible for this concessions.

c) The items of Product/Services mentioned under NSIC/MSME certificate should be the same or similar to the tendered items/Schedule of items of Tender]

d) The monetary limit stipulated in the NSIC/MSME certificate of MSE's should be equal or more than the value of works /supply is/are " In hand progress" awarded under MSME benefits during the financial year plus estimated cost of this tender for availing EMD exemption.

e) If monetary limit is less than the value of work/Supply " In hand [Progress] awarded under MSME benefits during the financial year plus estimated cost of this tender, they should obtain "competence Certificate" from participating in this tender as well as avail MSME benefits.

f) During the bid evaluation, EMD exemption shall be granted to the NSIC/MSME registered firm. In case, the NISC,MSE's registration certificate is found invalid during evaluation the bid of such bidder shall be rejected.

g) ITI may consider the award of work to MSE's as per provision of Public Procurement Policy for Micro and Small Enterprises [MSE's] order 2012, with special provision for Public Procurement Policy for Micro and Small enterprises owned by the Scheduled case or the Scheduled tribe enterprises.

26. Consortium/Joint ventures companies shall not be permitted. No single firm shall be permitted to submit two separate applications.

27. If at any stage, any information/documents submitted by the applicant is found to be incorrect, false or have some discrepancy which disqualified the bidders/firm then, the Company shall take the following action:

a. Forfeit the entire amount of EMD submitted by the firm.

b. The bidder/Firm shall be liable for debarment from tendering in the Company apart from any other appropriate contractual legal action.

28. CONFIDENTIALITY:

Information relating to the evaluation of tenderers and recommendations concerning awards shall not be disclosed to the bidders who submitted the tender or to other persons not officially concerned with the process, until the publication of the award of contract. The undue use by any bidder of confidential information related to the process may result in the rejection of its tender and may be debarred from participating.

GENERAL CONDITIONS OF CONTRACTS FOR CIVIL ENGINEERING WORKS
SUB HEAD - SOIL INVESTIGATION WORKS

1.0 DEFINITION AND INTERPRETATIONS:

1.1 Definition:

1.1.1 GENERAL:
In these general conditions of the contract, the following terms shall have the meaning hereby assigned to them except where the context otherwise requires.

1.1.2 COMPANY:
Company shall mean ITI LIMITED, having its registered & Corporate office at ITIBhavan, Doorvaninagar, Bengaluru - 560 016 in the state of Karnataka and includes a duly authorized representative of the Company or any other person empowered on their behalf by the Company to discharge all or any of its function.

1.1.3 MANAGEMENT:
Management shall mean the officer nominated by the Company to deal with the matters pertaining to the contract. The Officer so nominated shall be intimated to the contractor after the acceptance of the contract.

1.1.4 CONSULTANT:
'Consultant' shall mean the Consultant so designed by the Company and/ or every other officer authorized by the Consultant for the time being to deal with matters relating to Contract.

1.1.5 DEPUTY GENERAL MANAGER (DGM):
Deputy General Manager shall mean the officer in Administrative charge of the project.

1.1.6 CHIEF ENGINEER:
Chief Engineer shall mean the officer-In-charge of the Civil Engineering Department of the Project.

1.1.7 ENGINEER:
Engineer shall mean the Chief Engineer / Chief Manager, Deputy Chief Engineer / Manager, Senior Engineer / Deputy Manager, Executive Engineer / Assistant Manager, Assistant Executive Engineer / Engineer, Asst. Engineer or any other nominee for the execution of the work. The term Engineer- in – Charge shall also have the same meaning as the Engineer.

1.1.8 ENGINEER'S Representative:
Engineer's Representative shall mean the Assistant Engineer in Direct charge of the works and shall include any Junior Engineer/ Construction Assistant /Junior supervisors etc., appointed by the Company.

1.1.9 CONTRACTOR:

'Contractor' shall mean the person, firm or Company who has entered into an agreement for the execution of works and shall Include their executor's, successor's, administrator's and permitted assigns.

1.1.10 CONTRACT:

The contract shall mean the contract documents collectively, comprising agreement, Notice Inviting Tender, General terms and conditions, special terms and conditions, specifications, Time schedule of works, information and instructions to tenderers, accepted schedule of rates, and other documents and drawings constituting the tender and accepting thereof.

1.1.11 WORKS:

Work shall mean the works to be executed in accordance with the contract.

1.1.12 SPECIFICATION'S:

Specifications shall mean all directions, provisions and requirements attached to the Contract which pertain to the method and manner of performing the work or works to the quantities and qualities of work or works and the materials to be furnished under the contract for the work or works as may be amplified or modified by the Company or the Engineer during performance of the contract in order to provide for unforeseen conditions or in the best interest of the work or works.

1.1.13 ACCEPTED SCHEDULE:

Accepted Schedule in relation to the Contract means the schedule or schedules or quantities and the rates quoted /modified by the contractor in respect of which the Tender is accepted.

1.1.14 DRAWINGS:

'Drawings' shall mean the maps, drawings, Plans, and tracings or prints thereof annexed to the contract and shall include any modification of such drawings as may be issued or approved in writing by the Engineer from time to time.

1.1.15 CONSTRUCTIONAL PLANT:

'Constructional Plant' shall mean all appliances or things of whatsoever nature required for the execution, completion or maintenance of the works or temporary works (as hereinafter define) but does not include materials or other things intended to form or forming part of the permanent work.

1.1.16 TEMPORARY WORKS:

'Temporary work' shall mean all temporary works of every kind required for the execution, completion or maintenance of the works.

1.1.17 SITE:

'Site' shall mean the lands and other places on or through which the works are to be carried out and any other lands or places provided by the Company for the purposes of the contract.

1.1.18 LETTER OF ACCEPTANCE:

'Letter of Acceptance' is an intimation by a letter to the Tenderer that his/their tender has been accepted in accordance with the provisions contained in that letter.

1.1.19 APPROVED:

'Approved' means approved in writing by the Engineer including subsequent written confirmation of previous verbal approval and Approval means approval in writing including as aforesaid.

1.1.20 CONTRACT VALUE:

'Contract value' means the sum accepted or the sum calculated in accordance with the prices accepted in the tender and/or the contract rates as payable to the contractor for the entire execution and full completion of the work.

1.1.21 WORK ORDER:

'Work Order' shall mean the order in writing by the Engineer, intimating the contractor to commence the work wholly or partly, showing the date of commencement and completion of the work as a whole or the part so ordered to be commenced.

1.1.22 DATE OF COMMENCEMENT:

'Date of Commencement' is the date or dates for commencing the whole or part of the work as set out in or ascertained in accordance with the individual work orders or any subsequently agreed agreements thereto.

1.1.23 DATE OF COMPLETION:

'Date of Completion' is the date or dates for completion of the whole work as set out in or ascertained in accordance with the individual work orders or the tender documents or any subsequently agreed agreements thereto.

1.1.24 DEVIATION:

'Deviation' order means an order given in writing by the Engineer to effect an alteration in addition to or deduction from the scope or nature of the contract.

1.1.25 ACCEPTING AUTHORITY:

'Accepting Authority' is officer nominated by the management to accept a tender/ tenders up to a particular value.

1.1.26 MONTH:

'Month' shall mean the calendar month of the Gregorian Calendar.

1.2 SINGULAR & PLURAL:

Word imparting the Singular number shall also include the plural and vice versa where the context so requires.

1.3 HEADINGS& MARGINAL HEADINGS:

The headings and Marginal headings in these General Conditions are solely for the purpose of facilitating reference and shall not be deemed to be part thereof, or be taken into consideration in thereof or the context.

2.0 GENERAL OBLIGATION:

2.1 EXECUTION CORRELATION & INTENT CONTRACT DOCUMENTS:

The Contract Documents shall be signed in duplicate by the accepting authority and the contractor. The contract documents are complementary, and what is called for by anyone shall be binding as if called for by all the intention of the documents is to include all Labour and materials, equipment and transportation necessary for the proper execution of the work. Materials or work not covered by or property inferable from any heading or class of the specifications shall not be supplied by the Company to the contractor unless distinctly specified in the contract documents. Materials or works described in words which so applied have a well know technical or trade meaning shall be held to refer to such recognized standard.

2.2 LAWS GOVERNING THE CONTRACT:

2.2.1 The Contract shall be governed by the laws for the time being in force in the Republic of India

2.2.2 COMPLIANCE TO REGULATION & BYE-LAWS:

The Contractor shall conform to the provision of any status relating to the works and regulations and bye-laws of any local authority and of any water and electric companies or undertakings with those system the work is proposed to be connected and shall before making any variations from the drawings or the specifications that may be necessitated by so confirming, given to the Engineer notice specifying the variation proposed to be made and the reason for making the variation and shall not carry out such variation until he has received instructions in writing from the Engineer in respect thereof. The contractor shall be bound to give all notices required by statute, regulations or Bye-Laws as aforesaid and to pay all fees and taxes payable to any authority in respect thereof.

2.3 COMMUNICATION TO BE IN WRITING:

All notices, communications, references and complaints made by the Company or the Engineer or the Engineer's Representative or the contractor interse concerning the work shall be in writing and no notice, communication, reference or complaint not in writing shall be recognized.

2.4 SERVICE OF NOTICE ON CONTRACTOR:

The Contractor shall furnish to the Engineer the name, designation and address of his authorized agent and all complaints, notices, communications, and references shall be deemed to have been duly given to the contractor if delivered to the contractor or his authorized agent or left at or posted (Registered Post) to the address so given and shall be deemed to have been so given in the case of posting on the day on which they would have reached such address in the ordinary course of post or on the day on which they were so delivered of left in case of hand delivery. In the case of contract by partners, any change in the constitution of the firms shall be forthwith notified by the contractor to the Engineer with a copy of the accepting authority.

2.5 ASSIGNMENT OR SUBLETTING OF CONTRACT:

The Contractor shall not assign or sublet the contract or any part thereof or allow any person to become interested therein any manner whatsoever without the special permission of the Company, provided always that execution of the details of the works by petty contract under the direct and personal supervision of the contractor or his agent shall not be deemed to be subletting under this clause. The permitted sub-letting of work by the contractor could not establish any contractual relationship between the sub-contractor and the Company and shall not relieve the contractor of any responsibility under the contract.

2.6 REPRESENTATIVE ON WORKS:

The Contractor shall when he is not personally present on the site of works, place and keep a responsible agent at the works during working hours who shall on receiving reasonable notice, present himself to the Engineer and orders given by the Engineer or Engineer's representative to the agent shall be deemed to have the same force as if they had been given to the contractor before absenting himself, the contractor shall furnish the name and address of his agent for the purpose of his clause failure on the part of the contractor shall render him liable for the consequences mentioned hereafter.

2.7 RELICS:

All Gold, Silver, Oil and other materials of any description and all the precious stones, coins, treasure, relics, antiques and other similar things which may be found in or upon the site shall be the property of the Company, and the contractor shall duly preserve the same to such to the satisfaction of the Company, and shall from time to time deliver the same to such person or persons as the Company may appoint to receive the same.

2.8 INDEMNITY AND CHARGES:

2.8.1 INDEMNITY AND CHARGES PAYABLE:

The Contractor shall indemnify and save harmless the Company from and against all actions, suits, proceedings, losses costs, damages, claims and demands of every nature and description brought or recovered against the Company by reason of any act or omission of the contractor, his agents or employees in the execution of the work or in regarding of the same. All sums payable by way of compensation under any of these conditions shall be considered as reasonable compensation to be applied to use of the Company without references to the actual loss or damage sustained and whether or not damage shall have been sustained.

2.8.2 PATENT RIGHT:

The contractor shall fully indemnify the Company or the agent/ servant or employees of the Company, against any action claim or proceeding relating to infringement or the use of any patent or design or any alleged patent or design rights, and shall pay any royalties which may be payable in respect of any article or part thereof included in the contract. In the events of any claims being made or action brought against the Company or any agent or servant, or employee of the Company or in respect of any of the matters aforesaid the contractor shall immediately be notified thereof for taking

necessary action provided that the payment of indemnity shall not apply when such infringement has taken place in complying with the specific directions issued by the Company, but the contractor shall pay any royalties payable in respect of any such use.

2.8.3 OCTROI AND OTHER DUTIES: [Taxes and Duties]

All charges on account or Octroi, terminal or sales tax and/ or other duties or any other levy as the case may be for the materials obtained for the works shall be borne by the contractor. Rates quoted by the contractor shall also include the/GST/ sales tax on works contract wherever applicable.

The Contract price is inclusive of all taxes, duties, cess and statutory levies payable under any law by the Contractor in connection with the execution of the contract.

The contractors shall comply with all applicable provision of Goods and Service Tax[GST] levied by the Union Government and State Government[CGST]. The contractor shall get himself registered and discharge his obligation for payment of taxes, filing of returns etc. under the appropriate provision of law in respect of all the taxes, duties, levies, cess etc., ITILtd would have right to seek necessary evidence that the contractor is registered under the law and duly discharging its obligations under the tax law, enabling ITI Ltd to avail input tax credit.

In case any law requires ITI Ltd to pay tax on the contract price on reverse cage basis, the amount of tax deposited by ITI Ltd would be considered as paid to the contractor and accordingly the price payable to the contractor would *stand* reduced to that extent.

Tax deduction at source if any, shall be made by ITI Ltd. As per law applicable from time to time from the amount payable to the Contractor.

2.8.4 ROYALTIES:

Except where otherwise specified the contractor shall pay all tollage and other royalties, rent, and other payment or compensation (If any) for getting stone, sand, gravel, clay, and other material required for the works or temporary works or any of them.

2.9 EARNEST MONEY AND SECURITY DEPOSITS:

2.9.1 THE EARNEST MONEY, PERFORMANCE GUARANTEE AND SECURITY DEPOSITS:

a. The bid will be rejected by ITI Ltd. as non-responsive and shall not be considered in case EMD is not received in physical form.

b. The EMD of bidders other than L-1 will be returned as soon as the work order to L-1 is issued.

c. The EMD of the successful bidder will be released after the contractor has furnished the required acceptable performance guarantee of 3% value of work order and acceptance of the same by the Company.

d. EMD may be forfeited:

i. The bidder withdraws the bid after bid opening during the period of validity.

ii. Any unilateral revision in the offer made by the tenderer during the validity of the offer.

iii. Non-acceptance of LOA if and when placed.

iv. In the case of a successful bidder, if the bidder fails to sign the Agreement within the 15 days from the date of issue of LOA or furnish the required performance guarantee or fails to commence the work within the stipulated time period prescribed in the contract.

e. **PERFORMANCE GUARANTEE**: The successful bidder/contractor shall provide to the employer a total performance security of three percent [03%] of the Contract price covering initially the time period of completion of construction work plus 60 days within 15 days after issue of Letter of acceptance but before signing the contract, a performance security of five percent of Contract price shall be submitted by successful bidder to ITI. In case the time for completion of work gets extended, the contractor shall get the validity of performance Guarantee extended to cover such extended time for completion of work.

Security Deposit: The total amount of security deposit payable by the contractor shall be 10% of the total value of the contract, in which 3% payable from the contractor as Performance guarantee remaining 7% will be recovered from the gross value of work done from each running bill. The security deposit shall remain at the entire disposal of the Company for the satisfactory execution and completion of the works, in accordance with the conditions of the contract.

The Company shall be at liberty to deduct and appropriate from the security deposit such compensations and dues as may be payable by the contractor under the contract and the appropriation will be made good by the further deduction from the contractor's subsequent interim bills in the same manner as aforesaid until the security deposit is restored to its full limit mentioned above.

REFUND OF SECURITY DEPOSIT: Further, the contractor has to furnish No Claim Certificate to ITI at the time of claiming a refund of Security Deposit.

The security deposit shall remain at the entire disposal of the Company for the satisfactory execution and completion of the works, in accordance with the conditions of the contract

2.9.2 INTEREST ON AMOUNTS:

No interest will be payable on the Earnest money or the security deposit or amount payable to the contractor under the contract.

2.10 TIME LIMITATION:

2.10.1 Subject to any requirement in the contract as to dates of completion of any portion or portions of the work, before completion of the whole, the contractor shall fully and finally complete the whole of the works comprised in the contract (with such modifications as may be directed under these conditions) by the dated entered in the work order, provided that, if any modifications have been ordered, which in the opinion of the Engineer have materially increased the magnitude of the work, then such extension may be granted as shall appear to the Engineer to be reasonable in the

circumstances, provided however that the contractor shall be responsible for requesting such extension of the date as he may consider necessary as soon as a cause thereof shall arise and in any case not less than one month before original dated fixed for completion of the works.

2.10.2 DELAY AND EXTENSION OF TIME:

If the contractor has delayed at any time in the progress of the works by any act or neglect of the employees of the Company or by any other contractor employed by the Company under Cl-3.2.4 of these conditions, or by strikes, lockouts, fire unusual delay in transportation unavoidable casualties of any cause beyond the contractor's control, or by delays authorized by the Engineers pending arbitration or by any cause which the Engineer shall decide to justify the delay, then the time of completion of the works shall be extended for such reasonable time as the engineer may decide.

2.10.3 EXTENSION OF TIME ON COMPANY ACCOUNT:

In the event of any failure or delay by the Company to hand over the contractor possession of the lands, necessary notice to commence the works or to provide the necessary drawings or instructions or any other delay caused by the Company due to any other cause whatsoever, then such failure of delay shall in no way affect or vitiate the contract or alter the character thereof entitle the contractor to damages or compensation thereof but in any such case extension or extensions of the completion date as may be considered reasonable may be granted to the contractor.

2.10.4 TIME TO BE ESSENCE OF THE CONTRACT AND LIQUIDATED DAMAGES:

The time for completing the works or portions were of by their respect dates or extended dates fixed for their completion shall be deemed to be the essence of the contract, and if the contractor shall fail to complete the work within the time prescribed, the Company shall if satisfied that the works can be completed by the contractor within a reasonable short time thereafter be entitled, without prejudice to any other right or remedy available on that behalf, to recover by way of ascertained and liquidated, damages, a sum equivalent to ONE PERCENT of the contract value of the works or portion thereof for each week or part of week the contractor is in default even though the contract as a whole is completed by the date specified in the contract for any time or group of items of works and allow the contractor such further extension of time for the whole work of portions thereof as the Engineer may decide, if the Company is not satisfied that the works can be completed by the contractors and in the event of failure on the part of the contractor to complete the works within the further extension of time allowed as aforesaid the Company shall be entitled without prejudice to any other right or remedy available on that behalf, to appropriate the contractor's security deposit and rescind the contract under clause 8.3 of these conditions, whether or not actual damage is caused by such default. The amount of compensation will be adjusted or set off against any sum payable to the contractor under this or any other contract provided always that the entire amount of compensation to be paid under this clause shall not exceed 10 % of the contract value as a whole.

2.11 ILLEGAL GRATIFICATION:

Any bribe, commission, gift or advantage given, promised or offered by or on behalf of the contractor or his partner, agent or servant or anyone on his or on their behalf to

any officer, or employee of the Company or to any person or his or their behalf in relation to the obtaining or the execution of this or any other contract with the Company shall in addition to any criminal liability which may incur, subject to the contractor to the recession of the contract and all other contracts with Company and to the payment of any loss of damage resulting from such rescission, and the Company shall be entitled to deduct the amounts so payable from any money due to the contractor under the contract or any other contracts with the Company.

2.12 EVERYTHING AT CONTRACTOR'S RISK:

2.12.1 The contractor shall undertake all risks and liabilities of whatsoever nature arising out of the works Including by way of implications but not by way of limitations all risks attendant on the nature of the site, sub-soil, the levels and consistency of strata in or on which the works are to be found or constructed. Also, all risk of fire, Earthquakes, riots, war, gales, storms, winds, variations or water level, subsoil and quantities of water to be pumped, discharged of watercourses, Rains traffic delays and any other causes of whatsoever nature whether within or beyond contractor's control, which may affect or damage the works during the construction and all damages which may happen on any way howsoever to the works shall be made good by the contractor at his own risk and costs.

2.13 No Visitor or Photographer:

The contractor shall neither allow any visitor on the works nor take or allow to be taken any of the photographs without the permission of the Engineer in writing.

2.14 Work Site Order Book:

The Contractor will be required to keep a properly bound book at the site of work as the worksite order book. The pages of the book will be numbered and initialed by the Engineer. Any special orders and instructions to be issued to the contractor shall be recorded in this book by the Engineer or his representative and noted it. The book shall be the property of the Company.

3.0 EXECUTION of WORKS:

3.1 Contractor's Understanding:

3.1.1 It is understood and agreed that the contractor has by careful examination satisfied himself as to nature and location of the work, the confirmation of the ground, the character, quality and quantity of the materials to be encountered, the character of equipment and facilities needed preliminary to and during the execution of the works. The general and local conditions, the Labour conditions, prevailing therein and all the other matters which can in any way affect the works under the contract. No claim whatsoever on this account shall be entertained at a later date.

3.1.2 COMMENCEMENT OF WORKS:

The Contractor shall commence the works on the date or dates indicated in the work order in writing to this effect from Engineer and shall proceed with the same with due expedition and without delay.

