भारत हेवी इलेक्ट्रिकल्स लिमिटेड

(भारत सरकार का उपक्रम)

BHARAT HEAVY ELECTRICALS LIMITED

(A Govt. of India Undertaking)

TCN – 06

Ref: PSER:SCT:KGN-C2108:TCN-06 Date: 05-06-2021

Sub	Tender Change Notice (TCN) - 06	
Job	CIVIL, STRUCTURAL & ARCHITECTURAL WORKS(INCLUDING PILING WORKS) FOR FGD SYSTEM AREA OF 3 X 500 MW, STAGE-II KAHALGAON STPP, BIHAR.	
Ref	1.0	Tender no PSER:SCT:KGN-C2108:21
	2.0	BHEL's NIT, vide reference no PSER:SCT:KGN-C2108:8624 Date: 13-05-2021
	3.0	BHEL's TCN-01, vide reference no PSER:SCT:KGN-C2108:TCN-01, dated: 22-05-2021
	4.0	BHEL's TCN-02, vide reference no PSER:SCT:KGN-C2108:TCN-02, dated: 26-05-2021
	5.0	BHEL's TCN-03, vide reference no PSER:SCT:KGN-C2108:TCN-03, dated: 31-05-2021
	6.0	BHEL's TCN-04, vide reference no PSER:SCT:KGN-C2108:TCN-04, dated: 31-05-2021
	7.0	BHEL's TCN-05, vide reference no PSER:SCT:KGN-C2108:TCN-05, dated: 04-06-2021
	8.0	All other pertinent issues till date.

With reference to above, following points/ documents, relevant to tender, may please be noted and complied with while submitting offer.

1.0 Revised Volume-IF-TCC-CML-Rev-01 is attached, superseding Volume-IF-TCC-CML-Rev-00 issued earlier along with NIT. Bidders are requested to go through entire volume before submitting their offer.

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2.0 Introduction of Geotechnical Investigation Report (Revision-03) to VOL-IF-TCC, is attached for reference only.

3.0 The clarifications to bidder's queries are attached as **Annexure-A** to this TCN-06.

4.0 Revised `No deviation certificate' as per enclosed Annexure-2. Bidder shall submit no deviation certificate as per enclosed format only.

5.0 All other terms & conditions shall remain unchanged.

Thanking you,

Yours faithfully,
for BHARAT HEAVY ELECTRICALS LTD

DY. MGR (SCT)

Encl : As above.

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This volume shall be construed as part of tender document and shall be read along-with others volumes of tender. Unless otherwise specified, in case of any conflict or inconsistency between the general and technical conditions, the same shall be brought out by the bidder in writing to BHEL for clarification during pre-bid discussions; failing which most stringent interpretation/ clause in favour of BHEL shall be adopted and the same shall be binding to the bidder. Unless otherwise specified, all terms & conditions shall be applicable for entire scope and for each package of the tender.

CLAUSE NO	DESCRIPTION
1.0	**PROJECT SYNOPSIS AND GENERAL INFORMATION**
	Kahalgaon Super Thermal Power Plant has been set up by NTPC, is located near Kahalgaon town in Bhagalpur district of Bihar State. The Stage-I & Stage -II of the Project were comprised of four (4) units of 210 MW, three (3) units of 500 MW respectively. The ultimate capacity of the project is 2340 MW (4 X 210 MW, Stage-I + 3 X 500 MW, Stage-II). As per Govt. of India norms, Flue Gas Desulphurization (FGD) system is being set up by NTPC for all units. 1. Owner : NTPC Ltd. 2. Project title : Flue Gas Desulphurisation (FGD) system Package for 3x500 MW Kahalgaon STPS Stage-II 4. Location :Kahalgaon town in Bhagalpur district, Bihar 5. Nearest Rly Stn :Colgong (Kahalgaon) 2.0 km away from project site 6.Nearest Port :Paradip 7. Nearest Airport : Patna (250 KM FROM PROJECT LOCATION) 8. Road Approach : Bhagalpur - Sahibganj State Highway 9. Lattitide : 25 o 15 N 10. Longitude : 87 o 15 E 11. Average Elavation : 16 MTR. 12. Average Temp : 35-40°C During summer 13. Average Rainfall : 50-75 CM
2.0	**SITE VISIT**
	The contractor should visit project site and acquire full knowledge and information about conditionsprevailing at site and in & around the plant premises, together with all the statutory, obligatory, mandatory requirements of various authorities before submission of the bid.
3.0	**NAME OF WORK**
	Civil, structural and Architectural Works of Main Plant FGD including common systems of lime & gypsum handling system of Unit#5 ,6& 7 (3X500MW), NTPC, Kahalgaon, Bihar

4.0	**SCOPE OF WORK**
4.1	Following area/structures are broadly covered under this Package: Civil, structural and Architectural works including piling and pile cap of Main plant FGD Civil works of Unit #5, 6 & 7 (3x500 MW) which covers the following:

	1. Test piles installation and testing & report submission 2. Absorber foundation 3. FGD control room 4. Booster fan 5. Ball mill building & equipment foundation 6. Gypsum dewatering building & equipment foundation 7. Switchyard Control Building 8. RC pump & oxidation blower building & equipment foundation 9. ECW pump house 10. Compressor house 11. SO2 analyser room foundation 12. Limestone storage silo foundation 13. Wet ball mill foundation 14. Misc. tank foundation 15. Misc. pump /equipment 16. Duct foundations 17. Pipe rack 18. Paving, roads & drains 19. Filling and micro grading as per site requirement 20. Misc. sumps, plinth protection & underground works 21. Sewage network, 22. Storm water drainage system 23. Plumbing, sanitary works, microgradingetc 24. Any other structures as per scope of works required for system completion. Note: Pile installation of Chimney structure is also covered in agency's scope. However, pile cap & other work of Chimney are not covered under scope of this tender.
4.2	The scope shall include other related works although they may not be specifically mentioned. All incidental items, although not mentioned, but are necessary for completion of the work as a whole are covered in the scope of this contract. The scope also includes supply of all labour, technical personnel, materials, consumables and equipment for execution of work and getting all materials tested at site laboratory or approved laboratory outside, submitting test reports, arranging supervision etc. and execution of the contract with major areas of work mentioned above.
4.3	Cement, Reinforcement steel & Factory made shop fabricated Structural steel for civil works & MS round bar for below ground earthing shall be provided by BHEL free of cost only for incorporation in the permanent work wherever specifically mentioned in the BOQ. Embedments /inserts required for the works in general shall be supplied by the bidder and payment shall be made as per corresponding item in BOQ.
4.4	Any buried pipe / cable coming in the working fronts are to be removed safely & re-routed by the contractor at no extra cost to BHEL.
4.5	The work to be performed under this specification consists of providing all temporary works, temporary storage sheds for contractors own use, temporary colony for labour and staff, temporary site offices, constructional plant's transportation / handling and all incidental items not shown or specified but reasonably implied or necessary for the completion of subject scope, all in strict accordance with the specifications including revisions and amendments thereto as may be required during the execution of work.
4.6	All quality standards, tolerances, welding standards & other technical requirements shall be strictly adhered to. The bidder shall fully apprise himself of the prevailing conditions at the proposed site, climatic conditions including monsoon pattern, soil conditions, local conditions and site specific parameters and shall include for all such conditions and contingent measures in the bid, including those which may not have been specifically brought out in the

	specifications.
4.7	The scope shall also include setting up by the bidder a testing room with compressive strength testing machine and other site test instruments for conducting day to day testing of concrete cubes, compaction of earth & road work, brick & other material testing. One Qualified quality engineer to be deployed as necessary.
4.8	Before execution of work the bidder shall ensure that there is no obstruction to underground/over ground facilities like sewer lines, pipe lines etc. Any such damage and remedial/ rectification measures shall be at the contractors cost. For underground facilities survey, Ground Penetration Radar (GPR) has to be used to avoid any untoward incident during execution/excavation. No sepearate payment will be entertained in this regard.
4.9	Detailed Technical specification for the job is attached. Bidder is requested to refer relevant applicable portion.
4.10	**TEST PILE INSTALLATION AND LOAD TESTING**
4.10.1	Commencement of test pile installation work and completion of all initial pile load test is very critical for this package. Hence, contractor has to mobilize minimum necessary T & Ps required for completion of test pile work, within 15 days of placement of LOI or 7 days of handing over of drawings for test pile work, whichever is later.
4.10.2	Approximate number of tests piles are08. Diameter of pile will 900mm. Depth of pile will vary tentatively from 30 m to 31m. For exact length of pile, drawings for test pile shall be referred, which will be issued after award of contract.
4.10.3	Arrangement of Cement & Reinforcement steel required for test pile work is in the scope of contractor. Generally, cement shall be of 43 grade ordinary Portland cement conforming to IS:269-2015. Reinforcement steel shall be of Fe 500 grade corrosion resistant steel and as per relevant IS specification as mentioned in the contract/ drawings/ instructions. All bars shall be of tested quality. Reinforcement steel brought to site shall be of prime steel manufacturer viz. SAIL, JSPL, RINL, TATA STEEL. Reinforcement steel shall be procured either from the manufacturer as mentioned above or from authorized dealer of those mentioned manufacturer. Prior to procurement of cement, approval shall be sought from BHEL/ Owner. For RMC, approval shall be taken for cement to be used by RMC supplier
4.10.4	For casting of test piles, effort shall be made for making tie up with available RMC supplier in and around Kahalgaon for supply of ready-mix concrete for faster execution of test piles. Prior approval of RMC supplier shall be sought from BHEL/ Customer/ Owner. In connection to approval of RMC, all the relevant document of RMC supplier viz. source of aggregate, petrographic examination report of aggregates, initial tests and routine tests of aggregates (as per technical specification or IS:383), calibration certificate of batching plant, License for RMC production, water test report, etc. shall be submitted for BHEL/ Owner review.
4.10.5	Contractor has to carry out design mix for M30 grade concrete of required specification for initial test piles through agency duly approved by BHEL/Customer. Alternatively, contractor can use design mix for M30 grade concrete of required specification which is already establlshed and approved at site.
4.10.6	Prior to use, trial mix at site shall be taken and to be tested for establishment of concrete strength. Subject to approval by customer, curing of samples may be carried out by ACT (Accelerated curing tank) method for which, all necessary arrangement to be made by the contractor. Minimum number of cubes to taken should be in line with specification and instruction of BHEL/customer.
4.10.7	Minimum one hydraulic rotary rig (or DMC rig as approved by BHEL/ Owner for installation of test pile or as mentioned in drawing) for test pile works shall be arranged within 15 days of placement of LOI or 7 days of handing over of drawing for test pile, whichever is later. The same can be demobilized after

	installation of all test piles or as per direction of engineer in-charge.
4.10.8	Tie up with technically capable pile load testing agency shall be made within 20 days of placement of LOI and all relevant document shall be submitted to BHEL/ Owner for approval. Subsequently methodology for initial pile load testing shall be submitted to BHEL/ Owner for approval prior to commencement of initial load testing work.
4.10.9	Kentledge arrangement along with concrete blocks, required for testing purpose, are to be made available at site within one month from the LOI or date of handing over of site, whichever is later.
4.11	**FABRICATED STRUCTURAL STEEL**
4.11.1	Supply of Factory Made Shop Fabricated Structural Steel shall be in BHEL Scope.
5.0	**DEVIATIONS**
	The bidder is required to submit with his offer in the relevant schedule / format without any ambiguity. Any assumptions, presumptions, deviations etc. indicated or implied anywhere by the bidder except those indicated in the deviation schedule / format will not be recognized and will not form a part of consideration / offer. In the absence of such filled-up schedule / format it will be understood and agreed that the bidder's offer is based on strict conformance to the specification and no negotiation would be allowed in this regard. BHEL reserve the right not to recognize any / all deviations submitted after opening of the bid.
6.0	**DEWATERING**
	Contractor shall ensure at all times that his work area & approach/ access roads are free from accumulation of water, so that the materials are safe and the erection/ progress schedule are not affected. Unless otherwise specified in BOQ or contract, no separate payments for dewatering of subsoil, surface water or catchments water, if required, at any time during execution of the work including monsoon period shall be considered by BHEL.
7.0	**GENERAL TECHNICAL REQUIREMENTS (CODES AND STANDARDS)**
7.1	Except where otherwise specified, the plant / equipment shall comply with appropriate Indian Standard or an agreed internationally accepted Standard Specification as mentioned elsewhere in tender, each incorporating the latest revisions at the time of tendering. Where no internationally accepted standard is applicable, the bidder shall give all particulars and details as necessary; to enable BHEL to identify all of the plant/ equipment in the same detail as would be possible had there been a standard specification.
7.2	Where the bidder proposes alternative codes or standards he shall include in his tender one copy (in English) of each standard specification to which materials offered shall comply. In such case, the adopted alternative standard shall be equivalent or superior to the standards mentioned in the specification.
7.3	In the event of any conflict between the codes & standards referred above and requirements of this specification, the requirements which are more stringent shall govern.
7.4	Tools used during erection and commissioning shall not be accepted except with the specific approval of the engineer.
7.5	Wherever specified or required, the plant / equipment shall conform to various statutory regulations such as Indian Boiler Regulation, Indian Electricity Rules, Indian Explosive Act, Factories Act etc, wherever required, obtaining approval for plant / equipment supplied under the specification from statutory authorities shall be the responsibility of the contractor.
8.0	**GENERAL SERVICES TO BE RENDERED BY THE BIDDER**
8.1	Services for construction, fabrication, equipment erection, testing, trial run, commissioning of various equipment & accessories under the contract shall include but not be limited to the following:
8.2	Collecting materials from store / open yard from time to time for fabrication / erection as per the construction program and unloading of steel as per flow of

	consignment. The contractor shall be the custodian of all the materials issued till the plant / equipment is officially taken over by the owner / BHEL after complete erection and commissioning. The contractor shall maintain adequate security personnel and security measures for proper precaution and safety of material.
8.3	Deployment of all skilled and unskilled manpower required for erection supervision, watch & ward, for commissioning and other services to be rendered under this specification.
8.4	Deployment of all erection tools & tackle, construction machinery, transportation vehicles and all other implements in adequate number and size, appropriate for the erection work to be handled under scope of this specification except otherwise specified.
8.5	Supply of all consumables, e.g. welding electrodes, etc as well as materials required for temporary supports, scaffolding etc as necessary for such construction work, unless specified other wise.
8.6	Providing support services for the contractor's staff e.g. construction of site offices, temporary stores, residential accommodation and transport to work site for construction personnel, watch and ward for security and safety of the materials under the Contractor's custody etc. as required.
8.7	Maintaining proper documentation of all site activities undertaken by the contractor as per the proforma mutually agreed with BHEL / owner, submitting monthly progress reports / as and when desired by BHEL/ owner, taking approval of all statutory authorities e.g., Factory Inspector, Provident Fund authority etc. for respective portions of work under the jurisdiction of such statutes of laws.
8.8	As part of overall project management activity, the contractor shall be responsible for proper co-ordination of construction activities during various phases of execution of the contract. The contractor shall identify a person designated as construction manager, with whom BHEL shall interact on matters related to execution of the contract. The construction manager shall be the single point contact person on behalf of the contractor. BHEL shall interact with the construction manager only on all matters on co-ordination between BHEL and the contractor. For timely completion of work, the contractor may have to work in one or more shifts. He will not be eligible for any extra charge on this account.
8.9	The contractor shall confine all his field operations to those works which can be reformed without subjecting the equipment and materials to adverse effects, during inclement weather conditions, like monsoon, storms etc and during other unfavourable construction conditions. No field activities shall be performed by the contractor under conditions which might adversely affect the quality and efficiency thereof, unless special precautions or measures are taken by the contractor in proper and satisfactory manner in the performance of such works and with the concurrence of the engineer. Such unfavourable construction conditions in no way relieve the contractor of his responsibility to perform the works as per the schedule.
8.10	The contractor shall supply all the skilled workmen like labour, welders, gas cutters, electricians, sarangs, erectors, carpenters, bar bender, pipe fitters, masons, laggers, instrument machanicsetc, in addition to other skilled, semi-skilled and unskilled workmen required for all works of handling and transportation from site store to construction site, execution, testing contemplated under this specification. Only fully trained and competent men with previous experience on the job shall be employed. They shall hold valid certificates wherever necessary. BHEL reserve the right to decide on the suitability of the workers and the other personnel who will be employed by the contractor. BHEL reserves the right to insist on removal of any employee of the contractor at any time, if they find him unsuitable and the contractor shall forthwith remove him.
8.11	The supervisory staff employed by the contractor shall be technically qualified and experienced in the area of work. They shall ensure proper out turn of work and discipline on the part of labour put on the job by the contractor and in

	general see that the works are carried out in a safe and proper manner and in coordination with other labour and staff employed directly by BHEL or other contractors of BHEL / owner.
8.12	The contractor shall also furnish daily labour report showing by classification the number of employees engaged in various categories of work a progress report of work as required by BHEL engineer.
8.13	The work shall be executed under the usual conditions affecting major power plant construction and in conjunction with numerous other operations at site. The contractor and his personnel shall co-operate with other personnel, and other contractors, co-ordinating his work with others and proceed in a manner that shall not delay or hinder the progress of work as a whole.
8.14	The contractor's supervisory staff shall execute the work in the most substantial and workman like manner in the stipulated time. Accuracy of work and aesthetic finish are essential part of this contract. The contractor shall be responsible to ensure that assembly and workmanship conform to the dimensions and tolerance given in the drawing / instruction given by BHEL Engineer from time to time.
8.15	It is the responsibility of the contractor to engage his workman in shifts or on overtime basis for achieving the target set by BHEL during construction and testing period. Contractor's quoted rate shall include all these contingencies.
8.16	Any other service, although not specifically called for but required for a contract of the size and nature indicated in the specification.
9.0	**PROTECTION**
9.1	Equipment having anti-friction or sleeve bearings shall be protected by weather tight enclosures. Coated surfaces shall be protected against impact, abrasion, discoloration and other damages. Surfaces which are damaged shall be repainted.
9.2	Electrical equipments, controls and insulations shall be protected against moisture and water damages. All external gasket surfaces and flange faces, couplings, rotating equipment shafts, bearings and like items shall be thoroughly cleaned and coated with rust preventive compound and protected with suitable wood, metal or other substantial type covering to ensure their full protection. All exposed threaded parts shall be greased and protected with metallic or other substantial type protectors
9.3	All piping, tubing and conduit connections on equipment and equipment openings shall be closed with rough usage covers or plugs. Female threaded openings shall be closed with rough usage covers or plugs or forged steel plugs. The closures shall be taped to seal the interior of the equipment. Open ends of piping, tubing and conduit shall be sealed and taped.
9.4	All other consumables including wire brush, emery papers, painting brush etc to be supplied by the contractor within the quoted rate.
10.0	**GENERAL GUIDELINES FOR FIELD ACTIVITIES**
10.1	The contractor shall execute the works in a professional manner so as to achieve the target schedule without any sacrifice on quality and maintaining highest standards of safety and cleanliness.
10.2	The contractor shall co-operate with owner / BHEL and other contractors working in site and arrange to perform his work in a manner so as to minimise interference with other contractor’s works. BHEL's engineer shall be notified promptly of any defect in other contractors’ works that could affect the contractor’s work. If rescheduling of contractor’s work is requested by the owner's / BHEL's engineer in the interest of overall site activities, the same shall be compiled with by the contractor. In all cases of controversy, the decision of BHEL shall be final and binding on the contractor without any commercial implication.
10.3	The engineer shall hold weekly meeting of all the contractors working at site at a time and a place to be designated by the engineer. The contractor shall attend such meetings and take notes of discussions during the meeting and the

	decisions of the engineer and shall strictly adhere to those decisions in performing this work. In addition to the above weekly meeting, engineer may call for other meetings either with individual contractors or with selected number of contractors and in such a case the contractor, if called will also attend such meetings.
10.4	Time is the essence of the contract and the contractor shall be responsible for performance of his work in accordance with the specified construction schedule. If at any time the contractor is falling behind the schedule, he shall take necessary action to make good of such delays by increasing his work to comply with the schedule and shall communicate such action in writing to the engineer, satisfying that his action will compensate for the delay. The contractor shall not be allowed any extra compensation for such action.
10.5	The engineer shall however not be responsible for provision of additional labour and or materials or supply of any other services to the contractor except for the co-ordination work between various contractors as set out earlier.
10.6	The works under execution shall be open to inspection & supervision by BHEL's / Owner's engineer at all times. The contractor shall give reasonable notice to BHEL before covering up or otherwise placing beyond the reach of inspection any work, in order that same may be verified, if so desired by owner / BHEL.
10.7	Every effort shall be made to maintain the highest quality of workmanship by stringent supervision and inspection at every stage of execution. Manufacturer's instruction manual and guidelines on sequence of erection and precautions shall be strictly followed. If any error or ambiguity be discovered in such documents the same shall be brought to the notice of BHEL's engineer. Manufacturer's interpretation in such cases shall be binding on the contractor.
10.8	The contractor shall comply with all the rules and regulations of the local authorities, all statutory laws including Minimum Wages, Workmen Compensation etc. All registration and statutory inspection fees, if any, in respect of the work executed by the contractor shall be to his account. Contractor has to arrange Police verification for all workmen prior to mobilisation at site.
10.9	All the works such as cleaning, checking, levelling, aligning, assembling, temporary erection for alignment, opening, surface preparation, edge preparation, fabrication as per general engineering practice at site, cutting, grinding, straightening, chamfering, filling, chipping, drilling, fitting-up, bolting / welding, etc as may be applicable in such erection and necessary to complete the work satisfactorily, are to be treated as incidental and the same shall be carried out by the contractor as part of the work.
10.10	It is the responsibility of the contractor to do the alignment etc if necessary, repeatedly to satisfy engineer, with all the necessary tools & tackles, manpower etc. The alignment will be complete only when jointly certified so, by the contractor's engineer and BHEL. Also the contractor should ensure that the alignment is not disturbed afterwards.
10.11	Foundation, pedestals and material, in case wrongly constructed, shall be removed and to be redone to comply with the design requirement at the contractor expense, to the satisfaction of BHEL / owner.
10.12	After identification of materials at BHEL's store / storage yard, it shall be the responsibility of the contractor to take delivery of materials from BHEL's store / storage yard by contractor's own manpower and re-stack the leftover materials as per erection sequence at BHEL store at their own cost. The entire activities are to be carried out under supervision of BHEL's engineer.
11.0	**QUALITY ASSURANCE PROGRAMME**
11.1	INSPECTION & FIELD QUALITY ASSURANCE
11.1.1	Contractor shall carry out all activities conforming to the approved Field Quality Plan (FQP) & technical instructions as revised from time to time. 'Total Quality' shall be the watchword of the work and contractor shall strive to achieve the quality standards, procedures laid down by BHEL. He shall follow all the instructions as per BHEL drawings and quality standards. Contractor shall

	provide the services of quality assurance engineer as per the relevant clauses.
11.1.2	Preparation of quality assurance log sheets and protocols with customer / consultants / statutory authority, welding logs, NDE records, testing & calibration records and other quality control and quality assurance documentation as per BHEL engineer's instructions, is within the scope of work / specification. These records shall be submitted to BHEL / customer for approval from time to time.
11.1.3	The protocols between contractor and customer / BHEL shall be made for correctness of foundations, materials, procedures, at each stage of installation, generally as per the requirement of customer / BHEL. This is necessary to ensure elimination of errors and to avoid accumulation and multiplication of errors.
11.1.4	A daily log book (with proper indexing) should be maintained by every supervisor / engineer of contractor, for respective area of work, on the job for detailing and incorporating alignment/ clearance / centering / levelling readings and inspection details of various equipment, etc. This log book shall be always accessible to BHEL engineers. High pressure welding (as applicable under the scope of this contract) details like serial number of weld joints, welders name, date of welding, details of repair, heat treatment etc. will be documented in welding log as per BHEL Engineer's instructions. Record of radiography (as applicable under the scope of this contract) containing details like serial number of weld joints, date of radiography, repairs, if any, re-shots etc shall also be maintained as per BHEL Engineer's instructions. Record of heat treatments (as applicable under the scope of this contract) performed shall be maintained as prescribed by BHEL.
11.1.5	The contractor has to take prior permission / approval before deployment of NDE & Heat Treatment agencies at site as per BHEL document no. PP-QLY-AA-DC-106/01-20. The contractor's employees involved in NDE & Heat treatment job must be qualified & experienced as per the requirement of the above document.
11.1.6	The performance of welders (as applicable under the scope of this contract) will be reviewed from time to time as per the BHEL standards. Welders' performance record shall be furnished periodically for scrutiny of BHEL's Engineer. Currently, BHEL follows online Welder Performance Monitoring System. Contractor shall extend necesary support, as deemed fit by BHEL site-in-charge, regarding data entry into the system. Corrective action as informed by BHEL shall be taken in respect of those welders not conforming to these standards. This may include removal/ discontinuance of concerned welder(s). Contractor shall arrange for the alternate welders immediately.
11.1.7	Only welders duly authorized by BHEL / customer / consultant after welder qualification test as per ASME Sec-IX / AWS D1.1 (as applicable) shall be engaged on the work. All the welders shall carry identity cards as per the proforma prescribed by BHEL / Customer / Consultant. High Pressure welders and welders of special materail viz. C276, Ti, etc., must be trained & tested by experts from BHEL-WRI/ other units. Necessary infrastructure for welder traning & testing, as per BHEL's instruction, to be arranged by the contractor without any extra cost to BHEL.
11.1.8	Any re-laying or re-termination of cables / re-erection of instruments / recalibration of instruments etc. required due to contractor's mistake and found at any stage inspection, shall be carried out by the contractor at no extra cost. Repair / rectification procedure to be adopted to make any job acceptable shall be subject to the approval of BHEL. Weekly Quality Review Meeting at site shall be organised by BHEL to discuss quality issues and next weeks inspection plans. Site in-charge of the contractor along with QAEs of the contractor must be present in the meeting with closure report of the issues raised by BHEL in the previous meetings.
11.1.9	Weekly Quality Review Meeting at site shall be organised by BHEL to discuss

	quality issues and next weeks inspection plans. Site incharge of the contractor along with QAEs of the contractor must be present in the meeting with closure report of the issues raised by BHEL in the previous meetings.
11.2	REQUIREMENT OF ISO 9001
11.2.1	BHEL: PSER is accredited with ISO 9001 certification and as such this work is subject to various audits to meet ISO 9001 requirements.
11.2.2	The basic philosophy of the Quality Management System under ISO 9001 is to define the organizational responsibility, work as per documented procedures, verify the output with respect to acceptance norms, identify the non-conforming product / procedure and take corrective action for removal of non-conformance specifying the steps for avoiding recurrence of such non-conformities, & maintain the relevant quality records. The non-conformities are to be identified through the conduct of periodical audit of implementation of quality systems at various locations/stages of work. Suppliers / vendors of various products / services contributing in the work are also considered as part of the quality management system. As such the contractor is expected not only to conform to the quality management system of BHEL but also it is desirable that they themselves are accredited under any quality management system standard.
11.2.3	BHEL reserves the right to carry out quarterly quality audits and quality surveillance of the systems and procedures of contractor's quality management. Contractor shall provide all necessary assistance to enable BHEL to carry out such audit & surveillance.
11.2.4	Quality audits / approval of the results of test & inspection will not prejudice the right of BHEL to reject an equipment service not giving desired performance and shall not in no way limit the liabilities and responsibilities of the contractor in earning satisfactory performances of equipment / service as per specification.
11.3	MMEs / MMRs
11.3.1	Contractor shall ensure deployment of reliable and calibrated MMEs (Measuring and Monitoring Equipment). The MMEs shall have test / calibration certificates from authorised / Government approved / Accredited agencies traceable to National / International Standards. Retesting / re-calibration shall also be arranged at regular intervals during the period of use as advised by BHEL Engineer within the contract price. The contractor will also have alternate arrangements for such MMEs so that work does not suffer when the particular equipment / instrument is sent for calibration. Also if any MMEs not found fit for use, BHEL shall have the right to stop the use of such item and instruct the contractor to deploy proper item and recall i.e. repeat the readings taken by that instrument, failing which BHEL may deploy MME and retake the readings at Contractor's cost.
11.3.2	Contractor shall provide all the Measuring Monitoring Equipment (MMEs) required for completion of the work satisfactorily. These MMEs shall be of brand, quality and accuracy specified by BHEL Engineer and should have necessary calibration and other certificates as per the requirement of BHEL Engineer. Decision of BHEL Engineer regarding acceptance or otherwise of the measuring instruments / gauges / tools for the work under this specification, is final and binding on the contractor. BHEL shall give an indicative list of MMEs required for this work else where in this contract and to be made available by the contractor. The list will be reviewed by BHEL site as per the requirement of approved FQPs and the contractor shall meet any augmentation needed wherever required.
11.3.3	It is the responsibility of the contractor to prove the accuracy of the testing / measuring / calibrating equipment brought by him based on the periodicity of calibration as called for in the BHEL's quality assurance standards/BHEL Engineer's instructions.
11.3.4	Re-work necessitated on account of use of invalid MMEs shall be entirely to the contractor's account. He shall be responsible to take all corrective actions, including resource augmentation if any, as specified by BHEL to make-up for the

	loss of time.
11.3.5	In the courses of erection, it may become necessary to carry repeated checks of the work with instruments recently calibrated, re-calibrated. BHEL may counter / finally check the measurements with their own MMEs. Contractor shall render all assistance in conduct of such counter/ final measurements.
11.4	INSPECTION BY TS / FES / QA ENGINEERS OF BHEL UNITS / ENGINEERING CENTRES
11.4.1	Apart from day-to-day inspection by BHEL Engineers stationed at Site and Customer's Engineers, stage inspection of equipment under erection and commissioning at various stages may also be conducted by teams of Engineers from Field Engineering Services of BHEL's Manufacturing Units, Quality Assurance teams from Field Quality Assurance, Unit/Factory Quality Assurance and Commissioning Engineers from Technical Services etc. Contractor shall arrange all labour, tools and tackles etc along with proper access for such stage inspections free of cost.
11.4.2	Any modifications suggested by BHEL FES and QA Engineers' team shall be carried out. Claims of contractor, if any, shall be dealt as per applicable clause of the contract, and provided such modifications have not arisen for reasons attributable to the contractor.
11.5	CONFORMANCE TO THE STATUTORY REQUIREMENTS (AS APPLICABLE UNDER THE SCOPE OF THE CONTRACT)
11.5.1	The work to be executed under these specifications has to be offered for inspection, at appropriate stages of work completion, to various statutory authorities for compliance with applicable regulations. The work related statutory inspections, though not limited to, are as under: 1) Inspectorate of Steam Boilers and Smoke Nuisance 2) Electrical Inspector 3) Factory Inspector, Labour Commissioner, PF Commissioner and other authorities connected to this project work. The scope includes getting the approvals from the statutory authorities, which includes arranging for inspection visits of statutory authority periodically as per BHEL Engineer's instructions, arranging materials for ground inspection, taking rub outs for stamping of the pressure parts / pipes to be offered for inspection, submitting co-related inspection reports, documents, radiographs etc and following up the matter with them. Contractor shall also make all arrangements for offering the Products / Systems for inspection at location, as applicable, to the concerned authority
11.5.2	Contractor should be qualified to execute pressure parts & piping work coming under the purview of IBR or Competant Inspecting Authority, for which he should register himself with CIB of state concerned / Competant Inspector. Contractor also should be aware of the latest Boiler regulations and Electricity Act, including the amendments thereof, as applicable under the scope of this contract.
11.5.3	Contractor shall comply with 'Qualification Tests for welders engaged in welding of Boilers and Steam Pipes under Construction, Erection and Fabrication at Site in India and in repairing Boilers and steam pipes by welding' in line with Chapter XIII of Indian Boiler Regulations- 1950, for testing his welders / men / workers, including all associated fees, procedures, required instruments and equipment and their calibration there of. It shall be contractor's responsibility to obtain approval of Statutory Authorities, wherever applicable, for the conducting of any work which comes under the purview of these authorities, at his cost.
11.5.4	The following fees shall be excluded from scope of Contractor: 1. Registration Fee as per Regulation 385 of Chapter IX of Indian Boiler Regulations-1950 or Registration Fee as per prevailing statutory boiler regulations. 2. Fees for inspection of Boiler at the site of Construction as per Regulation 395 A, sl no 4 of Chapter IX of Indian Boiler Regulations- 1950. However all other fees like visit fees charged by the Boiler Inspector and other arrangements for his visit or visits till satisfactory completion of work, shall be included in scope of

	Contractor.			
11.6	STORAGE & PRESERVATION OF WELDING ELECTRODES & OTHER BHEL-ISSUED MATERIAL			
11.6.1	The contractor shall be responsible for storage & preservation of welding electrodes & other BHEL-issued materials as per BHEL Storage & Preservation Guidelines / Instructions.			
11.7	PENALTIES ON VENDORS / SUB-CONTRACTORS AGAINST NON-COMPLIANCE OF QUALITY NORMS			
Sl. No.	Nature of Non-compliance	Penalty for Domestic Project	Penalty for Export Project	Remarks
GENERAL				
11.7.1	Unavailability of QAE deployment schedule (duly approved by BHEL Site) matching with manpower requirement of approved L2 schedule	0.10%	0.10%	Against each RA bill
11.7.2	Unavailability of required number of QAE with proper experience & NDT certification as per the requirement of the Contract	Rs. 1,000.00	$16.00	Per person per day
11.7.3	Not attending quality meeting of BHEL by nominated member of vendor / sub-contractor	Rs. 2,000.00	$32.00	Per meeting
CALIBRATION				
11.7.4	Use of MMEs without valid calibration certificate	Rs. 1,000.00	$16.00	Per equipment per instance
11.7.5	Use of NDT equipment, welding equipment without having valid calibration certificate / condition not as per requirement	Rs. 1,000.00	$16.00	Per equipment per instance
WELDING & NDT				
11.7.6	Unqualified welders carrying out welding / tack welding	Rs. 1,000.00	$16.00	Per welder per instance. (Gatepass of the person shall be withheld)
11.7.7	Not using portable oven for welding consumables	Rs. 500.00	$8.00	Per welder per instance. (The consumables in the oven shall be confiscated)
11.7.8	Not using electrodes pre-baked in baking oven	Rs. 500.00	$8.00	Per instance. (The subject consumables shall be confiscated)
11.7.9	Not using welding consumables of	Rs. 1,000.00	$16.00	Per instance. (The subject consumables

	approved make & not using correct type of electrode as per approved EWS / Drawing / WPS			shall be confiscated)
11.7.10	Non-removal of welding slag and spatters after welding	Rs. 500.00	$8.00	Per joint
11.7.11	Not using NDT equipment as prescribed in the manual / FQP / guidelines / Contract	Rs. 1,000.00	$16.00	Per equipment per instance
11.7.12	Welder doing welding without valid job card	Rs. 500.00	$8.00	Per instance
11.7.13	Discrepancy observed in the weld joints identified by BHEL / Customer for RT vs RT film offered	Rs. 2,000.00	$32.00	per joint
MATERIAL MANAGEMENT				
11.7.14	Non-maintenance of grid pillar marking	Rs. 200.00	$3.00	Per location week
11.7.15	Mismatch of location of material in store area w.r.t. location mentioned in stock register	Rs. 500.00	$8.00	Per instance
11.7.16	Non-compliance of Preservation of material as per storage & preservation manuals	Rs. 1,000.00	$16.00	Per equipment
11.7.17	Not offering received material for verification within stipulated time as per contract	Rs. 500.00	$8.00	Per instance
PAINTING & ALLIED WORKS				
11.7.18	Not using primer / paints of approved make and as per Specifications	Rs. 1,000.00	$16.00	Per instance
11.7.19	Painting without proper surface preparation as per approved schedule / drawing / FQP	Rs. 500.00	$8.00	Per instance
PROTOCOLS & LOG SHEETS				
11.7.20	Delay in preparation of Protocols / Logsheets as per approved FQP	Rs. 200.00	$3.00	Per protocol per day delay

	within 3 days of completion of checks			
INSPECTION OF BOUGHT-OUT ITEMS / CONSUMABLES				
11.7.21	Delay in offering inspection of Bought-out Items / Consumables / Aggregates (for items which need site inspection as per approved QP) within 3 days of receipt of material at site	1% of the item value of the LOT	1% of the item value of the LOT	per item per day delay after receipt of material
11.7.22	Delay in submission of required documents (viz. Invoice, Inspection Release Note, COC, MDCC, MTC as the case may be) of Bought-out Items (shop inspection items / consumables) with in 3 days of receipt of material at site.	1% of the item value of the LOT	1% of the item value of the LOT	per item per day delay after receipt of material
NOTE: Any non-conformity requiring dismantling / rework, attributable to vendor / sub-contractor, shall be penalised at a rate mentioned above or cost to BHEL, which ever is higher.				

12.0	**HEALTH, SAFETY & ENVIRONMENT**
12.1	Applicable HSE norms shall be as per HSE Doc. No.: HSEP:14-ER, Rev-01 Dated 08/05/2020, OPERATIONAL CONTROL PROCEDURE , Doc. No.: HSEOCP: 61A , Rev. No.: 00 dated 27.04.2020 & of Tender OPERATIONAL CONTROL PROCEDURE , Doc. No.: HSEOCP: 61 , Rev. No.: 01 dated 01.06.2020 & of Tender
13.0	**LAND**
13.1	Availability of land within plant boundary is very limited and the contractor has to plan & use the existing land considering the use of land by other contractors and the storage of plant machineries and materials. The existing land shall be shared by all erections agencies. The same will be reviewed by BHEL and allotted to the extent available/ considered necessary free of cost. Contractor shall develop these areas for their site office, their own stores etc. Bidder must visit site to assess site condition, prior to quoting.
13.2	Levelled area for storage area for BHEL's material shall be provided as per availability free of cost.
13.3	Land for labour colony shall be arranged by successful bidder at their own. The contractor shall construct labour colony / hutment as per his requirements after obtaining approval of formalities from statutory body. Further, contractor must ensure minimum HSE norms and hyeiginic sanitary conditions in his labour colony.
13.4	The contractor will be responsible for handing back all lands, as handed over to him by BHEL/NTPC.
14.0	**WATER**
14.1.1	Contractor shall make all arrangements himself for the supply if construction water as well as potable water for labour and other personnel at the work site/

	colony. However, drawl of construction/ potable water from the bore-well shall be permitted if found suitable. Any statutory clearance required shall be obtained by the contractor. Assistance, if required shall be provided by the BHEL/NTPC.
15.0	**ELECTRICITY**
15.1	BHEL shall provide construction power on chargeable basis at 415V level at one point. The charges only for the actual energy consumed by the Contractor shall be recovered by the Employer based on prevalent rate of DISCOM for type of connection(HT/LT). Contractor has to make their own distribution arrangement to draw electricity. Overall area illumination will be provided by BHEL. However, for night working contractor should arrange illumination as and when required by them. Contractor shall be responsible for fulfillment of all requirements including statutory requirements in this regard. Contractor shall deploy and install required energy meter, cables, fuses, LT distribution boards, switchboards, bus bars, earthing arrangements, protection devices i.e, required capacity ELCB/RCCB in outgoing feeders and any other installation as specified by statutory authority/act. Contractor shall also obtain approvals of appropriate authority and pay necessary fees, levies etc towards the clearance of such installations, prior to use. Sufficient power factor compensation equipments like capacitor shall be provided by contractor for reactive loads like welding machines etc. In case of any fine/penalty on account of low power factor, same shall be shared by contractor proportionately according to power consumption.
15.2	Contractor shall make necessary arrangements for onward distribution of construction power taking due care of surrounding construction activities like movement of cranes & vehicles, civil work, fabrication/construction/assembly/ erection etc and safety of personnel. It may become necessary to relocate some of the installations to facilitate work by other agencies or by him.
15.3	It shall be the responsibility of the Contractor to provide, maintain the complete installation on the load side of the supply with due regard to the safety requirements at site. All cabling and installations shall comply in all respects with the appropriate statutory requirements. The installation and maintenance of this shall be done by licensed and experienced electrician.
15.4	While reasonable efforts will be made to ensure continuous electric power supply, interruptions cannot be ruled out and no claim from the Contractor shall be entertained on this account such as idle labor, extension of time etc. The Contractor shall adjust his working shift accordingly and deploy additional manpower, if necessary, so as to achieve the target.
15.5	Contractor shall be well equipped with back-up power supply arrangement like DG set and diesel operated welding machine etc to tackle situations arising due to failure of supplied power, so as to ensure continuity and completion of critical processes that are underway at the time of power failure or important activities planned in immediate future.
15.6	BHEL is not responsible for any loss or damage to the Contractor's equipment as a result of variations in voltage or frequency or interruptions in power supply.
15.7	Contractor is advised to maintain the calibrated energy measuring instruments and use their system as efficiently as possible. to maintain the HT side input energy meter reading and LT side outgoing energy meter reading to sub-contractors as equal. In case there is any difference between the sum of the LT side meter readings of all sub-contractors and the HT side meter reading of M/s NTPC, same shall be distributed proportionately among all sub-contractors working during the respective calendar month.
15.8	The bidder will have to Procure & install General mobile illumination system during construction right from start of his work. This system will include temporary pole lighting, portable lighting towers with DG back-up, within the quoted price. The illumination should be such that minimum illumination requirement as specified by Indian standards for general illumination is maintained.
15.9	If any other voltage level (other than normally available) is required, the same shall be arranged by the contractor from power supply as above. Contractor will

	have to provide at his own cost necessary calibrated energy meters (tamper proof, suitably housed in a weather proof box with lock & key arrangement) at point of power supply along with calibration certificate from authorized / accredited agency for working out the power consumption. In case of recalibration required for any reason the necessary charges including replacement by calibrated meters is to be borne by the contractor. Supply of electricity shall be governed by Indian Electricity Act and Installation Rules and other Rules and Regulation as applicable. The contractor shall ensure usage of electricity in an efficient manner and the same may be audited by BHEL time to time. In case of any major deviation from normally accepted norms is observed, BHEL will reserve the right to impose penalty as deemed fit for such cases.		
15.10	Contractor shall make arrangement of electricity of their own for labour colony.		
16.0	**CONSUMABLE**		
16.1	All consumables, like gas, electrodes, chemicals, lubricants etc. required for the scope of work, shall be arranged by the contractor at his own cost unless otherwise specifically mentioned in the contract. Prior approval from Engineer In-Charge shall be obtained for all the consumable to be used in permanent work		
16.2	In the event of failure of contractor to bring necessary and sufficient consumables, BHEL may arrange for the same at the risk and cost of the contractor. The entire cost towards this along-with overhead shall be paid by the contractor or deducted from the contractor's bills.		
16.3	All relevant portions in respect of bolted construction of the Specification for Fabrication of Structural Steelwork applicable to the Project shall also be applicable for field bolting in addition to the following :		
16.3.1	Bolts shall be inserted in such a way so that they may remain in position under gravity even before fixing the nut. Bolted parts shall fit solidly together when assembled and shall not be separated by gaskets or any other interposed compressible materials. When assembled, all joint surfaces, including those adjacent to the washers shall be free of scales except tight mill scales. They shall be free of dirt, loose scales, burns, and other defects that would prevent solid seating of the parts. Contact surfaces within friction-type joints shall be free of oil, paint, lacquer, or galvanizing. All high tensile bolts shall be tightened to provide, when all fasteners in the joint are tight, the required minimum bolt tension by any of the following methods.		
16.3.2	Turn-of-nut method		
	When the turn-of-nut method is used to provide the bolt tension, there shall first be enough bolts brought to a "snug tight" condition to ensure that the parts of the joint are brought into good contact with each other. "snug tight" is defined as the tightness attained by a few impacts of an impact wrench or the full effort of a man using an ordinary spud wrench. Following this initial operation, bolts shall be placed in any remaining holes in the connection and brought to snug tightness. All bolts in the joint shall then be tightened additionally by the applicable amount of nut rotation specified in Table-1 with tightening progressing systematically from the most rigid part of the joint to its free edges. During this operation there shall be no rotation of the part not turned by the wrench.		
	TABLE – I		
	Bolts length not exceeding 8 x dia. or 200 mm	Bolt length exceeding 8xdia or 200 mm	Remarks
	1/2 turn	2/3 turn	Nut rotation is relative to bolt regardless of the element (nut or bolt) being turned. Tolerance on rotation - 30
17.0	**TEST CERTIFICATES**		
17.1	Necessary test certificates of all materials supplied by contractor are to be		

	produced to BHEL prior to use of those materials.
17.2	Arrangement of testing at Site to be kept for cement (Initial & Final setting Time & compressive strength)
18.0	**PROJECT MANAGEMENT/ CONSTRUCTION MANAGEMENT**
	To meet the need of construction management at site, contractor shall provide the following services within quoted / accepted rates.
18.1	PLANNING & MONITORING
18.1.1	The bidder shall prepare detail construction schedule (L-3) as per completion dates given in this document. This schedule must include all milestone and key activities for each sub-system / components in the areas of engineering (wherever applicable), procurement, manufacture (wherever applicable), ecogniz, excavation/ construction/ erection. This network must conform to the overall project schedule. The bidder should also ensure monitoring of these activities at least weekly basis to start with and on daily basis whenever required by BHEL.
18.1.2	The bidder shall also prepare progress report indicating progress on key activities, management summary for critical activities, list of actions requiring attention of BHEL. This schedule is to be preferably made in PRIMAVERA/ MS PROJECTS, so that the same is compatible with BHEL's project management software.
18.1.3	The bidder will have to Supply & install of 2 No. PC (multimedia PC work station Pentium- Core-i5-650, 3.2 GHZ or above, 1 TB HDD, 8 GB RAM, 100 /1000 MBPS LAN card) of HP / HCL / COMPAQ / LENEVO or equivalent make with window 10 or higher, 64 bit (with roll back to 32 bit O/S and required software like MS Office 2016 or higher, AutoCAD 2014 or higher, ADOBE PDF CREATOR with 1 no. Multifunction (scanner / copy / print) & 2 No. A4 Colour laser printer as per instruction of BHEL for exclusive use of BHEL. These computers / printer / Multifunction shall remain Vendors property and they will be allowed to take out the same after closing of contract. The contractor shall provide data / information etc. in prescribed formats for periodical updating of the progress reports, material management reports, updating of network pertaining to the contractor's scope of work etc. The contractor shall also provide 1 (One) Number computer operators and 2 (Two) numbers service staff for miscellaneous service for BHEL's use at site / Kolkata for reconciliation, progress review & day-to-day planning purpose, documentation etc. These facilities are to be provided within 30 days from the date of start of work till completion of scheduled contract period. If BHEL do not availed the service of computer / printer / personnel as per requirement, BHEL shall have the right to deduct the amount as per following rates on prorate basis, from contractor's RA bill or any other dues.
18.1.3.1	@ Rs 20,000 (Twenty thousand) / month for each computer operator or at actual (rate +30%) if BHEL arranges this facility, whichever is lower.
18.1.3.2	@ Rs 12,000 (Twelve thousand) / month for each computer with printer or at actual (rate +30%) if BHEL arranges this facility, whichever is lower.
18.1.3.3	@ Rs 16,000 (Sixteen thousand) / month for each service staff or at actual (rate +30%) if BHEL arranges this facility, whichever is lower.
18.1.3.4	In the event of the contract period getting extended beyond the stipulated time for reasons not attributable to the bidder and if the services services of computer operator(Skilled) & Service staff(unskilled) are being used by BHEL then successful bidder shall be reimbursed by minimum wages with statutory benefits +15% minimum.
18.1.4	The contractor's site office must have facilities of communications like E-mail, and telephone / mobile phones within a month from LOI.
18.2	PROGRESS REPORTING
18.2.1	The bidder shall submit daily, weekly and monthly progress reports for work force, materials reports, consumables (gases/electrodes) report and other

	reports as per pro-forma considered necessary by the BHEL. In case of any failure on contractor's part to comply with this, BHEL may at its discretion, consider to withhold part payment against their RA bills.	
18.2.2	The progress report shall indicate the progress achieved against planned with reasons indicating delays, if any, and shall give the remedial actions which the contractor intends to take to make good the slippage or lost time, so that further works again proceed as per the original program and the slippages do not accumulate and effect the overall program.	
18.2.3	The daily work force reports shall clearly indicate the work force deployed, category-wise specifying also the activities in which they are engaged.	
18.2.4	Weekly progress review meetings will be held at site during which actual progress during the week vis-à-vis scheduled program shall be discussed or actions to be taken for achieving targets. For discussions, the contractor shall present program of subsequent week. The contractor shall constantly update/revise his work program to meet the overall requirement.	
18.2.5	Periodic progress reviews on the entire activities of execution in respect of supply and works in scope of bidder will be held once in a month at Kolkata / Site. These meetings will be attended by reasonably higher officials of the contractor and will be used as a forum for discussing all areas where progress needs to be speeded up. The contractor shall be further responsible for ensuring that suitable steps are taken to meet various targets decided upon such meetings.	
18.2.6	During construction contractor shall take an average twenty colour digital photograph / slides (indicating date) each month (not less than four per week) of the works during progress. In case of failure in providing such photograph in each month, an amount of Rs. 10,000/- per month shall be deducted from contractor's RA bill.	
18.2.7	Successful bidder has to provide for electronic/ computerized storing and re-production / printing / plotting of various data, log sheets, protocols, measurements etc. These may be stored in CD (as per requirement) and handed over to BHEL as per requirement.	
18.3	SITE ORGANIZATION	
18.3.1	The contractor shall maintain a site organization of adequate strength in respect of manpower, construction machinery and other implements at all time for smooth execution of the contract headed by a competent construction manager for site operations with sufficient level of authority to take site decisions. The vendor will submit organization chart (showing the name of Site-in-charge) with individual bio-data indicating various levels of experts to be posted for supervision in the fields of supervision and execution, quality, material management, planning, safety, etc. The organization shall be reinforced from time to time, as required to make up slippage (if any) from the schedule without any commercial implication to BHEL. The organization chart is to be submitted within 10 days from the date of LOI.	
18.3.2	Following (minimum) engineering manpower with power plant construction background to be deployed at site by the successful vendor for their day to day supervision etc.	
18.3.2.1	Qualified safety officers with assistants (exclusive for safety supervision for project jobs).	Officer – One nos. Assistant - Two nos.
18.3.2.2	Site supervising engineer and supervisors for Civil work.	Two Enigineers Four Supervisors
18.3.2.3	Engineer & Supervisors for quality inspection.	One Engineer. Three Supervisor.
18.3.3	Deputation of above man-power shall be jointly decided at site in line with construction schedule.	
18.3.4	Engineer/ supervisor for other functions like store & purchase, material management, planning, finance, administration etc are to be provided as per site	

	requirement and not considered above.
18.3.5	In the event of non deputation of engineer / supervisor by the bidder as per above agreed schedule, BHEL shall reserve the right to deduct Rs 70,000 per man-month for engineer, Rs 50,000 per man-month for the supervisor/ safety officer from RA bills. Further induction of manpower will be decided at site as per requirement without any financial implication.
18.3.6	BHEL reserves the right to reject or approve the list of personnel proposed by the contractor. The persons whose bio-data have been approved by BHEL will have to be posted at site and deviation in this regard will not be permitted unless specific & reasonable justification is made.
18.3.7	In addition to above, a well experienced qualified engineer to be designated, as 'Project Manager', shall be deployed by the contractor. Such engineer shall have adequate exposure on the job and shall remain fully involved in all planning activities, guidance etc to contractor's own team during the complete execution period of contract.
18.3.8	The contractor should also submit to BHEL for approval a list of T&Ps along with their fitness certificates. The tools & tackles shall not be removed from site without written permission of BHEL.
18.3.9	The contractor should also submit network programs for the erection of various items. These networks shall show the customer / BHEL hold points (CHP), which have to be cleared by customer/ BHEL, or their authorized representatives before further erection can take place. These programs for the erection would clearly identify responsibilities of the contractor and customer/ BHEL. It is the responsibility of the contractor to get the networks approved by BHEL within four weeks of the date of finalization of award of work/ placement of LOI.
18.4	CONSTRUCTION MANAGEMENT
18.4.1	Based on the approved program, the contractor shall submit a program of construction for implementation. These programs would be amplified showing start of erection and subsequent activities and shall form the basis for site execution and detail monitoring. The three monthly rolling program with the first month's program being tentative based on the site condition would be prepared based on these programs. The contractor shall also be involved along with NTPC / BHEL to tie up detailed resources mobilization plan over the period of the contract matching with the performance targets.
18.4.2	The program would be jointly finalized by the site in-charge of the contractor with BHEL / NTPC's project coordinator as well as the site-planning representative. The erection program will also identify sequential events matching financial turnover.
19.0	**TOOLS & PLANTS (TO BE PROVIDED BY CONTRACTOR)**
19.1	Tentative list of T&P to be deployed by contractor for successful completion of work is detailed below.
19.2	It may be noted that the list is not exhaustive and is only for general guidance. The contractor is required to provide all necessary T&P (other than those specified to be provided by BHEL, if any) measuring (calibrated) instruments & handing equipments for timely completion of total work as per contract. In case of project requirement, some activities may have to pre-pone. In such cases the contractor may have to deploy additional T&P. Quoted rate shall be inclusive of such requirements. However, contractor shall submit deployment plan of all T&P along with tender bid.
19.3	In the event of any failure on the part of the contractor, BHEL may at his discretion also terminate the contract on this ground and take out any or whole amount of the contract from the scope of the contractor. In the event of failure of contractor to deploy necessary and sufficient T&P/ IMTEs, BHEL will be at liberty to arrange the same at the risk & cost of contractor including transportation cost of same from any of BHEL site/ other agency & charges as applicable shall be deducted from contractor's RA bill. Decision of BHEL in this regard will be final & binding on contractor.