3.1.3 TIME AND PROGRESS CHART:

A detailed time and progress chart for the execution of various items of work within the overall period of completion shall be prepared jointly by the Engineer and the contractor, signed by both the parties and shall adhere to.

a. Time allowed for carrying out all the works as entered in the tender shall be as mentioned in the BOQ which shall be reckoned from the 15th day from date of issue of the work order to the Contractor. Time shall be the essence of the contract and contractor shall ensure the completion of the entire work within the stipulated time of completion.

b. The Contractor shall also furnish within 15 days of the date of issue of work order a CPM network/PERT chart /Bar chart for completion of work within the stipulated time. This will be duly got approved from ITI Ltd. This approved network /PERT chart shall form a part of the agreement. Achievement of milestones, as well as total completion, has to be within the time period allowed.

c. Contractor shall mobilize and employ sufficient resources for completion of all the works as indicated in the BAR Chart/PERT Chart. No additional payment will be made to the contractor for any multiple shift work or other incentives methods contemplated by him in his work schedule even though the time schedule is approved by the Engineer – in –charge.

d. Schedule on milestone and total completion and this adherence will be part of the Contractor's performance under the contract. During the execution of the work, the contractor is expected to participate in the review and updating of the Network/BAR Chart undertaken by ITI Ltd. These reviews may be undertaken at the discretion of Engineer in charge either as a periodical appraisal measure or when the quantum of work order on the contractor is substantially changed through deviation order or amendments. The review shall be held at the site or any of the office of ITI/Consultant at the sole discretion of ITI Ltd. The contractor will adhere to the revised schedule thereafter. The approval to the revised schedule resulting in a completion date beyond the stipulated date of completion shall not automatically amount to grant an extension of time to the contractor.

The photographs of the project taken on the last day of every month indicating the progress of work [in soft copies] shall be attached along with the physical progress reports to be submitted to Engineer in charge.

3.1.4. If the work(s) be delayed by

1. Force Majeure or

2. Abnormally bad weather or

3. Serious loss or damaged by fire, or,

4. Civil commotion, the local commotion of workmen, strike, or lockout, affecting any other trades employed on the work or

5. Delay in part of other contractors or tradesmen engaged by Engineer – in – charge in executing work not forming part of the contract or

6. Any other cause which, in the absolute discretion of the ITI is beyond the contractors control then upon the happening of any such event causing delay, the contractor shall immediately give notice thereof in writing to the authority but shall nevertheless use constantly his best endeavor’s to prevent or make good the delay and shall do all that may be reasonably required to the satisfaction of the Engineer in charge to proceed with the works.

3.2 COMPLIANCE TO ENGINEER'S INSTRUCTIONS:

3.2.1 The Engineer shall direct the sequence in which the several parts of the works shall be executed and the contractor shall execute without delay all orders given by the Engineer from time to time but the contractor shall not be relieved thereby from his/their responsibility for the due performance of the works in all respect.

3.2.2 Alterations to be Authorized:
No alterations in or additions to or omission or abandonment of any part of the work shall be deemed authorized, except under instructions in writing from the Engineer, and the Contractor shall be responsible to obtain such instruction in each and every case.

3.2.3 EXTRA WORKS BY ANOTHER AGENCY:
Should works over and above those included in the contract be required to be executed at the site, the contractor shall have no right to be entrusted with the execution of such works which may be carried out by another contractor or contractors or by other means at the option of the Company.

3.2.4 SEPARATE CONTRACTS IN CONNECTION WITH THE WORKS:
The Company shall have the right to let out other contracts in connection with the works. The Contractor shall afford such other contractors reasonable opportunity for the storage of their materials and the execution of their work and shall properly connect and coordinate his work with theirs. If any part of the contractor's work depends for proper results upon execution of the work of another contractor, the contractor shall inspect and promptly report to the Engineer and any defect in such work that render it unsuitable for such proper results and execution. The contractor's failure to inspect and report shall constitute acceptance of other contractor's work as fit and proper for the reception of his work, except as to defects which may develop in the other contractor's works after the execution of his work.

3.3 INSTRUCTION OF ENGINEER'S REPRESENTATIVE:

3.3.1 Any instruction or approval given by the Engineer's representative to the contractor in connection with the works shall bind the contractor as though it had been given by the Engineer provided always as follows.

3.3.1.1 Failure of the Engineer's representative to disapprove any work or materials shall not prejudice the powers of the Engineer thereafter to disapprove such work or materials and order the removal or breaking up thereof.

3.3.1.2 If the contractor shall be dissatisfied by reason of any decision of the Engineer's representative, he shall be entitled to refer the matter to the Engineer who shall thereupon confirm or vary such decision.

3.4 ADHERENCE TO SPECIFICATIONS AND DRAWINGS:

3.4.1 The whole of the works shall be executed in perfect conformity with the specifications and drawings of the contract. If the contractor performs any work in a manner contrary to the specifications or drawings or any of them and without such reference to and approval from the Engineer in writing he shall bear all the costs arising or ensuing there from shall be responsible for all loss to the Company.

3.4.2 COMPLIANCE WITH CONTRACTORS AND REQUEST FOR DETAILS:

The Engineer shall furnish with reasonable promptness after receipt by him of the contractor's request in writing for the same additional instruction by means of drawings or otherwise, necessary for the proper execution of the works or any part thereof. All such drawings and instructions shall be consistent with the contract documents and be reasonably inferable therefrom.

3.4.3 MEANING AND INTENT OF SPECIFICATIONS AND DRAWINGS:

If any ambiguity arises as to the meaning and Intent of any provisions of the specifications and drawings or as to execution or quality of any work of materials of the Engineer thereon shall be final subject to appeal (within 7 days of such decision being intimated to the contractor) to the Deputy general manager who shall have the powers to correct any errors, Omission, or discrepancies in the specifications, drawings, classifications of work or materials, and those decisions in the matter in dispute or doubt shall be final, inclusive and binding.

3.5 WORK ON HOLIDAYS AND DURING NIGHT:

The Contractor shall not carry out any work on holidays and between sunset and sunrise without the previous permission of the engineer in writing.

3.6 S

HEDS, STORE HOUSE AND YARDS:

The contractor shall at his own expenses provide himself with sheds, Storehouse, any yards in such situations and in such numbers as in the opinion of the Engineer is requisite for carrying on the works. He shall obtain from the Engineer in writing approval to the layout of the sheds, storehouses and the extent of the area to be enclosed by the yards, before undertaking constructions thereof.

The contractor shall keep at each of such sheds, storehouses and yards a sufficient quantity of materials and plant in stock as not to delay the carrying out of the works with the due expedition and the Engineer and Engineer's representative shall have the free access to the sheds, storehouse or yards at any time for the purpose of inspecting the stock of materials or plant so kept in hand and any materials or plant which the Engineer may object to shall not be brought upon or used in the works, but shall be forthwith removed from the sheds, storehouse or yards by the contractor. The contractor shall at his own expenses provide and maintain suitable construction plant-like Mixers, Compressors, Welding Sets, Mortar mills and soaking vats or any other equipment necessary for the execution of the works.

3.7 PROVISION OF EFFICIENT AND COMPETENT STAFF:

The contractor shall place and keep on the works at all-time efficient and competent staff to give the necessary directions to his workmen and to see that they execute their work in sound proper manner and shall employ only such supervisor, workmen and labourers in or about the execution of any works as are careful and skilled in their various trades and callings.

The contractor shall at once remove from the works any agent, permitted sub-contractor, supervisor workmen or labourer who shall be objected to by the Engineer if any and whenever required by the Engineer, he shall submit a correct return showing the names of all staff and workmen employed by him. In the event of the Engineer

being of the opinion that the contractor is not employing on the works a sufficient number of staff and workmen as is necessary for the proper completion of the works within the time prescribed. The contractor shall forthwith or receiving intimation to this effect take on the additional number of staff and labour specified by the Engineer within seven days of being so required and failure on the part of the contractor to the Company to rescind the contractor under clause 8.3 of these conditions.

3.8 FACILITIES FOR INSPECTION:

The contractor shall afford the Engineer and the Engineer's Representative every facility for entering in upon every portion of the work at all hours for the purpose of inspection or otherwise and shall provide all labour, materials, planks, ladders, pumps appliances and things of every kind for the purpose an Engineer and the Engineer's Representative shall at all times have free access to every part of the works and to all places at which materials for the works are stored or being prepared.

3.9 SUPPLY OF WATER AND POWER:

3.9.1 WATER AND POWER SUPPLY FOR THE WORKS:

The contractors have to make their own arrangement for the water supply and power supply required for carrying out the works at their own cost and the rates may be quoted accordingly.

3.10 PRECAUTIONS:

3.10.1 PRECAUTIONS DURING PROGRESS OF WORKS:

During the execution of works unless otherwise specified the contractor shall at his own cost provide the materials for and execute all shoring, Timbering and Strutting work as is necessary for the stability and safety of all structures, excavation works and shall ensure that no damages, injury or loss is caused or likely to be caused to any person or property.

3.10.2 ROADS AND WATER COURSES:

Existing roads or watercourses or pipe, electrical lines and conduits shall not be blocked, cut through altered, diverted or obstructed in any way by the contractor, except with the permission of the Engineer in writing. All compensation claimed for any unauthorized closure, cutting through, alteration, diversion or obstructions to such roads or watercourses etc., by the contractor or his agent or his staff shall be recoverable from the contractor by deduction from any sums which may become due to him in terms of the contract, or otherwise according to law.

3.10.3 PROVISIONS OF ACCESS TO PREMISES:

During progress of work in any street or thoroughfare, the contractor shall make adequate provision for the passage of traffic for securing safe access to all premises approached from such street or thoroughfare and for any drainage, water supply or means of lighting which may be interrupted by reason of the execution of the works and shall erect and maintain at his own cost diversions, barriers, lights and other safeguards as prescribed by the Engineer for the regulation of the traffic and provide watchmen necessary to prevent accidents. The work shall in such cases be executed

in night and day if so ordered by the Engineer and with such vigour so that traffic may be impeded for as short a time as possible.

3.10.4 SAFETY OF PUBLIC:

The contractor shall be responsible to take all precautions to ensure the safety of the public whether on the public of Company property and shall post such lookout men as may in the opinion of the Engineer be required to comply with the regulations appertaining to the work.

3.10.5 MOVEMENT OF CONSTRUCTIONS PLANT AND EQUIPMENT:

The contractor must take sufficient care in moving his construction plants and equipment's from one place to another so that they do not cause any damage to the property of the Company, particularly to the overhead and underground cables, in event of any damages, resulting to the property of the Company during the movement of aforesaid, the cost of such damages including eventual loss of working hours in any plant as estimated by the Company shall be borne by the contractor.

3.11 USE OF EXPLOSIVES:

Explosives shall not be used on the works or on the site by the contractor without the permission of the Competent Authority in writing and then only in the manner and to the extent which such permission is given. When explosives are required for the works they shall be stored in a special mezzanine to be provided at the cost of the contractor in accordance with the Explosive rules. The contractor shall obtain the necessary license for the storage and the use of the explosive and all operations in which or for which explosives are employed shall be at the sole risk and responsibility of the contractor and the contractor shall indemnify the Company in respect thereof.

3.12 SUSPENSION OF WORKS:

3.12.1 The contractor shall on the order of the Engineer in writing suspend the progress of works or any part thereof for such times and in such manner as Engineer may consider necessary and shall during such suspension properly protect and secure the work so far as is necessary for the opinion of the Engineer.

3.12.1.1 If such suspension is provided for in the contract

OR

3.12.1.2 Necessary for the proper execution of the works or by reasons of weather conditions or by some default on the part of the contractor.

OR

3.12.1.3 Necessary for the safety of the works or any part thereof, the contractor shall not be entitled to any extra costs if any incurred by him during the period of suspensions of the works, but in the event of any suspension ordered by the Engineer for Reasons other than aforementioned and when each such period of suspensions exceeds 14 days the contractor shall be entitled to such extension of time for completion of the works as the engineer may consider proper having regards to the period or periods of such suspensions and such compensation as the Engineer may consider reasonable in respect of salaries or wages paid by the contractor to his employees during the periods of such suspensions. Contractor shall not resume work or part of work so suspended by the Engineer without a written order from the Engineer to that effect.

3.12.2 SUSPENSION LASTING MORE THAN THREE MONTHS:

If the progress of the works or any part thereof is suspended on the order of the Engineer in writing for more than three months at a time, the contractor may serve a written notice to the Engineer requiring permission within 15 days from the receipt thereof to proceed with the work or part thereof in regards to which progress is suspended and if such permission is not granted within that time the contractor by a further written notice so served may (but is not bound to)elect to treat the suspension where it affects part only of the works as an omission of such part or where it affects the whole of the works as an abandonment of the contract by the Company.

3.13 RATES FOR ITEMS OF WORKS:

The rates entered in the 'Accepted Schedule of Rates' of the contract are intended in provide for works duly and properly completed in accordance with the General and Special (if any) conditions of contract and the specifications and drawings, together with such enlargements, extensions, diminutions, reductions, alterations or additions as may be ordered in terms of clause 4.2.1 of these conditions and without prejudice to the generally thereof and shall be deemed to include and cover superintendence and Labour, supply, including full freight, of materials, of stores, patterns, profiles, moulds fittings, centering, scaffoldings, shoring, props, timber, machinery, derricks, tackle, ropes, pegs, posts, tools, and all apparatus and plant, required on the works, except such tools, plant or materials, as may be specified in the contract to be supplied to the contractor by the Company, the erections to maintenance and removal of all temporary works and buildings all watching, lighting, bailing, pumping, and draining, etc. All prevention of or compensation for trespass, all barriers and arrangements for the safety of the public or of employees during the execution of works, all sanitary and medical arrangements for labour camps as may be prescribed by the Company, the setting out of all works and of the construction repair and upkeep of all centre lines, benchmark and level pegs thereon. Site clearance, all fees, duties, royalties, rent and compensation to owners for surface damage or taxes and impositions payable to local authorities in respect of land, structures, and all the materials supplied for the work or other duties or expenses for which the contractor may become liable or may be put to under any provision of law for the purpose of or in connection with the execution of the contract, and all such other incidental charges or contingencies as may have been specially provided for in the specifications.

3.14 DEMURRAGE AND WHARF AGE DUES:

Demurrage charges calculated in accordance with the scales in the force for the time being of the Company and incurred by the contractor failing to load or unload any goods or materials within the time allowed by the railways for loading or unloading as also wharf age charges on materials not removed in time as also charges due on consignments booked by or to him shall be paid by the contractor, failing which such charges shall be deducted from any sums which may become due to him in terms of contract.

3.15 RATES FOR EXTRA ITEMS:

If any items of work carried out by the contractor on the instructions of the Engineer which is not covered by the 'Accepted schedule of rates' (i.e. the Tendered Rates),

rates for such additional, altered or substituted work shall be worked out in accordance with the following provisions in their respective order.

i) If the rates for the additional altered or substituted work are not specifically provided in the contract for the work the rates will be derived from rates for a similar class of work as are specified in the contract for the work.

ii) If the altered, additional or substituted work included any work for which no rates are specified in the contract then such work shall be carried out at the rates entered in the CPWD Schedule of Rates 2018 (Civil) and the latest Schedule of Rates for Electrical Works, New Delhi minus / plus percentage which the total tendered amount bears to the estimated cost of the entire work put to tender.

iii) If rates for the altered, additional or substituted work cannot be determined in the manner specified in sub-clause (i) or (ii) above then rates for such work shall be worked out on the basis of the schedule of rates specified in sub-clause (ii) above minus/plus the percentage which the total tendered amount bears to the estimated cost of the entire work put to tender. Provided always that if the rate for a particular part or parts of the items is not in the schedule of rates, the rates for such part or parts will be determined by the Engineer on the basis of the prevailing market rates, when the work was done.

iv) If rates for the altered, additional or substituted work cannot be determined in the manner specified in sub-clause (i) to (iii) above, then the contractor shall within 7 days of the date of receipt of order to carry out the work, inform the Engineer of the rate which it is his intention to charge supported by analysis of the rate or rates claimed and the Engineer shall determine the rates on the basis of prevailing market rates and pay the contractor accordingly. However, the Engineer by notice in writing will be at liberty to cancel his order to carry out such work and arrange to carry out it out in such manner as he may consider advisable, provided always if the contractor commences the work or incur any expenditure before determination of the rate(s) hereinbefore mentioned, then in such case the contractor shall be entitled to be paid in respect of the work carried or expenditure incurred prior to date of determination of the rates as aforesaid to such rate or rates as shall be fixed by the Company. But under no circumstances, the contractor shall suspend the work on the plea of non-settlement of rates for items falling under this clause.

3.16 CLEARANCE OF SITE:

3.16.1 CLEARANCE OF SITE ON COMPLETION:

On the completion of the works, the contractor shall clear away and remove from the site all constructional plant, surplus materials, rubbish and temporary works of every kind and leave the whole of the site and works clean to the satisfaction of the Engineer.

No Final payment in settlement of the accounts for the works shall be made or held to be due to the contractor till in addition to any other condition necessary for such final payment, site clearance shall have been affected by him and such clearance may be made by the Engineer at the expenses of the contractor. In the event of his failure to comply with this provision within 7 days after receiving notice to that effect, should it become necessary for the Engineer to have the site cleared at the expense of the

contractor, the Company shall not be held liable for any loss or damage to such of the contractors property as may be on the site and due to such removal therefrom, which removal may be effected by means of public sale of such materials and property or in such a way as deemed fit and convenient to the Engineer.

4.0 VARIATION IN EXTENT OF CONTRACT:

4.1 MODIFICATIONS TO THE CONTRACT TO BE IN WRITING:

In the event of any of the provisions of the contract requiring to be modified after the contract documents have been signed, the modifications shall be made in writing and signed by the Company and the contractor. Any verbal or written arrangements abandoning, modifying, extending, reducing or supplementing the contract or any of the term thereof shall be deemed conditional and shall not be binding on the Company unless and until the same is incorporated in a formal instrument and signed by the Company.

4.2 POWER OF MODIFICATIONS TO CONTRACT:

4.2.1 The Engineer on behalf of the Company shall be entitled by order in writing to enlarge or extend, diminish or reduce the works or make any alterations in their design, character, position site, quantities, dimensions or in the method of their execution or in the combination and use of materials for the execution thereof and to order any additional works to be done or any works not be done as provided on clause 4.2.2 the contractor will not be entitled to any compensation for any reductions and for approved materials furnished against a specific order.

4.2.2 VALUATION OF VARIATIONS:

The enlargements extensions, diminutions, reduction, alterations or additions referred to in clause 4.2.1 shall in no degree affect the validity of the contract but shall be performed by the contractor as provided therein and be subject to the same conditions, stipulations and obligations as if they had been originally and expressly included and provided for in the specifications and drawings and the amounts to be paid therefore shall be calculated in accordance with the accepted schedule of rates and for extra items of works at the rates determined under the clause 3.15 of these conditions.

4.2.3 ADDITIONAL WORKS: If required, the contractor shall have to execute additional works within the site to the extent of 25% Twenty-five] of the accepted contract sum. The said percentage of 25% shall apply separately to civil as well as public health and electrical works. No adjustment of rates shall be made upto this limit and the terms and conditions of the contract shall remain unaltered.

5.0 CLAIMS:

5.1 MONTHLY SETTLEMENT OF CLAIMS:

5.1.1 The contractor shall prepare and furnish to the Engineer once in every month an amount giving full and detailed particulars of all claims for any additional expense to which the contractor may consider himself entitled and of all extra or additional works

ordered by the Engineer which he has expected up to and including the preceding month under the following sub-heads:

a) Deviations from items and specifications provided in contract documents.
b) Extra items of Work.
c) Quantities in excess of those provided in the contract schedule.
d) Items in respect of which the rates have not been settled.

No claim for payment for any such work will be considered which has not been included in such particular.

He should in addition furnish a clear certificate to the effect that the claims submitted by him as aforesaid cover all the claims and that no further claims shall be raised by him in respect of the works done up to and including the period under report.

5.1.2 SIGNING OF 'NO-CLAIMS' CERTIFICATE:

The contractor shall not be entitled to make any claim so ever against the Company under or virtue of entertain or considered any such claim, if made by the contractor, after he shall have signed "No Claim" certificate in favour of the Company, in such form as shall be required by the Company.

5.1.3 SUBMISSION OF BILLS:

The contractor shall submit the bills in duplicate on the prescribed form(s) of the Company. For "On Account" payment, bill shall be submitted by the contractor periodically depending on the progress of work at site.

All payments due shall be subject to any deductions which may be made under these presents and shall further be subject to unless otherwise required by clause 2.12 of these conditions, a retention of 7% percent by way of security deposit until the amount of security deposit by way of the retained earnest money and such retention shall total up to the required amount of the security deposit of 10%.

6.0 MEASUREMENT CERTIFICATES AND PAYMENTS:

6.1 Quantities in Schedule Annexed to Contract:

The quantities set out in the accounted schedule of rates are the estimated quantities of the works and they shall not be taken as the actual and correct quantities of the work to be executed by the contractor in fulfilment of his obligations under the contract.

6.2 MEASUREMENTS OF WORKS:

The contractor shall be paid for the works at the rates in the accepted schedule of rates and for extra works at the rates determined under clause 3.21 of these conditions on the measurements taken by the Engineer or the Engineer's representative in accordance with rules prescribed for the purpose by the Company.