19.4	All the tools and plants required for satisfactory completion of the work have to be arranged by the contractor. The contractor is required to arrange the following tentative Major T&Ps and other T&Ps for the satisfactory completion of the work	
A	Structural works	
	Major T&P items	Mobilisation time (from the date of written intimation by BHEL to start the work)
A1	1 Nos. 150 T capacity crawler crane for erection.	As per BHEL requirement at site.
A2	1 Nos. 135 T capacity crawler crane for erection.	As per BHEL requirement at site.
A3	1 Nos. 75 T capacity crawler crane	As per BHEL requirement at site.
A4	1 Nos. 45 T capacity Tyre mounted crane	As per BHEL requirement at site.
A5	Other T&Ps	Mobilisation time (from the date of written intimation by BHEL to start the work)
A5.1	4 nos. hydra (10/ 12 T cap)	As per BHEL requirement at site.
A5.3	Magnetic base drill machine	As per BHEL requirement at site.
A5.6	20 nos. welding rectifier	As per BHEL requirement at site.
A5.7	1 no. trailor – 15T	As per BHEL requirement at site.
A5.8	3 nos. power driven torque control (Digital) machine for HSFG bolt (Capacity up to 30 dia HSFG bolt tightening)	As per BHEL requirement at site.
A5.9	2 nos. manual torque control m/c. for HSFG Bolt (Capacity up to 30 dia HSFG bolt tightening)	As per BHEL requirement at site.
A5.10	Bolt Tension Calibrator for M20 to M30 bolt	As per BHEL requirement at site.
A5.11	Sufficient quantity of steel ladders for approach up to the top of each erected column to be required during erection of columns.	As per BHEL requirement at site.
A5.12	Power winch – 3T - 3 no's for structural erection	As per BHEL requirement at site.
A5.13	Power winch – 5T - 3 no's for structural erection	As per BHEL requirement at site.
A5.14	1 no ultra-sonography testing machine with printing facility for structural work.	As per BHEL requirement at site.
A5.15	1 nos. Painting equipment sets complete with compressor, hopper, screen, blasting hose pipe, nozzle airless/conventional spray (within CGI temporary cover shed)	As per BHEL requirement at site.
A5.16	Baking oven for electrodes	As per BHEL requirement at site.
A5.17	Portable oven	As per BHEL requirement at site.
A5.18	1 no. Plate Bending Machine	As per BHEL requirement at site.
B	Civil Work	Mobilisation time (from the date of written intimation by BHEL to start the work)
B1	Bored cast in situ hydraulic rig – 10nos	01nos within 15 days and balance as per BHEL requirement in site
B2	2 sets - Kentledge arrangement (Concrete blocks with structural arrangement) with high capacity hydraulic jack, dial gauges for vertical load test of pile.	Within 30 days
B3	02 nos Jack Hammer	As per BHEL requirement at site.
B4	1 no. Concrete core Cutting machine for	As per BHEL requirement at site.

	drilling in concrete upto 300 mm diaalongwith diamond bits	
B5	Ground Penetration Radar (GPR)- 01 SET	As per BHEL requirement at site.
B6	2 No. hydraulic excavator/Poclain	1 no. within 15 days and balance in a progressive manner depending up on the requirement.
B7	1 no. automatic concrete batching plant with printing facility (30 Cum/Hr) – and DG backup. With minimum 2 Nos of silo (100MT each)	1 nos to be commissioned within within 45 days.
B8	1 no. Mobile batching plant (5/6 CUM per hr capacity)	As per BHEL requirement at site.
B9	2 Nos Truck mounted concrete mixer cum pump along with placing boom minimum 36m high Concrete boom placer (36m)	1 No within 120 days and balance as per BHEL requirement at site
B10	2 nos. concrete pump (60 cum/ hr min capacity& lift 90M)	1 No within 90 days and balance as per BHEL requirement at site
B11	4 nos. transit mixer (5/6 M3 capacity) with standby 1 no.	2 nos within 15 days. Balance progressively as per site requirement.
B12	Other T&Ps	Mobilisation time (from the date of written intimation by BHEL to start the work)
B12.1	3 No. JCB	2 no. within 15 days and balance as per site requirement.
B12.2	6 nos. dumper (Min 10 cum each)	2 nos. Within 15 days.. Balance as per site requirement.
B12.3	2 nos. diesel Mixer machine of 0.5 cum capacity	As per BHEL requirement at site.
B12.4	3 nos. self-priming dewatering pump 5 HP (diesel)	2 nos. Within 15 days.. Balance as per site requirement
B12.5	3 nos. self-priming dewatering pump 5 HP (electric)	1 no. Within 15 days.. Balance as per site requirement
B12.6	02 nos 10 HP Submersible Mono-Block Electric Pump (KOS-1040+ ofKirloskar or equivalent).	As per BHEL requirement at site.
B12.7	01 no Dozer.	As per BHEL requirement at site.
B12.8	4 nos. curing pump – 1.5 /2 HP (pump for curing at heights)	1 no. Within 30 days.. Balance as per site requirement
B12.9	6 nos. reinforcement bending machine	2 nos. within 15 days and balance progressively as per requirement
B12.10	1 no. Vibromax (earth compactor)	as per BHEL site requirement.
B12.11	02 nos Hand Earth Compactor	as per BHEL site requirement.
B12.12	10 nos. reinforcement cutting machine	2 nos. within 15 days, balance as per requirement
B12.13	Vacuum dewatered flooring machine – 2nos	As per BHEL requirement at site
B12.14	MS scaffolding pipe / ACROW PIPE	As per BHEL requirement at site
B12.15	MS scaffolding pipe cup lock system /Doka D3 load bearing tower system.	As per BHEL requirement at site for various decks
B12.16	3 nos. power driven earth rammer (Roller Type 1/2 T)	As per BHEL requirement at site
B12.17	Civil Laboratory Equipments as per list attached in per relevant annexure of this TCC	Within 90 days.

B12.18	2 nos. building hoist	As per BHEL requirement at site
B12.19	2 no total station with adequate arrangement for Surveyors.	1 no. Within 15 days. and balance progressively as per requirement
B12.20	5 no's auto level & staff	2 nos. Within 15 days. And balance as per requirement.
B12.21	120 no's concrete cube moulds	30 nos with in 15 days and balance progressively as per requirement
B12.22	Adequate no. of small trucks 2T/5T for shifting of reinforcement/cement/shuttering etc. within site	As per BHEL requirement at site
B12.23	2 nos. drinking water tank – 5000 lit.	1 nos. Within 15 days. Balance as per site requirement.
B12.24	Curing tank as per site requirement	
B12.25	4 nos. mobile toilet blocks for labour use	1 no's within 15 days balance within 120 days.
B12.26	2 nos. truck mounted 125 KVA DG set	1 no. within 15 days and balance as per requirement at site.
B12.27	2 nos.water tanker with sprinkling arrangemen	As per Requirement
B12.28	Construction power cable	As per Requirement
B12.29	Construction water Pipeline	As per Requirement
B12.30	1 no. Concrete Paver machine	As per Requirement
B12.31	1 no. trailor for shifting of crawler mounted equipment's like Poclain, Dozer	As per site requirement
B12.32	Concrete vibrator with adequate needle (Minimum 20 nos diesel/power nos.)	6Nos (at least 3nos. diesel driven) within 90 Days. Balance as per site requirement.
B12.33	Sheet Pile (Z / U shape)	As per Requirement
B12.34	Good quality fairface 12 mm thick ply shuttering board.	As per Requirement
B12.35	Portable fire extinguishers as below: Soda acid – 10 sets. Dry chemical powder – 10 sets CO2 – 10 sets. Water & sand bucket (4 buckets in one stand) – 10 sets. Fire hose with nozzle (50 M length) – 5 sets.	20% within 15 days and balance as per Requirement
B12.36	2 no. compression testing machine (200 T cap)	1 Nos. within 15 days and balance as per requirement.
19.5	T&P shown in the above-mentioned list and the mobilization schedule is tentative requirement considering parallel working. However, mobilization schedule modification as well as no. of T&Ps as mutually agreed at site for major T&Ps, have to be adhered to. Numbers/ time of requirement will be reviewed time to time at site and contractor will provide required T&P/ equipment's to ensure completion of entire work within schedule/target date of completion without any additional financial implication to BHEL. Vendor shall give advance	
19.6	All T&P and all IMTEs, which are required for successful and timely execution of the work covered within the scope of this tender, shall be arranged and provided	

	by the contractor at his own cost in working condition.
19.7	In the event of contractor failing to arrange the required tools, plants, machineries, equipment, material or non-availability of the same owing to breakdown, BHEL will make alternative arrangement at the risk and cost of the contractor.
19.7.1	Case 1: BHEL provides its own Capital T&P.
	In case the BHEL provides any T&P which is owned by BHEL, hire charges (as per BHEL norms) will be recovered from the contractor as per the prevailing BHEL corporate hire charges. In case, the T&P is specifically listed in "T&Ps to be deployed by Contractor", "Hire charges applicable to outside agencies other than contractors working for BHEL" will apply. If not listed, "hire charges applicable to contractor working for BHEL" will apply. The hire charges of Capital tools & plants are exclusive of operating expenses e.g. operator, fuel & consumables and the same shall be arranged by the contractor at his cost.
19.7.2	Case 2 In all cases other than that specified in case 1 above, actual expenses incurred by BHEL along with applicable overheads will be back-charges to the contractor.
19.8	In the event of need of change of type of any of major T&Ps, approval shall be taken from BHEL Engineer in-charge prior to mobilization. The decision of Number of T&P required due to replacing the enlisted T&P as per above table, shall be taken after analyzing the production capacity and suitability of both the T&Ps.
20.0	**INTEREST BEARING RECOVERABLE ADVANCE/ MOBILISATION ADVANCE**
	Not applicable for this tender.
21.0	**OVERRUN COMPENSATION (ORC)**
	Not applicable for this tender.
22.0	**REVISION ON ACCEPTED CONTRACT RATE**
	Not applicable in this tender.
23.0	**INSURANCE**
23.1	BHEL shall arrange comprehensive MCE (marine cum erection) Insurance Policy for total project supply & services including balance of plant package covering transit risks & loss, destruction or damage during handling at Site, Storage, civil works ,erection, testing and commissioning up to trial operation completion of unit including theft, sabotage, fire, lightning and other natural calamities.
23.2	Contractor shall report to BHEL in writing any damages to equipment/components on receipt, storing, and during withdrawal of the materials from stores, in transit to site and unloading at place of work and during erection and commissioning till trial operation completion including handing over. The above report shall be as prescribed by BHEL site management. Any consequential loss arising out of non-compliance of this stipulation will be borne by contractor.
23.3	The contractor will take necessary precautions/ due care to protect the material at Project site, while in his custody from any damage / loss till the same is handed over to BHEL/ customer at Project site. For lodging/ processing of insurance claim the contractor will submit necessary documents. BHEL will reserve the right to recover the loss from the contractor as detailed below in case the damage/loss is due to negligence/ carelessness on the part of the contractor. In case of theft of material under contractor's custody, the same shall be reported to police by the contractor immediately and copy of FIR and subsequently police investigation report shall be submitted to BHEL/ customer for taking up with insurance. However, this will not relieve the contractor of his contractual obligation for the materials in his custody.
23.4	In case the damage/loss/theft of materials are attributable to negligence/failure in discharging the duties and obligations of the contractor, the expenses incurred for repair/replacement of such components in excess of the amount realized from the underwriters, limited to Normal Excess (Deductible Franchise) shall be

	recovered from the contractor.
23.5	Other conditions of Insurance shall be as per relevant clause of GCC/SCC.
24.0	**MATERIAL HANDLING (BHEL ISSUED MATERIAL)**
24.1	Cement, Reinforcement Steel, shop fabricated Structural steel and Mild Steel earthing rod as mentioned specifically in BOQ will be issued free of cost by BHEL for use in the work covered in this contract. All these free issue material consignments coming from outside will be directly handed over to vendor as per discretion of BHEL and vendor has to receive the same on arrival of consignment. All these free issue material may also be issued to the contractor from BHEL / customer's store within the plant premises.
24.2	Except shop fabricated steel structures, all free issue steels shall be issued on weighment basis. Shop fabricated steel structure shall be issued on the basis of quantity (in MT) as received from supplier/BHEL Unit. Receipt from BHEL / customer's stores or directly from suppliers vehicles, handling / transportation to work site, unloading etc will be under the scope of contractor within his quoted rate. The contractor shall in no case be entitled for any compensation or damages on account of any delay in supply or non-supply thereof for all or any such material.
24.3	Open land (Limited area free from encumberance) shall be provided by BHEL on free of cost basis. Contractor shall maintain one centralized fenced store cum bar bending yard & storage yard (Area approx 7500 Sqm). Hard surfacing of this yard and all round drain shall be carried out by the contractor at his own cost within the quoted rate. Bidder shall make complete arrangement of necessary security personnel, to safeguard all such materials in his custody. Materials issued will be used only for construction of permanent work. The contractor shall take care of material issued by BHEL and shall protect the same from theft, damage and weathering.
24.4	Excessive rusting of steel must be avoided. In case, due to any cause attributable to the contractor, such rusting of steel occur rendering the same unusable, then such quantity of steel shall be recovered from the interim payment at the penal rate specified in the tender.
24.5	The contractor shall construct waterproof cement store (capacity - 2nos of 1000 MT) for storing and stacking of cement. Actual size shall be decided before the construction in consultation with BHEL site engineer. CGI / Metal Sheet roofing (slope) with brick masonry wall, PCC flooring. Materials required for the same shall be provided by contractor at his own cost. Cement has to be kept over wooden raised platform. Stacking of cement is to be done as per IS codes with proper illumination and locking arrangements.
24.6	Clodding of cement must be avoided. In case, due to any cause attributable to the contractor, such clodding of cement occur rendering the same unusable, then such quantity of cement shall be disposed immediately from the plant premises by the vendor.
24.7	No material shall be issued to the contractor except as those indicated above. Contractor will have to make his own arrangement at his own cost for procurement of any other material as required for the works and of such quality as acceptable to BHEL unless specifically mentioned otherwise in the contract.
24.8	The contractor shall maintain proper store account for all the BHEL issued materials and shall give copy of once in a monthscomputerised reconciliation statement along with RA Bill for maintaining account for the BHEL issued material.
24.9	The contractor shall solely be responsible for the safety & quality of material after it is handed over and issued to contractor by BHEL.
24.10	Under any circumstances, BHEL issued materials shall not be taken out of the project site unless otherwise permitted by BHEL.
25.0	**ISSUE OF MATERIALS** The free issue steel those specifically mentioned in price schedule shall be issued to the successful bidder on the following basis.

25.1	**ISSUE OF CEMENT**
25.1.1	Cement as received from the manufacturer/ stockiest will be issued free of cost to the contractor. In case if cement is issued in bags, theoretical weight of each bag of cement for issued purposes will be considered as 50 kg, the contractor shall be accountable for the cement issued to the contractor on this notional weight only. No claim whatsoever will be entertained because of difference between theoretical and actual weight of the bags of cement. The empty cement bags duly accounted for against issue shall be the contractor's property and the same shall be disposed as per statutory regulation prevailing in the project. In case cement is issued through bulkers being supplied from manufacturer/stockiest; the same shall be emptied in cement silos of batching plant and necessary arrangemnts for the same shall be provided by contractor.
25.1.2	In case BHEL supplies cement through Bulker, Bidder has to store cement in Silos of Suitable capacities as decided by Engineer in charge. Silos Capacities shall be finalized mutually.
25.1.3	The contractor shall submit to the Engineer-in-charge, a statement indicating estimated quantity of cement required during a quarter, at least two months in advance of the quarter. In addition, the contractor shall also furnish the estimated requirement of cement during a month by the third week of the previous month indicating his requirement.
25.1.4	Bidder is responsible for unloading the cement as soon as the arrival of cement, either in silo, if received in bulker or in the weather proof cement storage sheds, if received bags. Bagged cement shall be stored in a weatherproof shed having dense impervious bituminous or concrete floors which shall be kept swept clean at all times. The storage arrangements (to be made by the contractor at his own cost) shall be fully completed and approved by the owner (BHEL/NTPL) before any cement is delivered to site. The construction of cement storage sheds as per the requirement of BHEL, unloading of cement bags, stacking properly in the storage sheds, removal of the sheds after the completion of the work is in the scope of bidder within the quoted price.
25.1.5	Bidder is responsible for sampling and testing of cement as per Indian Standard/Specification/approved quality plan in the testing laboratory established by the bidder.
25.1.6	Bidder is responsible for carrying out design mix as per IS 456/10262 Latest revision and specification, using the cement provided by BHEL and submit the design mix proportions for the approval of BHEL/NTPL. The design/trial mix shall be carried out time to time on change of brand/type of cement supplied by BHEL and suitable adjustments on the quantity of ingredients (fine aggregates, coarse aggregates, admixture) of the concrete to get the required workability and durability, shall be the responsibility of the bidder without any extra cost to BHEL.
25.2	**ISSUE OF STEEL**
25.2.1	The steel shall be issued to the contractor on the following basis (a) Structural Steel: Weighment basis (Unit – MT) (b) Reinforcement Steel and Earthing rod (MS round). : Weighment basis (Unit – MT) (c) Shop fabricated steel structure: On the basis quantity (in MT) as received from supplier/BHEL Unit
25.2.2	All the steel (structural, reinforcement, earthing MS rod,) issued by the BHEL shall be properly accounted for. The total quantity of steel required for the work will be calculated from the approved Bar Bending schedule, fabrication drawings, approved laps, chairs and lugs. The measurement for payment as well as for accounting shall be based on the sectional weights as indicated in the following IS specifications. No rolling tolerances shall be accepted in any case for issue, return of materials, reconciliation and payment purposes. IS: 808 (Latest revision): Beams, Channels and Angles

	IS: 1730 (Latest revision) Plates, Sheets and Strips/Flats IS: 1732 (Latest revision) Rounds including deformed high yield strength bars. IS:1786 (Latest revision) Reinforcement steel
25.2.3	In case any such sectional weights are not available in the above documents, the manufacturer recommendation shall be binding.
25.2.4	The steel issued to the contractor shall be mainly in standard length and sections as received from the supplier. However, the contractor shall be bound to accept the steel in length as available in the project stores no claims for extra payment because of issue of non-standard length will be entertained.
25.2.5	The contractor shall satisfy himself of the quality and quantity of the materials at the time of taking delivery from BHEL stores. No claims whatsoever will be entertained by BHEL because of quality or quantity after the materials are taken by the contractor from BHEL stores.
25.2.6	The contractor shall submit to the Engineer-in-charge, a statement indicating estimated quantity of steel required during a quarter, at least two months in advance of the quarter. In addition, the contractor shall also furnish the estimated requirement of steel during a month by the third week of the previous month indicating his requirement
25.2.7	Bidder to note that steel materials required for foundation bolts, embedded items, etc. other than those supplied by BHEL, etc shall be supplied by the bidder. However, Bidder shall use the scrap materials (if issued by BHEL) for their use in the permanent works as embedment/inserts etc. after necessary store issue formalities and shall be accounted for monthly reconciliation.
25.2.8	You have to note that steel required for your enabling job like store/ site office etc shall be arranged at your own cost.
26.0	**CONSUMPTION, WASTAGE ANDRETURN OF MATERIALS**
26.1	SURPLUS & SCRAP MATERIAL
	In addition to unused and untampered material, following shall also be considered as surplus for reconciliation purpose of BHEL issued material
26.1.1	All pipes measuring 2 M and above in length shall be treated as serviceable materials provided, they are in good and acceptable condition.
26.1.2	All TMT measuring 3 M and above in length shall be treated as serviceable materials provided, they are in good and acceptable condition.
26.1.3	All structural steel of length above 2m except MS plate shall be considered as serviceable materials provided the material is in good and acceptable condition.
26.1.4	MS plates having both sides greater than 1 meter or if any side is less than 1m but greater than 0.5m and the total area is equal or greater than 2 sq. m. shall be considered as serviceable.
26.1.5	In case of cement, only sealed cement bags remaining un-used and in perfectly good condition as mensioned elsewhere in the contract shall be considered as surplus
26.1.6	All used pipes, reinforcement and structural steel of dimensions less than those specified above against each of the item shall be treated as scrap for reconciliation purpose.
26.2	**RETURN OF MATERIALS**
26.2.1	**CEMENT**
26.2.1.1	**RETURN OF CEMENT**
	Sealed cement bags remaining unused and in perfectly good condition at the time of completion or termination of the contract shall be returned promptly, (within 15 days from assessment) if BHEL/ Engineer-in-charge is satisfied of the physical condition of the cement. Return of such cement to the project stores/ place as identified within the project area by Engineer-in-charge/ BHEL will not be entitled to handling and incidental charges. Surplus sealed and good conditioned cement bags will be taken back on weighment basis
26.2.1.2	**CEMENT CONSUMPTION AND WASTAGE**
26.2.1.2.1	The theoretical consumption of cement shall be based on the following. i.For design mix concrete as per approved design mix.

<table>
<tr><td></td><td>ii.For nominal mix concrete work, as per minimum cement as specified or as approved by Engineer-in-charge.

For item of works, where volume mix is permitted in writing by the BHEL, for masonry works, plaster other miscellaneous items, the cement consumption shall be governed by the “Statement of Cement Consumption” attached to the Delhi schedule of Rates of CPWD-DSR- LATEST REVISION unless otherwise specified in the specifications or the drawing of contract or mutually agreed by Engineer-in-charge and contractor.

i) Actual consumption = Issue – Surplus quantity of cement returned in good condition by contractor to store. (No sweep cement will be taken back by BHEL).
Wastage = Actual consumption – Theoretical consumption</td></tr>
<tr><td>26.2.1.2.2</td><td>CEMENT WASTAGE
Allowable wastage: One and half percent (+1.5%) of theoretical consumption of cement unless specified otherwise in the technical specification.

For any material issued by BHEL to the contractor free of cost, and which is not accounted by the contractor to BHEL, then recovery for such material shall be effected at penal rates.
<table>
<tr><th>Sl No</th><th>Cement consumption</th><th>Basis of issue & penal recovery</th></tr>
<tr><td>C-1</td><td>Theoretical consumption (without considering any wastage or loss).</td><td>Free</td></tr>
<tr><td>C-2</td><td>Actual consumption being Limited to one and half percent (+1.5%) of aforesaid theoretical consumption towards allowable wastage</td><td>Free</td></tr>
<tr><td>C-3</td><td>Actual consumption beyond one and half percent (+1.5%) of above (C-1).</td><td>Penal rate</td></tr>
</table></td></tr>
<tr><td>26.2.2</td><td>STEELS</td></tr>
<tr><td>26.2.2.1</td><td>RETURN OF STEELS</td></tr>
<tr><td>26.2.2.1.1</td><td>All surplus steel and all wastage materials will be taken back on weighment basis.</td></tr>
<tr><td>26.2.2.1.2</td><td>Surplus, steel shall be sorted section-wise and returned separately as directed by BHEL/Engineer-in-charge within the project area. Return of such materials will not be entitled to any handling and incidental charges.</td></tr>
<tr><td>26.2.2.1.3</td><td>All wastage / scrap (including melting scrap, wastage, un usable scrap) shall be promptly returned to the stores and a receipt obtained for material accounting purposes. Return of such material will not be entitled to any transportation and incidental charge.</td></tr>
<tr><td>26.2.2.2</td><td>STEEL CONSUMPTION AND WASTAGE</td></tr>
<tr><td>26.2.2.2.1</td><td>CONSUMPTION</td></tr>
<tr><td>A</td><td>REINFORCEMENT AND EARTHING ROD MS ROUND STEEL CONSUMPTION.
The theoretical consumption of various sections and/or diameter of reinforcement and earthing rod steel shall be based on approved construction drawing and bar bending schedule. Weight shall be calculated considering the sectional weights as per Indian standards. No extra cost shall be payable to the contractor for any deviation in weights for the different procedures adopted for issue and calculation of the theoretical consumption including rolling tolerances.</td></tr>
</table>

	i) Actual consumption = Issue – Surplus. Surplus as mentioned in 26.1 above. ii) Wastage = Actual consumption – Theoretical consumption.		
B	**STRUCTURAL STEEL, (ROLLED SECTION, PLATES ETC.) CONSUMPTION**		
	The theoretical consumption of various sections shall be based on approved drawings. Weights shall be calculated considering the sectional weights as per Indian standard. No extra shall payable to the contractor for any deviation in weights for the two different procedures adopted for issue and calculation of the theoretical consumption including rolling tolerances. i) Actual consumption = Issue – Surplus. Surplus as mentioned in 26.1 above. ii) Wastage = Actual consumption – Theoretical consumption		
26.2.2.2.2	**WASTAGE**		
A	**REINFORCEMENT AND EARTHING ROD MS ROUND STEEL**		
	Allowable wastage: - 3% (Three percent) of the theoretical consumption shall be considered as allowable wastage.		
	S.No	**CONSUMPTION OF STRUCTURAL STEEL (ROLLED SECTION, PLATES)**	**BASIS OF ISSUE**
	S-1	Theoretical consumption (without considering any wastage, scrap or loss) as per spec. &drg.	Free
	S-2A	Wastage limited to plus Three percent (+3%) of the aforesaid theoretical consumption (S-1) towards allowable wastage and returned to BHEL's store.	Free
	S-2B	Wastage limited to plus Three percent (+3%) of the aforesaid theoretical consumption (S-1) towards allowable wastage but not returmed to BHEL	Penal rate
	S-3	Wastage beyond three Percent (3%) of the aforesaid theoretical consumption (S-1)	Penal rate
B	**STRUCTURAL STEEL, (ROLLED SECTION, PLATES ETC.) WASTAGE.**		
	Allowable wastage: - 4% (FOUR percent) of the theoretical consumption shall be considered. Wastage shall be considered as cut pieces and scrap material, measured as per actual weighment basis. Invisible wastage (max limit to 0.5% of theoretical consumption), if any, shall be considered to be included in the specified 4 % allowable wastage.		
	S.No	**CONSUMPTION OF STRUCTURAL STEEL (ROLLED SECTION, PLATES)**	**BASIS OF ISSUE**
	S-1	Theoretical consumption (without considering any wastage, scrap or loss) as per spec. &drg.	Free
	S-2A	Wastage limited to plus three-point five percent (+3.5% excluding invisible	Free

		wastage) of the aforesaid theoretical consumption (S-1) towards allowable wastage and return to BHEL Store.	
	S-2B	Wastage limited to plus three-point five percent (+3.5% excluding invisible wastage) of the aforesaid theoretical consumption (S-1) towards allowable wastage but not returned to BHEL Store.	Penal rate
	S-3	Wastage beyond Four Percent (4%) of the aforesaid theoretical consumption (S-1)	Penal rate
27.0	**Deleted**		
28.0	**RECONCILIATION OF BHEL ISSUED MATERIALS (FREE OF COST)**		
28.1	You shall submit a reconciliation statement of steel issued to you, once in a month. The same may be submitted alongwith RA bill.		
28.2	You shall properly account for the material issued to you as specified herein to the satisfaction of BHEL certifying that the balance material are available with your custody at site.		
28.3	If it is noticed by BHEL that the wastage is high and calls recovery at the penal rate, then BHEL will proceed for recovery for the excess wastage as per penal recovery rates as specified from RA bill.		
28.4	The approved drawings/ bar bending schedules are to be considered for the purpose of reconciliation of materials.		
28.5	Reconciliation of steel shall be done on total issue & consumption basis.		
29.0	**RECOVERY OF MATERIAL**		
29.1	If wastage exceeds the specified limit, the recovery of excess wastage shall be made from monthly RA bill at the penal rate stipulated below.		
29.2	PENAL RATE OF MATERIALS		
	ITEM		PENAL RATE (Rs)
29.2.1	REINFORCEMENT STEEL (Cold rolled steel, high strength, deformed bar or mild steel round bars including earthing rod MS round)		65,000 per MT
29.2.2	STRUCTURAL STEEL MATERIALS. (MS plates, MS flats, rolled steel joists, channels, and angles, MS pipes, Chequered Plates, etc in sizes and lengths as available)		65,000 per MT
29.2.3	CEMENT (OPC/ PPC/PSC)		65,00 per MT
30.0	**CONSTRUCTION OF TEMPORARY OFFICE, STORES ETC**		
	The contractor shall arrange at his own cost cleaning of area allotted, construction of his temporary office, stores, cement godown etc. and also the watch and ward of all the above. Materials required for the same shall be provided by contractor at his own cost.		
31.0	**CIVIL LABORATORY AT SITE**		
	Contractor shall establish and maintain civil laboratory with necessary equipment (as per Annexure-I) for conducting relevant site tests, as required. However, list of lab equipmentsmenioned at Annexure-I is indicative. Contractor shall also have to refer TECHNICAL SPECIFICATIONS, SECTION-VI, PART-B, SUB-SECTION-V-QD1(QA CIVIL WORKS) in this regard.		
32.0	**CONSTRUCTION SCHEDULE**		

32.1	Entire work shall be carried out in accordance with the construction schedule given below, within the stipulated completion period. Within 30 days of LOI, the contractor shall discuss with Engineer-in-charge & furnish the (L-3) construction schedule indicating all milestones on the basis of major activities and get it approved from Engineer-in-charge.		
32.2	Construction Schedule of FGD system package for Kahalgaon STPS Stage II (3 X 500 MW) and Common Systems		
32.2.1	Schedule for major construction activities covered under the scope of work is as below.		
	Major activity description	Completion schedule from the date of start of work as certified by Engineer-in-charge at site.	
32.2.1.1	Completion of test piles including testing of piles and submission of report	02 months	
32.2.1.2	Civil Works including piling for Absorber	06 months	
32.2.1.3	Civil works including piling of Booster Fan foundation	07 months	
32.2.1.4	RC Pump and Oxidation blower foundation	09 months	
32.2.1.5	Civil works including piling of Lime Stone Storage Silo	11 months	
32.2.1.6	Ball mill Building / Limestone grinding house including equipment foundation including piling	12 months	
32.2.1.7	RC Pump and Oxidation blower Building	13 months	
32.2.1.8	Civil works including piling of FGD Control Room Building	14 months	
32.2.1.9	Pipe cable rack, duct foundation & Foundation for Misc tanks including piling	15 months	
32.2.1.10	All Balance Civil ,Structural&Architechural Work including Roads,Drains and Pavings	17 months	
32.2.3	The schedule given above is for Unit 5 and 7 & common facilities of Stage-II covered under the scope. The activity specific for Unit 6 shall be phased at interval of three (03) months.		
32.4	The contractor shall plan his work in such a manner so as to meet the overall project schedule, in consultation with BHEL / customer Engineer-in-charge.		
32.5	**PROVISION OF PENALTY IN CASE OF SLIPPAGE OF INTERMEDIATE MILESTONES:**		
32.5.1	In case of slippage of Two Major Intermediate Milestones, mentioned as M1 & M2 hereunder, Delay Analysis shall be carried out on achievement of each of these two Intermediate Milestones in reference to F-14.		
	Milestones	**Civil work of following Activity**	**Completion schedule from the date of start of work**
	M1	Civil Works including piling for Absorber	06 months
	M2	Civil works including piling of FGD Control Room Building	14 months
32.6	Contractor shall submit daily work program based on above construction schedule.		
33.0	**COMPLETION PERIOD**		
33.1	The entire work under this scope shall be successfully completed in all respect within 20 (Twenty months) from the date of start of work as certified by Construction Manager, BHEL.		
33.2	Contractor shall mobilise resources to start the work within 15 days from date of		

	intimation by BHEL.
33.3	However, actual date of start of work shall be recknoned based on certification of Construction manager,
34.0	**LIQUIDATED DAMAGE/ PENALTY**
34.1	**Penalty for Intermediate Milestones**
34.1.1	M1 and M2 shall be intermediate Milestones for this work. Refer Clause No. 32.5 above for M-1 & M-2.
34.1.2	In case of slippage of these identified Intermediate Milestones, Delay Analysis shall be carried out on achievement of each of these two Intermediate Milestones in reference to Form 14.
34.1.3	Incase delay in achieving M1 milestone is solely attributable to the contractor,0.5% per week of executable contract value* limited to Maximum 2% of executable contract value will be withheld.
34.1.4	Incase delay in achieving M2 milestone is solely attributable to the contractor,0.5% per week of executable contract value* limited to maximum 3% of executable contract value will be withheld.
34.1.5	Amount already withheld, if any, against slippage of M1 milestone, shall be released only if there is no delay attributable to contractor in achievement of M2 milestone.
34.1.6	Amount required to be withheld on account of slippage of identified intermediate milestone(s) shall be withheld out of respective milestone payment and balance amount (if any) shall be withheld @10% of RA Bill amount from subsequent RA bills.
34.1.7	Final deduction towards LD (if applicable), on account of delay attributable to contractor shall be based on final delay analysis on completion / closure of contract. Withheld amount, if any due to slippage of intermediate milestones shall be adjusted against LD or released as the case may be.
34.1.8	In case of termination of contract due to any reason attributable to contractor before completion of work, the amount already withheld against slippage of intermediate milestones shall not be released and be converted in to recovery.
	Note: *Executable contract value-value of work for which inputs/fronts were made available to contractor and were scheduled for execution till the date of achievement of that milestone.
34.2	**LIQUIDATED DAMAGE/ PENALTY FOR OVERALL DELAY**
34.2.1	If the contractor fails to maintain the required progress of work which results in delay in the completion of the work as per the contractual completion period, BHEL shall have the right to impose Liquidated Damage/Penalty at the rate of 0.5% of the contract value, per week of delay or part thereof subject to a maximum of 10% of the contract value. For this purpose, the period of delay shall be the delay attributable to the Contractor for the completion of work as per contract. Contract Value for this purpose, shall be the final executed value exclusive of ORC, Extra Works executed on Manday rate basis, Supplementary/Additional Items and PVC.
35.0	**CERTIFICATE TOWARDS COMPLETION**
	The work under the scope of the contractor shall be deemed to have been completed in all respects only when so certified by BHEL/ customer. Decision of BHEL in this regard shall be final and binding on the contractor.
36.0	**GUARANTEE**
36.1	Even though the work will be carried out under supervision of BHEL, the contractor will be responsible for the quality of workmanship, quality of materials/ items and design for which the contractor is responsible.
36.2	The contractor shall guarantee the work executed under the scope of the contract for a period of 12 (twelve) months from the date of start of guarantee period as certified by the Engineer-in-charge (ie on completion of total work under scope and taking over by BHEL) and shall rectify free of cost all defects due to faulty supply or work done. In case the contractor fails to repair/ replace the defective works within the time specified by the Engineer-in-charge, BHEL

	may proceed to undertake the repairs/ replace such defective works at contractor's risk and cost without prejudice to any other rights and recover the same from security deposit/ other dues.
37.0	**PRICE VARIATION CLAUSE**
	Applicable as per GCC
38.0	**EXTRA/ ADDITIONAL ITEMS OF WORK**
	As per GCC.
39.0	**SECURITY DEPOSIT, PERFORMANCE BOND & FINAL BILL**
39.1	Security deposit shall be applicable as per relevant clause of GCC (Volume-IB).
39.2	Performance bond is not applicable for the tender.
39.3	RELEASE OF SECURITY DEPOSIT AND FINAL BILL
	In addition to other provisions of tender regarding release of Security deposit and final bill, following provisions shall also be governing to this tender.
39.3.1	In case of submission of security deposit in the form of BG (fFully or partly), further extension beyond date of acceptance of final bill will not be enforced if the following is fulfilled.
39.3.1.1	Contractor discharges their responsibility in r/o of submission of final bill alongwith absolute 'No Demand Certificate' and other documents as detailed below to the satisfaction of BHEL
39.3.1.2	Joint protocol of set of documents as submitted as detailed in below is certified by site & contractor's representative.
39.3.1.3	There is no negative value of the final bill (after release of SD BG) as per site certification.
39.3.1.4	Contractor has returned the property belonging to BHEL as per site certification.
39.3.1.5	Contractor has submitted joint protocol against `Delay analysis', if applicable for delayed execution of job.
39.3.2	List of documents to be submitted & jointly protocoled indicating acceptance of final bill by BHEL.
39.3.2.1	Final bill.
39.3.2.2	Measurement for final bill signed, jointly signed by BHEL & contractor's representative.
39.3.2.3	Statement having cumulative joint measurement for the contract, jointly signed by BHEL & contractor's representative.
39.3.2.4	Claim by contractor for refund of security deposit.
39.3.2.5	Jointly signed material reconciliation statement.
39.3.2.6	Statement of payment received from BHEL – Bill wise (Including RA/ PVC/ ORC/ rate revision/ extra work).
39.3.2.7	No claim certificate by contractor.
39.3.2.8	Clearance certificates wherever applicable, viz clearance certificates from customer, various statutory authorities, like Labour Department, PF Authorities, Commercial Department, etc.
39.3.2.9	Notarized Indemnity Bond as per prescribed format.
40.0	**TAXES, DUTIES ETC**
40.1	All taxes excluding GST & BOCW Cess (as specified elsewhere in the tender) but including, Charges, Royalties, any State or Central Levy and other taxes for materials if any obtained for the work and for execution of the contract shall be borne by successful bidder and shall not be payable extra by BHEL. Any increase of above at any stage during execution of contract, including extension of the contract, shall have to be borne by successful bidder contractor. Bidder's quoted/ accepted rates/ price shall be inclusive of all such requirements.
40.2	GST along with Cess (as applicable) legally leviable& payable by successful bidder as per GST Law shall be paid by BHEL, extra. Hence, bidder shall not include GST along with Cess (as applicable) in their quoted rates/ price.
40.3	Successful bidder shall furnish proof of GST registration with GSTN Portal covering the services under this contract. Registration should also bear endorsement for the premises from where the billing shall be done by successful bidder on BHEL for this project / work.

40.4	Since GST on output will be paid by BHEL separately as enumerated above, bidder's your quoted rates / price should be after considering the Input Credit under GST law at bidder's end.
40.5	TDS under Income Tax shall be deducted at prevailing rates on gross invoice value from the running bills (RA bills) unless exemption certificate from the appropriate authority / authorities is furnished.
40.6	TDS under GST shall be deducted at applicable rates on gross invoice value from the running bills (RA bills).
40.7.1	You may collect TCS under section 206C(1H) of Income Tax Act, 1961 if applicable.
40.7.2	In case, you collect TCS under section 206C(1H) of Income Tax Act, 1961, following compliance is required.
40.7.2.1	TAN and PAN of vendor should appear in all invoices/claims. Copy of TAN /TCS registration is to be submitted.
40.7.2.2	Amount of TCS and Assessable value on which TCS has been calculated should be specified clearly in the invoice.
40.7.2.3	You shall be required to submit certificate of TCS in Form no. 27D within 15 days from the due date for furnishing the statement of tax collected at the source.
40.7.3	In case, you do not collect TCS under section 206C(1H) of Income Tax Act, 1961, following declaration is to be submitted alongwith each invoice: - "I/We hereby declare that I/We are not required to collect TCS under section 206C(1H) of Income Tax Act, 1961, on this bill.
40.7.4	In event of failure to comply with the provisions of the Act, or proper certificate not issued, or if tax collected but not remitted to the Government, or for any other reason and thereby causing loss to BHEL, the same shall be recoverable from the vendor with applicable interest.
40.7.5	You shall comply with all statutory amendment/notifications in this respect.
40.8	Bidder shall note that GST Tax Invoice complying with GST Invoice Rules (Section 31 of GST Act & Rules referred thereunder) wherein the 'Bill To' details shall encompass following. BHEL GSTN – Refer attached GSTN code table of BHEL. Name - BHARAT HEAVY ELECTRICALS LIMITED Address - Shall be intimated later. Specific details of BHEL GSTN, Name and Address as stated above, have been specified elsewhere in the tender.
40.9	Successful bidder to intimate immediately on the day of removal of goods (in case of any supply of goods) to BHEL along with all relevant details and send a scanned copy of Tax Invoice to BHEL through following communication mode for enabling BHEL to meet its GST related compliances. Portal address. and Email address – Shall be intimated later. Specific details of above shall be intimated to successful bidder by BHEL at appropriate juncture.
40.10	In case of delay in submission of above mentioned documents on the date of despatch, BHEL may incur penalty / interest for not adhering to Invoicing Rules under GST Law. The same will be liable to be recovered from successful bidder, in case such delay is not attributable to BHEL.
40.11	In case of raising any Supplementary Tax Invoice (Debit / Credit Note), successful bidder shall issue the same containing all the details as referred to in Section 34 read with Section 31 of GST Act & Rules referred there under.
40.12	Successful bidder shall comply with the Time Limit prescribed under the GST Law and rules thereof for raising of the Tax Invoice. If any supply of goods is applicable, successful bidder shall also ensure prompt delivery of goods after despatch.

40.13	Bidder shall note that in case GST credit is delayed / denied to BHEL due to delayed / non receipt of goods and / or Tax Invoice or expiry of the timeline prescribed in GST Law for availing such ITC, or any other reasons, not attributable to BHEL, GST amount shall be recoverable from successful bidder along with interest levied/ leviable on BHEL, as the case may be.
40.14	Successful bidder shall upload the invoices raised on BHEL in GSTR-1 within the prescribed time as given in the GST Act. Bidder shall note that in case of delay in declaring such invoice in your return and GST credit availed by BHEL is denied or reversed subsequently as per GST Law, GST amount paid by BHEL towards such ITC reversal as per GST law shall be recoverable from the successful bidder along with interest levied / leviable on BHEL.
40.15	Way Bill: Successful bidder to arrange for way bill / e-waybill for any transfer of goods for the execution of the contract. Successful bidder has to make their own arrangement at their cost for completing the formalities, if required, with Issuing Authorities, for bringing materials, plants & machinery at site for execution of the works under this contract, Road Permit / Way Bill, if required, shall be arranged by successful bidder and BHEL will not supply any Road Permit/ Way Bill for this purpose.
40.16	Any new taxes & duties, if imposed subsequent to due date of offer submission as per NIT & TCN, by statutory authority during contract period (including extension, if the same is not attributable to you), shall be reimbursed by BHEL on production of relevant supporting document to the satisfaction of BHEL. However, you shall obtain prior approval from BHEL before depositing new taxes and duties.
40.17	Benefits and / or abolition of all existing taxes must be passed on to BHEL against new taxes, if any, proposed to be introduced at a later date.
41 .0	**TERMS OF PAYMENT**
41.1	**RETENTION AMOUNT** **Clause no 2.22 of GCC modified as under**
41.1.1	Retention Amount shall be 5% of executed contract value and shall be recovered at the rate of 5% from each Running Bill admitted, including PVC Bills.
41.1.2	Refund of Retention Amount shall be as follows:
41.1.2.1	50% of retention amount along with Final Bill
41.1.2.2	The balance 50% of retention amount shall retained towards 'Performance Guarantee for Workmanship' and shall become refundable after expiry of Guarantee period, provided all the defects noticed during the guarantee period have been rectified to the satisfaction of BHEL Site Engineer/BHEL Construction Manager, and after deducting all expenses/other amounts due to BHEL under the contract/other contracts entered into by BHEL with them.This portion of the retention amount can be released on commencement of the Guarantee period, on submission of equivalent Bank Guarantee. This portion of the retention amount can be released on commencement of the Guarantee period upon submission equivalent Bank Guarantee or after expiry of Guarantee period, as the case may be, subject to approval of final bill. Submission of bank guarantee towards retention is separate and other bank guarantee(s) cannot be utilized for this purpose.

41.2	**INTERIM PAYMENT**
41.2.1	For all items of work as per Volume-III, Price Schedule, interim payment shall be limited to 95 % of the gross value of interim bill on item rate basis.5% of gross shall be retained from each RA bill as 'rentention Amount' as described in clause no 41.1 above. All admissible recovery / adjustments etc. shall be made from the interim payable amount.
41.2.2	Out of this 95 %, 1.5 % of gross bill amount shall be paid in the following manner on certification by Engineer-in-chargeafter compliance of each of following activity in each month. In case of non-fulfilment of respective activity by vendor in each month, no payment shall be made by BHEL against corresponding activity and no claim of bidder at a later date, whatsoever, in this regard shall be entertained by BHEL.
41.2.2.1	0.7 % shall be paid on compliance of house keeping of vendor's working area and store/ office areas.
41.2.2.2	0.3 % shall be paid on compliance of general illumination of vendor's working area and stores, office area.
41.2.2.3	0.2 % shall be paid on compliance of applicable OHSAS requirement as per guidelines of BHEL/ PSER and as specified in the tender.
41.2.2.4	0.3 % shall be paid on compliance of applicable safety requirement as per guidelines of BHEL/ PSER and as specified in the tender.
41.2.3	Contractor's RA bill, complete & correct in all respects, certified by BHEL Engineer-in-charge, shall be paid after 45 days of receipt of bill with all supporting documents.
41.2.4	BHEL site at its discretion may further split up the above percentages of break up and effect payment to suit the site condition, cash flow requirement, according to the progress of work.
41.2.5	The contractor shall submit his running bill, once in a month at the end of each month. The RA bill complete in all respect, accompanied by Engineer-in-charge certified measurement sheets, jointly signed, will be paid after 45 days of submission of bill, subject to completeness and correctness. Income Tax at the prevailing rates on gross value of work done & applicable surcharge shall be deducted from contractor's bill, unless exempted by Income Tax Authority.
41.2.6	Applicable GST, which can be claimed at any point, shall be released to you upon compliance of following:
41.2.6.1	You declaring such Invoice in your GSTR-1
41.2.6.2	Receipt of Goods / services and Tax Invoice by BHEL
41.2.6.3	Confirmation of payment of GST thereon by you on GSTN Portal
41.2.7	Above is subject to receipt of goods / service and tax invoice thereof along with you declaring invoice in your return and paying GST within timeline prescribed for availing ITC by BHEL.
42.0	**CONTRACT PRICE**
42.1	The bidder shall quote their price/rates strictly in accordance with prescribed price/rate schedule -Volume-III (SCH-1).
42.2	The quantities of the various items mentioned in the respective Price schedules, Volume-III are approximate, based on very preliminary information and may vary to any extent or to be deleted altogether. The quoted rates of each item will remain firm throughout the period of execution including extension, for reasons whatsoever, as long as variation in the total value of the work executed under any part of this contract including extra items, if any, but excluding any price variation, remains within +/- 15 % (plus/minus fifteen percent) of the awarded price (as per LOI / WO).
42.3	The quoted rates shall remain firm irrespective of any variations in the individual quantities. No compensation becomes payable in case the variation of the final executed contract value is within the limits of Plus (+) or Minus (-) 15% of awarded contract value.
42.4	Compensation due to variation of final executed value in excess of the limits defined in clause above, shall be as follows:

42.4.1	In case the finally executed contract value reduces below the lower limit of Contract Value due to quantity variation specified above, the contractor will be eligible for compensation @ 15% of the difference between the lower limit of the contract value and the actual executed value.
42.4.2	In case the finally executed contract value increases above the upper limit of Contract Value due to quantity variation specified above, there will be no revision in the rates within the contract period.
43.0	**METHOD OF MEASUREMENT**
43.1	Mode of measurement shall be as per relevant clauses of technical specification of this tender. In case the same is not available the relevant IS 1200 in conjunction of IS code 3385 shall be adopted. In case the same is also not available, the standard procedure adopted in CPWD shall be adopted. In case the same is also not available in CPWD, the measurement of the work done will be based on the mutual agreement between BHEL and contractor. In all the above cases, the interpretation of BHEL will be final and binding to the contractor.
43.2	Method of measurement for earth work shall be as per following:
43.2.1	Earthwork in excavation - Measurement shall be as per actual excavated quantity at site and as per clause 5.2.0 of Technical Specification, Section D, Sub-Section D1 of VOL-II B (Standard Technical Specification).
43.2.2	Earthwork in backfilling – Measurement shall be as per excavation quantity after deduction for concrete etc. Difference in final backfilled level with respect to initial ground level shall also be taken into account for deduction, if any, from excavation quantity.
44.0	**OTHER TERMS**
44.1	While bidder's scope includes deplyment of all resources, like T&P, materials, consumables, manpower including supervision etc for proper completion of the subject job and no sub-contracting for execution of the job is allowed by BHEL, depending on project's requirement and on prior acceptance of BHEL, bidder may associate agencies for deployment of skilled/ unskileld manpower only for site execution. Bidder should arrange all resources, like T&P, materials, consumables, supervision etc directly for the subject job.
44.2	Customer Specific qualifying requirement for bidder’s approval
44.2.1	Following are the customer specific requirement for bidder’s approval
44.2.1.1	Bidder should have been in past executed civil and structural works of 195 MW or higher capacity coal/lignite based power plant including earth work in filling involving mechanical compaction and cutting in hard rock,foundations, Bulk material handling plant involving underground storage hopper and underground tunnels.
44.2.1.2	In case bidder is not meeting above requirement then bidder should have executed such works in the past and annual rate of execution in reference work in such works should not be less than eighty(80%) of asking rate of such works for which the the tender is being floated.
44.2.2	Bidder to consider the above requirement also apart from PQR before submitting the bid.In case of customer’s requirement,bidder may have to submit the document in support of the above for submission of the same to customer for approval.
44.3	Contractor’s Labour Information Management System (CLIMS):
44.3.1	The Contractor has to necessarily get itself registered in the Contractor’s Labour Information Management System (CLIMS), which will be installed by the NTPC.
44.3.2	The entry and exit of all contract labour to the plant premises will be through Gate Access Control System of above ‘Contractor’s Labour Information Management System’
44.3.3	It will be the responsibility of the Contractor to ensure timely exit of all labours from the plant premises after completion of job of that day.
44.3.4	The contractor has to abide with all the statutory compliance applicable to its workers and employees and update the details of the same in the above System.