6.3 On Account Payments:

6.3.1 No payments shall be made for the works estimated to cost rupees Ten thousand or less till after the whole work shall have been completed and certifications of completion given.

For works estimated to cost more than Ten thousand, the contractor shall submit a bill thereon and be entitled to receive running account payment proportionate to the part thereof then executed to the satisfaction of the Engineer whose certificate of the sum so payable shall be final and conclusive against the final payment only and not as payments for work actually done and completed and shall not preclude the requiring of bad, unsound and imperfect or unskilled work to be removed and taken away and reconstruct or re-erected or be considered as an admission of the due performance of the contract or the part thereof in any respect or the accruing of any claim nor shall it conclude, determine or affect in any way the powers of the engineer under these conditions or any of them as to the final settlement and adjustment of accounts or otherwise, or in any other way or affect the contract.

6.3.2 Rounding off Amounts:

In calculating the amount of each item due to the contract in every certificate prepared for payment sums of less than 50 Paise shall be omitted and the total amount on each certificate shall be rounded off to the nearest rupee, i.e. sums of less than 50 paise shall be omitted and sums of 50 paise and more up to one rupee shall be reckoned as one rupee.

6.3.3 'On Account' Payment Not Prejudicial to Final Settlement:

'On Account' payments made to the contractor shall be without prejudice to the final making up of the accounts (except where measurements are specifically noted in the measurement book as 'Final Measurement' and as such have been signed by the contractor) and shall in no respect be considered or used as evidence of any facts stated in or to be inferred from such accounts nor of any particular quantity of work having been executed nor of the manner of its execution being satisfactory.

6.4 CERTIFICATE OF COMPLETION OF WORK:

6.4.1 As soon as in the opinion of the engineer the work shall have been substantially completed shall have satisfactorily passed any final test that may be prescribed, the engineer shall issue a certificate of completion in respect of the works and the period of Maintenance shall commence from the date of such certificate, provided that the engineer may issue such a certificate with respect to any part of the works before the completion of the whole of the works or with respect to any substantial part of the work which has been both completed to the satisfaction of the engineer and occupier or used by the Company and when any such certificate is given in respect of a part of the work, such part shall be considered as completed and the period of maintenance of such part shall commence from the date of such certificate.

6.5 LIABILITY AND OBLIGATIONS:

6.5.1 CESSATION OF COMPANY'S LIABILITY:

The Company shall not be liable to the contractor for any matters arising out of or in connection with the contract or the execution of the works unless the contractor shall have made a claim in writing in respect thereof before the issue of the Maintenance certificate under this clause.

6.5.2 UNFULFILLED OBLIGATIONS:

Notwithstanding the issue of the Maintenance Certificate the contractor or/and the Company shall remain liable for the fulfilment of any obligations incurred under the provisions of the contractor prior to the issue of the Maintenance certificate which remains unperformed at the time such certificate is issued and for the purpose of determining the nature and extent of any such obligation the contract shall be deemed to remain in force between the parties hereto.

6.6 PAYMENT:

6.6.1 Final Payment:

On the Engineer's certificate of completion in respect of the works, an adjustment shall be made and the balance of amount based on the Engineer's representative certified measurement of the total quantity of work executed by the contractor up to the date of completion and on the accepted schedule of rates and for extra works on rates determined under clause 3.15 of these conditions shall be paid to the contractor subject always to any deductions which may be made under these payments and further subject to the contractor having delivered to the engineer either a full account in detail of all claims he may have on the Company in respect of the works having delivered a 'No Claim' certificate and to the Engineer having after the receipt of such account given a certificate in writing that such claims are correct, that the whole of the works to be done under the provisions of the contract have been completed, that they have been inspected by him since their completion and found to be in good substantial order, that all properties works and things removed, disturbed or injured in consequence of the works, have been properly replaced and made good and all expenses and demands incurred by or made upon the Company for or in the respect of damage or loss by, from or in consequence of the works, have been satisfied agreeably and in conformity with the contract.

6.6.1.1 Final Bill:

The final bill shall be submitted by the Contractor within one month of the date of certificate of completion furnished by the Engineer and payment shall be made within three months if the amount of contract plus that of the additional items is up to Rs. 2 lakhs and in six months if the same exceeds Rs.2 lakhs of the submission of such bills.

If there shall be any undisputed about any item or items of the work, then the undisputed items or items only shall be paid within the said period of three months or six months as the case may be.

6.6.2 REFUND OF SECURITY DEPOSIT:

The security deposit shall be refunded to the contractor on the Engineer-in-Charge certifying in writing that the work has been completed as per Conditions 6.4.1 hereof and after submission of the soil investigation report and acceptance of the same by the Company. The security deposit will be refunded after the payment of the final bill and on receipt of a written request from the contractor for the same.

6.7 COMPANY'S LIEN ON ALL MONEY DUE AND POST PAYMENT CHECK:

The Company shall have a lien on and all or any moneys that may become due and payable to the contractor under these presents and/or also on and over the deposit or security amount or amounts made under the contract and which may become repayable to the contractor under the conditions in that behalf herein contained for, or, in respect of any debt sum that may become due and payable to the Company by the contractor either alone or jointly with another or others and either under this and under any other contract or transactions of any nature whatsoever between the Company and the contractor.

The Company reserves the right to carry out a post-payment audit and/ or Technical examination of the works and the final bills including all supporting vouchers, abstracts etc., and to enforce recovery if as a result of such examination, any over-payment is discovered in respect of any work done by the contractor or alleged to have been done by him under the contract and such recovery will be made by the Company from the contractor by any or all of the methods presented above. If on the other hand any underpayment is discovered the amount shall be duly paid to the contractor by the Company. Further the Company reserves the right to make such recoveries and adjustment notwithstanding the fact that the amount of the final bill may be included by one of the parties as an item of dispute before any arbitrator appointed under the arbitration clause of the contract and notwithstanding the fact that the amount of the final bill figures in the Arbitrators award. And further, unless the contractor pays and clear the claims of the Company immediately on demand, the same will bedebited from the money, securities or deposit which may have become or will become payable to the contractor or under these presents or under any other contract or transactions whatsoever between the contractor and the Company.

6.8 SIGNATURE ON RECEIPTS FOR AMOUNTS:

Every receipts for moneys which may become payable or for any security which may become transferable to the contractor, under these presents, shall notwithstanding anything to the contrary contained in the partnership deed, if signed in the partners in name by any one of the partners of a contractors firm be a good and sufficient discharge to the Company in respect of the money or security purported to be acknowledged, thereby and in the event of death of any of the contractor partners during the tendency of contract, it is hereby expressly agreed that every receipt by any one of the surviving contractor partners shall if so signed as aforesaid to be a good and sufficient discharge as aforesaid provided that nothing in this clause contained shall be deemed to prejudice shall be deemed to prejudices or affect any claim which the Company may hereafter have against the legal representatives of the contractors partner so dying or in respect of any breach of any of the conditions of the contract, provided also that nothing in this clause contained shall be deemed to prejudice or affect the respective rights or obligations of the contractor partners and of the representatives of any deceased Contractor partner.

7.0 LABOUR:

7.1 WAGES TO LABOUR:

The contractor shall comply with the provisions of the minimum wages act, (hereinafter referred to as the "said act") and the Rules made thereunder in respect of

any employees employed by him on road constructions or in building operations or in stone breaking or stone crushing or any other work being executed for the Company by the contractor for the purpose of carrying out this contract.

If, in compliance with terms of the contract, the contractor supplies any labour to be used wholly or partly under the direct orders and control of the Company whether in connection with any work being executed by the contractor or otherwise for the purpose of the Company such labour shall for the purpose of this clause, still be deemed to be persons employed by the contractor.

If any moneys shall, as a result of any claim or applications made under the said act be directed to be paid by the Company, such money shall be payable to the Company by the contractor. On failure by the contractor to repay the Company aforesaid amount within seven days after a notice writing by the Engineer, the Company shall be entitled to recover the same from any moneys due to accruing under this or any contract with the Company.

7.2 INSURANCE:

The contractor shall, at his own expense, carry and maintain insurance to the satisfaction of the Company as follows:

If and when the Employees State Insurance Act is made applicable to the site of works, the contractor agrees to and does hereby accept the full and exclusive liability for the compliance with all obligations imposed by the Employees State Insurance Act as modified from time to time and the contractor further agrees to ensure the compliance of all sub-contractors with the applications of the said Act. The contractor further agrees to defend, indemnify and hold harmless the Company from any liability or penalty which may be passed by any State or Local Authority by reason of any asserted violations by the contractor or sub-contractors of the Employees State Insurance Act and also from all claims, suits or proceedings that may be brought against the Company arising under, occurring out of/or be Central or State Government authorities, or any political subdivisions thereof. The Company shall retain such sums as may be necessary from the total contract value until the contractor shall furnish satisfactory proof that all payments as required by the Employees State Insurance Act have been paid.

7.3 PROVISION OF PAYMENT OF WAGES ACT:

The contractor shall comply with the provisions of the payment of wages Act and the Rules made thereunder in respect of all employees employed by him on the works. If in compliance with the terms of the contract the contractor supplies any labour to be used whole or partly under the direct orders and control of the Engineer whether in connection with the works to be executed hereunder or otherwise for the purpose of Company such labour shall nevertheless be deemed to comprise persons employed by the contractor and any moneys which may be ordered to be paid by the Company shall be payable to the Company by the contractor. On failure of the contractor to repay such money to the Company within 7 days after a notice in writing by the Engineer, the Company shall be entitled to deduct from any money due to the contractor (whether under this contract or any other contract). The decision of the

Engineer upon any question arising out of the effect or force of this clause shall be final and binding upon the contractor.

7.4 REPORTING OF ACCIDENTS TO LABOUR:

The contractor shall be responsible for the safety of all employees employed by him on the works and shall report serious accidents to any of them however and wherever occurring on the works to the Engineer or them Engineer's representative and shall make every arrangement to render all possible assistance.

7.5 WORKMEN'S COMPENSATION:

7.5.1 PROVISION OF WORKMEN'S COMPENSATION ACT:

i) Insurance shall be taken for all the contractor's Employees engaged in the performance of this contract. If any of the work is sublet, the contractor shall require the subcontractor to provide workmen's compensation and Employee Liability Insurance for the latter's employees unless such employees are covered under the contractor's insurance or by reason of the work provided for by this contract whether brought by employees of the contractor by third parties.

ii) In every case in which by virtue of the provisions of the workmen's compensation Act, Company is obliged to pay compensation to a workman employed by the contractor in executing work the Company will recover from the contractor the amount or the compensation so paid, and without prejudice to the right of Company under the said Act, Company shall be at liberty to deduct it from the security deposit or from any sums payable to the contractor, whether under this contract or otherwise Company shall not be bound to contest any claim made against it under the said act except on the written request of the contractor and upon his giving to Company full security for all costs for which Company might become liable in consequence of contesting such claim.

7.5.2 PROVISIONS OF MINES ACT:

The contractor shall observe and perform all the provisions of the Mines Act or any statutory modifications or re-enactment thereof for the time being in force and any rules and regulations made thereunder in respect of all the persons employed by him under this contract and shall indemnify the Company from and against any claims under the mines act or the rules and regulations framed thereunder by or on behalf of any persons employed by him or otherwise.

7.5.3 COMPLIANCE TO RULES FOR EMPLOYMENT OF LABOUR:

The contractor shall conform to all laws, bye-laws, rules and regulations for the time being in force pertaining to the employment of local or imported labour and shall take all necessary precaution to ensure and preserve the health and safety of all staff employed on the works.

7.5.4 PRESERVATION OF PEACE:

The contractor shall take requisite precautions and use his best endeavours to prevent any riotous or unlawful behavior by or amongst his workmen and others employed on the works and for the preservation of peace and protection of the inhabitants and security of the property in the neighborhood of the work. In the event of the Company requiring the maintenance of a special police force at or in the vicinity of the site during

the tenure of work, the expenses thereof shall be borne by the contractor and if paid by the Company shall be recoverable from the contractor.

7.5.5 SANITARY ARRANGEMENTS:

The contractor shall obey all sanitary rules and carry out all sanitary measures that may from time to time prescribed by the Company and permit inspection of all sanitary arrangements at all times by the Engineer, the Engineer's representatives or the medical staff of the Company, should the contractor fail to make adequate sanitary arrangements these will be provided by the Company and the cost thereof recovered from the Contractor.

7.5.6 OUTBREAK OF INFECTIOUS DISEASE:

The contractor shall remove from his camp such labour and their families who are infected as a refugee. Protective inoculation and vaccination shall be arranged by the contractor at his own cost when called upon to do so by the Engineer or Engineer's Representative. Should Cholera, Plague or any other infectious disease break out the contractor shall burn the huts, beddings, clothes and other belongings of or used by the infected parties and promptly erect new huts on healthy sites as required by the Engineer, failing which within the time specified in the Engineer's requisition, the work may be done by the Company and the cost thereof recovered from the Contractor.

7.5.7 MEDICAL FACILITIES AT SITE:

The contractor shall provide medical facilities at the site as may be prescribed by the Engineer on the advice of the prescribed Medical Authority of the Company or any other authority in relation to the strength of the contractor's resident staff and workmen.

7.5.8 USE OF INTOXICANTS:

The sale of ardent spirits or other intoxicating beverages upon the work in any of the buildings encampments or tenements owned, occupied by or within the control of the contractor or any of his employee is forbidden and the contractor shall exercise his influence and authority to the utmost extent to secure strict compliance with this condition.

7.5.9 NON – EMPLOYMENT OF LABOURERS BELOW THE AGE OF 14:

The contractor shall not employ children below the age of 14 as labourers for the execution of work.

8.0 DETERMINATION of CONTRACT:

8.1 RIGHT OF COMPANY TO DETERMINE THE CONTRACT:

The Company shall be entitled to determine and terminate the contract at any time should in the Company's opinion, the cessation of work become necessary owing to paucity of funds or form any other cause whatsoever, in which case the value of approved materials at site and of work done to date by the contractor will be paid for in full at the rates specified in the contract. Notice in writing from the Company of such determination and the reasons therefor shall be conclusive evidence thereof and binding upon the contractor.

8.2 PAYMENT ON DETERMINATION CONTRACT BY COMPANY:

Should the contract be determined under clause 8.1 and the contractor claims payment for expenditure incurred by him in the expectation of completing the whole works, the Company shall admit and consider such claims as are deemed reasonable and are supported by vouchers to the satisfaction of the Engineer. The contractor shall, however, have no claim to any payment whatsoever on account of profit and advantage which he might have derived from the execution of the work in full but which he did not derive in consequence of the determination of the contract. The Company's decision on the necessity and propriety of such expenditure shall be final and conclusive.

8.3 DETERMINATION OF CONTRACT OWING TO DEFAULT OF CONTRACT:

If the contractor should –

8.3.1.1 Become bankrupt or insolvent

8.3.1.2 Make an arrangement, with or assignment in favour of his creditors, or agree to carry out the contract under a committee of Inspection of his creditors.

Or

8.3.1.3 Being a Company or corporation, go into liquidation (Other than a voluntary liquidation for the purpose of amalgamation or reconstruction).

Or

8.3.1.4 Have an execution levied on his goods or property on the works.

Or

8.3.1.5 Assign the contract or any part thereof otherwise than as [provided in condition 2.5 of these conditions.

Or

8.3.1.6 Abandon the contract

Or

8.3.1.7 Persistently disregard the instructions of the Engineer, or contravene any provisions of the contract.

Or

8.3.1.8 Fail to adhere to the program of work by a margin of 10% of the stipulated period.

Or

8.3.1.9 Fail to remove materials from the site or to pull down and replace work after receiving from the Engineer's notice to the effect that the said materials or work have been condemned or rejected.

Or

8.3.1.10 Fail to take steps to employ competent or additional staff and Labour as required under condition 3.7 of these conditions

Or

8.3.1.11 Fail to afford Engineer or Engineer's Representative proper facilities for inspecting the works or any part thereof as required under conditions 3.8 of these conditions.

Or

8.3.1.12 Promise offer or give any bribe, Commission, Gift or advantage either himself or through his partner, agent or servant to any officer or employee of the Company, or to any person on his or in their behalf in relation to the execution of this or any other contract with the Company.

Then and in any of the aforesaid cases, the Engineer on behalf of the Company may serve the contractor with a notice in writing to that effect and if the contractor does not within 7 days after the delivery to him of such notice proceed to make good his default in so far as the same is capable of being made good and carry on the work or comply with such directions as aforesaid to the entire satisfaction of the Engineer, the Company shall be entitled after giving 42-hour notice in writing under the hand of the accepting authority to rescind the contract as a whole or in a part or parts(as may be specified in such notice) and adopt either or both of the following courses.

a) To carryout whole or part of the work from which the contractor has been removed by the employment of the required labour and materials, the costs of which shall include lead, lift, freight, supervision and all such incidental charges.

b) To Measure up the whole or part of the work from which the contractor has been removed and to get it completed by another contractor.

The manner and method in which such work is completed shall be in the entire discretion of the accepting authority whose decision shall be final and in both cases (a) and (b) mentioned above and the Company shall be entitled to:

i) To forfeit the whole or such portion of the security deposit as it may consider fit.

AND

ii) To recover from the contractor the cost of carrying out the work in excess of the sum which would have been payable according to the certificates of the Engineer to the contractors, if the works had been carried out by the contractor under the terms of the contract, such certificate being final and binding upon the contractor, provided however, such recovery shall be made only when the cost incurred in excess is more than the security deposit proposed to be forfeited and shall be limited to the amount by which the cost incurred in excess is more than the security deposit proposed to be forfeited and shall be limited to the amount by which the cost incurred in excess, exceeds the security deposits proposed to be forfeited. The amount thus to be forfeited or recovered may be deducted from any moneys then due or which at any time thereafter may become due to the contractor by the Company under this or any other contractor or otherwise.

Provided always that in any case, in which any of the powers conferred upon the Company by sub-clause as above shall have become exercisable and the same shall not be exercised, the non-exercise thereof shall not constitute a waiver of any of the conditions thereof, such powers shall notwithstanding to exercisable in the event of any future case of default by the contractor for which his liability for past and future shall remain unaffected.

8.3.2 RIGHT OF COMPANY AFTER RESCISSION OF CONTRACT OWING TO DEFAULT OF CONTRACTOR.

In the event of any of several of the courses, referred to in conditions 8.3 of this clause, being adopted:

8.3.2.1 The Contractor shall have no claim to compensation for any loss sustained by him by reason of his having purchased or procured any materials or entered into any commitments or made any advance on account or with a view to the execution of the works of the performance of the contract and Contractor shall not be entitled to recover or be paid any sum for any work thereto or actually performed under the contract unless until the Engineer shall have certified the performance of such work and the value payable in respect whereof and the Contractor shall only be entitled to be paid the value so certified.

8.3.2.2 The Engineer or the Engineer's representative shall be entitled to take possession of any materials, tools, implements, machinery and buildings on the works or on the property on which these are being or ought to have been executed and to retain and employ the same in the further execution of the works or and part thereof until the completion of the works without the Contractor being entitled to any compensation for the use and employment thereof or for wear and tear or destruction thereof.

8.3.2.3 The Engineer, shall as soon as may be practicable after removal of the Contractor fix and determine ex-party or by or after reference to the parties or after such investigation or inquiries as he may consider fit to make or institute and shall consider fit to make or had at the time or rescission of the contract been reasonably earned by or would reasonably accrue to the Contractor in respect of the work than actually done by him under the contract and what was the value of any unused, or partially used materials, any construction plant and temporary works upon the site.

8.3.2.4 The Company shall not be liable to pay to the Contractor any money on account of the contract until the expiration of the period of maintenance and thereafter until the cost of completion and maintenance damages (if any), and all other expenses incurred by the Company have been ascertained and the amount thereof certified by the Engineer. The Contractor shall then be entitled to receive only such sum or sums (if any) as the Engineer may certify would have been due to him upon due completion by him after deducting the said amount, but if such amount exceeds the sum which would have been payable to the Contractor, shall upon demand, pay to the Company the amount of such excess and it shall be deemed a debit by the Contractor to the Company and shall be recoverable accordingly.

8.3.3 TERMINATION OF CONTRACT FOR DEATH:

If the contractor is an individual or a proprietary concern and the individual or the proprietor dies and if the contractor is a partnership concern and one of the partner dies then unless the Company is satisfied that the legal representative of the individual contractor or of the proprietor of the proprietary concern and in the case of partnership, the surviving partners, are capable of carrying out and completing the contract, the Company shall be entitled to cancel the contract as to its incomplete part without the Company being in any way liable to payment of any compensation to the

estate of the deceased contractor and/or to the surviving partners of the contractors firm on account of the cancellation of the contract. The decision of the Company that the legal representative of the deceased contractor or the surviving partners of the contractor's firm cannot carry out and complete the contract shall be final and binding on the parties. In the event of such cancellation, the Company shall not hold the estate of the deceased contractor and/or the surviving partners of the contractor's firm liable for damages for not completing the contract.