44.4	Contractor Performance Feedback and Evaluation System
44.4.1	Customer(NTPC) has in place an established 'Contractor Performance and Feedback System' against which the Contractor's performance during the execution of Contract shall be evaluated on a continuous basis at regular intervals on the following seven parameters: I. Engineering & Quality Assurance Capability II. Finance III. Supply IV. Construction/ Installation V. Field Quality VI. Safety VII. Claims & Disputes
44.4.2	The score-based feedback formats based on which Contractor's performance shall be evaluated is enclosed at Annexure-III to TCC. In case the performance of the Contractor is found unsatisfactory, the Contractor shall be considered ineligible for participating in future tenders of customer for three years.
44.5	All other term & conditions of this specification, not mentioned above shall be governed by the pertinent provisions of GCC, Volume-IB.

ANNEXURE - I
LIST OF EQUIPMENTS FOR CIVIL SITE LABORATORY

SL NO	NAME OF TEST	NAME OF EQUIPMENT	SIZE OF EQIPMENT	REF
CONCRETE TESTING EQUIPMENT				
1	Concrete Compressive test	Digital Compressive Testing Machine with 2000 KN capacity.	2000KN capacity	IS 2505
2	Concrete Cube casting	Concrete Cube Mould	150x150x150mm, minimum 60 Nos.	IS 10086
3	Workability of concrete	Slump cone	Standard, atleast 04 nos	IS 456
4	Initial & final setting time, Consistency of cement	Vicat Apparatus with desk pot	Standard	IS 5513
5	Cement mortar cube casting	Mortor Cube mould	70.6 x 70.6 x 70.6 mm, minimum 09 sets desired.	IS 10086
SOIL TESTING EQUIPMENT (LEVELLING & GRADING)				
1	Core Cutter test	core cutter apparatus	Rammer, 6 nos of std core cutter mould, dolly	IS 2720
2	Proctor density test	Std proctor Compaction apparatus	Standard	IS 2720
3	Moisture Content	Rapid moisture meter	Standard, atleast 04 nos	IS 2720
PROCESS CONTROL ACCESSORIES				
1	Hot air oven	Temperature range 50° C to 300° C	600x600x600mm (min.size)	
2	Electronic balance	2 nos	600g x 0.01g, 5g	
3	Physical balance	10 kg capacity	Weights 20 gmto 10 kg	
	Mechanical Weighing Machine	100 Kg Capacity		
4	Thermometer	Temperature range 0° C to 150° C	Digital (4 nos)	
5	Measuring jars	2 nos set of each size	100ml, 200ml, 500ml & 1000 ml	
6	Gauging trowlers	2 nos	100mm & 200 mm with wooden handle	
7	Spatula	2 nos	100mm & 200 mm with long blade wooden handle	
8	Stainless steel scoop	2 nos	2 kg and 5 kg	
9	Digital pH meter	02 nos	0.01 mm least count,	
10	GI tray	02 nos	600x450x50mm, 450x300x40mm,	
11	Digital paint thickness meter for masanory / concrete painting measurement	02 nos	150 micron range	
12	Digital elcometer for paint thickness	02 nos		
13	Mud Balance	02 nos	Range of 0.8 to 2.5	
14	Dial gauge	08 Nos.	0.01 mm least count,	
15	Hydraulic Jack with Calibrated Pressure Gauge	04 Nos.	2 Nos. 800 MT Capacity & 2 Nos. 600 MT Capacity	
16	Slurry Sampler	02 sets		
17	Marsh Funnel and Cup	02 sets		

18	DP Test Kit	10 nos.		
19	Vernier 300 mm & 600 mm set	2 nos each		
20	Radiography film viewer	2 nos		
21	Radiographic facilities	As per requirement	Agency should deploy BARC approved agency	
22	Radiography film viewer	As per requirement		
23	Flakiness and elongation index test gauges	2 nos each		
24	Atterberg Limits set-up (Liquid Limit and Plastic Limit) and Shrinkage Limit Apparatus with mercury	1 set each		
25	Impact testing machine	01 Set		
26	Pycnometer	02 Set		
27	Crushing value apparatus	01 Set		
28	Los angeles Abrasion Testing Machine	01 Set		
29	Free swell Index Apparatus	01 Set		
30	Bitumen Extractor Machine	01 Set		

Annexure-II

NOTE:

LIST OF TENTATIVELY APPROVED SUPPLIERS / DESIGNERS IS PROVIDED HEREUNDER. HOWEVER, IN CASE THE BIDDER PROPOSES TO PROCURE ITEMS FROM OTHER SUPPLIERS, SPECIFIC APPROVAL SHALL BE REQUIRED TO BE TAKEN FROM BHEL / NTPC AS PER APPROVED QP. FURTHER BIDDER MAY NOTE THAT LIST CONSISTS OF ONLY TENTATIVELY APPROVED VENDORS. SPECIFIC APPROVAL MUST BE TAKEN FROM BHEL / NTPC PRIOR TO EXECUTION AT SITE.

SL. NO.	ITEM	PROPOSED SUB SUPPLIER	PLACE OF MANUFACTURING	REMARKS
1	CONSTRUCTION CHEMICALS - ADMIXTURES, PLASTISIZERS, RETARDERS WATER PROOFING COMPOUNDS GROUTS	SIKA INDIA LTO	-	
		CICO TECHONOLOGIES LTD	-	
		FOSROC CHEMICALS (I) PVTLTD	-	
		BASF	-	
2.	FALSE CEILING- GLASS REINFORCED GYPSUM SYSTEM, MINERAL FIBRE BOARD SYSTEM,PREPAINTED COIL COATED STEEL SYSTEM	SAINT GOBAIN	NEW DELHI	
		HUNTER DOUGLOUS	MUMBAI	
		TIGER STEEL	PUNE/MUMBAI	
		INTERARCH	NOIDA	
		LLOYD INSULATION	-	
		MG INDUSTRIES	FARIDABAD	
		ARM STRONG	NEW DELHI	
3	PAINT AND PAINTING SYSTEM	BERGER	-	
		SHALIMAR PAINTS	-	
		JENSON AND NICHOLSON	-	
		KANSAI NEROLAC	-	
		AKZO NOBEL	-	
		ASIAN PAINTS	-	
4	COLOUR COATED SHEET (FOR COIL)	UNION STEEL	KOREA	
		DONGBU STEEL	KOREA	
		BHUSHAN STEEL AND STRIPS LTD.	RAIGAD	
		ESSAR STEEL LTD	PUNE	
		NATIONAL STEEL AND AGRO	DHAR	
		JSW STEEL COATED PRODUCTS LTD	KAMLESHWAR	Formerly JSW ISPAT Steel Ltd
		BHUSHAN STEEL LTD.	SAHIBABAD	
		JSW LTD	THANE	

		TATA BLUESCOPE STEEL LTD	JAMSHEDPUR	*AL-ZN COIL FOR CLADDING

5	PROFILERS FOR DECKING SHEETS	UNIMET PROFILES LIMITED	DHARUHERA	
		MULTICOLOUR STEEL INDIA LIMITED	GURGAON	
		ISOLLOYD	SOLAN	
		NATIONAL STEEL AND AGRO	DHAR	
		ERA BUILD SYS	RUDRAPUR	
		TATA BLUE SCOPE	PUNE	HINJEWARI WORKS
		TATA BLUE SCOPE	BHIWADI	
		PENNAR INDUSTRIES	HYDERABAD	
		ALFA STEEL BUILDING SOLUTIONS	HOSUR	
6	PROFILERS FOR CLADDING SHEETS	MULTICOLOUR STEEL INDIA LIMITED	GURGAON	
		UNIMET PROFILES LIMITED	DHARUHERA-HARYANA	
		ERA BUILD SYS	RUDRAPUR	
		TATA BLUE SCOPE	PUNE	HINJEWARI WORKS
		TATA BLUE SCOPE	BHIWADI	
		PENNAR INDUSTRIES	HYDERABAD	
		ALFA STEEL BUILDING SOLUTIONS	HOSUR	
		ISOLLOYD	SOLAN	
		NATIONAL STEEL AND AGRO	DHAR	
7	ELECTROFORGED GRATING	INDIANA GRATING	PUNE	
		PREMIER POWER PRODUCTS (CALCUTTA) PVT LTD	HOWRAH	
		GREATWELD	PUNE	
		BHOLA RAM STEELS	PATNA	
		KANADE ANAND UDYOG	THANE	

		PINAX STEEL INDUSTRIES	PATNA	
8	GI PIPES	BIS APPROVED SOURCES HAVING VALID BIS LICENCE	-	
9	PVC WATER STOP	DURON POLYVINYLS PVT. LTD	GURGAON	
		KANTA RUBBER	HYDERABAD	
		MARUTI RUBBER	NOIDA	
		JYOTI POLYVINYL	VADODARA	
		DEEP-JYOTI RUBBER PVT LTD	NOIDA	
10	BITUMEN ASPHALT	ALL GOVERNMENT REFINARIES	–	
11	PLASTIC, PVC PIPES	BIS APPROVED SOURCES HAVING VALID BIS LICENCE	-	
12	BITUMEN IMPREGNATED FIBER BOARD JOINT FILLER, BITUMEN SEALING COMPOUND	BIS APPROVED SOURCES HAVING VALID BIS LICENCE	-	
13	ALUMINUM COMPOSITE CLADDING	INDOMAX	ROORKEE	
		ALSTONE	DEHRADUN	
14	CERAMIC / VITRIFIED TILES	KAJARIA	-	
		SOMANY		
		SPARTEK INDIA	-	
		NITCO	-	
		ORIENT BELL	-	
		MARBITO		
		RESTILE	-	
		JOHNSON	.	
15.	ACID / ALKALI RESISTANCE TILES, AR BRICKS, ARCEMENT (POTASSIUM SILICATE BASED CEMENT MORTAR, PHENOLIC BASED RESIN CEMENT) AR BITUMASTIC	CARBORANDUM UNIVERSAL	CHENNAI	
		PELICAN	BHIWADI	
		CAMBRIAN	ALWAR	
		KERATECH	VADODARA	
		CHAMPION CERAMICS	CHAMPA	
		SUNSHINE CERAMICS	CHAMPA	
		MAHAKOSHAL POTTRIES	KATNI	
		PERFECT ACID WARE	JABALPUR	
		BABA BAIDNATH REFRACTORIES	PURULIA	

16.	FIRE PROOF DOORS	NAVAIR INTERNATIONAL LTD.	NEW DELHI	
		SHAKTI MET DOOR	HYDERABAD	
		SUPER STEEL	DELHI	FOR SINGLE LEAF ONLY
		SIGNUM FIRE PROTECTION	NAGPUR	
		RADIANT SAFE DOORS	AHMEDABAD	
17	PARTICLE BOARDS, PLYWOOD, MDF .	NOVAPAN	-	
		ECOBOARD	-	
		BHUTAN BOARD	-	
		KITPLY	-	
		CENTURY	-	
		GREEN PLY	-	
		DUROPLY	-	
		MERINO	-	\
18	ALUMINUM SECTIONS	HINDALCO	-	
		INDALCO		
		BALCO (VEDANTA)	-	
		NALCO	-	
		J1NDAL	-	
19	HIGH SOLID CONTENT LIQUID APPLIED URETHANE BASED ELASTOMERIC MEMBRANE FOR WATER PROOFING	STP	-	
		IWL INDIA LTD	-	
		LLOYDS	-	
		CICO TECHONOLOGIES LTD		
		MK PETRO	-	
20	SANITARY ITEMS	PARRYWARE	-	
		HINDWARE	-	
		SEABIRD		
		ORIENT		
		HINDUSTAN		
		CERA		
21	CP BRASS TAP AND OTHER SANITARY FITTINGS	GEM	_	
		PARKO	-	
		JAQUAR	.	
		MARC	_	
22	POLYTHENE WATER STORAGE TANKS	BIS APPROVED SOURCES HAVING VALID BIS LICENCE	-	
23	NEOPRENE BELLOW STRAPS	CORI	CHENNAI	
		RESISTOFLEX	NOIDA	
		DWREN	KOLKATA	

24	RCC PIPES	BIS APPROVED SOURCES HAVING VALID BIS LICENCE	-	
25	POLYCARBONATE SHEETS	GE PLASTIC (SABIC)	–	
		BAYER (MAKROLON)	–	
26	ELECTRICALLY OPERATED HOIST (5T/2T)	CONSOLIDATED HOIST	SATARA	
		HERCULES HOIST	RA1GARH	
		GRIP ENGG	FARIDABAD	
		EDDY CRANE	PUNE	
		ARMSHEL	BANGLORE	
		CENTURY CRANE	PALWAL	
		ELECTROTHERAPY	HOWRAH	
		TRACTEL TRIFFER	PALWAL	
		ALFA CRANES	ALWAR	
		REVA HOIST	FARIDABAD	
27	STOP LOG GATES, TRASH RACK AND LIFTING BEAM	GENERAL MECHANICAL WORKS	BARODA	
		TRIVENI	NOIDA	
		MACMET	KOLKATA	
		PRADEEP STRUCTURES	HOWRAH	
		RED FAG	HYDERABAD	
		BSBK ENGG	NOIDA	
28	PTFE BEARING ELASTOMERIC BEARING	ALL CURRENT MORTH/RDSO APPROVED VENDORS		
29	FABRIC EXPANSION COMPENSATOR	KELD ELLENTOFT INDIA LTD	CHENNAI	
		EAGLE BURGMANN KE PRIVATE LTD	CHENNAI	
30	MINERAL WOOL FOR THERMAL INSULATION -	ROCKWOOL INDIA LTD.	HYDERABAD	Subject to. carrying out K-value test at CBRI Roorkee / NTPC approved lab.
		ROCKWOOL INDUSTRIES	BHILA1	
		LAP INUS	MALANPUR (MP)	
		M1NWOOL	RAJANANDGAON	
		LLOYD INSULATION	BHILAI	
		U.P. TWIGA	BULENDSHAHAR	
31	GEOTEXTILE	GARWARE WALL ROPES Ltd	PUNE	
		TENCATE GEOSYNTHETICS ASIA	MALAYSIA	NON WOVEN

32	GEOMEMBRANE (HDPE LINER)	D P WIRES PVT. LTD	RATLAM	
33	CI PIPES	BIS APPROVED SOURCES HAVING VALID BIS LICENCE		
34	COAL TAR ANTICORROSIVE COATING	RUSTECH	KOLKATA	
		PORWAL INDUSTRIES	RAIPUR	
		MP TAR	BHILAI	
		STP UMITED	JAMSHEDPUR	
35	ELASTOMERIC POLYURETHANE COATING	CIPY	PUNE	
		AMCHEM	NOIDA	
		E. WOOD. (APPLICATOR: PSL HOLDING, INDIA)	UK	
		CICO TECHONOLOGIES LTD	GURGAON	
36	HIGH PERFORMANCE MOISTURE COMPATIBLE CORROSION RESISTANT COATING SYSTEM	CECRI LICENSED SOURCES		
37	MS PIPES (IS:3589, WELDED PIPES)	BIS APPROVED SOURCES HAVING VALID BIS LICENCE		
38	PVC COATED CHAIN LINK FENCING & REINFORCED BARBED TAPE	SAUDAGAR MAC MAMMANLAL PVT LTD		
		MECAFERRI		

NTPC LIMITED

FLUE GAS DESULPHURISATION (FGD) SYSTEM
KAHALGAON STPP

GEOTECHNICAL INVESTIGTION REPORT

BHEL DOCUMENT NO. PE-DC-481-602-C001

NTPC DOCUMENT NO. 4200-109-PEM-PVC-U-632

(REVISION R03)

BHARAT HEAVY ELECTRICALS LIMITED
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Compliance report

KAHALGAON FGD PACKAGE

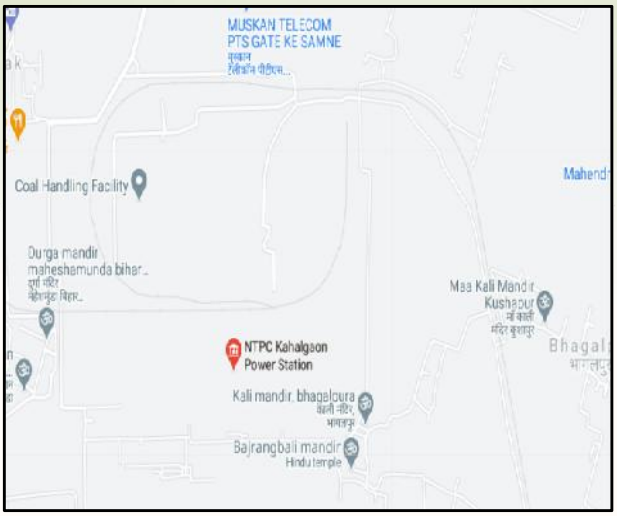
Reference document:

NTPC doc No: 4200-109-PVC-U-632
BHEL doc No: PE-DC-481-602-C001, Rev-02

	NTPC Comments	BHEL Reply 31.05.2021
1	Page 77/115: BH-30: Consider filled up as surcharge	Noted and corrected suitably
2	Page 78/115: BH-52: Consider filled up as surcharge	Noted and corrected suitably
3	Page 78/115: IBH-06 & 07: Consider filled up as surcharge	Noted and corrected suitably

BHARAT HEAVY ELECTRICALS LIMITED

REPORT ON
GEOTECHNICAL INVESTIGATION WORK FOR FGD SYTEM AREA OF 4 x 210MW STAGE-I + 3x 500 MW STAGE –II, KAHALGAON STPP, BIHAR









Submitted To

M/s.Bharat Heavy Electricals Ltd.
9/1 D.J. Block, Sector – II,
Salt Lake City,
Kolkata– 700 091

Geotechnical Consultants

CETEST Engineering Consultants

C. E. Testing Company Pvt. Limited
An ISO 9001, 14001& 45001
Certified Company
NABL Accredited Laboratory
124A, N.S.C. Bose Road
Kolkata – 700 092
Phones: 2428-6221/6222/6223
Fax: (033) 2428-6220
Email: cetest@cetestindia.com

Job No.: 4388
Doc. No.:CETEST/4388/001/GTR/FR/V1/R1

29th May, 2021

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REPORT ON
GEOTECHNICAL INVESTIGATION WORK FOR FGD SYTEM AREA OF 4 x 210MW STAGE-I + 3x 500 MW STAGE –II, KAHALGAON STPP, BIHAR

1. INTRODUCTION

M/s. NTPC has proposed the construction of FGD system for 4 x 210 MW Stage-I + 3 x 500 MW Stage-II at Kahalgaon STPP, Bihar and the job was awarded to **M/s. Bharat Heavy Electricals Limited**. For designing of Foundation Structures coming under this project, it was necessary to conduct a Detailed Geotechnical Investigation Work and **M/s Bharat Heavy Electricals Limited**, in turn awarded the job to **M/s. C. E. Testing Company Pvt. Ltd., Kolkata.**

The scope of the work comprises of sinking 62 nos. Boreholes, 8 nos. Trial Pit (TP), 2 nos. Plate Load Tests (PLT), 3 nos. Cyclic Plate Load Tests (CPLT), 4 nos. Field Permeability Tests (FPT), 17 nos. Electrical Resistivity Tests (ERT) and 3 Nos. Cross Hole Test (CHT).

The boreholes of 150 mm diameter were advanced by Shell and Auger method in soil. In rock, rotary core drilling of “NX” size was adopted. The scope also included conducting Standard Penetration Tests, collecting disturbed samples at regular intervals for identification and logging purposes, collecting undisturbed tube samples at suitable intervals or at change of strata whichever is earlier and testing these in the laboratory.

Based on the above, this report presents the Bore Logs, few laboratory and field Test Results. On the basis of field tests and laboratory test results and their analysis thereof, the most suitable type of foundation is suggested. However, this is discussed in details later.

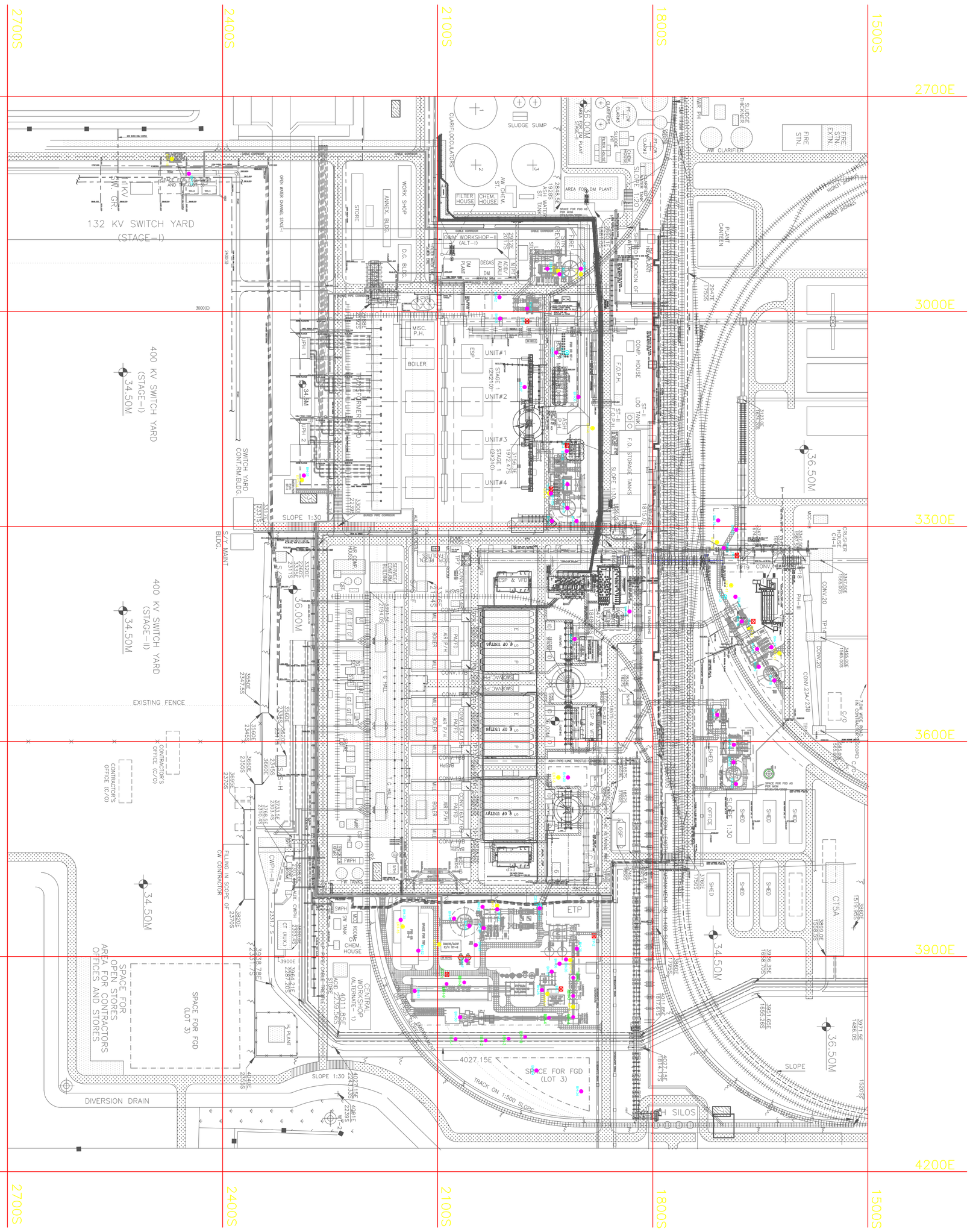
The subsoil is characterised by a layer of filled up soil at top followed by soft to medium silty clay layer. Below this stiff to very stiff silty clay layer was found. After that hard silty clay layer was found and that continues upto the terminating depth of all the boreholes. However, dense to very dense silty sand layers have also been observed at few borehole locations.

Considering the nature of the subsoil as revealed from field tests, most suitable type of foundation is recommended. However, this is discussed in details later.