9.0 SETTLEMENT OF DISPUTES:

9.1 MATTERS FINALLY DETERMINED BY THE COMPANY

All disputes or difference of any kind whatever arising out of or in connection with the contract, whether during the progress of the works or after completion and whether before or after the determination of the contract, shall be referred by the Contractor to the Company and the Company shall within a reasonable time after their representation make and notify decision thereon in writing. The decisions, direction and certificates with respect to any conditions given and made by the Company or by the Engineer on behalf of the Company which matters are referred to herein after as accepted matters shall be final and binding upon the Contractor and shall not be set aside or be attempted to be set aside on account of any informality, omission, delay of error in proceeding in about the same or any other ground or for other reason and shall be without appeal.

9.2 DEMAND FOR ARBITRATION:

9.2.1 If the Contractor be dissatisfied with the decision of the Company, on any matters in question, dispute or difference on any account or as to the withholding by the Company of any certificates to which the Contractor may claim to be entitled to or if the Company fails to make a decisions within a reasonable time, when and in any such cases but except in any of the expected matters with in ten days of the receipt of communication or such decisions or after the expiry of reasonable time (which reasonable time will in no case exceed three months) as the case may be shall demand in writing that such matters in question, dispute or difference be referred to Arbitration. Such demand for Arbitration shall be delivered to the Company by the Contractor and shall specify the matters which are in question, dispute or difference and such disputes or difference of which the demand has been made and no other matter shall be referred to arbitration.

9.2.2 OBLIGATION DURING PENDENCY OF ARBITRATION:

Work during the contract shall unless otherwise directed by the Engineer, continue during proceedings and no payment due or payable by the Company shall be withheld on account of such proceedings provided, however, it shall be open for the arbitrator to decide whether such work should continue or not during arbitration proceedings.

9.2.3 ARBITRATION:

Except where otherwise provided for in the contract, all questions and dispute relating to the meaning of the specifications, designs, drawings, estimates, instructions and conditions herein mentioned and as to the quality of workmanship, or materials used on the work or as any way arising out of or relating to the contract, designs, drawings, specifications, estimates, Instructions, orders or these conditions or

otherwise concerning the works or the execution or failure to execute the same whether arising during the progress of work or after the completion or abandonment thereof shall be referred to the sole arbitration of accepting authority and if the accepting authority is unable or unwilling to act, to the sole arbitration of some other person appointed by the accepting authority. There will be no objection if the arbitrator so appointed is an employee of the ITI LIMITED and that he had to deal with the matters to which the contract relates and that in the course of his duties as such he has expressed views on all or any of the matters in disputes of difference. The Arbitrator to whom the matter is originally referred being transferred or vacating his office being unable to act for any reason, the accepting authority as aforesaid at the time of such transfer, vacation of office or inability to act shall appoint another person to act as Arbitrator in accordance with the terms of the contract. Such person shall be entitled to proceed with the reference from stage at which it was left by his predecessor. It is also a term of this contract that no person other than a person appointed by accepting authority, as aforesaid, should act as arbitrator and if for any reason, that is not possible, the matter is not to be referred to Arbitration at all. In all cases where the amount of the claim on dispute is Rs. 50,000/- (Rupees fifty thousand) and above, the arbitrator shall give reason for the award. It is also terms of this contract that the venue of the arbitration shall be ITI Limited, Dooravaninagr, Bengaluru, 560016.

It is term of the contract that the party invoking arbitration shall specify the dispute or disputes to be referred to arbitration under this clause together with the amount or amounts claimed in respect of each such dispute.

It is also a term of the contract that if the Contractor(s) does/do not make any demand for Arbitration in respect of any claim(s) in writing within ninety days[90] of receiving the intimation from the Company, that the bill is ready for payment the claim of the contractors will be deemed to have been waived and absolutely be barred and the Company shall be discharged of all liabilities under the contract in respect of these claims.

The arbitrator(s) may from time to time with the consent of the parties extend the time for making and publishing the award.

Subject as aforesaid the provisions of the Arbitration Act 1996 with latest amendments or any statutory modification or re-enactment thereof & the rules made there under & for the time being in force shall apply to the arbitration proceedings under this clause.

Jurisdiction of Courts: For any legal matters arising out of this contract, the designated courts in Bangalore only shall have jurisdictions.

The decision of the Arbitrator shall be final and binding on the parties to this Contract.

Each party shall bear its own cost of preparing and presenting its case. The cost of Arbitration including the fees and expenses of the Arbitrator shall be shared equally by the Contractor and the Company.

SPECIAL CONDITIONS OF CONTRACT- I

1. Specifications:

1.1 The work shall be executed in strict accordance with the accepted conditions of contract, bill of quantities, specifications and orders as may be issued by the Engineer-in-Charge and his representatives.

1.2 Specifications shall include relevant provisions in all the following documents and standards. These provisions shall be supplementary to each other. In the case of conflict amongst the provisions for any item of work in the various documents under reference, the following precedence's shall be followed.

a) Latest Indian Standard Specifications and code or practice.
b) Latest C.P.W.D Specifications for works at Delhi.
c) Latest M.E.S Specifications.

1.3 If Specifications for any item of work are not covered by any of the documents mentioned in para 1.2 above the same shall be decided and conveyed by the Engineer-in-charge to the contractor.

1.4 In case of conflict amongst the provisions of the bill of quantities, specifications and drawings the following precedence shall be followed.

a) Descriptions of item in the bill of quantities.
b) Provisions in the specifications.
c) Provision in the drawings.

1.5 In the case of conflict amongst the various drawings, the decisions of Engineer -in–charge shall be final and binding.

SPECIAL CONDITIONS - II

1. General: These special conditions shall be read in conjunction with general of the contract. Where the provisions of these conditions are at variance with the provisions of the general conditions of the contract, the provisions of these special conditions shall take precedence.

2. The Bill of quantities is to be read in conjunction with the form of Tender, Drawings, Conditions of Contract, specifications as these documents are jointly explanatory and descriptive of the works included in contract.

3. The rates quoted in the bill of Quantities are to be for full inclusive value of the work described under the several items, including all costs and expense which may be required in and for the construction and full protection of the work described, together with all general risks, liabilities and obligations set forth or implied in the documents on which the tender is based. The quoted rates will be for all heights, lifts and leads unless otherwise mentioned specifically in the description of them.

4. The quantities of work in the schedule are not to be considered as limiting for the amount of work to be done by the contractor. The quantities are an estimate of the amount of work to be executed and the work will be measured on completion and the Contract amount adjusted accordingly.

5. General directions and descriptions of work and materials given elsewhere in the contract documents are not necessarily repeated in the Schedule. Reference is to be made to the other documents for full information.

LOCATION OF SITES:

The sites are mainly located in border areas. An officer from the Company will accompany the successful bidder's team for soil testing of the location for taking samples at fixed points.

SPECIFICATIONS FOR SOIL EXPLORATION AND INSTRUCTIONS TO THE AGENCIES.

1. The soil investigation shall be conducted as per relevant IS Specifications and codes.

2. Testing of samples shall be done in accordance with IS codes.

3. **Spacing of boreholes:**
In case of tower foundations, one borehole should be done in the center of the tower, and one on the leg with three dynamic cone penetration tests, one under each leg. If variation in strata is considerable, the number of test bore may be increased to provide one on each leg diagonally with the prior permission of Engineer-in-charge.

4. Depth of Borings in Rocky Strata:
Boring should extend to a minimum depth of 5.0 meters in rocks.

5. One borehole shall be done first approximately at the geometric center of the plan of the tower leg location and soil characteristic at various depths along with the changes in strata of this borehole shall be noted. The number of boreholes, their depths and type, and number of various fields and laboratory tests to be carried out shall be decided by the Engineer-in charge based on the characteristics of soil strata as obtained from the first borehole.

6. The settlement of the foundation shall not be more than 16 mm and the differential settlement between two tower legs shall not be more than 12 mm which shall be the guiding factor for recommending the SBC and other soil parameters.

7. All the above works includes transportation of plant and personnel to the site of work, providing suitable accommodation for their personnel and clearance of site after completion of field work.

8. All the samples should be collected in the presence of representative of Engineer-in-charge.

9. Only relevant test actual required at each site will be conducted and payment will be made only for the actual tests conducted.

10. The quantities are approximate and are likely to vary. Only minimum number of Borehole s and tests required shall be taken at each site.

11. As the work is time bound and is required to be completed within the stipulated time. The contractors will submit a pert chart along with the tender indicating the number of sites that they would take up simultaneously at a time to ensure timely completion.

12. Contractors are at liberty to quote for either all the Zones or for as many number of Zones as they can take up for execution and explain the same clearly in the tender. They may also indicate the areas in the order of preference.

13. As the soil investigations are meant for a time bound project, the work has to be carried out strictly according the time frame. In case there is failure on the part of the contracting firm to complete the work in the stipulated time, a penalty of 1% per week of the uncompleted value of the work will be levied subject to a maximum 10% of the total contract value.

14. If the firm to which the work is awarded fails to give satisfactory progress, the Company will be free to terminate the contract at any stage and entrust the balance work to a third agency and recover the extra cost if any from the defaulting contractor.

15. The Company reserves the right(i) to reject any or all the tenders without assigning any reason thereof (ii) to distribute the work between more than one contractor. The whole work may be split up and accepted in parts entirely at the sole discretion of the Company. The tenderer should specifically state in case he would be unwilling to accept a part of the work.

TECHNICAL SPECIFICATIONS
FOR
GEOTECHINCAL INVESTIGATION

NOTE:

These Technical specifications contain the details of specifications for the test equipment's, test procedures, preparation of report etc. The type of tests/ investigations and the number of tests to be conducted shall be as indicated in the schedule of Items. However, if the contractor feels that some more additional tests /exploration are to be carried out for ascertaining the soil properties sought in the tender, such additional tests/exploration have to be carried out by the contractor without any extra cost. The rates quoted by the contractor will be deemed to include the cost of carrying out such additional tests/exploration. This supersedes anything specified otherwise in the Technical specifications.

1.0 INTRODUCTION:

1.1 The Company desires that detailed Geo-Technical Investigation be carried out at various sites to provide the designer with sufficiently accurate information, both general and specific, about the sub strata profile and relevant soil rock parameters at site on the basis of which the foundations for various structures can be designed rationally. Such structure would include Buildings, Underground buildings, Microwave Towers, Diesel Generator sets, Retaining walls, Underground tanks etc. The above list is indicative and not exhaustive.

2.0 SCOPE:

2.1 This specification covers the technical requirements for detailed Geo-Technical investigation and submission of a Geo technical report. The work shall include mobilization of all the necessary equipment's, providing necessary engineering supervision and technical personal, skilled and unskilled labour etc. as required to carry out the entire field as well as laboratory investigation, analysis and interpretation of test data collected and preparation of Geo-Technical Report. The entire field as well as laboratory investigation work shall be supervised by a graduate in civil engineering with sufficient experience in respective areas of Geo Technical investigation work. The scheduling of laboratory tests, analysis and interpretation of tests results and drafting of report shall be carried out by a post graduate in Geo-Technical engineering with sufficient experience.

2.2 All the field and laboratory data shall be recorded in the proformas recommended in Indian Standard Codes. All the field records shall be counter signed by the Engineer soon after the completion of borehole / test. The contractor shall submit to the Company Two copies of field bore log. All the investigations are to be carried out by the agency as per the priority requirements of the Company.

2.3 The contractor shall intimate the Company, giving reasons if any additional specific tests he considers necessary to be carried out duly considering local conditions and get an approval in writing before starting of such tests.

2.4 Whenever the contractor is unable to extract undisturbed samples he should immediately inform the engineer. In such case payment for boring charges shall be subject to the Company being satisfied that adequate effort has been made to extract undisturbed samples.

2.5 All the laboratory test data shall be recorded in proformas recommended in the Indian Standard Codes and a copy of this shall be sent to the Company. Whenever desired during the progress of the work, the representative of the Engineer-In-Charge may be present at the laboratory where the contractor is arranging for execution of the laboratory tests.

2.6 The Contractor shall interact with the Company to get acquainted with the different types of structures envisaged and in assessing the load intensities on the foundations for the various structures of the project to enable him to arrive at allowable bearing pressure.

2.7 After the review of the draft report, the Company may call for discussions in order to explain to the contractor the Company's observation on the report. Within one week of such a request, the contractor's technically qualified Geo-Technical Engineer shall be available at the Company's office at Bangalore for a discussion. Any expenditure on account of redrafting, finalizing the report including cost of visits to the Company's office at Bangalore shall be deemed to have been included in the quoted rates.

2.8 The contractor shall carry out all the works meant within para 1.0 of this specification even if not explicitly mention under the scope. All work shall be executed to the satisfaction of the engineer.

3.0 GENERAL REQUIREMENTS:

3.1 In areas of which have already been developed, the contractor shall take advantage of existing local knowledge, records of trial pits, boreholes etc., in the vicinity and the type of foundations adopted and behavior of existing structures. Particularly those of similar nature to ones proposed for this project.

3.2 The contractor shall make use of information gathered from quarries, unlined wells cuttings from nearby areas etc. The general topography of the nearby areas will often give some indication about the variation of the soil conditions which are likely to exist.

3.3 The contractor shall gather data regarding the removal of over burden by excavation, erosion or landslides in the areas which make you an idea of the amount of reconsolidation that the soil strata has undergone. Similarly, data regarding the recent fills shall be studied to determine the characteristics of the fill as well as the original strata.

3.4 The water level in streams and water courses, if any in the neighborhood shall be noted. Reliable information regarding ground water level shall also be gathered from water level in the wells nearby.

3.5 The contractor shall make enquire and verify regarding earlier use of the site, which can have important bearing on its suitability for the proposed structures. This is important particularly in areas where there have been underground works e.g. worked out Blast pits, Quarries, Old Brickfields, Mines, Mineral workings etc. The possibility of damage to the structures, sewers, conduits, and drainage systems by subsidence shall also be investigated.

3.6 It is essential that the equipment's/instruments are properly calibrated at the commencement of the work so that they represent true values and submit the test reports to engineer. If the engineer so desires, the contractor shall arrange for having the instrument tested in the presence of the engineer at an approved laboratory at his cost and test reports shall be submitted to the engineer.

3.7 When blasting with explosives is involved, agency/contractor shall arrange statutory clearances and also the portable storing/carrying arrangement for the explosives.

4.0 CODES and STANDARDS:

4.1 The works shall be carried out in conformity with the latest Indian Standard Codes.

4.2 In case of conflict between this specification and those specified in the relevant Indian Standard Codes, the former shall prevail.

5.0 FIELD INVESTICATIONS – SOIL:

5.1 Boring:

5.1.1 General Requirements:

a) Bores holes shall be taken at specified locations to obtain information about the sub soil profile, its nature and strength and to collect soil samples for strata identification and conducting laboratory tests. The minimum diameter of the borehole shall be 150 mm and boring shall be carried out in accordance with the provision of IS:1892 and as per this specification.

b) All the borehole s shall extend up to depths indicated in the schedule of quantities or as directed by the engineer. If the strata with Standard Penetration Test (SPT) – N value greater than100 with characteristics of rock is met with, earlier, the borehole shall be advanced further either by chiseling and /or by core drilling by deploying Nx size diamond bit with double core barrel with prior approval of engineer, identification of rock strata shall be on the basis of visual examination of SPT sample and rock fragments/rock cores. Chiseling shall be continued for a maximum depth of 20Cms or up to Two hours whichever is earlier. During chiseling and/or by coring, rock fragment/rock cores shall be collected. In such case borehole shall be advanced further drilling rock as specified in clause 6 and core shall be collected. When the borehole is terminated in soil strata an additional standard penetration test shall be carried out at the termination depth.

c) Casing pipes shall be used in the borehole to support its sides when side fall is suspected to occur inside the borehole. When casing pipe is used, it shall be ensured that its bottom end is at all times less than 15cms above the bottom of the borehole and not below the level at which the test has to be conducted or sampling has to be done. In case of cohesion less soils the advancement of the casing pipe shall be such that it does not disturb the soil to be tested or sampled. The casing shall be advanced by slowly turning the casing pipe and not by driving.

d) In-situ tests shall be conducted or undisturbed samples(UDS) shall be collected in the borehole s at every 1.50 M intervals or change of strata whichever is earlier or as decided by the engineer. representative. Disturbed samples shall be preserved for conducting various identifications tests in the laboratory. Water table in the borehole shall be carefully recorded and reported. No water /drilling mud shall be added while boring above ground water table. For cohesion less soil below water table, the water level in the borehole s shall be at all times be maintained slightly above the water table.

e) The borehole shall be cleaned using suitable tools up to depth of testing of sampling, ensuring that there is minimum disturbance of the soil at the bottom of the borehole. The process of jetting through an open tube sampler shall not be permitted. In cohesive soils, the borehole may be cleaned using a bailer with a flap valve. Gentle circulation of drilling fluid shall be done when rotary mud circulation boring is adopted.

f) On completion of the borehole, the contractor shall back fill all the borehole as directed by the Engineer. Holes in superficial deposits shall be filled within 1 metre, of ground level using arising excavated material. The remaining 1 metre shall be back filled using a selected material from the risings in order to that the ground is restored to its original condition.

5.1.2 Auger Boring:

Auger boring can be adopted in soft to stiff cohesive soils above water table. Auger shall be of helical or post hole type, which may be manually or power operated. While boring, care shall be taken to minimize the disturbance to the deposits below the bottom of the borehole. The cuttings brought up by the auger shall be carefully examined in the field and the description of all the strata shall be duly recorded in the field bore lock as per IS:1498. No water shall be introduced from the top while conducting auger boring.

5.1.3 Shell and Auger Boring:

Shell Auger boring can be used in all types of soil free from boulders. For cohesion less soil below ground water table, the water level in the borehole shall always be maintained at or above the ground water level. The use of chisel bit shall be permitted in hard strata with SPT – N value greater than 100. Chisel bit may also be used to extend the borehole through local obstruction, such as old construction, boulders, rocky formations etc. All other requirements in clause 5.12 shall apply for this type of boring also.

5.1.4 PERCUSSION BORING:

This method can be adopted in soil with gravel and boulders when the boring has to be done at a fast rate. This method consists of breaking up the strata by repeated blows from a chisel or drilling bit and bailing out the debris at intervals by adding water into the borehole. This method is not suitable for careful and very reliable sampling operation because of the disturbances caused during boring.

5.1.5 ROTARY MUD CIRCULATION BORING:

This method can be used in all types of soil below water table. In this method boring shall be done by rotating the bit fixed at the bottom of the drill rod. Proper care shall be taken to keep firm contact between the bit and the bottom of the borehole. Bentonite of mud laden fluids shall be used as drilling fluid to serve as the protective surface inside the borehole. Use of percussion tool shall be permitted in hard clays and dense sandy deposits.

5.2 STANDARD PENETRATION TEST:

This test shall be conducted in all types of soil deposits met within a borehole to find the variation in the soil stratification by correlating with the number of blows required for unit penetration of standard penetrometer. This test shall be conducted at 3 Mtrs, intervals and every change of strata and as per the direction of Engineer. The starting depth of performing SPT shall be between 1.0M to 2.0M depth below ground level. This depth shall be altered in alternate borehole s. The depth interval between the top levels of standard penetration test and next undisturbed sampling shall not be less than 1.0 M. The specification for the equipment and other accessories, procedure for conducting the test presentation of test results and collection of the disturbed soil samples shall conform to IS:2131.

This test shall be carried out driving a standard split spoon sampler in the borehole by means of a 650N hammer having free fall of 0.75 m. The sampler shall be driven using the hammer up to a depth of 450mm. While driving the number of blows for every 150mm penetration and the penetration for every 50 blows shall be recorded. The number of blows for the last 300mm drive shall be reported as N value. This test shall be discontinued when the blow count is equal to 100, the penetration shall be recorded. Refusal shall be considered to be met with when the blow count is equal to 100. At the location where the test is continued the penetration and the number of blows shall be reported. Sufficient quantity of disturbed soil samples shall be collected from the split spoon sampler for identification and laboratory testing. The samples shall be visually classified and recorded at the site shall properly preserved without loss of moisture content and labelled for future identification.

5.3 SAMPLING:

5.3.2 GENERAL:

a. Sufficient number of soil samples shall be collected for reliable estimation of soil properties. The samples collected shall be either disturbed or undisturbed. Disturbed soil samples shall be collected for field identification and conducting tests such as sieve analysis, index properties, specific gravity, chemical analysis

etc. Undisturbed samples shall be collected to estimate physical, strength and settlement properties of the soil.

b. All the accessories required for sampling and the method of sampling shall conform to IS:2132. All the disturbed and undisturbed samples collected in the field shall be classified at the site as per IS:1498.

c. All the samples shall be identified with date, borehole or trial pit number, depth of sampling etc. It is also essential to mark an arrow pointing towards the top surface of the sample as the soil was In-situ. Care shall be taken to keep the undisturbed soil samples and box samples vertically with the arrow directing upwards. The tube samples shall be properly trimmed at both ends and suitably caped and sealed with molten paraffin wax at both ends immediately after extracting the samples from the borehole and suitably caped on both sides.

d. When the contractor fails to collect the undisturbed soil sample at a specified depth the reason for the same shall be indicated in the borehole log and the borehole shall be advanced by 0.50 M. In such a case, for cohesion less soil standard penetration test shall be performed and for very soft cohesive soil field vane shear test shall be performed.

e. Precaution shall be taken to ensure that there shall not be any change in moisture content and disturbance after soil samples and they shall be placed in a temporary store at the end of the day's work. All the samples shall be kept over a bed of sand, jute bags, saw dust etc. and covered over on top with similar material. The bed and top cover shall be kept moist till they are properly packed in wooden boxes. The contractor shall be responsible for packing and transporting of all the samples from site to the laboratory within seven days after sampling with proper protection against loss and damage.

f. All the samples shall be suitably packed in wooden boxes using sand and saw dust etc., around the samples below transportation to laboratory for testing.