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DRAWING No. PE-DG-481-602-C002



BORE HOLE FOR ISG (IBH)		
MARKING	CO-ORDINATES	DEPTH (M)
IBH-1	4015 E 2075 S	35
IBH-2	4017 E 2033 S	35
IBH-3	4014 E 2001 S	35
IBH-4	3985 E 1944 S	35
IBH-5	3984 E 1911 S	35
IBH-6	3954 E 1911 S	35
IBH-7	3929 E 1911 S	35
IBH-8	3936 E 2063 S	35
IBH-9	3938 E 2087 S	35
IBH-10	4012 E 1978 S	35

TRIAL PIT (TP / ITP)		
MARKING	CO-ORDINATES	DEPTH (M)
ITP-1	3925 E 2087 S	4
TP-1	3945 E 1928 S	4
TP-2	3871 E 1882 S	4
TP-3	3248 E 1942 S	4
TP-4	3186.980 E 1919.554 S	4
TP-5	3014 E 1975 S	4
TP-6	3433 E 1660 S	4
TP-7	3340 E 1683 S	4

CROSS SHEAR TEST (CST)	
MARKING	CO-ORDINATES
CST-1	3057 E 1920 S
CST-2	3398 E 1700 S
CST-3	3829 E 1958 S

BORE HOLE COORDINATES		
MARKING	CO-ORDINATES	DEPTH (M) (REFER NOTE 2)
BH-01	2996 E 1975 S	35
BH-02	2980 E 2014 S	35
BH-03	3010 E 2013 S	35
BH-04	4059 E 1962 S	35
BH-05	3057 E 1935 S	35
BH-06	3119.308 E 1903.545 S	35
BH-07	3105.600 E 1978.700 S	35
BH-08	3195 E 1920 S	35
BH-09	3254 E 1942 S	35
BH-10	3292 E 1906 S	35
BH-11	3292 E 1941 S	35
BH-12	3330 E 1701 S	35
BH-13	3305 E 1684 S	35
BH-14	3292 E 1709 S	35
BH-15	3398 E 1685 S	35
BH-16	3433 E 1676 S	35
BH-17	3468 E 1634 S	35
BH-18	3515 E 1630 S	35
BH-19	3496 E 1652 S	35
BH-20	3650 E 1918 S	35
BH-21	3833 E 1958 S	35
BH-22	3834 E 2017 S	35
BH-23	3831 E 2037 S	35
BH-24	3860 E 2036 S	35
BH-25	3889 E 1906 S	35
BH-26	3904 E 1921 S	35
BH-27	3921 E 1941 S	35
BH-28	3947 E 1955 S	35
BH-29	3884 E 2047 S	35
BH-30	3849 E 2151 S	35
BH-31	3229 E 2287 S	35
BH-32	3419 E 1832 S	35
BH-33	3457 E 1909 S	35
BH-34	4088 E 1900 S	35
BH-35	2808 E 2447 S	35
BH-36	3910 E 1930 S	35
BH-37	3906 E 2060 S	35
BH-38	3659 E 1684 S	35
BH-39	3629 E 1687 S	35
BH-40	3605 E 1687 S	35
BH-41	3563 E 1710 S	35
BH-42	3471 E 1655 S	35
BH-43	3241 E 1919 S	35
BH-44	2941 E 1900 S	35
BH-45	2948 E 1930 S	35
BH-46	2938 E 1947 S	35
BH-47	3847 E 2077 S	35
BH-48	3274 E 1919 S	35
BH-49	3857 E 2056 S	35
BH-50	3985 E 2069 S	35
BH-51	3948 E 2132 S	35
BH-52	3892 E 2127 S	35

ELECTRICAL RESISTIVITY TEST (ERT)	
MARKING	CO-ORDINATES
ERT-1	3883 E 2098 S
ERT-2	3829 E 2017 S
ERT-3	3952 E 1947 S
ERT-4	3905 E 1915 S
ERT-5	3650 E 1932 S
ERT-6	3163 E 1864 S
ERT-7	3253.900 E 1944.480 S
ERT-8	2943.526 E 1932.308 S
ERT-9	2948.172 E 1900.304 S
ERT-10	3322 E 1711 S
ERT-11	3382 E 1691 S
ERT-12	3442 E 1666 S
ERT-13	3477 E 1623 S
ERT-14	3235 E 2269 S
ERT-15	3858 E 2149 S
ERT-16	2787.300 E 2470.700 S
IERT-01	3970 E 1911 S

WIND ROSE

NOTES:-

1. ALL DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE.
2. BORE HOLE SHALL BE DRILLED UPTO THE DEPTH INDICATED AGAINST EACH BORE HOLE OR UP TO 5M IN ROCK WITH CONTINUOUS ROD GREATER THAN 25% WHICHEVER IS EARLIER.
3. BACKFILLING OF BORE HOLES AND PITS SHALL BE AS PER SPECIFICATION AND AS DIRECTED BY THE ENGINEER-IN-CHARGE.
4. STARTING DEPTH OF STANDARD PENETRATION TEST (SPT) SHALL BE 1M BELOW GROUND LEVEL AND THE TEST SHALL BE CONDUCTED AT EVERY 1M INTERVAL ALTERNATE TO COLLECTION OF UNDISTURBED SAMPLE (UDS) UPTO 10M DEPTH BELOW GROUND LEVEL AND AT EVERY 1.5M INTERVAL ALTERNATE TO COLLECTION OF UDS BEYOND 10M DEPTH, AT CHANGE OF STRATA & AT DEPTHS WHEREVER UDS COULD NOT BE COLLECTED.
5. STARTING DEPTH OF COLLECTION OF UDS SHALL BE 2M BELOW GROUND LEVEL AND UDS SHALL BE COLLECTED AT 1M INTERVAL ALTERNATE TO CONDUCTING SPT UPTO 10M DEPTH BELOW GROUND LEVEL & AT EVERY 1.5M INTERVAL ALTERNATE TO CONDUCTING SPT BEYOND 10M DEPTH.
6. CROSS HOLE SHEAR WAVE TEST SHALL BE CARRIED OUT AT 2M, 4M, 6M, 8M, 10M, 12M, 15M, 18M, 20M, 25M, 30M & 35M DEPTH BELOW GROUND LEVEL.
7. PUMP IN TYPE FIELD PERMEABILITY TEST SHALL BE CARRIED OUT AT DEPTH 1M, 3M, 5M, 8M & 12M DEPTH BELOW EXISTING GROUND LEVEL IN BH-5, BH-15, BH-29 & IBH-10.
8. ELECTRICAL RESISTIVITY TEST SHALL BE CARRIED OUT BY WENNER'S METHOD.
9. GROUND WATER SAMPLE SHALL BE COLLECTED FROM BH-6, BH-16, BH-27 & IBH-1.
10. PLT SHALL BE CONDUCTED IN TP-7 & ITP-1 AT 3M DEPTH BELOW GROUND LEVEL.
11. CPLT SHALL BE CONDUCTED IN TP-2, TP-4 & TP-6 AT 3M DEPTH BELOW GROUND LEVEL.
12. GEOTECHNICAL INVESTIGATION SHALL BE CARRIED OUT AS PER SPECIFICATION.
13. DO NOT SCALE THIS DRAWING.

REFERENCE DRG:-

1. DRG. NO. 4230-999-POC-F-001, REV-10, TITLED "GENERAL LAYOUT PLAN".

GEOTECHNICAL INVESTIGATION LEGEND:-

1. BOREHOLE (BH / IBH) . . . . . ●
2. TRIAL PIT (TP / ITP) . . . . . ⊠
3. ELECTRICAL RESISTIVITY TEST (ERT / IERT) . . . . . ◎
4. CROSSHOLE SHEAR TEST (CST / ICST). . . . . ⊙

BHEL-PROJECT ENGINEERING MANAGEMENT(CIVIL)

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- ☐ CONSTRUCTION

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02	01.01.21	YK	PK/AKV	TMS
01	15.12.20	YK	PK/AKV	TMS

THE DRAWING IS REVISED TO INCORPORATE CUSTOMER'S COMMENTS AND THUS MKD. ⚠

DRG IS REVISED TO INCORPORATE THE NEW BORE HOLE AS PER REVISED FGD LAYOUT AND THUS MKD. ⚠

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NATIONAL THERMAL POWER CORPORATION LTD.
KAHALGAON SUPER THERMAL POWER PROJECT

BHARAT HEAVY ELECTRICALS LTD
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GEOTECHNICAL INVESTIGATION LAYOUT

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SHEET 1 OF 1 | REV. 02

SIZE-A0

"ON OWNWAYS SERVICE TO CUSTO

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM

2. FIELD INVESTIGATION

2.01. GENERAL:

In an attempt for finalisation in the design of foundation for these proposed structures to be constructed at this site, Geotechnical Investigation was envisaged. The entire Investigation programme had been divided mainly into two parts, I) Field works & II) Laboratory tests.

I) Field works unfold the sub-surface deposit types and their characteristics and

II) Laboratory tests part would help determining the relevant physical and geotechnical properties of the sub-surface deposits leading to finalisation of foundation depths of the structures and the bearing capacity with particular reference to the sub-surface types and their strength parameters and settlement potentials at the site.

A list of the bore holes with the location, ground level, standing water level etc. are presented in a tabular form below:

Name of Structure	Bore Hole No.	Co-ordinate (M)		E.G.L. (M)	Terminating Depth (M)	Standing Water Level (M)
		Easting	Southing			
Booster Fan Stage I	BH-01	2996	1975	34.657	35.55	0.80
--	BH-02	2980	2014	34.526	35.50	0.70
	BH-03	3010	2013	35.523	35.50	0.60
Space for FGD (Lot 3)	BH-04	4059	1962	36.304	35.55	2.40
FGD Control Room Stage I	BH-05	3057	1935	34.651	35.50	0.50
	BH-06	3119.308	1903.545	34.908	35.50	1.10
--	BH-07	3105.600	1978.700	34.842	35.50	0.70
Booster Fan Stage I	BH-08	3210	1930	34.725	35.00	0.60
--	BH-09	3258	1928	35.321	35.00	0.60
Chimney Stage I	BH-10	3292	1906	34.738	35.45	0.30
--	BH-11	3292	1941	35.309	35.50	0.30
--	BH-12	3330	1701	37.986	35.60	1.90
--	BH-13	3305	1684	37.263	35.60	1.70
--	BH-14	3292	1709	36.899	35.50	1.80
--	BH-15	3398	1685	37.655	35.50	1.70
Booster Fan Stage II	BH-16	3433	1676	37.178	35.50	1.60
Absorber Stage II	BH-17	3468	1634	37.440	35.55	2.10
Chimney Stage II	BH-18	3515	1630	36.864	35.50	2.00
	BH-19	3496	1652	37.833	35.50	1.80
Compressor House	BH-20	3650	1918	36.048	35.50	1.55
--	BH-21	3833	1958	36.682	35.55	0.90
Absorber Stage II	BH-22	3834	2017	36.877	35.50	2.10
	BH-23	3831	2037	36.678	35.50	1.10
	BH-24	3860	2036	36.121	35.50	0.60
Near Ball Mill Building	BH-25	3889	1906	37.452	35.50	1.70
Near Lime Stone Slurry Storage Tank	BH-26	3904	1921	36.883	35.50	1.35
Elect. Annex Compressor House	BH-27	3921	1941	36.486	35.50	1.50
Near Elect. Annex Compressor House	BH-28	3947	1955	36.894	35.38	1.20

Name of Structure	Bore Hole No.	Co-ordinate (M)		E.G.L. (M)	Terminating Depth (M)	Standing Water Level (M)
		Easting	Southing			
--	BH-29	3884	2047	37.000	35.50	2.80
FGD CR Stage II	BH-30	3849	2151	39.501	35.55	1.70
--	BH-31	3229	2287	34.734	35.55	0.70
--	BH-32	3419	1832	36.347	35.50	0.75
--	BH-33	3457	1909	36.287	35.50	0.60
Space for FGD (Lot 3)	BH-34	4088	1900	39.607	35.50	2.60
Space for SWGR	BH-35	2820	2447	34.805	35.45	1.30
--	BH-36	3910	1930	36.497	35.50	1.40
Process Water Tank B	BH-37	3906	2060	35.710	35.50	2.40
Chimney Stage II	BH-38	3659	1684	35.652	35.50	1.15
	BH-39	3646	1710	35.349	35.50	1.20
Absorber Stage II	BH-40	3623	1732	35.445	35.50	1.10
Booster Fan Stage II	BH-41	3553	1737	35.228	35.50	1.95
Absorber Stage II	BH-42	3471	1655	36.998	35.50	2.25
Absorber Stage I	BH-43	3241	1919	34.732	35.50	0.75
Chimney Stage I	BH-44	2941	1900	35.498	35.50	1.55
	BH-45	2948	1930	35.796	35.50	1.40
Absorber Stage I	BH-46	2938	1947	34.912	35.40	0.80
Chimney Stage II	BH-47	3847	2077	36.354	35.50	1.95
Chimney Stage I	BH-48	3274	1919	35.045	35.40	0.80
Chimney Stage II	BH-49	3857	2056	37.089	35.50	1.95
--	BH-50	3985	2069	36.244	35.50	1.30
Gypsum Storage Stock Pile	BH-51	3948	2132	38.105	35.50	2.30
Space for TRF	BH-52	3892	2127	38.661	35.50	3.80
--	IBH-01	4015	2075	35.986	35.50	1.15
--	IBH-02	4017	2033	36.289	35.50	0.70
--	IBH-03	4014	2001	35.926	35.30	0.50
--	IBH-04	3985	1944	36.589	35.50	0.60
--	IBH-05	3984	1911	38.118	35.50	0.80
Lime Stone Storage Silo	IBH-06	3954	1911	37.358	35.55	1.70
	IBH-07	3929	1911	36.977	35.50	1.30
Gypsum Storage Stock Pile	IBH-08	3936	2063	36.500	35.40	1.50
	IBH-09	3938	2087	36.530	35.50	1.10
--	IBH-10	4012	1978	36.134	35.40	0.40

2.02. BORING IN SOIL:

Boring was carried out by Shell and Auger method to sink nominal 150mm diameter bore holes to depths envisaged by using a mechanical winch. Undisturbed soil samples were collected at suitable intervals or at change of strata whichever is earlier by open drive sampling method since it was intended to ascertain the sub-soil characteristics.

2.03. SAMPLING:

Nominal 100 mm diameter undisturbed samples were recovered. The sampling equipment used consists of a two-tier assembly of sample tubes 450 mm in length fitted at its lower end. The sampling assembly was driven by means of a jarring link to its full length or as far downs as was found practicable. As the soil is very stiff to hard and contains sand mixtures / calcareous nodules, cutting shoe was used with a area ratio < 20%. After withdrawal the ends of the tubes were sealed with wax and capped before onward transmission to the laboratory. At close intervals in depth disturbed samples were collected for identification and logging purpose. These were tagged and packed in polythene packets and transported to the laboratory.

2.04. STANDARD PENETRATION TESTS:

Standard Penetration Tests were conducted in the bore holes at intervals of 2.0M depth (at the upper reaches due to collection of UDS) or 1m depth (at the lower reaches when no UDS could be collected) or at change of strata whichever is earlier using a split spoon sampler. The split spoon sampler used is of a Standard design having an outer diameter of 50.8 mm and inner diameter of 35 mm, driven with a monkey weighing 63.5 kgs, falling freely through 75cms. A record of the number of blows required to penetrate every 15cms to a maximum depth of 45cms was made. The first 15cm of drive are considered to be seating drive and are neglected. The total blows required for second & third 15cm of penetration is counted and termed as penetration resistance "N". On completion of a test, the split spoon sampler was opened and soil specimens were preserved in polythene bags for logging purpose.

All the boreholes were sunk with winch. However, raising of hammer for SP Tests were done manually. Hence there will not be any inertia loss and the efficiency of hammer blows should be considered as 100%.

2.05. MEASUREMENT OF WATER TABLE:

Standing water level after 24 hours of removal of casing was also noted and shown in the borelog.

2.06. TRIAL PITS:

Total 8 nos. Trial Pit was excavated for physical verification of subsoil with depth. The co-ordinate and ground level of the Trial Pit locations are presented below.

Trial Pit No.	Co-ordinate (M)		E.G.L. (M)	Depth (M)	Standing Water Level (M)
	Easting	Southing			
TP-01	3945	1928	37.486	4.00	2.00
TP-02	3871	1822	36.257	4.00	3.00
TP-03	3243	1935	34.612	4.00	0.60
TP-04	3186.980	1919.554	34.908	4.00	1.50
TP-05	3014	1975	35.028	4.00	0.80
TP-06	3340	1683	37.318	4.00	2.60
TP-07	3433	1660	37.004	4.00	1.80
ITP-01	3925	2087	36.470	4.00	1.20

2.07. PLATE LOAD TESTS:

Total five (5) sets of Plate Load Tests (2 nos. of Routine type and rest 3 nos. of Cyclic type) were conducted **using a 600mm square plate**. Tests are continued upto a maximum desired loading intensity or specified plate settlement whichever is earlier. The load is applied through a hydraulic jack. The reaction for applying the load on the plate is obtained by a loading platform with sandbags. After applying the load increments, settlement records are made at intervals of 1, 2.25, 4, 6.25, 9, 16, 25 & 60 minutes and thereafter at an interval of an hour. Next increment of load was applied only when the rate of plate settlement reduced to 0.02 mm per minute.

In case of CPLT, when the rate of plate settlement reduced to 0.02 mm per minute, the final reading of the dial gauges is recorded. The applied load is then released and the plate allowed to rebound. When no further rebound occurs or the rate of rebound becomes negligible, the readings of the dial gauges are again noted. The load then is increased gradually till its magnitude acquires a value equal to the proposed next higher stage of loading which is to be maintained constantly and the final dial gauge readings are noted as earlier. The entire load is then reduced to zero and final dial gauge readings recorded when the rate of rebound becomes negligible.

The coordinate, ground level and depth of test locations are given below.

PLT No.	Reference TP	Type of Tests	Plate size (mm x mm)	Co-ordinates (M)		E.G.L. (M)	Depth (M)
				Easting	Southing		
PLT-01	TP-07	Routine Type	600 x 600	3340	1683	37.318	1.80
PLT-02	ITP-01	Routine Type	600 x 600	3925	2087	36.470	1.20
CPLT-01	TP-02	Cyclic Type	600 x 600	3871	1822	36.257	3.00
CPLT-02	TP-04	Cyclic Type	600 x 600	3186.980	1919.554	34.908	1.60
CPLT-03	TP-06	Cyclic Type	600 x 600	3433	1660	37.004	2.60

2.08. FIELD PERMEABILITY TESTS:

Field Permeability Tests were conducted in four (4 nos.) borehole locations using falling head method as per IS: 5529 (Part 1). The test locations, type of test and depth of test are presented below.

Test Locations	Co-ordinates (M)		E.G.L. (M)	Type of Test	Depth of Test (M)
	Easting	Southing			
BH-05	3057	1935	34.651	Falling Head	0.80 – 1.50
				Falling Head	2.85 – 3.50
				Falling Head	4.90 – 5.60
				Falling Head	7.70 – 8.40
				Falling Head	11.85 – 12.50
BH-15	3398	1685	37.655	Falling Head	0.80 – 1.50
				Falling Head	2.80 – 3.50
				Falling Head	4.70 – 5.40
				Falling Head	7.80 – 8.50
				Falling Head	11.70 – 12.40
BH-29	3884	2047	37.000	Falling Head	0.70 – 1.50
				Falling Head	2.80 – 3.50
				Falling Head	4.60 – 5.30
				Falling Head	7.70 – 8.40
				Falling Head	11.80 – 12.50
IBH-10	4012	1978	36.134	Falling Head	0.75 – 1.50
				Falling Head	2.70 – 3.40
				Falling Head	4.80 – 5.50
				Falling Head	7.70 – 8.50
				Falling Head	11.80 – 12.50

2.09. ELECTRICAL RESISTIVITY TESTS:

Seventeen (17) nos. Electrical Resistivity Tests are to be carried out at the following locations. These test results are presented in Section 7.

ERT No.	Co-ordinate (M)		E.G.L. (M)	ERT No.	Co-ordinate (M)		E.G.L. (M)
	E	S			E	S	
ERT-1	3883	2098	38.446	ERT-9	2948.172	1900.304	34.535
ERT-2	3829	2017	37.179	ERT-10	3322	1711	37.431
ERT-3	3952	1947	37.072	ERT-11	3382	1691	38.440
ERT-4	3905	1915	36.950	ERT-12	3442	1666	37.015
ERT-5	3650	1932	36.168	ERT-13	3477	1623	36.512
ERT-6	3163	1884	34.798	ERT-14	3235	2289	34.688
ERT-7	3253.900	1944.480	34.967	ERT-15	3858	2149	39.675
ERT-8	2943.526	1932.308	34.563	ERT-16	2787.300	2470.700	34.810
				IERT-01	3970.00	1911.00	37.950

2.10. CROSS HOLE SHEAR TEST:

Three (3) nos. Cross Hole Shear Test was carried out to determine the dynamic properties of the layer for the construction of machine foundations at the following locations. The test procedure and results are presented and discussed in Section-8.

CHST No.	Co-ordinates (M)		E.G.L. (M)
	E	S	
CHST -1	3057	1920	34.830
CHST -2	3398	1700	36.609
CHST -3	3829	1958	36.759

3. LABORATORY TESTING

For proper identification and classification of the sub-soil deposits and for deriving adequate information regarding its relevant physical and geotechnical properties at the site under investigation, the following laboratory tests were conducted on the soil samples collected from the exploratory bore holes:

1. **Grain size analysis (Sieve as well as Hydrometer).**
2. **Determination of Liquid Limit, Plastic Limit & Shrinkage Limit.**
3. **Determination of Natural Moisture Content.**
4. **Determination of Specific Gravity.**
5. **Determination of Bulk & Dry Unit Weight.**
6. **Strength determination by Triaxial Unconsolidated Undrained Test (UU).**
7. **Strength Determination of Unconfined Compression Test on "UDS" (UNCONFD).**
8. **Strength Determination of Unconfined Compression Test on REMOULDED samples.**
9. **One-dimensional Consolidation Test for determining settlement potentiality.**
10. **Determination of Free Swelling Index & Swelling Pressure.**
11. **Conducting Standard Proctor Compaction Test to determine Optimum Moisture Content (OMC) and Maximum Dry Density (MDD).**
12. **Conducting CBR test (soaked) on sample prepared at 95% of MDD.**
13. **Chemical tests on soil and water samples to determine pH value, Sulphate, Chloride content, carbonate content, organic matter etc.**

Laboratory test results are presented in a tabular form in the Appendix. The results are self explanatory excepting that of consolidation tests. The compressibility for a pressure range has been separated into 2 components through the compression ratio. As a first step dial gauge reading is plotted against square root of time and by extrapolation dial reading at zero time, is obtained. The compression ratio is given as

$r = (d_i - d_s)/(d_i - d_f)$, where

d_i = Initial reading of dial before load application

d_s = Dial reading corresponding to theoretical zero time

d_f = Final dial reading after 24 hrs.

Now we write $m_{vc} = (1- r) \times m_v$

All the tests were conducted as per relevant Indian Standard Specifications.

4. SUBSOIL CONDITION, STRATIFICATION AND PROPERTIES

4.1. SUB-SOIL CONDITION:

The boring records showing the various soils met with are enclosed in the Appendix. These are prepared from field logs after proper modifications in the light of the laboratory test results and observation of disturbed and penetrometer soil samples. The results of the Standard Penetration Tests are given as 'N' values in these boring records. The sub-soil profiles (as obtained from field and Laboratory test results) across the bore holes are shown under Figs. 2.01 to 2.30 giving description, consistency and colour of each strata. The "N" values are shown in the profiles as well as presented in the borelogs. The laboratory test results and the back up sheets are also presented there.

4.2. SUB-SOIL STRATIFICATION:

The subsoil is characterised by a layer of filled up soil at top followed by soft to medium silty clay layer. Below this stiff to very stiff silty clay layer was found. After that hard silty clay layer was found and that continues upto the terminating depth of all the boreholes. However, dense to very dense silty sand layers have also been observed at few borehole locations. The description of each layer is presented below.

4.2.1. Fill:

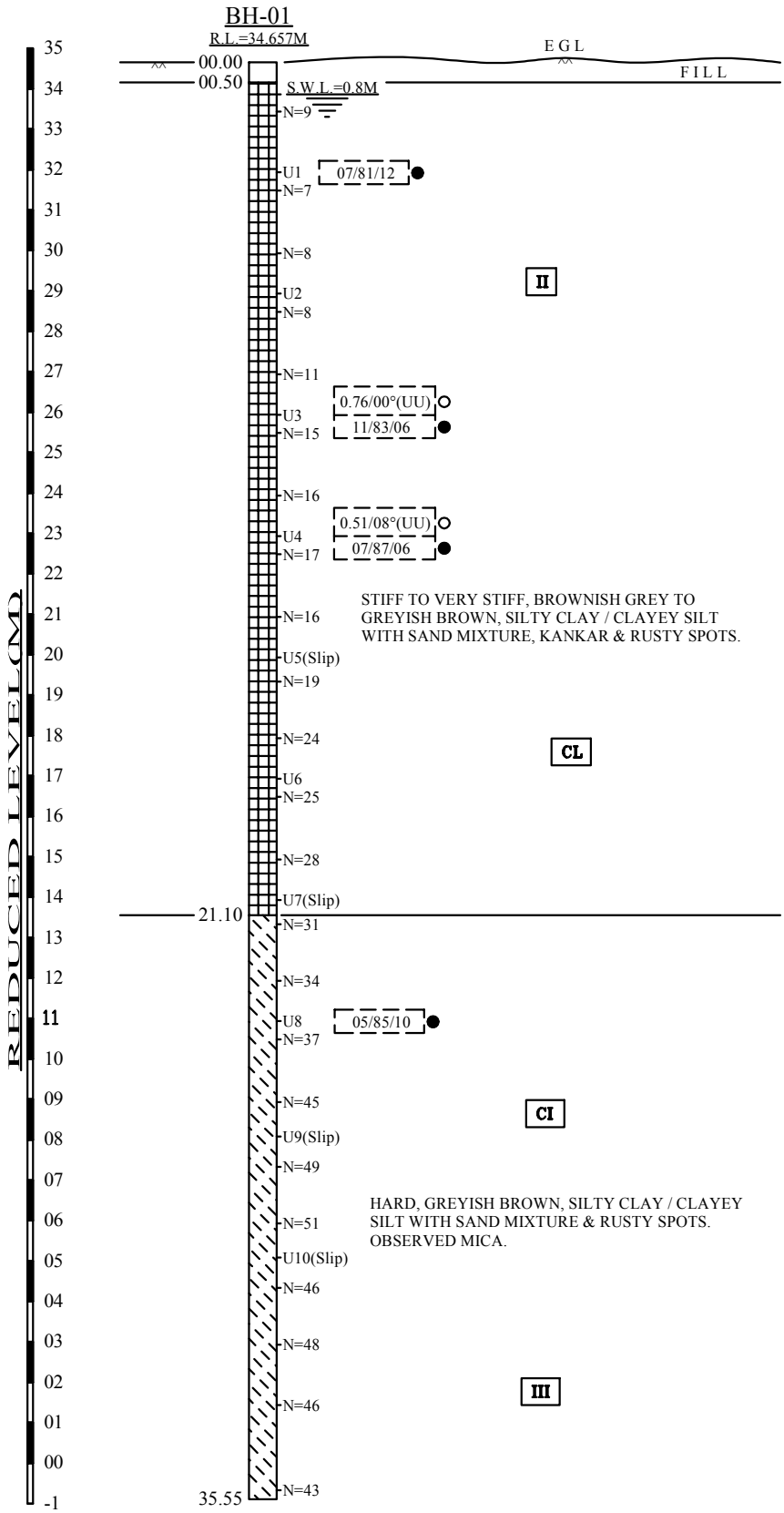
The filled up soil consists of blackish grey, clayey silt with brick bats, boulder pieces, fly ash, kankar, coal pieces etc.

4.2.2. STRATUM - I:

The soil in this layer is characterized by soft to medium brownish grey / deep grey silty clay with rusty spots. Kankar have been observed in this layer. Routine laboratory tests conducted on the "UDS" and “SPT” samples that could be collected from this layer show the following average properties.

Bulk Density, gms/cc	2.01	Specific gravity	2.68
Dry Density, gms/cc	1.63	Void Ratio	0.590
Natural Water Content %	23	Liquid limit %	34
TRSH-UU:		Plastic Limit %	18
Cohesion kg/sqcm	0.35	Shrinkage Limit %	15
Friction angle °	1°	**GRAIN SIZE**	
UNCONFD “C” kg/sqcm	0.33	Sand %	07
REMOULD “C” kg/sqcm	0.24	Silt %	84
Sensitivity	1.38	Clay %	09

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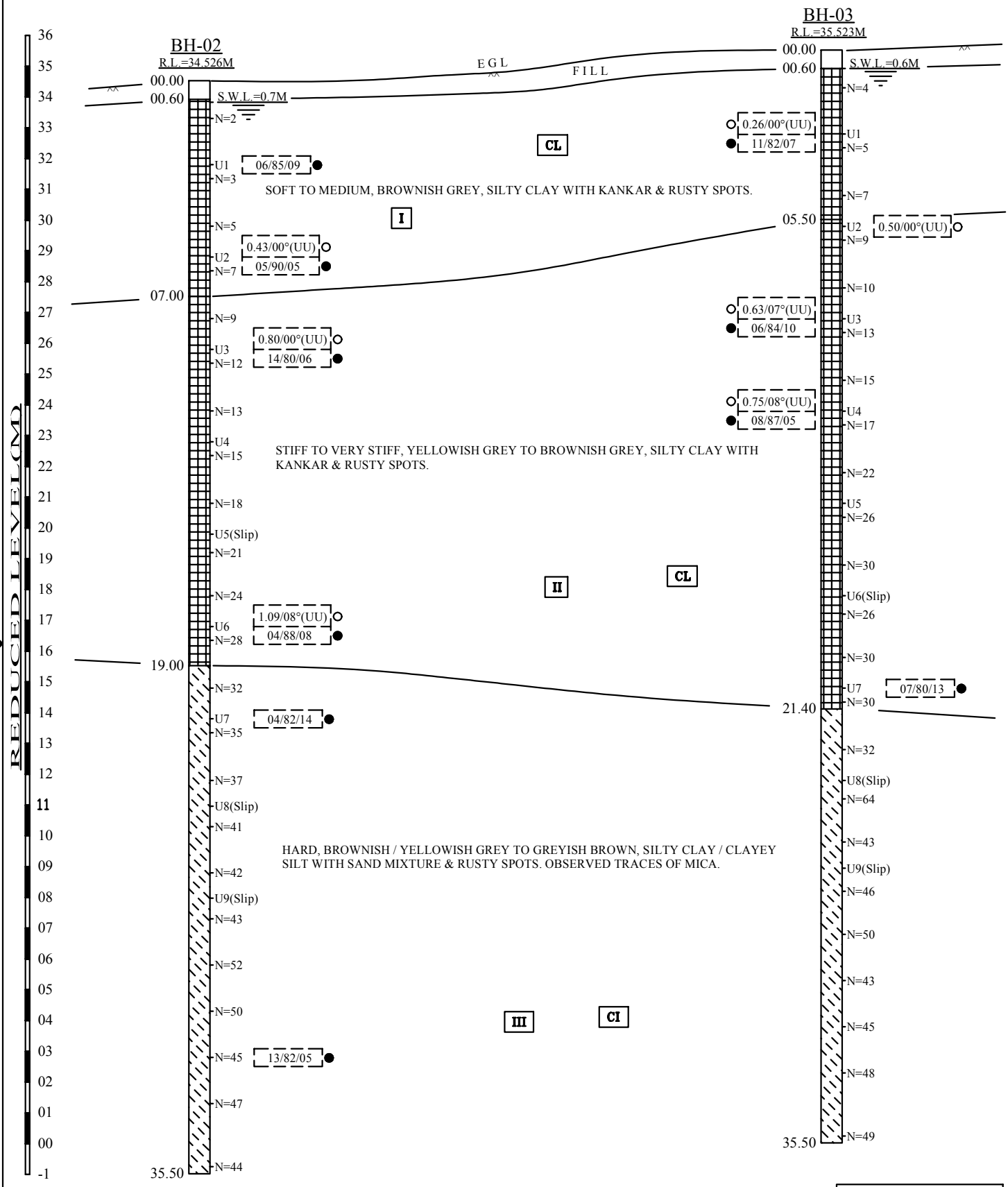
FILL → FILLED UP WITH BLACKISH GREY, CLAYEY SILT, BRICK PCS. & BOULDELR PCS.

U means UDS
N means `N' value
○ C(kg/sqcm) / Ø(°) values
● Sand/Silt/Clay %

(Booster Fan Stage I)

FIG. 2.01 : SUB-SOIL PROFILE

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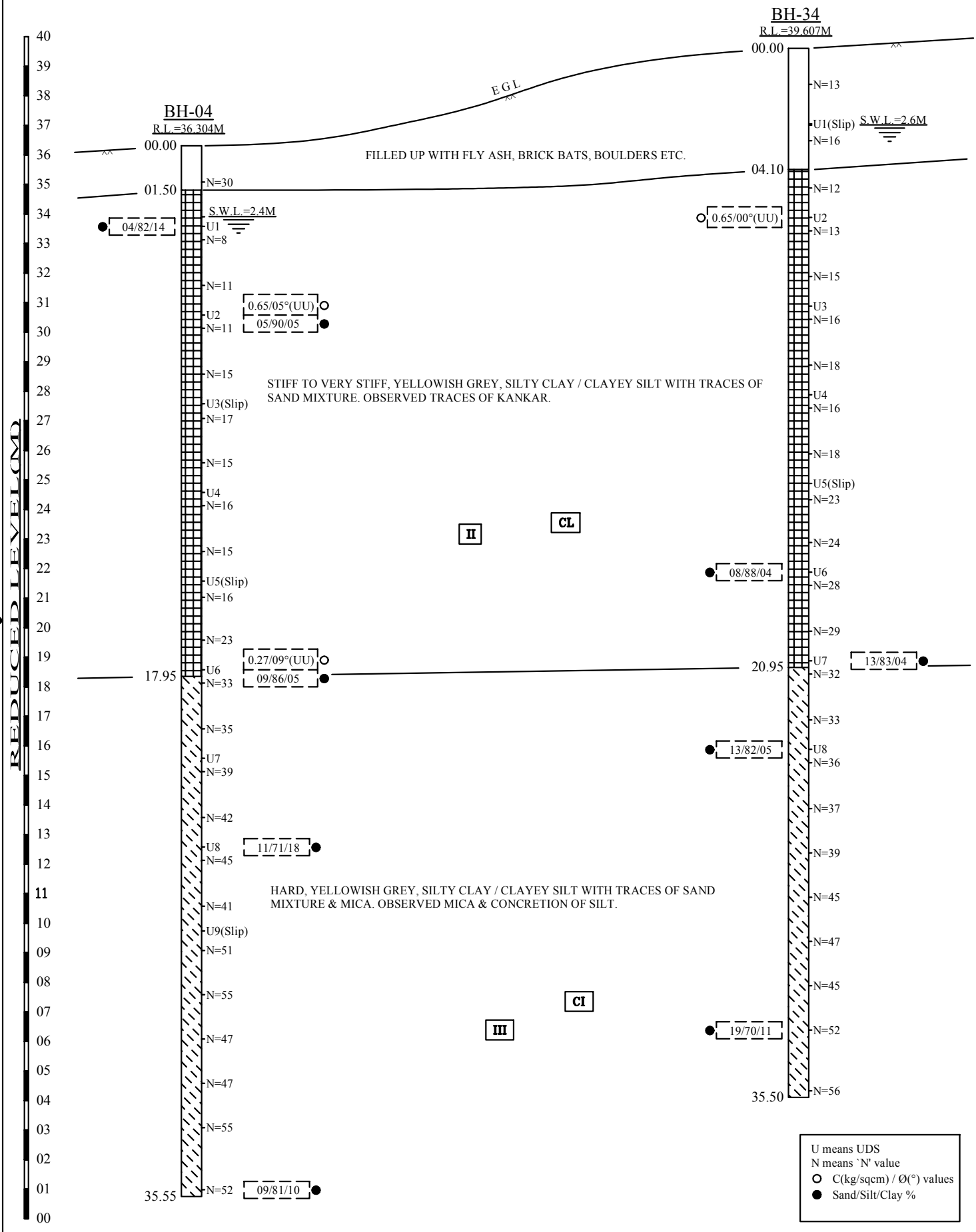


FILL ▶ FILLED UP WITH BLACKISH GREY, CLAYEY SILT, BRICK BATS & BOULDELR PCS.

(--)

FIG. 2.02 : GENERALISED SOIL PROFILE

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(Space for FGD (Lot 3))

FIG. 2.03 : GENERALISED SOIL PROFILE

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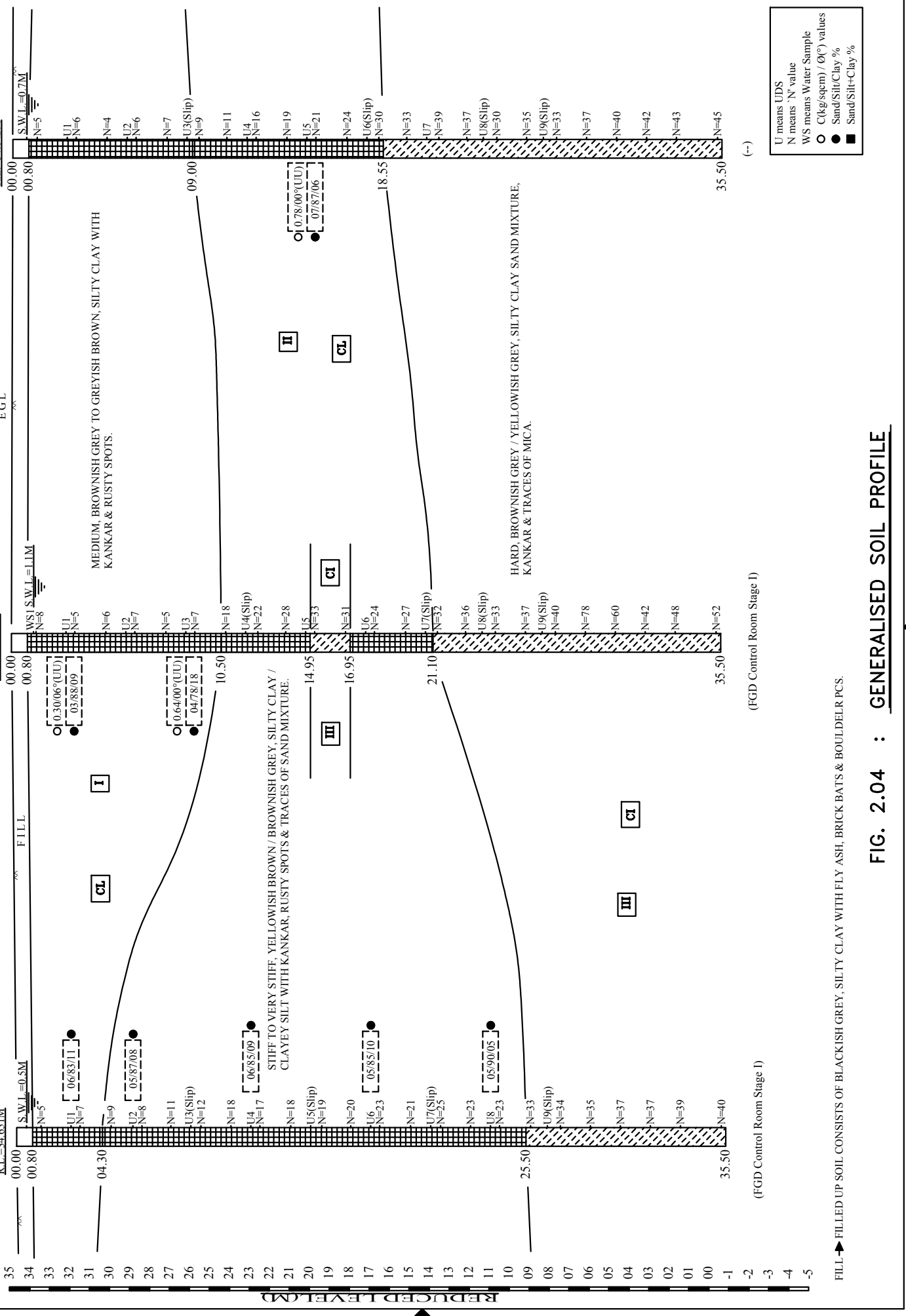


FIG. 2.04 : GENERALISED SOIL PROFILE

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Job No : 4388	Created by : SKD	Created on : 03 / 02 / 2021	Sheet No:	

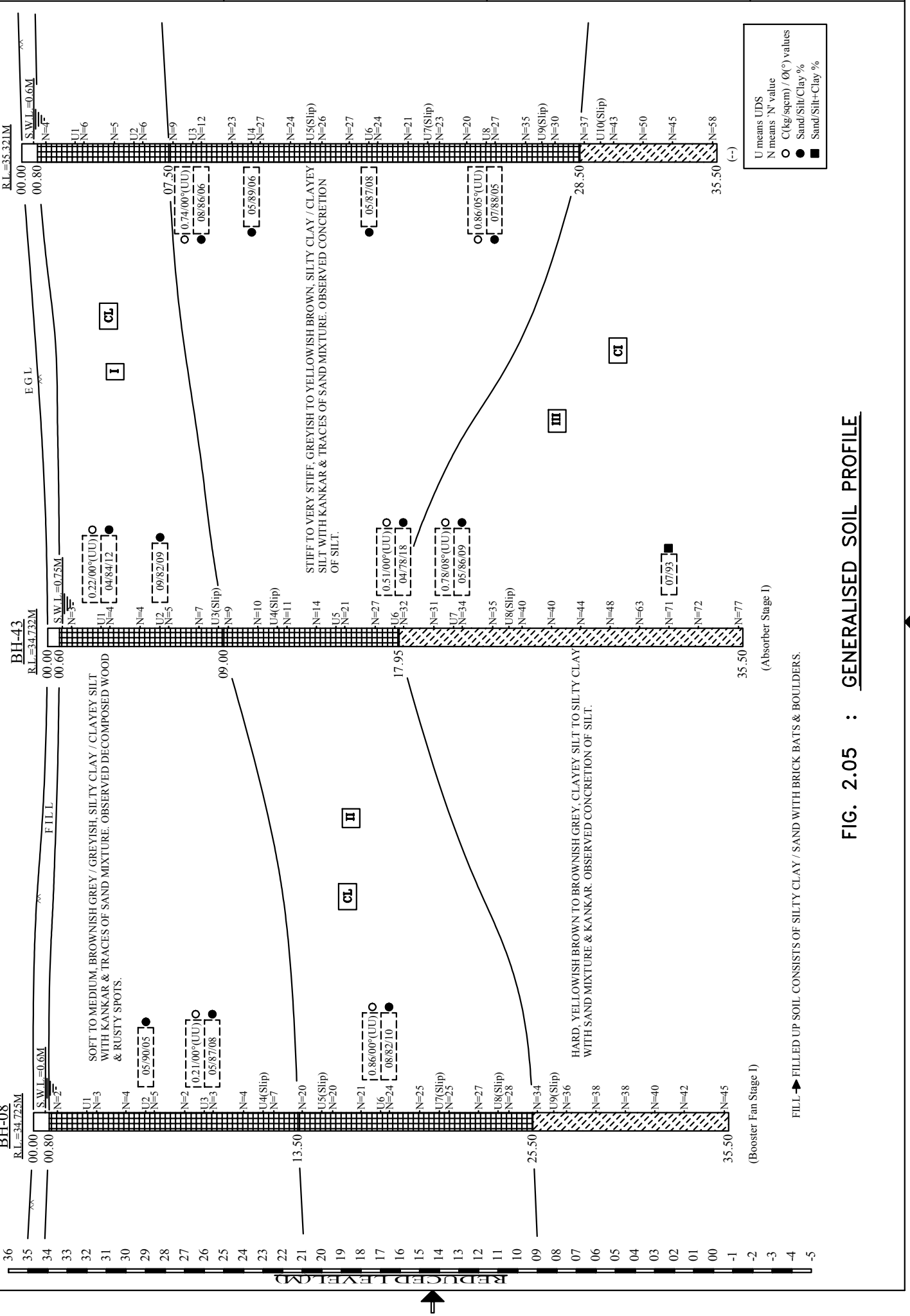


FIG. 2.05 : GENERALISED SOIL PROFILE

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Job No : 4388	Created by : SKD	Created on : 03 / 02 / 2021	Sheet No:

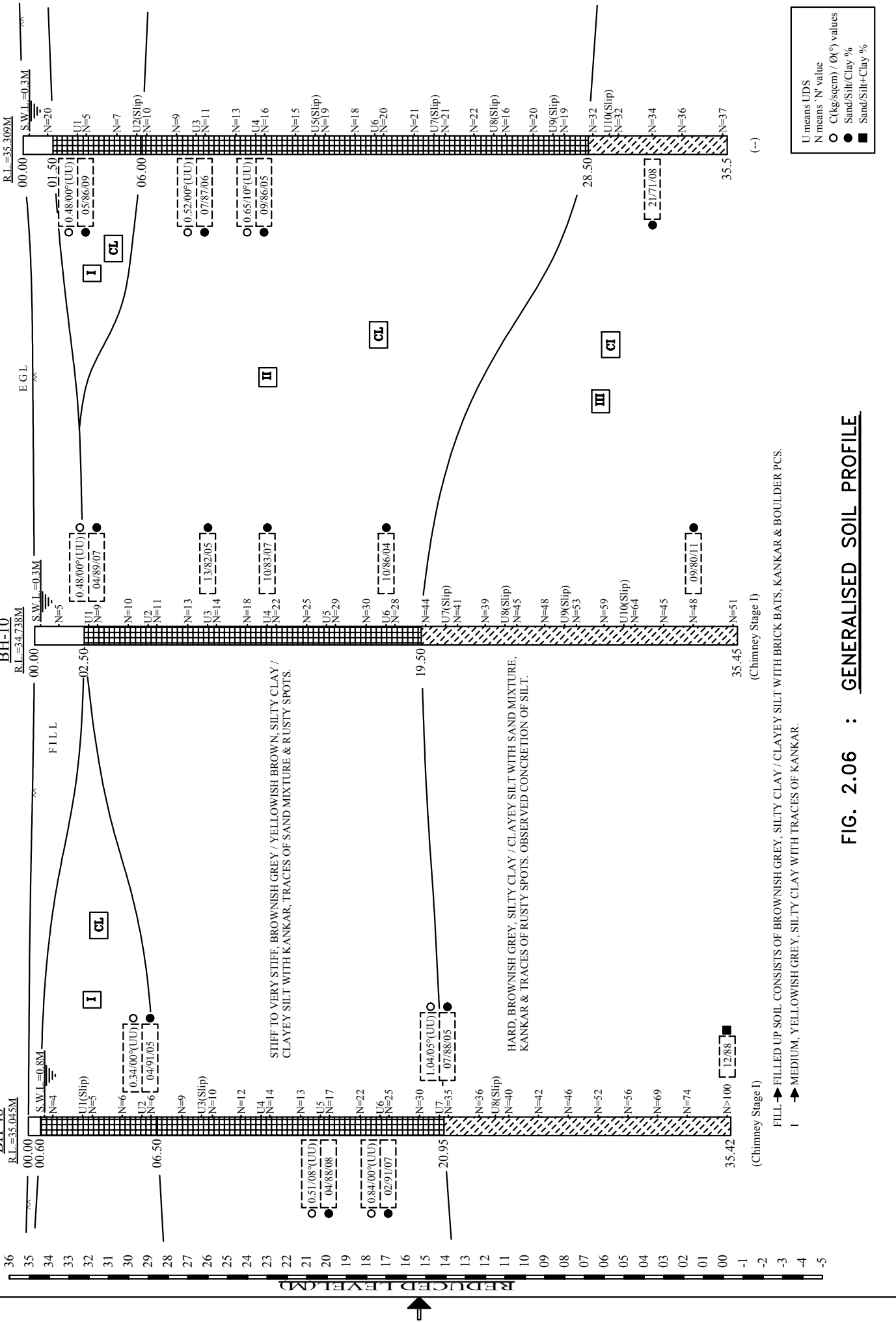


FIG. 2.06 : GENERALISED SOIL PROFILE

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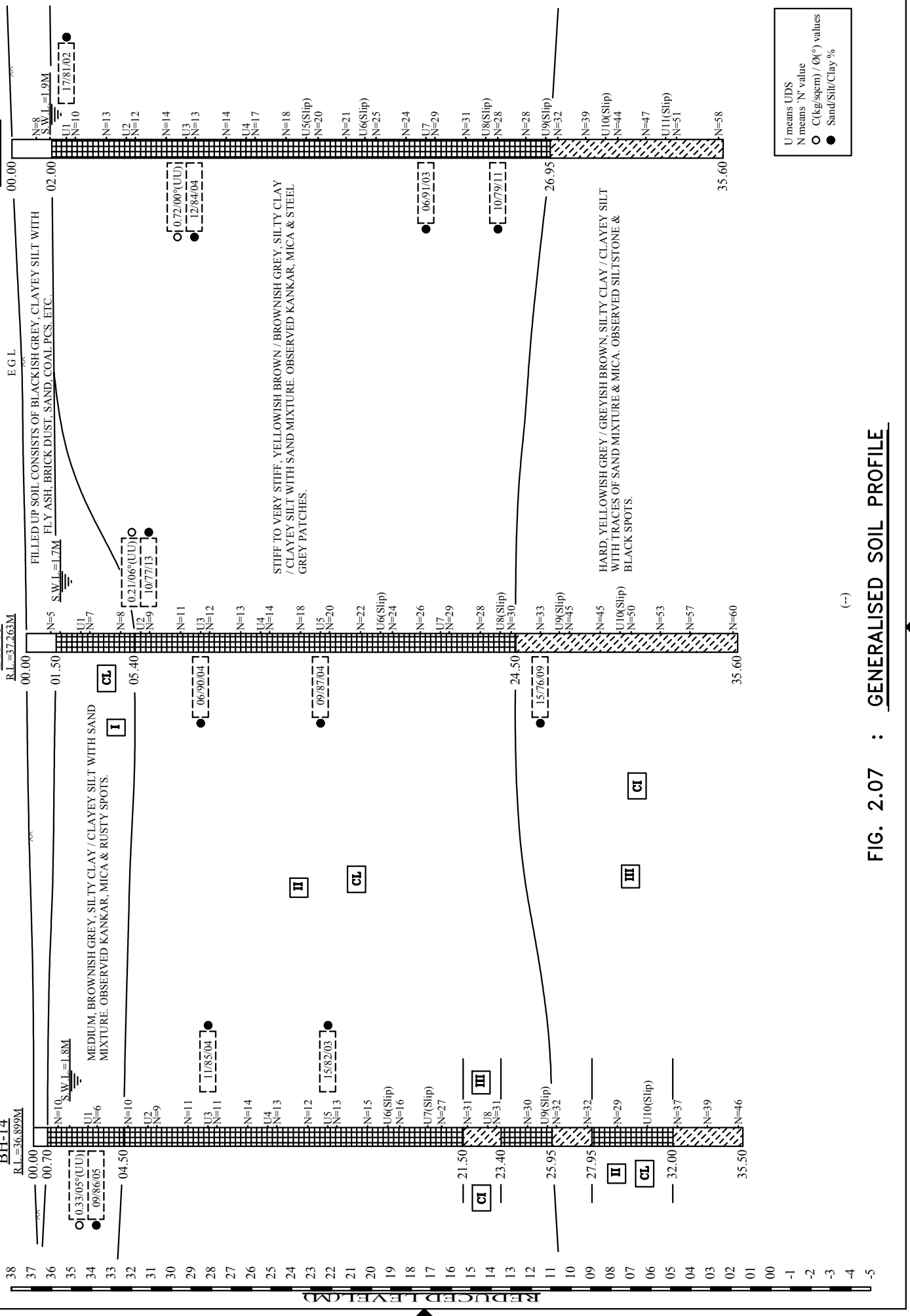