5.3.3 Disturbed Samples:

a. Disturbed soil samples shall be collected from borehole s at regular intervals to provide complete description of soil profile and its variation. Jar samples weighing approximately 10N shall be collected in borehole s at 0.5 m intervals staring from a depth of 0.5 m below ground level and at every identifiable change of strata to supplementary boring records. Samples shall be immediately stored in airtight jars or polythene bags and labelled with borehole number and depth.

b. In elevated areas, if superficial materials available in plenty then bulk samples from a depth of about 0.50 m below ground level shall be collected to establish all the required properties to use it as fill material. Disturbed samples weighing about 250 N shall be collected at shallow depths and immediately stored in polythene bags as per IS:1982. The bags shall be sealed properly to avoid any change in moisture content and they shall be kept in wooden boxes.

5.3.4 Undisturbed Sample:

In each hole undisturbed sample shall be collected at every change of strata and at regular intervals of 3.0 m and as directed by the Engineer. The starting depth of collecting UDS shall be between 1.0m to 3.0m below ground level and as decided by the Engineer. The starting depth shall be varied in alternate boreholes. In cohesive soils collection of UDS shall be preferred in place of SPT. The depth interval between the top level of undisturbed sampling and Standard Penetration test shall not be less than 1.0m. The undisturbed sample shall be of 100mm dia and 450mm length. Samples shall be collected in such a manner that the structure of the soil and its moisture content do not get altered. The specifications for the accessories required for sampling and the sampling procedure shall conform to IS:1892 and IS: 2132. Undisturbed sampling in sand shall be done using compressed air technique mentioned in IS:8763. The thin-walled sampler shall be used to collect undisturbed samples by pushing the tube into the soil. The sampling tube shall have a smooth finish on both surfaces and a minimum effective length of 450mm. The area ratio of sampling tubes shall be less than 12.5%. However, in case of very stiff soils area ratio up to 20% shall be permitted.

a. Undisturbed Sampling in cohesive soil:

Undisturbed sample in soft to stiff cohesive soils shall be obtained using thin-walled sampler. In order to reduce the wall friction, suitable precautions such as oiling the surfaces shall be taken. The borehole shall be cleaned and the depth of sampling below the ground level shall be noted. The sample shall then be attached to the bottom of the boring rods and lowered into the borehole. The sampler shall be pushed into the clay layer by hand or by jacking and a soil sample of specified length shall be collected without disturbing the soil.The distance by which the sampler penetrates into the soil strata shall be checked. Care being taken to ensure that the sampler is not driven too far as this compress the soil. The sampler shall be rotated to break the core at the bottom of the sampler and then steadily drawn up.

b. Undisturbed Sampling using Piston Sampler:

Undisturbed samples in very loose saturated sandy and silty soils and very soft clays shall be obtained by using a piston sampler consisting of a sampling cylinder and piston system. In soft clays and silty clays, with water standing in the casing pipe piston sampler shall be used to collect undisturbed samples. During this method of sampling expert supervision is called for.

The interior surface of the sampler shall be smooth, clean and corrosion-resistant. Its cutting edge, the ring seals shall be inspected for wear & tear and rejected if worn out.The check shall be done to ensure that the moving part of the sampler function freely before the sampler is lowered into the borehole. While pushing the system into the soil and till the beginning of the sampling operations, the bottom of the piston shall be flush with the cutting edge of the sampler. At the depth of sampling, the piston should be fixed relative to the ground and the sampler cylinder shall be independently pressed down smoothly and continuously into the ground. If an obstruction is met, the sampler shall be withdrawn and another sample taken after the obstruction is removed.

Accurate measurement of the samplings, the height of sampler, stoke and length of sample recovery shall be recorded. After the sampler is pushed to the required depth both the sampler cylinder and piston system shall be drawn up together ensuring that there shall not be any disturbance to the sample, which shall then be protected from changes in moisture content.

c. Undisturbed Sampling in Cohesion Less Soils:
Undisturbed samples in cohesion less soils shall be obtained as per the procedure is given in IS:8763. Compressed air sampler shall be used to take samples of cohesion less soil below the water table. Precaution shall be taken to clean the borehole before sampling. Thin-walled tube samplers of 60mm internal diameter shall be used. The height and the other dimensions of the samplers shall be recorded before use. Proper care shall be taken to maintain the water level slightly above the groundwater table before and during sampling operations. Immediately after the sample is obtained the ends of the sample shall be waxed and caped to avoid moisture content change.

5.3.5 Relaxation During Sampling:

a) The sampler shall be pushed into soil and driving of sampler shall be resorted to only when it cannot be pushed into the soil. This shall be done only with the permission of the Engineer and all the details about the same shall be recorded in the bore logs.

b) In clays when N value is above 50, undisturbed samples may be replaced by the Standard Penetration Test.

5.4 Ground Water:

5.4.1 One of the following methods shall be adopted for determining groundwater table in boreholes as per IS:6935 and as per the instructions of the Engineer.

a. In permeable soils, the water level in the borehole shall be allowed to stabilize after lowering it adequately by bailing. When the water level inside the borehole is found to be stable, the depth water table below ground level shall be measured. Stability of sides and bottom of the borehole shall be ensured at all times.

b. For both permeable and impermeable soils, the following method shall be suitable. The borehole shall be filled with water and then bailed out to various depths. Observations on the rise or fall of water level shall be made at each depth. The level at which neither a fall nor a rise is observed shall be considered as the water table elevation. This shall be established by three successive readings of water level taken at an interval of 2 hours.

5.4.2 In case any variation in the ground water level is observed in any specific borehole s, then the water level in these boreholes shall be recorded daily during the course of the field investigation. Levels in nearby wells, streams etc. if any shall also be noted whenever these readings are taken.

5.4.3 If so called for, observation wells shall be drilled for the purpose of long terms studies of the fluctuations in groundwater levels and pressure. Either a standpipe or piezometer shall be installed in selected previously drilled or specially drilled boreholes covering complete site area. These shall be at specified depths as per the specifications and instructions of the Engineer. Daily water level readings shall be recorded immediately following the installation up to the time of leaving the site. At the end of fieldwork, this installation shall be handed over in satisfactory working condition to the engineer without disturbing their position so that the Company can continue further observations. It is important that some standpipes and piezometer are installed, prior to the coming monsoon, in order to record the local effects and variations in the groundwater levels during that period.

5.4.4 Standpipes and piezometers shall consist of 19mm internal diameter rigid unplasticised (UPVC) tubing. All the joints in the tubing shall be made of coupling sleeves. The top of UPVC tubing shall be enclosed in a 75mm diameter galvanized steel pipes of 1.5 m length having galvanized steel screw with well-greased threads and the caps shall be tightened such that it would be impossible to loosen by hand. The lower end of the pipe shall have four legs of 6mm thick and 100mm long and welded to have a projection of 25mm. The pipe shall be sealed into the ground with cement grout so that it does not rotate. The top end of the pipe shall project approximately 300mm above ground level unless otherwise specified by the Engineer.

5.4.5 The perforated tubing for the porous element shall be surrounded by a response zone of well-graded sand from 500mm below to 150mm above the lower end of the stand pipe or piezometer. The borehole above the response zone shall be back filled with natural soil or well graded sand. The later shall compose of particles that vary in amount according to the size in such a manner that the void space formed by the larger particles can be filled by smaller size particles.

a) Stand Pipe:

Stand pipe shall be installed to measure the water level in soils with high permeability such as sand and gravel. The standpipe shall consist of a perforated tubing attached to the bottom of the UPVC tubing. The perforated tube shall be 150mm long having a perforation of diameter not greater than 1mm.

b) Piezometers:

Piezometers shall be installed to measure the pore pressures in soil with low to medium permeability. Piezometers shall consist of a porous filter attached to the bottom of the UPVC tubing. The filter shall be of 300mm length and shall be placed in the borehole sealed at top and bottom by grouting. Hydraulic piezometer with double line to be used to remove the air trapped in the system.

5.4.6 Sub Soil Water Samples:

a) Subsoil water samples shall be collected for carrying out chemical analysis. The representative samples of groundwater shall be collected when it is first

encountered in borehole s before the addition of water to aid boring or drilling. Water samples shall not be collected when bentonite slurry or mud has been used for drilling purposes or if groundwater has been diluted by surface rainwater, then the borehole shall be de-watered and water allowed to rise from which the sample may be taken.

b) The sampling apparatus shall be such that the water at the desired depth can be collected directly without any disturbance and any change in the concentration of the constituents like dissolved gases etc. Undue agitation shall be avoided. An ordinary suction pump with its suction and inserted up to required depth in the borehole shall be used for this purposes.

c) The samples shall be collected in a clean vessel and allowed to settle so that the supernatural liquid can be poured into a clean well rinsed glass or polythene bottle. Sufficient quantity and number of samples can be collected to carry out the chemical analysis and send to a laboratory in airtight bottles with proper labelling. Chemical analysis of water samples shall include determination of PH value, turbidity, sulphate, carbonate, nitrate and chloride contents, presence of organic and suspended solids.

d) In some cases, constituents may be mixed and analyzed later as specified in the specific tests method. Chemical preservatives may be added to the sample for cases as specified in the test method / IS codes. This shall only be done if analysis cannot be conducted within an hour of collection and shall have prior written permission and approval of the Engineer.

5.5 In-Situ Permeability Test:

5.5.1 Determining of Water Percolation Capacity of Over Burden Soil:

In-situ permeability test shall be conducted to determine the water percolation capacity of the overburden soil. This test shall be performed inside the borehole / trial pit at specified depths or in each layer or as per the direction of the Engineer. The type of test shall be either Pump in or Pump out test depending on the subsoil and groundwater conditions. Pump in the test shall be conducted when the groundwater in borehole exists or not. Pump out test shall be conducted to obtain data for de-watering purposes when groundwater is met in the borehole. The specifications for equipment required for the tests and the procedure of the test shall be in accordance with IS:5529 - part I. When it is required to carry out the permeability test for a particular section of the soil strata above the groundwater table, bentonite slurry shall not be used while boring.

5.5.2 Pump in Test:

Pump in test shall be conducted in the borehole / trial pit by allowing water to percolate into the soil. Choice of the method of testing shall depend on the soil permeability and prevailing groundwater level. Only clear water shall be used for conducting test. Before conducting the test, the borehole shall be cleaned as specified in para 5.1.1 (e) water shall be allowed to percolate through test section for sufficient period of time to saturate the soil before starting the observation.

a) Constant Head Method (in borehole):

This test shall be conducted in borehole s where soil has a high permeability. Water shall be allowed into the borehole to a metering system ensuring gravity flow at constant head so as to maintain a steady water level in the borehole. A reference mark shall be made at a convenient level which can be easily seen in the casing pipe to note down the fluctuations of water level. The fluctuation shall be counteracted by varying the quantity of water flowing into the borehole. Elevation of water shall be observed at every 5-minute interval. When 3 consecutive readings show constant value, the necessary observations such as flow rate, elevation of water surface above test depth, diameter of casing pipe etc., shall be made and recorded as per the proforma recommended in IS:5529, Part I- Appendix A.

b) Falling Head Method:

This method shall be adopted for soils of low permeability and which can stand without casing. The test section shall be sealed by the bottom of the borehole and packer at the top of the test section. If the test has to be conducted at an intermediate section a test section through the packer shall be by means of a pipe which shall extend to above the ground level. Water shall be filled into the pipe up to the level marked just below the top of the pipe and water allowed to drain into the test section. The water level in the pipe shall be recorded at regular intervals as mentioned in IS:5529 Part I, Appendix B. The test shall be repeated till the constant records of water level are achieved.

c) Percolation Test (In trial pit):

Percolation test can be conducted in the trial pit in areas where water/ effluent is stored /discharged in ground-level tanks. The loss of water due to percolation into the soil shall be estimated by the soil absorption capacity. This test shall be conducted in trial pits as per the procedure is given in IS:2470 Part I Appendix – A.

5.5.3 Pump Out Test:

This test shall be carried out to determine accurate values of permeability of soil below water table. This test shall be conducted by continuous pumping out water from the well so as to maintain a steady water level at the desired depth in the well. The fluctuations in the water level shall be counteracted by varying the quantity of water pumped out of the well. The specifications for the equipment and accessories required for performing the test shall be as per relevant IS. The test procedure, field observations and reporting of results shall conform to IS:5529 Part I. The well shall be 400mm dia. Perforated GI/MS pipe to be installed in the well shall be of 250mm dia and observation pipe of 50mm dia shall be installed at regular intervals along three radial lines extending from the well at 120 degrees to each other. Length of these pipes shall depend upon the ground level, estimated lowering of groundwater table and distance from the well.

The sufficient number of observation pipes shall be installed along each of the radial lines so as to assess the zone of influence due to de-watering, drawdown depth etc.

5.6 Trial Pit:

5.6.1 The trial pit shall be minimum 2.00M X 2.00M size at the bottom so as to permit easy access for visual examination of wall of the pits and to facilitate sampling and in-situ testing operations. Pits shall be up to 4.00M deep or as per the directions of the Engineer. Precautions shall be taken to ensure the stability of pit walls including the provision of shoring, if necessary, as per IS:4453. Precautions shall be taken to prevent surface water draining into the pit.The arrangement shall be made for de-watering if the pit is extended below the water table. Trial pits shall be kept dry and ladder shall be provided for easy access to the bottom of pit. In-situ tests shall be conducted and undisturbed samples shall be collected immediately on reaching specified depth so as to avoid substantial changes in the moisture content of the subsoil. Arrangements shall be made for barriers, protective measures and lighting necessary for the period the pits remain open.

5.6.2 A note on the visual examination of soil strata shall be prepared. This should include the nature, colour consistency and visual classification of the soil, thickness of soil strata, the thickness of expansive soil, groundwater table if any etc.

5.6.3 Undisturbed samples shall be collected at 1.0, 2.0 and 3.0m depth and at the termination depth in all the pits.

a) Chunk Samples:

In cohesive soil weathered rock undisturbed samples of regular shape shall be collected. A sample shall be cut and trimmed to a suitable size (0.3.x0.3x0.3m). A square area (0.35x0.35m) shall be marked at the centre of the level surface at the bottom of the pit. Without disturbing the soil inside the marked area, the soil around this marking shall be carefully removed up to a depth of 0.35m. The four vertical faces of the soil block protruding at the centre shall be trimmed slowly so that its size reduces to 0.3x0.3m. Wax paper cut to suitable size shall be rapped uniformly and covered with two layers of thin cloth over the five exposed surfaces of the soil block and sealed properly using molten wax. A firmly constructed wooden box of size 0.35x0.35x0.35m (Internal dimension) with top and bottom open shall be placed around the soil block and held such that its top edge protrudes just above the surface of the block. The space between the soil block and the box shall be filled uniformly and tightly with moist sawdust. A top surface shall also be covered with sawdust before nailing the wooden lid to cover the box firmly taking care that the soil block is not disturbed. The area of contact between the bottom portion of the block and the ground shall be reduced slowly by removing soil in small quantities using small rods so that the block can be separated from the ground slowly without disturbance. After inverting the wooden box along with the soil blocks, the bottom portion shall be trimmed and covered with wax paper, cloth and sealed with molten wax. A wooden lid shall be nailed to the box after providing proper saw dust cushion below it. An arrow mark shall be made on the vertical face of the box to indicate the top surface of the sample along with the location, date and depth of the sampling.

b) Tube Samples:

Undisturbed tube samples may also be obtained by means of a 100mm diameter sampling tube with a cutting edge. The sampler shall be slightly oiled or greased inside and outside to reduce friction. The sampler shall be pushed into the soil and while doing so, the soil around the tube shall be carefully removed. In case it is not possible to push the sampler, it may be driven by light blows.

5.6.4 After the completion of the tests, sampling and visual examination, the pit shall be suitably backfilled as directed by the Engineer. Unless otherwise specified, excavated soil shall be used for this purpose.

5.6.5 In case it not possible to collect undisturbed samples in the trial pit, In-situ density of soil shall be determined by the sand replacement method. The specifications, equipment's, accessories, required for the tests procedure shall be as per IS:2720 Part XXVIII. No separate payment shall be made for this test.

5.7 Static Cone Penetration Test:

Static cone penetration test shall be conducted to know the soil stratification and to estimate the various fiscal and engineering soil properties. The cone penetrometer shall be advanced by pushing and the static force required for unit penetration shall be determined. The test to be conducted using 100kN capacity mechanically operated equipment up to the specified depth or refusal whichever is easier. For this test, refusal means meeting very hard strata which cannot be penetrated at the rate of at least0.3cm/second even when the equipment is loaded to its full capacity. The specifications for the equipment and accessories required for performing the test procedure, field observations and reporting of results shall conform to IS:4968 Part III. At the ground level, pre boring up to 0.5m depth shall be permitted if the overlaying strata is hard. No extra payment shall be made for boring. A continuous record of the penetration resistance shall be maintained. On completion of the test, the results shall be reported to in an approved proforma as in IS:4968 Part III Appendix – A.

5.8 Dynamic Cone Penetration Test:

Dynamic cone penetration test shall be conducted to predict stratification, density, bearing capacity etc., of soils. The test shall be conducted using bentonite slurry by driving a standard size cone attached to the bottom of a string of drill rods. The test shall be conducted up to the specified depth or refusal whichever is earlier. The refusal shall be considered when the blow count exceeds 150 for 300mm penetration. The specification for the equipment and accessories required for performing this test, procedure, field observations and reporting of results shall conform to IS:4968Part II.

The driving system shall comprise of a 650N weight having a free fall of 0.75m. The cone shall be 65mm diameter provided with vents for continuous flow of bentonite slurry through the cone and rods in order to avoid friction between the rods and soil. On completion of tests, the results shall be presented as a continuous record of the number of blows required for every 300mm penetration of the cone into the soil in a suitable chart supplement by a graphical plot of blow count for 300mm penetration vs depth.

5.9 Vane Shear Test: *

Field vane shear test shall be performed inside the hole to determine the shear strength of cohesive soils, especially of soft and sensitive clays, which are highly susceptible to sampling disturbance. This test shall be conducted by advancing a four-winged vane of suitable size (75mm or 100mm diameter as per the soil condition) into the soil up to the desired depth and measuring the torque required to rotate the vane. The specifications for the equipment and accessories required for conducting the test, the test procedure and field observations shall conform to IS:4434. Test may also be conducted by direct penetration from ground surface. If the cuttings at the test depth in the borehole show any presence of gravel, sand, shells, decomposed wood etc., which are likely to influence the test result substantially, the test at that particular depth may be omitted with the permission of the Engineer. However, the test shall be conducted at a depth where these obstructions cease to occur. On completion of the test, the results shall be reported in an approved proforma as specified in IS:4434 Appendix– A.

Note: Test not required for preliminary investigation.

5.10 Plate Load Test:

5.10.1 Plate load test shall be conducted to determine the bearing capacity and load/settlement characteristics of soil at shallow depth by loading a plane and level steel plate kept at the desired depth and measuring the settlement under different loads until the desired settlement takes place or failure occurs. The specifications for the equipment and accessories required for conducting the test, the test procedure, field observations and reporting of results shall conform to IS:1888. The location and depth of the test shall be indicated by the Engineer. Undisturbed tube samples as specified in para – 5.6.3(b) shall be collected at 1.0M and 2.50M depths from the natural ground level for carrying out laboratory tests.

5.10.2 The size of the pit shall not be less than five times the plate size and shall be taken up to the specified depth. All provisions regarding excavation and visual examination of pit under para - 5.6.1 and 5.6.2 shall apply here also.

5.10.3 If the ground water table is at a depth higher than the specified test depth, the ground water table shall be lowered and maintained at the test depth for the entire duration of the test. De-watering shall be at the cost of the contractor.

5.10.4 Unless otherwise specified the reaction method of loading shall be adopted. Settlement shall be recorded from dial gauges placed at four diametrically opposite ends of the test plate. The test plate shall be 600 x 600 mm size and at least 25mm thick. The bottom of the pits shall be levelled before placing the plate in position for conducting the test.

5.10.5 A seating load of 70gm / Sq.cm. shall be applied and after the dial gauge readings are stabilized, the load shall be released and the initial readings of the dia gauges recorded after they indicate constant reading. The load shall be increased in stages. These stages shall be 20,40,70,100,150,200,250,300,400,500,600 and 800 KN / Sq.M

or as directed by the Engineer. Under each loading stage, the record of the time of settlement shall be kept as specified in IS:1888.
The load shall be maintained for a minimum duration of one hour or till the settlement rate reduces to 0.02mm/min whichever is later. No extrapolation of settlement rate from periods less than one hour shall be permitted.

5.10.6 Loading shall be carried out in stages as specified above till one of the following conditions occur.

a) Failure of the soil under the plate i.e., the settlement of the plate at constant load becomes progressive and reaches avalue of 40mm or more.

b) Loading intensity of 800Kn/Sq.M is reached without failure of the soil.

5.10.7 Backfilling of the pit shall be carried out as per the directions of the Engineer. Unless otherwise specified the excavated soil shall be used for this purpose.

5.10.8 Dial gauge readings for settlements shall generally be taken at 1,2.25,4,6.25,9,16,25,60,90 and 120 minutes from the commencement of each stage of loading. Thereafter the readings shall be taken at hourly intervals up to a further 4 hours and at Two hour's interval thereafter for another 6 hours.

5.11 Cyclic Plate Load Test:

This test shall be carried out to determine the dynamic soil properties required for the analysis of foundation subjected to dynamic loads. This test shall be conducted on similar lines as the ordinary plate load test. In addition, unloading shall also be done before such a stage of loading. The test set up, load increment, maximum load intensity, recording of field data etc., shall be as per Para- 5.10.

5.11.1 After each stage of loading, the load shall be removed in a minimum of two stages and as directed by the Engineer. After each stage of reduction of load, dial gauge readings and settlements shall be taken for at least one hour until the readings stabilise. Thereafter the next loading stage shall commence. Analysis of test data shall be reported as per IS:5249.

5.12 FIELD CALIFORNIA BEARING RATIO TEST:

This test shall be carried out to obtain the properties of soil required for the construction of roads. The equipment's and accessories required for carrying out the test procedure, recording of observations and presentation of results shall conform to IS:2720 Part-XXXI. The test locations and depth shall be as specified by the Engineer.

5.13 Electrical Resistivity Test:

This test shall be conducted to determine the electrical resistivity of soil required for designing safety-grounding system. The specifications for the equipment's and other accessories required for performing electrical resistivity test, the test procedure and reporting of field observations shall conform to IS:3043. The test shall be conducted using Wanner's four-electrode method as specified in IS:1892, Appendix–'B2'. A

minimum of 8 to 10 readings shall be taken by changing the spacing of the electrodes from an initial small value of 0.50M up to a distance of 10.0M.

5.14 Seismic Refraction Test:

5.14.1 This test shall be carried out to establish the rock and soil profiles of varying density. The dynamic shear modulus of the soil shall also be obtained from the results of this Test. The specification for the equipment's and other accessories procedure for carrying out the test, recording and analysis of results and their presentation shall conform to IS:1892.

5.14.2 This test shall be carried out by inducing shock waves into the soil by striking a plate placed on the ground surface with a hammer. The shock waves shall be picked up through geophones placed on the ground surface at regular intervals in line with the plate along a straight line. The time elapsed before the waves reach the geophones shall be recorded to an accuracy of one mile second or better.

5.14.3 The distance between the shock point and the geophone shall be increased to cover a wider area. Alternatively, multiple geophones shall be used simultaneously using multiple channel seismograph to record the arrival time and intensity of the waves reaching the geophones. The spacing of the geophones shall be 5M. As the distance between the geophones and the shocks producing points are increased, the time-lapse for the waves passing through different underlying strata and reaching the geophone shall be recorded. The waveforms shall be recorded for each test using seismographs.

5.14.4 The test shall be conducted along with two orthogonal directions. During testing, proper care should be taken to avoid disturbances caused due to the movement of the vehicle's or other working operations around the test location. The type of wave (Compression or Shear) shall be analyzed properly using the data recorded the test.

5.15 Pressure Meter Test:

5.15.1 This test shall be conducted in borehole s at the desired depth. To obtain the in-situ stress-strain characteristics and strength parameters of the soil/rock layer by measuring the deformation of the probe at different pressure of the volumeter. The location and depth of the test shall be as per the directions of the Engineer.

5.15.2 All precautions shall be taken to ensure a smooth borehole of required diameter with minimum disturbance to the surrounding soil. The ratio of diameters of borehole to probe shall be between 1.03 and 1.02. In soft, loose and sensitive soils, the borehole shall be predrilled deeper than the testing depth far enough so that the cuttings setting at the bottom of the bore shall not interfere with the test. In stiff soils and weathered rock, the borehole may be predrilled to greater depths.

5.15.3 The equipment shall be calibrated for pressure and volume loses (membrane resistance) as well as to determine the static probe volume radius before staring of test and at regular intervals as per the manufacturers.

5.15.4 Maximum value of pressure correction shall not be more than 50% of limit pressure. The total volume loses in the system shall not exceed 0.5% of the static probe volume per 100kpa. Volume correction may be neglected in soil if it is less than 0.1% of probe volume per 100kpa.

5.15.5 The test shall be performed by expanding a cylindrical probe to obtain a pressure vs volume or pressure vs radius curve as specified in IS: 1892. The probe may be of Ax, Bx or Nx size. Hosepipe connecting the probe with the surface unit shall be of flexible tubing of single or co-axial type. The equipment should be able to reach a maximum pressure of 2500kpa for testing in soil and 8000kpa for testing in rock. The accuracy of measuring device shall be such that a change of 0.2% of static probe volume of 0.1% of probe radius is measurable as specified in IS: 1892.

5.15.6 The probe shall be lowered down to the required depth as soon as the boring is completed so as to limit the expansion of soil due to the release of stresses. The probe shall be held by a clamping device ensuring that it is not located at the interface of two different soil/ rock layers.

5.15.7 The pressure shall be increased in at least 20 equal stages as directed by the Engineer. At each stage the pressure shall be maintained for a period of at least 60secs., and volume reading shall be taken for 7 to 14 minutes. The volume of water sent into the probe during this period shall be measured up to an accuracy of 0.01 Cum. In case the water level in the volumeter drops rapidly, it is necessary to close the volumeter valve quickly so that the reservoir does not empty and allow air or gas into the tubing.

5.15.8 The test shall be carried out in stages till one of the following conditions occurs:

a) The volume of the probe is doubled.

b) The ultimate failure of soil/rock occurs.

c) Load intensity of 2000kpa for soil and 8000kpa for rock is reached without failure.

5.15.9 If the shape of the uncorrected Pressure v/s Volume curve drastically varies from the ideal test curve, the test shall be repeated at no extra cost to the Company at a different depth as directed by the Engineer.

5.15.10 On completion of the test all the results mentioned in clause 8.2 shall be reported.

5.16 Field Vibration Test:

5.16.1 Field vibration test shall be conducted to determine the dynamic soil properties required for the design of foundations subjected to dynamic loads. This test shall be conducted in a pit of size 4.50X2.50M at the proposed depth of foundation, on a concrete block of size 1.50 x 0.75 x 0.70m. Excavation and backfilling of pits shall be carried out as per the provision in Para – 5.6.1 and 5.6.4. Undisturbed tube samples as specified in Para- 5.6.3 (b) shall be collected at the bottom of the pit before testing.

5.16.2 All the equipment's required, the procedure for conducting the test and the evaluation of test results shall conform to IS: 5249. The eccentric weight of the oscillator shall be positioned such that it generates frequency-dependent vertical sinusoidal forces. There shall be a provision for changing the eccentricity of the weight so as to vary the force generated by the oscillator. Sufficient no of pickups shall be calibrated (as per IS:5249) and kept ready before starting the test, they shall be checked again after completion of the test to find out any possible changes in their sensitivity during testing. The oscilloscope, amplifier and other accessories shall also be calibrated. It shall be ensured that the oscillator is fixed tightly to the foundation block and the base of the foundation is in full contact with the soil below it. During the progress of the test, proper precautions shall be taken to avoid any disturbance of the ground from the surroundings.

5.16.3 Two pickups shall be fixed on the opposite sides of the concrete blocks to sensing the vertical vibration developed due to the dynamic force generated by the oscillator. The test shall commence with a known static load and a low eccentricity for the weight. The speed of the motor shall be increased insteps after recording the amplitude indicated in the oscilloscope for each speed. As the resonance condition reaches, which is indicated by a fast rate of increase in amplitude, the speed of the motor shall be increased at lower increments. This rate of increment is to be continued till the amplitude stars falling after reaching a peak value and thereafter the speed increment shall be increased, the motor speed range shall be properly selected such that a well-defined peak is obtained, if not the test shall be repeated. On completion of the test, the results shall be reported in an approved proforma as given in IS:5249, Appendix-'A'.

5.16.4 The test shall be repeated for at least three static loads and five eccentricities to predict the effect of each parameter. Before conducting the test, the selection of the load range and eccentricity shall be approved by the Engineer.

6 FIELD INVESTIGATION – ROCK:

6.1 Rock Drilling:

6.1.1 Rock Drilling at Specified Location:

Drilling rock shall be done at a specified location or as per the directions of the Engineer. Before commencing drilling, it shall be proved that characteristics of rock have been met with as mentioned in clause 5.1.1(b). The staring depth of drilling in rock as mentioned clause 5.1.1(b) shall be certified by the Engineer. The portion drilled in rock shall be backfilled with cement and sand (1:3) grout.

6.1.2 Equipment:

a) Core drilling shall be done by rotary motion using a diamond bit. The feed or thrust to the drilling bit shall be actuated by hydraulic type. The rotary core drilling equipment and procedure for drilling shall conform to IS:6926. The equipment shall be provided with necessary facilities to regulate the spindle

speed, bit pressure and water pressure during core drilling to get good core recovery.

b) Drilling shall be carried out with NX size diamond-tipped drilled bit or impregnated diamond bit depending on the type of rock encountered. Double tube swivel core barrel of type B conforming to IS:6926 shall be used to ensure good core recovery and to pick up cores from all layers of rock. Suitable core catchers shall be used to ensure continuous and good core recovery.

6.1.3 Procedure:

a) The drilling fluid shall be clean water. Circulation of the drilling fluid shall be started before barrel the core barrel reaches the bottom of the hole to prevent cuttings or sludge from entering the core barrel at the start of coring. Drilling fluid shall be circulated continuously down the hollow rods and the sludge conveying the rock cuttings to the surface shall be collected.

b) When drilling through soft/weathered/fractured rock water circulation must be reduced so as to avoid shuttering/breaking the core.

c) The rotational speed of the bit (Spindle Speed) the amount of downward pressure applied on the bit (Bit Pressure) and water pressure shall be suitably adjusted and properly monitored so that the core is collected with least disturbances and avoid shearing of the core from its base. Bit speed, bit pressure, water pressure for the type of bit for various rock types shall be as given in Appendix – 'A' of IS:6926.

d) No drilling run shall exceed 0.75m in length. This can be increased to 1.5m provided the core recovery is observed more than 80% two successive 0.75m drill runs and on approval from Engineer the core recovery is less than 20% then SPT shall be performed before commencing the next drill runs as explained in clause 6.3.

e) If at any time blocking of the bit or grinding of the core is indicated, the core barrel shall be immediately withdrawn from the borehole regardless of the length of drill run completed.

6.1.4 Observations:

a) The colour of return water at regular intervals, the depth at which any change of colour of return water is observed, the depth of occurrence and amount of flow of hot water, if encountered, shall be recorded.

b) The depths through which a uniform rate of penetration was maintained, the depth at which marked a change in the rate of penetration sudden fail of drill rod occurs, the depth at which any blockage of drill bit causing coreless, if any, shall be recorded.

c) Any heavy vibration or torque noticed during drilling should be recorded together with the depth of occurrence.

d) Special conditions like the depth at which grouting was done during drilling, presence of artesian, conditions, loss of drilling fluid, observation of gas discharge with return water etc., shall also be observed and recorded.

e) During the drilling operation, observation on return water, rate of penetration etc., shall be recorded in proforma as given in IS:5313, Appendix – 'A'.

6.1.5 Core Samples:

a) Core samples shall be extracted by the application of a continuous pressure at one end of the core with the barrel held horizontally without vibration. Friable cores shall be extracted from the barrel directly to a suitable sized half-round plastic channel section. Care shall be taken to maintain the direction of extrusion of sample same as that while coring to avoid stress reversal.

b) Immediately after drawl from the core barrel, the cores shall be placed in a tray and transferred into boxes specially prepared for the purpose. The boxes shall be made from seasoned timber or any other durable material and shall be indexed on top of the lid as per IS:4078. The cores shall be numbered serially and arranged in the boxes in sequential order. The description of the core samples shall be recorded as per IS:4464. Where no core is recovered, it shall be recorded as specified in the continuous record of core recovery and RQD to be mentioned in the core log as per IS:11315 Part – II.

c) The basic information for the description of rocks shall cover:

i) Degree of weathering.

ii) Discontinuity sparing.

iii) Strength.

iv) Colour.

v) Grain-size.

vi) Structural condition the mineralogy of the grains and cementing material.

vii) Rock name special features like major joint plane's features/laminations and faults etc. shall also be indicated.

6.2 Permeability Test:

6.2.1 Permeability test shall be conducted in bedrock inside the drilled hole by pumping in water under pressure to determine the percolation capacity of the rock strata. This test shall be conducted in encased and ungrouted sections of the drill hole and the use of bentonite slurry during drilling is strictly prohibited. Clear and clean water shall be used for the purpose of both drilling and testing. The equipment required and the procedure to be followed for conducting the test shall conform to IS:5529 Part –II. The

length of the hole for the test section shall be either 1.5m or 3.0m as per field conditions and the directions of the Engineer. The levels of the water table, if any in the drill hole shall be recorded and the drill hole shall be cleaned before starting the test. Depending upon the depth of the test section, a single packer door double packer method shall be adopted. Care shall be taken to see that all joints and connections are watertight during the test.

a. Single Packer Method:

This method shall be adopted when the bottom of the test section is the same as the bottom of the drill hole and where it is considered necessary to know the permeability value during drilling itself. This test shall be useful where the full length of the hole cannot stand encased or un grouted. The packer shall be fixed at the top level of the test section such that only the test section lies below the packer. Water shall then be pumped through a pipe into the test section under a required pressure and maintaining it till a constant quantity of water intake is observed. The amount of water percolating through the hole shall be recorded at every 5-minute intervals. The test shall be repeated by increasing the pressure at regular intervals up to a pressure limit as specified in IS: 5529, part-II. The details and observations during the test shall be suitably recorded in a proforma recommended in IS:5529, Part – II Appendix – B.

b. Double Packer Method:

This method shall be used when the permeability of an isolated section inside a drill hole has to be determined. Packers shall be fixed both at the top and bottom of the test section such that their spacing is exactly equal to the lengths of the test section. The test shall then be conducted as specified in clause 6.2 (a).

6.3 Standard Penetration Test:

6.3.1 The relevant hardness of rocks shall be tested in both holes and after every drill run of 0.75m in rock if core recovery is observed less than 20% or as directed by Engineer. The test equipment and arrangement shall be conforming to IS:2131. An initial seating of the blows shall be given and the number of blows for each 7.5m penetration to a total penetration of 45Cm. shall be recorded. Penetration shall be recorded (to mm) for every 50 blows and test shall be stopped at a total of 100 blows.

6.4 Plate Load Test:

6.4.1 The test shall be conducted as described under clause 5.10 for soil subject to the following changes.

The test plate on the surface of the rock shall be of size 45cmx45cm and at least 25mm thick, the maximum load shall be 2500KN / Sq.M applied in stages for 25,50,100,150,200,300,400,600,800,1000,1500,2000 and 2500KN/Sq.M under each load the time v/s settlement shall be recorded and plotted.

6.5 Pressure Meter Test:

6.5.1 This test shall be conducted as described under clause 5.15 for soil, subject to the following changes. The test shall be carried out till one of the following condition occurs:

a. The volume of the probe is doubled.

b. The ultimate failure of rock.

c. Load intensity of 8000 KN / Sq.M is reached without failure.

7 LABORATORY TESTING:

7.4 Essential Requirements:

a. All the laboratory tests shall be conducted in an approved laboratory using approved apparatus complying with the requirements and specifications of Indian Standards or other approved standards for this class of work. It shall be checked that the apparatus is in good working condition before starting the laboratory tests. Calibration of all the instruments and their accessories shall be done carefully and precisely.

b. Depending on the substrata encountered, appropriate laboratory tests shall be conducted on soil and rock samples collected in the field. Laboratory tests shall be scheduled and performed by qualified and experienced personnel who are thoroughly conversant with the work. Tests indicated in the schedule of items shall be performed on soil, water and rock samples as per relevant IS codes. One copy of all the laboratory test data records shall be submitted to the Company progressively every week. Laboratory tests shall be carried out concurrently with field investigation since initial laboratory test results could be useful in planning at later of fieldwork. A schedule of laboratory tests shall be established by the contractor and the same shall be submitted and got approved by the Engineer before starting of laboratory tests.

c. All samples, whether undisturbed or disturbed shall be extracted prepared and examined by competent personnel properly trained and experienced in soil sampling, examination, testing and in using the apparatus as per the specified standards.

d. Undisturbed soil samples retained in liners or seamless shall be taken out without causing any disturbance to the samples using suitably designed extruder just prior to actual testing. If the extruder is horizontal, proper support shall be provided to prevent the sample from breaking. Fore screw-type extrudes; the pushing head shall be free from the screw shaft so that no torque is applied to the soil sample in contact with the pushing head. For soft clay samples, the sample tube shall be cut by means of a high-speed hacksaw of specified test length and placed over the mould before pushing the sample into it with a suitable piston.

e. While extracting a sample from a liner or tube, care shall be taken to see that its direction of movement is the same as that during sampling to avoid stress reversal.

f. On all undisturbed soil samples tested for bulk density, water content, grain size distribution, liquid limit and plastic limit tests shall also be performed.

g. On all Rock samples tested for an unconfined compression test, bulk density, water content tests shall also be performed.

7.5 Tests:

Tests are indicated in this specification and as called for by the Engineer shall be conducted. These tests shall include but not be limited to the following:

a. Test on Undisturbed and Disturbed Samples:

i. Visual and Engineering Classification.

ii. Sieve Analysis and Hydrometer Analysis.

iii. Liquid, Plastic and Shrinkage Limits.

iv. Specific Gravity.

v. Chemical Analysis.

vi. Swell pressure and Free Swell Index Determination.

vii. Proctor Compaction Test.

viii. California Bearing Ratio.

b. Test on Undisturbed Samples:

- Bulk Density and Moisture Content.
- Relative Density (For sand)
- Unconfined Compression Test.
- Box Shear Test (In case of sand)
- Triaxial Shear Tests: (Depending on the soil and field conditions on undisturbed or remoulded samples).

i. Unconsolidated undrained.

ii. Consolidated Undrained Test with the Measurement of pore water pressure.

iii. Consolidated Drained.

- Consolidation

c. Test on Rock Samples:

i. Visual Classification.

ii. Moisture Content, Porosity and Density.

iii. Specific Gravity.
iv. Hardness.

v. Slake Durability.

vi. Unconfined Compression Test (Both saturated and at in-situ water content).

vii. Point Load Strength Index.

viii. Deformability test (Both saturated and dry samples).

d. Chemical Analysis of Sub-Soil Water

7.6 SALIENT TEST REQUIREMENTS:

a. Re-moulded soil specimen, whenever desired, shall be fully reworked at field density and moisture content. For conducting CBR test and Triaxial test for Dyke/Road material the sample shall be re-moulded to 95% of standard proctor density.

b. The triaxial shear test shall be conducted on undisturbed soil samples, saturated by the application of backpressure. Only if the water table is at sufficient depth such that chances of its rising to the base of the footing is meagre or nil, the Triaxial tests shall be performed on specimens at natural moisture content. Each test shall be carried out on a set of three test specimen from one sample at cell pressures equals to 100, 200 and 300 KN/Sq.M as required depending on the soil conditions.

c. Effective stress Triaxial shear test could be either consolidated drained or consolidated undrained with pore water pressure measurement. The test shall be conducted at cell pressures of 100,200 and 300 KN/Sq.M increased in stages of 50Kn/Sq.M ensuring complete consolidation at each stage.

d. Direct shear test shall be conducted on undisturbed soil samples. The three normal vertical stresses for each test shall be 100, 200 and 300 KN/ Sq.M or as required as per the soil conditions.

e. Consolidation test shall have loading stages of 10,25,50,75,100,200,400 and 800 KN/Sq.M. Rebound curve shall be recorded for all the samples by unloading

the specimen at the in-situ stress of the specimen. Additional rebound curves shall also be recorded whenever desired by the Engineer.

f. Chemical analysis of sub-soil shall include determination of PH value, carbonate, Sulphates (Both SO3 and SO4), Chlorides, Nitrates, Organic Chemical Matter, Salinity and any other chemicals harmful to the foundation material. The contents in solid shall be indicated as a percentage (%).

g. Chemical analysis of sub-soil water sample shall include the determination of the properties such as colour, odour, turbidity, Ph value and specific conductivity both at 25oC and chemical contents such as Carbonates, Sulphates (Both SO3 and SO4), Chlorides, Nitrates, Organic Matter and any other chemical harmful to the foundation material. The contents such as Sulphates, etc., shall be indicated as PPM by weight.

h. The lab CBR test shall be performed on the undisturbed and remoulded sample for the soaked and un-soaked condition.

8 REPORT:

8.4 GENERAL:

a. On completion of all field and laboratory work, the contractor shall submit a draft report containing Geological Information of the Region, Procedure adopted for investigation, Field observations, summarized test data, statistical average parameters for each identified layer. The report shall include detailed bore logs, subsoil sections, field test results, laboratory observations and test results both in tabular as well as graphical form, practical and theoretical considerations for the interpretation of test results, the supporting calculations/documents for the conclusions drawn etc. Initially, the contractor shall submit three copies of the report in draft form for the Company's review.

b. The contractor's qualified Geo-Technical Engineer shall visit the Company's office for a discussion on the Company's comments on his draft reports. During the discussions, it shall be decided as to the modifications that need to be done in the draft report. Thereafter the contractor shall incorporate in his report the agreed modifications and after getting the amended draft report approved, sixcopies of the detailed final report shall be submitted along with one set of reproducible graphs and tables etc.

c. The detailed final report based on field observations, in-situ and laboratory tests shall encompass theoretical as well as practical considerations to arrive at foundations of different types of structure envisaged in the area under investigation. The contractor shall acquaint himself about the type of the structures, foundation loads and other information required from the Engineer.

8.5 DATA TO BE FURNISHED:

The report shall also include but not limited to the following:

a. A plot plan showing the locations and reduced levels of all field tests e.g. boreholes, trial pits, Static cone penetration tests, Dynamic cone penetration tests, plate load tests, etc., properly drawn to scale and dimensioned with reference to the established gird lines.

b. Geological information of the area such as Geomorphology, Geological structure, lithology, stratigraphy and tectonics faults, seismicity of the region and site, core recovery and rock quality designations etc.

c. Past observations and historical data, if available, for the area or for other areas with similar soil profile for the similar structures in the surrounding areas.

d. A true cross-section of all individual borehole and trial pits with reduced levels and co-ordinates showing the classification and thickness of individual stratum, the position of groundwater table, various in-situ tests conducted and samples collected at different depths and the rock stratum if met with.

e. A set of longitudinal and transverse soil/rock profiles vertical scale 1:200, horizontal scale 1:2000 connecting various boreholes in order to give a clear picture of the variation of the subsoil strata as per IS:6065.

f. Water level contours and Rock level contours.

g. The plot of Standard Penetration Test (N value both uncorrected and corrected) with depth for identified areas.

h. Results of all laboratory tests summarized:

i) For each sample

ii) A consolidated table giving layer-wise soil and rock properties in a neat format. All the relevant charts, tables, graphs, figures, supporting calculations, conclusions and photographs of representative rock cores and trial pits shall be furnished.

i. For all Triaxial shear tests stress v/s strain diagrams as well Mohr's circle envelopes shall be furnished. If backpressure is adopted for saturation, the magnitude of the same shall be indicated. The value of modulus of elasticity, E shall be furnished for all the tests along with relevant calculations.

j. For all consolidation tests, the following curves shall be furnished:

i) e v/s log P.

ii) e v/s P and

iii) Compression v/s Log t or

iv) Compression v/s Square root of t (depending upon the shape of the plot for the proper determination of coefficient of consolidation).

v) The point showing the initial condition (eo, Po) of the soil shall be marked on the curves.

k. Values of compression index, coefficient of volume compressibility shall be furnished. The procedure adopted for calculating the compression index from the field curve and settlement of soil strata shall be clearly specified. The time required for 50% and 90% primary consolidation along with the secondary settlement, if significant, shall also be calculated.

l. For pressure meter tests, the following shall be furnished:

i) **Calibration Record including:**
Description of membrane and sheath on probes, dimensions of thick-walled cylinder, length of flexible tubing, calibration curves, temperature.

ii) **Drilling Record Including:**
Borehole number, Method of making borehole along with type and condition. Depth of water in the hole, notes pf SPT value observed in borehole, weather and temperature.

iii) **Test record:**
Type of soil, date and time, depth of centre point of the probe, volume readings at 30 and 60 seconds elapsed time for method 1 and pressure readings at 15 seconds elapsed time for method 2. Notes on any deviation from standard test procedure.

iv) Field pressure meter, creep and air calibration curves indicating Po, Pf and P1.

v) Corrected pressure Meter and creep curves indicating Po, Pf and P1 along with calculation for the corrections.

vi) Values of cohesion, angle of internal friction, pressure meter modulus, Shear modulus and coefficient of sub-grade reaction along with sample calculation, the calculation for allowance bearing pressures and corresponding total settlements for shallow foundations mentioned in Para 8.3 (b) and load capacity calculation of piles in various modes.

8.6 Additional Details:

In addition to the above, the following shall also be furnished in the report.

a) Statistical average soil parameters viz., engineering and physical, for each identified layer.

b) For shallow foundations necessary information shall be provided to arrive at the following:

i. Net safe allowable bearing pressure for isolated square footings and continuous strip footings of sizes 2.0,3.0 and 4.0m at three different founding depths of 1.0, 2.0 and 4.0m below ground level considering both shear failure and settlement criteria.

ii. Net safe allowable bearing pressure for raft foundations of widths greater than 6.0 m at 2.0m,3.0m and 4.0m below ground level, considering both shear failure and settlement criteria.

iii. Net safe bearing capacity for foundation sizes mentioned in para-(1) above modulus of sub-grade reaction, modulus of elasticity from plate load test results along with time settlement curves and load settlement curve in both natural and log-log graph, the variation of modulus of sub-grade reaction with size, shape and depth of foundation.

c) For piling necessary information shall be provided to arrive at the following:

i. Type of pile

ii. Suitable founding strata for the pile.

iii. Estimated length of pile for 500KN (400mm dia), 750 KN (450mm dia), 1000KN (500mm dia) and 4500 KN (1070mm dia) capacities. End bearing and frictional resistance shall be indicated separately.

iv. The magnitude of negative skin friction, if any pile spacing, to be considered in pile design.

d) Coefficient of permeability of various subsoil and rock strata based on in-situ permeability tests.

e) Cone resistance, frictional resistance, total resistance relation between cone resistance and standard Penetration Test N value, and settlement analysis for different sizes of foundation as specified in para – 8.3 b (i) based on a static cone penetration test.

f) Electrical resistivity of sub-soil based on electrical resistance tests including electrode v/s commutative resistivity curve.

g) Dynamic Soil Properties such as:

Dynamic shear modulus, Poisson's ratio, coefficient of elastic uniform compression coefficient of elastic non-uniform shear taking into account the effect of the water table, as well as the size and shape of foundations and vertical and horizontal stiffness of the soil-pile system.

h) Suitability of the soil for construction of roads and pavements, their stable slopes for shallow and deep excavations, active and passive, earth pressure at rest and modulus of elasticity as a function of depths for use in the design of underground structures.

i) Suitability of locally available soils at the site for filling and backfilling purposes.

j) If expansive soil is met with removal/detainment of the same under the structures/roads etc., shall be given. In the latter case, detailed specifications of any special treatment required including specifications for materials to be used, construction method, equipments to be deployed etc., shall be furnished.

k) Chemical nature of soil and groundwater with due regard to potential deleterious effect on concrete, steel and other building materials etc., shall be furnished.

l) Susceptibility of subsoil strata to liquefaction in the event of an earthquake.

m) Any other information of special significance like de-watering schemes, etc.

n) Additional soil investigation beyond the scope of the present work if the contractor considers such investigation is necessary.

9 RATES AND MEASUREMENTS:

9.1 Rates:

a. The bidder's quoted rate shall be inclusive of providing all plants, equipment's, men, materials, skilled and unskilled labour, making observations establishing the ground level and location of each borehole, test pit, etc., by carrying levels from one established benchmark. Also, no extra payments shall be made for conducting the Standard Penetration Test, Collecting, Packing, Transporting of all samples and cores, recording of all results and submitting them in approved formats.

ANNEXURES

Sl.No.	Description
1	Annexure -1- Agreement Format
2	Annexure – 2 – Non Disclosure Agreement with Appendix -A
3	Annexure – 3 – Pre Contract Integrity Pact
4	Annexure – 4 - Turnover last three years
5	Annexure – 5 - Organization set up
6	Annexure – 6 - Details of Completed Works
7	Annexure – 7 - Details of Ongoing Works
8	Annexure - 8 - Proforma of Performance BG
9	Annexure - 9 - Format of Solvency Certificate
10	CHECK LIST
11	Part – II - Price Bid / Schedule of Quantities
10	CHECK LIST
11	Part – II - Price Bid / Schedule of Quantities

ANNEXURE - 1

PROFORMA OF AGREEMENT

An AGREEMENT made this day the .....
Between M/s .....
(hereinafter called the "CONTRACTORS") of the first part and M/s ITI LIMITED, ……..(Hereinafter called the "COMPANY") of the second part.
Whereas the Contractors have by tender dated ……. offered to execute and fully complete the intended works in connection with the construction of ……
…… for the Company as set forth in the as amended and the drawings, general conditions, special conditions, specifications, bill of and schedule hereto annexed according to the terms, obligations and conditions therein at and for an approximate total sum of Rs …… and the Company has accepted such rate tender in terms of its letter no dated ……..

Now, this AGREEMENT witnesseth as follows :

1. The CONTRACTORS covenant and agree with the COMPANY that the CONTRACTORS will within the time of …….. months from the date stipulated in the work order and in the manner and pursuant and subject to all and singular the terms, obligations and conditions in the said tender as amended and the drawings, general conditions, special conditions, specifications, bill of quantities and schedule provided, contained and referred to execute and fully complete all and singular the works specified, described or referred to in and by the said tender as amended and the drawings, general conditions, special conditions, specifications, bill of quantities and schedule and will well truly observe, perform, fulfil, submit to and keep all the said terms, obligations, conditions, and matters in the said tender as amended and drawings general conditions, special conditions, specifications, bill of quantities and schedule contained and referred to and on the part of the CONTRACTORS to be observed, performed, fulfilled, submitted to or kept according to the true intent and meaning of the said tender as amended and the drawings general conditions, special conditions, specifications, bill of quantities and schedule. Any items not covered by the tendered rates will be worked out as per special conditions attached to the tender documents.

In case the work is not completed in the manner mentioned above to the complete satisfaction of the COMPANY in every respect within the aforesaid time limit …….. of months from the date stipulated in the work order, the CONTRACTORS agree to pay a penalty of ……. % of the value of the work order for each week of delay beyond the date stipulated for the completion, subject, however to a maximum of …….. % of the work order. It is agreed that time is the essence of the contract.

2. In consideration of the premises the COMPANY covenants with the CONTRACTORS that it will pay to the CONTRACTORS at the several times and in the sums, proportions and manner in the said general conditions, special conditions in that behalf provided the amount accruing from time to time, but subject to conditions therein contained.

3. This agreement further witnesseth that the CONTRACTORS hereby covenant with the COMPANY that in the event of the non-fulfilment in any respect by the CONTRACTORS of the said covenants, terms, agreements, obligations will pay to the COMPANY all loss, damages, costs, charges and expenses as the COMPANY may be directly or indirectly put to in consequence of such non-fulfilment by the CONTRACTORS.

4. If the CONTRACTORS fail to perform the contract or carry out the contract to the satisfaction of the COMPANY within the period fixed for the purpose or at any time repudiates the contract before the expiry of such period, the Deputy General Manager (Civil) or any officer of the COMPANY so authorized may, without prejudice to the right of the COMPANY to recover from the CONTRACTORS damages for the breach of the contract, terminate the contract as a whole or terminate a part of the contract at the risk and cost of the CONTRACTORS without prior notice and get the balance work executed through some other agencies and held the CONTRACTORS liable for all the losses and expenses incurred by the COMPANY. The decision of the Deputy General Manager (Civil) is final with regard to the satisfactory performance of the contract and is binding on both the parties.

5. In the event of any disputes arising in connection with this contract, it is further agreed that such disputes shall be referred to the sole arbitrator as per the arbitration clause in the general terms and conditions of the contract.

6. The following documents are deemed to form part and parcel of the agreement viz., the tender dated …….. and letter no ……. dated …… the general terms and conditions, special conditions, the specifications, the priced bill of quantities, the schedule of rates and prices, and the drawings mentioned in the specifications, acceptance letter no …….. dated …….. all of which for the purposes of identification have been signed by the …….. on the behalf of the COMPANY, and …… on behalf of acceptance and all letters referred therein will also form a part of this agreement.

7. This agreement further witnesseth that the CONTRACTORS are responsible for any accident or other compensation payable to the workman employed by the working under the control of CONTRACTORS feat the COMPANY has no sort of liability in the matter, and that if any payment would have to be made by the COMPANY, the same shall be reimbursed by the CONTRACTORS.

In witness whereof, the said parties hereto have hereunto set their hands.

For ITI LIMITED,

For ……..

Witness:	Witness:
1. ……	**1. ……..**
2. ……	**2. ……...**

ANNEXURE- 2

I T I LTD.
(A Government of India Enterprise)
Network Systems Unit, Dooravaninagar
BENGALURU – 560 016.

NON-DISCLOSURE AGREEMENT

This Agreement is made on _____ day of _____ 2019 between ITI LIMITED, NETWORK SYSTEMS UNIT a Government of India Enterprise, having its registered and corporate office at ITI BHAVAN, DOORAVANINAGAR, BENGALURU – 560 016. hereinafter called ITI LIMITED which expression shall unless repugnant to the subject or the context mean and included its successor, nominees or assigns and M/s_____ a Company incorporated under the Indian Companies act, 1956, and having its registered office at _____ herein after called "Bidder" which expression shall unless repugnant to the subject or the context mean and include its successors, nominees or assigns.

Whereas a Tender was floated by ITI LIMITED for Soil investigation works and M/s_____ is one of the Bidders. The Bidder will be issued a tender document, which contains highly classified and confidential information. The information is to be protected from unauthorized use and disclosure:

In consideration of this, the Bidder agrees as follows:

1. This Agreement will apply to any information attached hereto pertaining to project disclosed by ITI LIMITED to the Bidder in writing or otherwise, information consists of tender document, specifications, designs, plans drawing, software, prototypes and/or technical information, and all copies and derivatives containing such Information, that may be disclosed to Bidder for and during the purpose. Information may be in any form or medium, tangible or intangible, and may be communicated/disclosed in writing, orally, or through visual observation or by any other means by ITI LIMITED to the Bidder.

2. The Bidder shall use the information pertaining to this project only for the purpose and shall hold information in confidence using the same degree of care as it normally exercises to protect its own proprietary information, but not less than reasonable care, taking into account the nature of the information and shall grant access to information only to its employees who have need to know, but only to the extent necessary to carry out the business purposes of this project as defined in. The Bidder shall cause its employees to comply with the provisions of this Agreement applicable to his and shall not reproduce information without prior permission of ITI LIMITED. The permission to reproduce shall only be given if considered necessary and to the extent essential for fulfilling the purpose. The Bidder may, however, disclose the information to its consultants and contractors with a need to know; provided that by doing so, the Bidder agrees to bind those consultants and contractors to terms at least as restrictive as those stated herein, advise them of their obligations and indemnify ITI LIMITED for any breach of those obligations.

3. The Bidder shall not disclose any information pertaining to this project to any third party.

4. Upon the request of ITI LIMITED, he shall return all information to ITI LIMITED immediately, provided, however, that an archival copy of the information may be retained in the files of the Bidder's counsel, solely for the purpose of providing the contents of the information.

5. In case the Bidder is not selected for awarding the work of this project, he shall return to ITI LIMITED all the original documents that have been made over by ITI LIMITED to him pertaining to this project Within 15 days of outcome of the tender and/or shall destroy all hard/soft copy/(ies)of the information pertaining to this project. Intimation in this regard is to be given by Bidder to ITI LIMITED.

6. The Bidder recognizes and agrees that all the information pertaining to this project is highly confidential and is owned solely by ITI LIMITED, Govt of India and that the unauthorized disclosure or use of such confidential information would cause irreparable harm and significant injury, the degree of which may be difficult to ascertain. Accordingly, the Bidder agrees that ITI LIMITED will have the right to obtain an immediate injunction enjoining any breach of this Agreement, as well as the right to pursue any and all other rights and remedies available at law or in equity for such a breach.

7. The Bidder's failure to enforce any provision, right or remedy under this agreement shall not constitute waiver of such provision, right or remedy.

8. This Agreement will be construed in, interpreted and applied in accordance with the laws of India.

9. This Agreement and Appendix- A attached hereto constitute the entire agreement with respect to the Bidder's obligations in connection with information disclosed hereunder.

10. The Bidder shall not assign this Agreement without first securing ITI LIMITED's written consent.

11. This agreement will remain in effect for ten years from the date of the last disclosure of confidential information, at which time it will terminate unless extended by ITI LIMITED in writing.

IN WITNESS WHEREOF, the parties hereto have executed this agreement by their duly authorized officer or representatives.

ForITI LIMITED	For Bidder(s)
…..……..	**..……..**
Signature**……..**	Signature**……..**
Printed Name: **……**	Printed Name: **……**
Title**…….……..……**	Title**…….……..……**
Signed	Signed

APPENDIX- A

Business Purpose**: Soil Investigation Works for Design of Foundations for Buildings & Towers**

1. Confidential Information of ITI LIMITED

1.1. Tender document for Soil Investigation Works for Design of Foundations for Buildings & Towers

1.2. The technical specifications / bill of material for Soil Investigation Works

1.3. Details of locations

1.4. All information shared in oral or in written by ITI LIMITED with M/s._____.

For ITI LIMITED

Signature _____

Name _____

Title _____

For M/s._____

Signature _____

Name _____

Title_____

ANNEXURE –3

PRE-CONTRACT INTEGRITY PACT

PURCHASE ENQUIRY/ORDER No: NSU / CIVIL / ASC-4 / Soil / 01 / 141 dtd: 20.04.2021

THIS Integrity Pact is made on……day of ……20...

BETWEEN:
ITI Limited having its Registered & Corporate Office at ITI Bhavan, Dooravaninagar, Bangalore – 560 016 and established under the Ministry of Communications, Government of India (hereinafter called the Principal), which term shall unless excluded by or is repugnant to the context, be deemed to include its Chairman & Managing Director, Directors, Officers or any of them specified by the Chairman & Managing Director in this behalf and shall also include its successors and assigns) ON THE ONE PART

AND:**…….** represented by **……..…..**
Chief Executive Officer (hereinafter called the Contractor(s), which term shall unless excluded by or is repugnant to the context be deemed to include its heirs, representatives, successors and assigns of the bidder/contract ON THE SECOND PART.

Preamble
WHEREAS the Principal intends to award, under laid down organizational procedures, contract for **……** of ITI Limited (name of the Stores/equipment/items). The Principal, values full compliance with all relevant laws of the land, regulations, economic use of resources and of fairness/ transparency in its relations with its Bidder(s)/ Contractor(s).

In order to achieve these goals, the Principal has appointed an Independent External Monitor (IEM), who will monitor the tender process and the execution of the contract for compliance with the principles as mentioned herein this agreement.

WHEREAS, to meet the purpose aforesaid, both the parties have agreed to enter into this Integrity Pact the terms and conditions of which shall also be read as integral part and parcel of the Tender Documents and contract between the parties.

NOW, THEREFORE, IN CONSIDERATION OF MUTUAL COVENANTS STIPULATED IN THIS PACT THE PARTIES HEREBY AGREE AS FOLLOWS AND THIS PACT WITNESSETH AS UNDER:

Section 1 – **Commitments of the Principal**

1.1 The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:

a. No employee of the Principal, personally or through family members, will in connection with the tender for or the execution of the contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.

b. The Principal will, during the tender process treat all bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all bidder(s) the same information and will not provide to any bidder(s) confidential/additional information through which the bidder(s) could obtain an advantage in relation to the tender process or the contract execution.

c. The Principal will exclude from the process all known prejudiced persons.

1.2 If the Principal obtains information on the conduct of any of its employee, which is a criminal offence under IPC/PC Actor if there be a substantive suspicion in this regard, the Principal will inform the Chief Vigilance Officer and in addition, can initiate disciplinary action as per its internal laid down Rules/ Regulations.

SECTION 2 – COMMITMENTS OF THE BIDDER/CONTRACTOR

2.1 The Bidder(s)/Contractor(s) commits himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during the participation in the tender process and during the execution of the contract.

a. The bidder(s)/contractor(s) will not, directly or through any other person or firm offer, promise or give to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material or other benefit which he/she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.

b. The bidder(s)/contractor(s) will not enter with other bidders/contractors into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.

c. The bidder(s)/contractor(s) will not commit any offence under IPC/PC Act, further, the bidder(s)/contractor(s) will not use improperly, for purposes of competition of personal gain, or pass onto others, any information or document

provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

d. The Bidder(s)/Contractor(s) of the foreign original shall disclose the name and address of the agents/representatives in India if any. Similarly, the Bidder(s)/Contractor(s) of Indian Nationality shall furnish the name and address of the foreign principals, if any.

e. The Bidder(s)/Contractor(s) will, when presenting the bid, disclose any and all payments made, are committed to or intend to make to agents, brokers or any other intermediaries in connection with the award of the contract.

f. The Bidder(s)/Contractor(s) will not bring any outside influence and Govt bodies directly or indirectly on the bidding process in furtherance to his bid.

g. The Bidder(s)/Contractor(s) will not instigate third persons to commit offences outlined above or to be an accessory to such offences.

SECTION 3 – DISQUALIFICATION FROM TENDER PROCESS & EXCLUSION FROM FUTURE CONTRACTS

3.1 If the Bidder(s)/Contractor(s), during tender process or before the award of the contract or during execution has committed a transgression in violation of Section 2, above or in any other form such as to put his reliability or credibility in question the Principal is entitled to disqualify Bidder(s)/ Contractor(s) from the tender process.

3.2 If the Bidder(s)/Contractor(s), has committed a transgression through a violation of Section 2 of the above, such as to put his reliability or credibility into question, the Principal shall be entitled exclude including blacklisting for future tender/contract award process. The imposition and duration of the exclusion will be determined by the severity of the transgression. The severity will be determined by the Principal taking into consideration the full facts and circumstances of each case, particularly taking into account the number of transgressions, the position of the transgressor within the Company hierarchy of the Bidder(s)/Contractor(s) and the amount of the damage. The exclusion will be imposed for a period of minimum one year.

3.3 The Bidder(s)/Contractor(s) with its free consent and without any influence agrees and undertakes to respect and uphold the Principal's absolute right to resort to and impose such exclusion and further accepts and undertakes not to challenge or question such exclusion on any ground including the lack of any hearing before the decision to resort to such exclusion is taken. The undertaking is given freely and after obtaining independent legal advice.

3.4 A transgression is considered to have occurred if the Principal after due consideration of the available evidence concludes that on the basis of facts available there are no material doubts.

3.5 The decision of the Principal to the effect that breach of the provisions of this Integrity Pact has been committed by the Bidder(s)/ Contractor(s) shall be final and binding on the Bidder(s)/ Contractor(s), however the Bidder(s)/ Contractor(s) can approach IEM(s) appointed for the purpose of this Pact.

3.6 On the occurrence of any sanctions/ disqualifications etc arising out from violation of integrity pact Bidder(s)/ Contractor(s) shall not be entitled to any compensation on this account.

3.7 subject to full satisfaction of the Principal, the exclusion of the Bidder(s)/ Contractor(s) could be revoked by the Principal if the Bidder(s)/ Contractor(s) can prove that he has restored/ recouped the damage caused by him and has installed a suitable corruption preventative system in his organization.

SECTION 4 – PREVIOUS TRANSGRESSION

4.1 The Bidder(s)/ Contractor(s) declares that no previous transgression occurred in the last 3 years immediately before signing of this Integrity Pact with any other Company in any country conforming to the anti-corruption/ transparency International (TI) approach or with any other Public Sector Enterprises/ Undertaking in India of any Government Department in India that could justify his exclusion from the tender process.

4.2 If the Bidder(s)/ Contractor(s) makes incorrect statement on this subject, he can be disqualified from the tender process or action for his exclusion can be taken as mentioned under Section-3 of the above for transgressions of Section-2 of the above and shall be liable for compensation for damages as per Section- 5 of this Pact.

SECTION 5 – COMPENSATION FOR DAMAGE

5.1 If the Principal has disqualified the Bidder(s)/Contractor(s) from the tender process prior to the award according to Section 3 the Principal is entitled to forfeit the Earnest Money Deposit/Bid Security/ or demand and recover the damages equitant to Earnest Money Deposit/Bid Security apart from any other legal that may have accrued to the Principal.

5.2 In addition to 5.1 above the Principal shall be entitled to take recourse to the relevant provision of the contract related to the termination of Contract due to Contractor default. In such case, the Principal shall be entitled to forfeit the Performance Bank

Guarantee of the Contractor or demand and recover liquidate and all damages as per the provisions of the contract agreement against termination.

SECTION 6 – EQUAL TREATMENT OF ALL BIDDERS/CONTRACTORS

6.1 The Principal will enter into Integrity Pact on all identical terms with all bidders and contractors for identical cases.

6.2 The Bidder(s)/Contractor(s) undertakes to get this Pact signed by its sub-contractor(s)/sub-vendor(s)/associate(s), if any, and to submit the same to the Principal along with the tender document/contract before signing the contract. The Bidder(s)/Contractor(s) shall be responsible for any violation(s) of the provisions laid down in the Integrity Pact Agreement by any of its sub-contractors/sub-vendors/associates.

6.3 The Principal will disqualify from the tender process all bidders who do not sign this Integrity Pact or violate its provisions.

SECTION 7 – CRIMINAL CHARGES AGAINST VIOLATING BIDDER(S)/ CONTRACTOR(S)

7.1 If the Principal receives any information of conduct of a Bidder(s)/Contractor(s) or sub-contractor/sub-vendor/associates of the Bidder(s)/Contractor(s) which constitutes corruption or if the Principal has substantive suspicion in this regard, the Principal will inform the same to the Chief Vigilance Officer of the Principal for appropriate action.

SECTION 8 – INDEPENDENT EXTERNAL MONITOR(S)

8.1 The Principal appoints competent and credible Independent External Monitor(s) for this Pact. The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this pact.

8.2 The Monitor is not subject to any instructions by the representatives of the parties and performs his functions neutrally and independently. He will report to the Chairman and Managing Director of the Principal.

8.3 The Bidder(s)/Contractor(s) accepts that the Monitor has the right to access without restriction to all product documentation of the Principal including that provided by the Bidder(s)/Contractor(s). The Bidder(s)/Contractor(s) will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The Monitor is under contractual obligation to treat the information and documents Bidder(s)/Contractor(s) with confidentiality.

8 .4 The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the project provided such meeting could have an impact

on the contractual relations between the Principal and the Bidder(s)/Contractor(s). As soon as the Monitor notices, or believes to notice, a violation of this agreement, he will so inform the Management of the Principal and request the Management to discontinue or take corrective action, or to take other relevant action. The monitor can in this regard submit non-binding recommendations. Beyond this, the Monitor has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action.

8.5 The Monitor will submit a written report to the Chairman & Managing Director of the Principal within a reasonable time from the date of reference or intimation to him by the principal and, should the occasion arise, submit proposals for correcting problematic situations.

8.6 If the Monitor has reported to the Chairman & Managing Director of the Principal a substantiated suspicion of an offence under relevant IPC/PC Act, and the Chairman & Managing Director of the Principal has not, within the reasonable time taken visible action to proceed against such offence or reported it to the Chief Vigilance Officer, the Monitor may also transmit this information directly to the Central Vigilance Commissioner.

8.7 The word 'Monitor' would include both singular and plural.

8.8 Details of the Independent External Monitor appointed by the Principal at present is furnished below: -

Shri Javeed Ahmad, IPS(Retd.)
M-1101, Shalimar Gallant Apartment,
Vigyanpuri, Mahanagar, Lucknow-226006

Any changes to the same as required/desired by statutory authorities are applicable.

SECTION 9 – FACILITATION OF INVESTIGATION

9.1 In case of any allegation of violation of any provisions of this Pact or payment of commission, the Principal or its agencies shall be entitled to examine all the documents including the Books of Accounts of the Bidder(s)/Contractor(s) and the Bidder(s)/Contractor(s) shall provide necessary information and documents in English and shall extend all help to the Principal for the purpose of verification of the documents.

SECTION 10 – LAW AND JURISDICTION

10.1 The Pact is subject to the Law as applicable in Indian Territory. The place of performance and jurisdiction shall the seat of the Principal.

10.2 The actions stipulated in this Pact are without prejudice to any other legal action that may follow in accordance with the provisions of the extant law in force relating to any civil or criminal proceedings.

SECTION 11 – PACT DURATION

11.1 This Pact begins when both the parties have legally signed it. It expires after 12 months on completion of the warranty/guarantee period of the project/work awarded, to the fullest satisfaction of the Principal.

11.2 If the Bidder(s)/Contractor(s) is unsuccessful, the Pact will automatically become invalid after three months on the evidence of failure on the part of the Bidder(s)/Contractor(s).

11.3 If any claim is lodged/made during the validity of the Pact, the same shall be binding and continue to be valid despite the lapse of the Pact unless it is discharged/determined by the Chairman and Managing Director of the Principal.

SECTION 12 – OTHER PROVISIONS

12.1 This pact is subject to Indian Law, place of performance and jurisdiction is the Registered & Corporate Office of the Principal at Bengaluru.

12.2 Changes and supplements, as well as termination notices, need to be made in writing by both the parties. Side agreements have not been made.

12.3 If the Bidder(s)/Contractor(s) or a partnership, the pact must be signed by all consortium members and partners.

12.4 Should one or several provisions of this pact turn out to be invalid, the remainder of this pact remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

12.3 Any disputes/ difference arising between the parties with regard to the term of this Pact, any action taken by the Principal in accordance with this Pact or interpretation thereof shall not be subject to any Arbitration.

12. 4 The action stipulates in this Integrity Pact are without prejudice to any other legal action that may follow in accordance with the provisions of the extant law in force relating to any civil or criminal proceedings.

In witness whereof the parties have signed and executed this Pactat the place and date first done mentioned in the presence of the witnesses:

For PRINCIPAL	For BIDDER(S)/CONTRACTOR(S)
……..	**……**
(Name & Designation)	(Name & Designation)
Witness	Witness
1) **……**	**1)……...**
2) **……..**	**2)……....**

ANNEXURE-4

FORMAT - TURNOVER FOR LAST THREE FINANCIAL YEARS.

Sl.no.	Financial year	Turnover	Average of three years
1	2018-19		
2	2019-20		
3	2020-21		

Note:

In addition to the above, the applicant has to submit the following documents/information,

a. Copy of the balance sheets

b. Copy of the valid GST no.

c. Copy of the PAN/TAN

d. Details of litigation if any.

e. Other relevant details if any.

The requisite Turnover certificate shall be duly certified by a Chartered Accountant with his seal /Signature and Registration No.

Signature of the bidder with Seal

ANNEXURE-5

FORMAT - ORGANISATION SET UP OF THE COMPANY.

SL.NO.	NAME	DESIGNATION	QUALIFICATION	PROFESSIONAL EXPERIENCE	YEARS WITH THE FIRM	REMARKS

Signature of the bidder with Seal

ANNEXURE-6

FORMAT - DETAILS OF THE WORK COMPLETED DURING THE LAST 5 YEARS

Sl.No.	Name of work	Scope of services	Value of Contract	Date of start/ completion	Name and address of the client	Value of TDS in case of private work	Remarks

NOTE:

THE FOLLOWING DOCUMENTS ARE TO BE ENCLOSED FOR EACH OF THE ABOVE WORKS.

a. Completion certificate.

b. Copy of award letter.

c. Other relevant documentary evidence, if any.

Signature of the bidder with Seal

ANNEXURE-7

DETAILS OF ONGOING WORKS

Sl.No.	Name of work	Scope of services	Value of Work	Date of start/completion	Name and address of the client	Remarks

NOTE:

(1) The scope of services included Soil Investigation work for civil works.

(2) The following documents are to be enclosed for each of the above works.
- **a.** Copy of Award letter.
- **b.** Other relevant documentary evidence if any.

Signature of the bidder with Seal

ANNEXURE—8

ITI LIMITED
(A GOVERNMENT OF INDIA ENTERPRISE)

PROFORMA OF BANK GUARANTEE (PERFORMANCE)
(Judicial Stamp Act - paper of appropriate value as the respective state)

ITI LIMITED,
(Address as mentioned in Notice Inviting Tender)

'Whereas the ITI Limited (hereinafter called ITI" which expression shall include its successors and assigns) having awarded a work order/contract/supply order No. dated (hereinafter called the contract) to M/S. ..... (hereinafter called the Soil Investigation agency) at a total price of RS..... subject to the terms and conditions contained in the contract.

WHEREAS, the terms and conditions of the contract require the Contractor to furnish a bank guarantee for Rs. …… (RUPEES.....} Being …… 3% of the total value of the contract for proper execution and due fulfilment of the terms and conditions contained in the contract.

We, the Bank, (hereinafter called the "Bank") do hereby unconditionally and irrevocably undertake to pay to ITI Ltd. immediately on demand in writing and 'without protest/or demur all moneys payable by the Soil investigation agency to ITI in connection with the execution/supply of and performance of the works/equipment, inclusive of any loss, damages, charges, expenses and costs caused to or suffered by or which would be caused to or suffered by ITI Ltd. by reason of any breach by the Soil Investigation agency of any of the terms and conditions contained in the contract as specified in the notice of demand made by ITI Ltd. to the bank. Any such demand made by ITI Ltd on the bank shall be conclusive evidence of the amount due and payable by the Bank under this guarantee. However, the Bank's liability under this guarantee shall be limited to Rs …… in the aggregate and the Bank hereby agrees to the following terms and conditions: -

i) This guarantee shall be a continuing guarantee and irrevocable for all claims of ITI Ltd as specified above and shall be valid during the period specified for the performance of the contract.

We, the said bank further agree with ITI Ltd. that ITI shall have the fullest liberty without our consent and without affecting in any manner our obligations and liabilities hereunder to vary any of the terms and conditions of the said contract or to extend time for performance of contract by the Soil Investigation agency from time to time or to postpone for any time or from time to time any of the powers exercisable by ITI Ltd. against the soil Investigation agency under the contract and forbear or enforce any of the terms and conditions relating to the said contract and we shall not be relieved from our liability by reason of any such variations or extension being granted to the Soil Investigation agency or for any forbearance, actor omission on the part of ITI Ltd. or any indulgence by ITI to the Soil Investigation agency or by any such matter or thing

whatsoever, which under the law relating to the sureties would, but for this provision, have effect of so relieving us.

(iii) This guarantee/undertaking shall be in addition to any other guarantee or security whatsoever ITI may now or at any time have in relation to the performance of the works/equipment and the Company shall have full recourse to or enforce this security in performance to any other security or guarantee which ITI may have or obtained and there shall be no forbearance on the part of the Company in enforcing or requiring enforcement of any other security which shall have the effect of releasing the Bank from its full liability, It shall not be necessary for ITI Ltd. to proceed against the said Soil Investigation agency before proceeding against the Bank.

(iv) This guarantee/ undertaking shall not be determined or affected by the liquidation or winding up, dissolution or change of constitution or insolvency of the Soil investigation agency, but shall in all respects and for all purposes be binding and operative until payment of all money payable to ITI in terms thereof are paid by the Bank.

(v) The Bank hereby waives all rights at any time inconsistent with the terms of this Guarantee and the obligations of the bank in terms hereof, shall not be otherwise effected or suspended by reasons of any dispute or disputes having been raised by the Soil Investigation agency (whether or not pending before any Arbitrator, Tribunal or Court) or any denial of liability by the Soil Investigation agency firm stopping or preventing or purporting to stop or prevent any payment by the Bank to ITI in terms hereof.

We, the said Bank, lastly undertake not to revoke this guarantee during its currency except with the previous consent of ITI Ltd.in writing upon expiry of which, we shall be relieved from all liabilities under this guarantee thereafter.

Signed this **.....** day of **……..** at **……..**

For and on behalf of Bank

WITNESS.

1. **……**

2. **……**

ANNEXURE-9

Dispatch number of bank/Date:

SOLVENCY CERTIFICATE ON LETTERHEAD OF BANK

This is to state that the best of our knowledge and information that

M/s ----------having /registered office address----------is a customer of the bank and has been maintaining his accounts with our branch since----------. As per records available with the bank, M/s ----------can be treated as solvent up to a limit of Rs----------[Rupees in words----------]

It is clarified that the above information is furnished and this certificate is being issued at the specific request of the customer.

Name Designation signature with seal

Note: The certificate shall have been issued on or after 01.10.2020

Annexure-10

Bid-Securing Declaration

Date:
Tender Ref: NSU/CIVIL/ASCON-4/Soil/001/141 dated 20.04.2021

To,
ITI LIMITED,
N S Unit, Bengaluru.

We, the undersigned, declare that:

1. I/We understand that, according to the conditions of tender, bids must be secured with a bid security as provided in the tender or to be supported with a Bid-Securing Declaration.

2. Accordingly, in lieu of Bid security, I/We unconditionally declare that:

   (a). I/We will follow all the conditions of this tender secured with the Bid Security.
   (b). I/we will not alter or change any of the conditions during the bid validity and after the award of Tender, if declared successful.
   (c). I/We will abide by all the terms and conditions of the tender.
   (d). I/we fully understand that I/we will be automatically disqualified from bidding for any contract with any procuring entity for a period of two (2) years upon receipt of your Blacklisting/Suspension Order,
   (e). I/we will pay the applicable fine or damages as provided by any stipulation or guidelines from the appropriate authority in this regard for the violation of Bid Securing Declaration; and,
   (f). I/We undertake to comply above, without prejudice to other legal action or remedies ITI Ltd. may have, to secure itself from the damages and losses incurred due to the act of violation by undersigned company/entity.

Duly authorized to sign the bid for and on behalf of:

[insert complete name of Bidder]

Dated on_____day of_____,_____*[insert date of signing]* Corporate Seal *(where appropriate).*

Signature of the bidder

CHECK LIST FOR THE SUBMISSION OF TENDER:

Whether the following documents are enclosed:

1	Documents in support of submission of cost of tender document	Yes	No.	Page No.
2	Documents in support of submission of EMD			
3	Copy of Power of Attorney of authorized signatory of the bid on stamp paper duly notarized			
4	EPF registration certificate			
5	GST registration certificate			
6	Average annual financial turnover for the last three years certified by the Chartered Accountant with registration number			
7	Bank Solvency certificate on or after 01-10-2020			
8	Work completion certificate during the last five years			
9	Organization set up of the company [as per annexure]			
10	Details of ongoing works			
11	Signed Integrity Pact			
12	Any Litigation History			
13	All the pages of tender documents signed			
14	Signed non-disclosure agreement			
15	Price Bid – Part II (Separate)			

Note: Bidder has to take a notice of above points and check mark Yes / No along with page number. The checklist shall be placed in the technical bid.

Signature of the bidder

P A R T – II
PRICE BID / SCHEDULE OF QUANTITIES

NOTES:

1. The sites are likely to be located in the border / remote areas and the quantities may vary to any extend. The sites' locations will be shown to successful bidders as and when authorities hand over the sites to the Company, which may be staggered.

2. If in case quantity of site increase, work order will be given to L-1 bidder at L-1 Rate.

3. Type of Tests to be carried out are given in **Annexure – E.**

4. Financial eligibility for bidding is as below:

Sl. No.	Rate to be quoted in	EMD Amount	Solvency Certificate Value	Average Annual Turnover	Time for Completion
1	Annexure - A	Rs. 8,700/-	Rs. 1,74,000	Rs.2,17,500	30 DAYS

ANNEXURE – A1

(SITES LOCATED IN Bomdilla (Arunachal Pradesh), & Tezpur (Assam))

Item No.	Description	Unit	Quantity	Rate	Amount
1	Carrying out Soil and Geotechnical Investigation of proposed construction sites by conducting all the relevant tests as per Annexure - E attached herewith, analysis of data in field laboratory and an accredited testing laboratory, compiling test results, ascertaining the Bearing Capacity of the soil, preparation and submission of six signed copies & one soft copy of final detailed investigation report along with definite recommendations about the safe allowable soil pressure, type of foundation to be adopted, depth of foundation and minimum width of foundation for single floor above ground / underground building construction and associated works etc. complete. The rate quoted shall be all inclusive and nothing extra will be payable on account of taxes, transportation etc.	Per Site	02		

(Rupees……..……)

ANNEXURE – E

LIST OF INVESTIGATION TESTS TO BE CARRIED OUT

Sl. No.	DESCRIPTION OF TESTS	UNIT	QUANTITY
1.	Boring of minimum 10 cm Diameter holes through clay, sandy and salty strata by auger boring at the location fixed by Engineer in charge. Including the collection of disturbed /undisturbed sample at every change of strata or at 3.0 meters' interval whichever is earlier. The samples are to be collected and transported to the laboratory for testing in accordance with Indian standard and General practice IS 1892. [As per detailed technical specifications in tender] [minimum two borehole]	Metre	20 Mtr.
2	Carrying out standard penetration test in borehole s at various depths [1.5 meters] interval or change of strata] as per standard practice and IS CODAL provisions. [As per detailed specifications in the tender] IS 2131, IS 2132	Each	10 Nos.
3	Conducting of following laboratory tests on the samples collected from the site [As per detailed technical specifications in the tender]		
	a] Grain size analysis	Each	5 Nos.
	b] Atterberg limits [liquid limit]	Each	5 Nos.
	c] Plastic Limit	Each	5 Nos.
	d] Natural Moisture Content	Each	5 Nos.
	e] Specific Gravity	Each	5 Nos.
	f] Bulk /Dry Unit Weights	Each	5 Nos.
	g] Shear characteristics of undisturbed/disturbed samples using tri-axial shear test [drained or untrained depending on soil characteristics /	Each	5 Nos.
	h]Swelling index test for expansive soil	Each	5 Nos.
4	Vane shear test [in case of soft clays and clay soils at every 1m [one-meter interval][As per detailed technical specification in the tender]	Each	1 No.
5	Dynamic cone penetration test for clay, salty, and sandy soil near borehole or as specified.[As per detailed technical specification in the tender] IS 4968 Part-I	Each	3 Nos.
6	Chemical analysis of subsoil water for its portability SULPHATE and chloride contents where water table is high and is likely to come in contact with foundations[As per technical specifications in the tender].	Each	1 No.
7	Boring of 10cm holes by core drilling in soft/hard rock including core collection at every 3.0-mtrs interval or change of strata whichever is earlier [quantity may vary depending upon substratum conditions.](As per technical specifications in the tender]	Metre	5 Mtr.
8	Conducting core recovery test on core samples obtained from rock strata[As per technical specifications in the tender]	Each	5 Nos.