FIG. 2.07 : GENERALISED SOIL PROFILE

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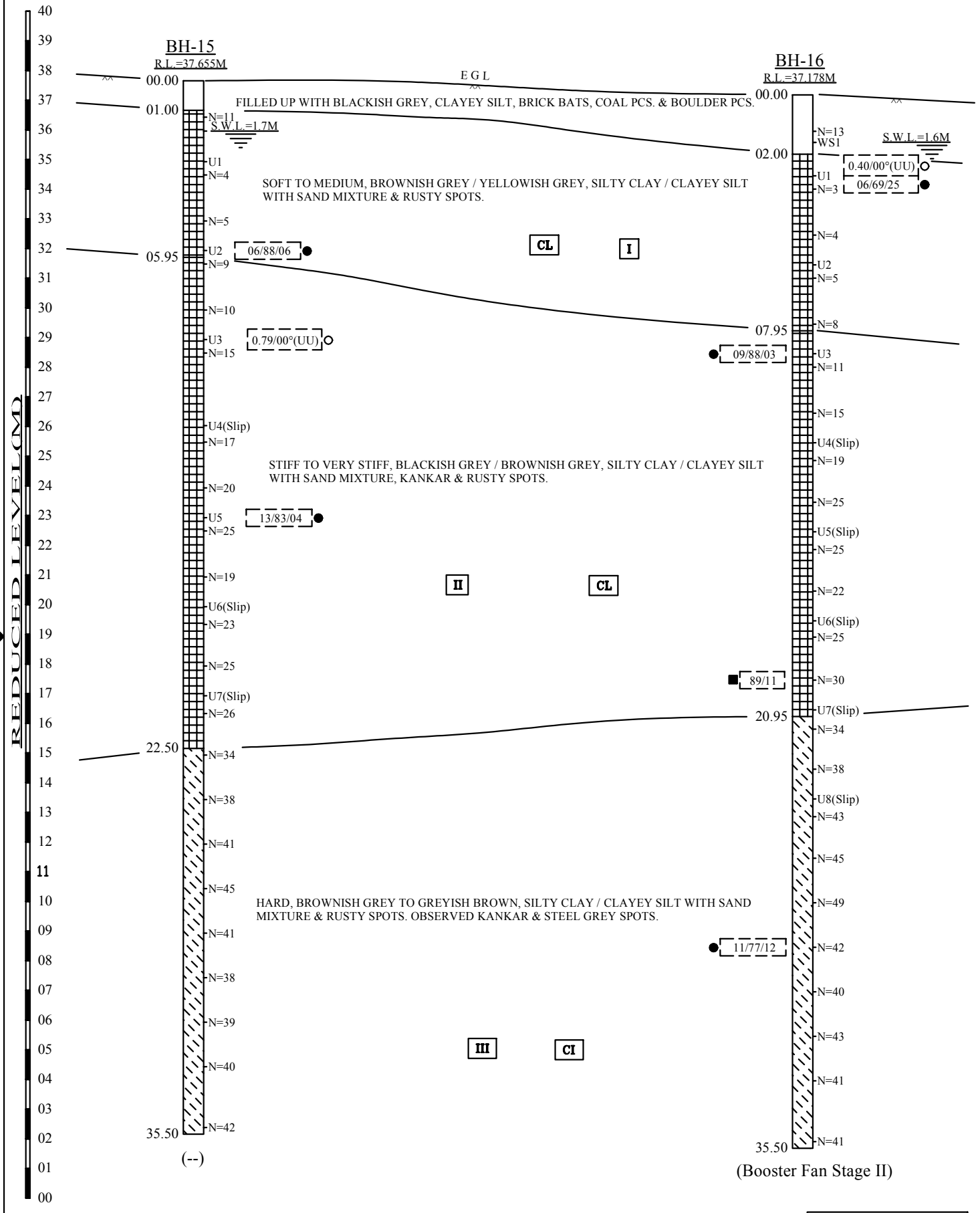
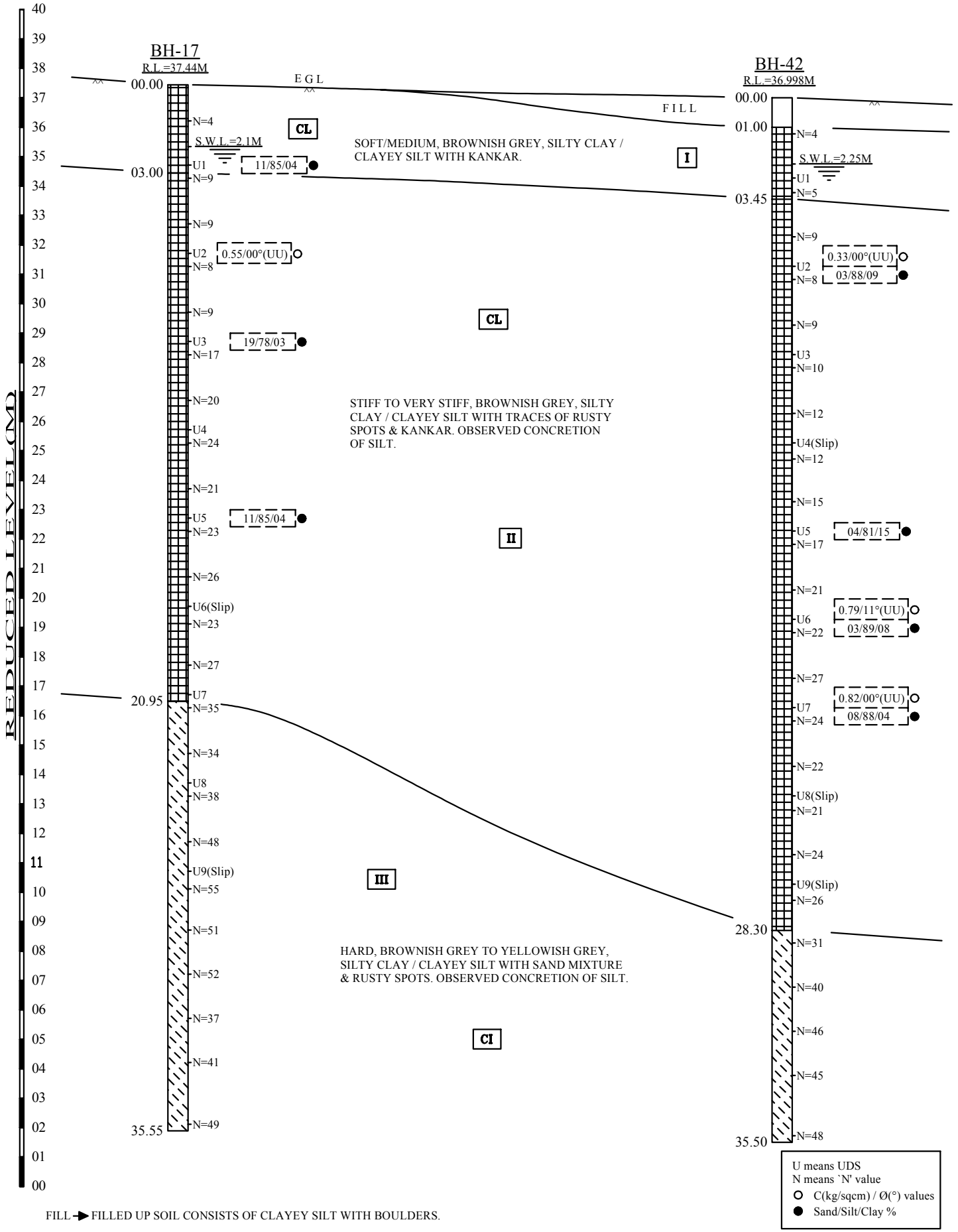


FIG. 2.08 : GENERALISED SOIL PROFILE

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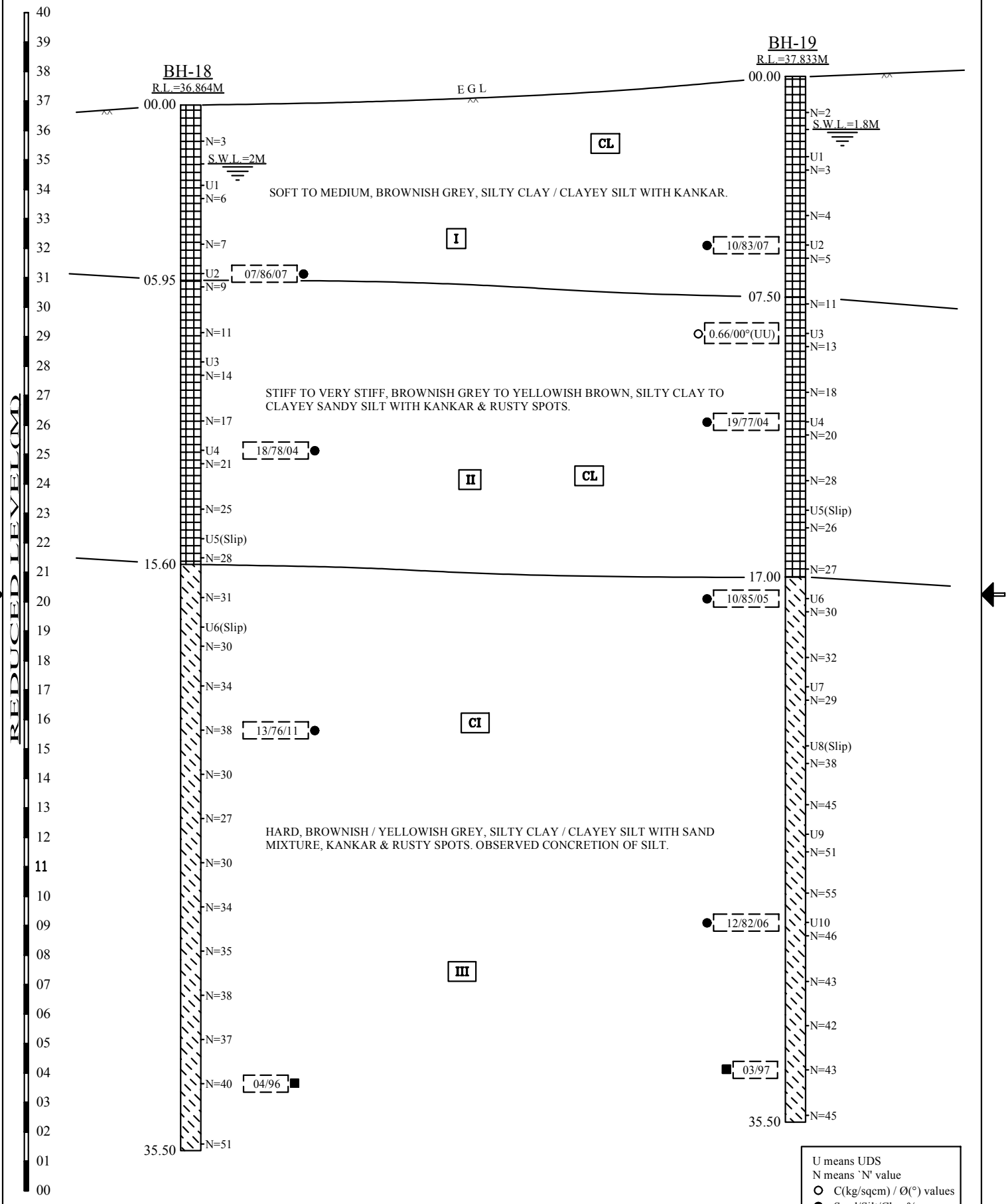


FILL → FILLED UP SOIL CONSISTS OF CLAYEY SILT WITH BOULDERS.

(Absorber Stage II)

FIG. 2.09 : GENERALISED SOIL PROFILE

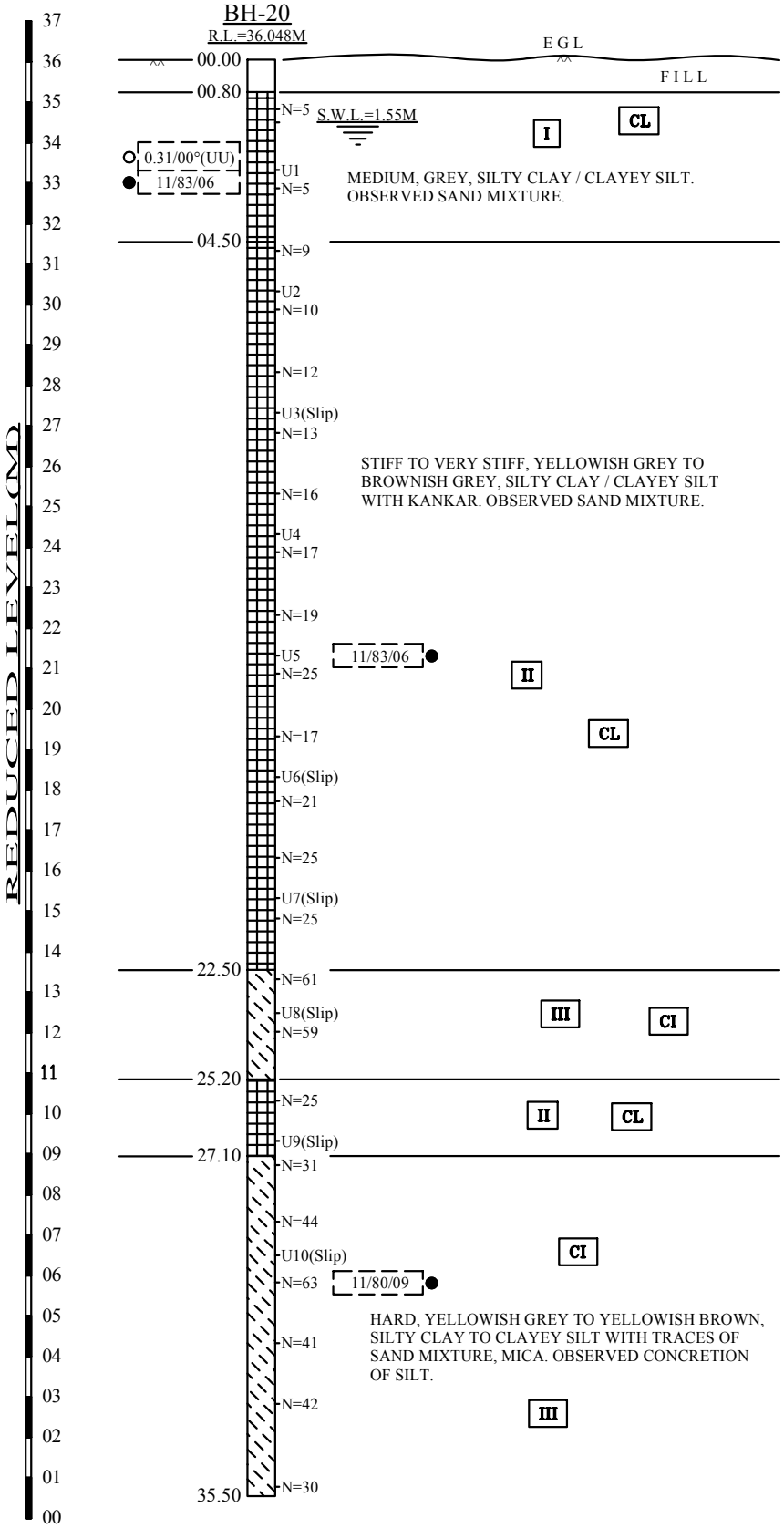
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[Chimney Stage II]

FIG. 2.10 : GENERALISED SOIL PROFILE

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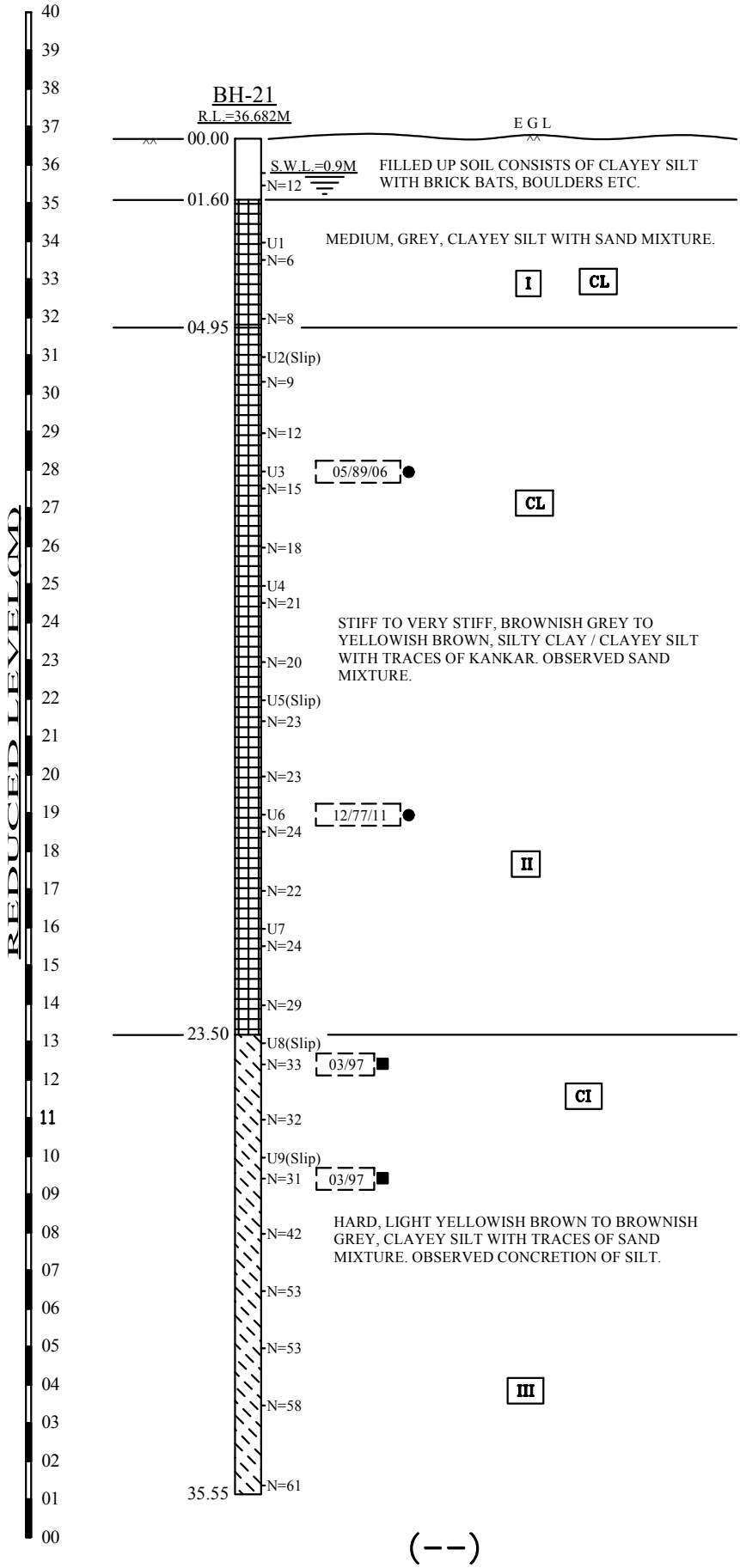
FILL → FILLED UP SOIL CONSISTS OF SILTY CLAY WITH BOULDELRS.

U means UDS
N means `N' value
○ C(kg/sqcm) / Ø(°) values
● Sand/Silt/Clay %

(Compressor House)

FIG. 2.11 : SUB-SOIL PROFILE

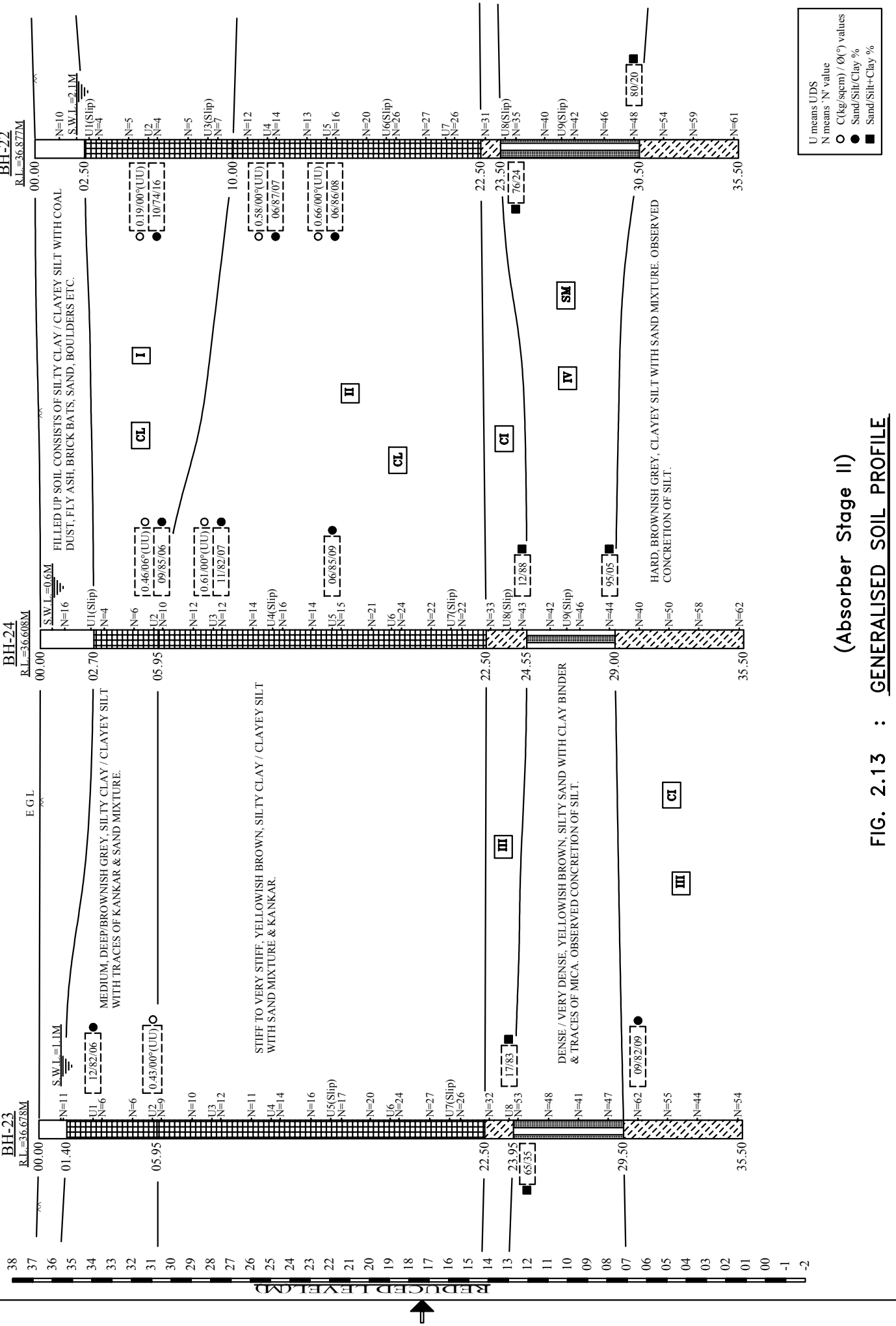
Project :	Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
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FIG. 2.12 : SUB-SOIL PROFILE

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(Absorber Stage II)

FIG. 2.13 : GENERALISED SOIL PROFILE

Project :	Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 22 / 12 / 2020	Sheet No:	

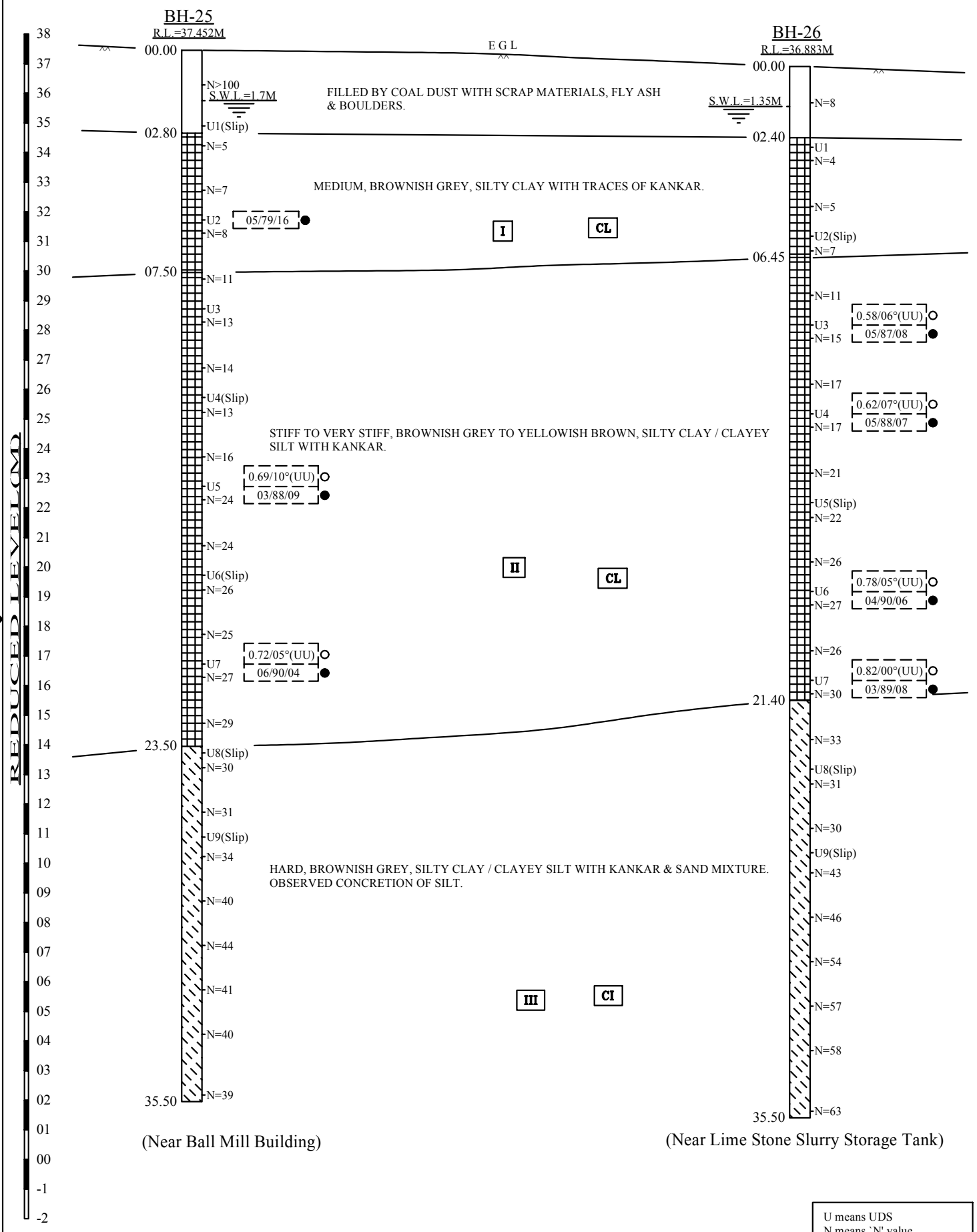


FIG. 2.14 : GENERALISED SOIL PROFILE

Project :	Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar					CETEST
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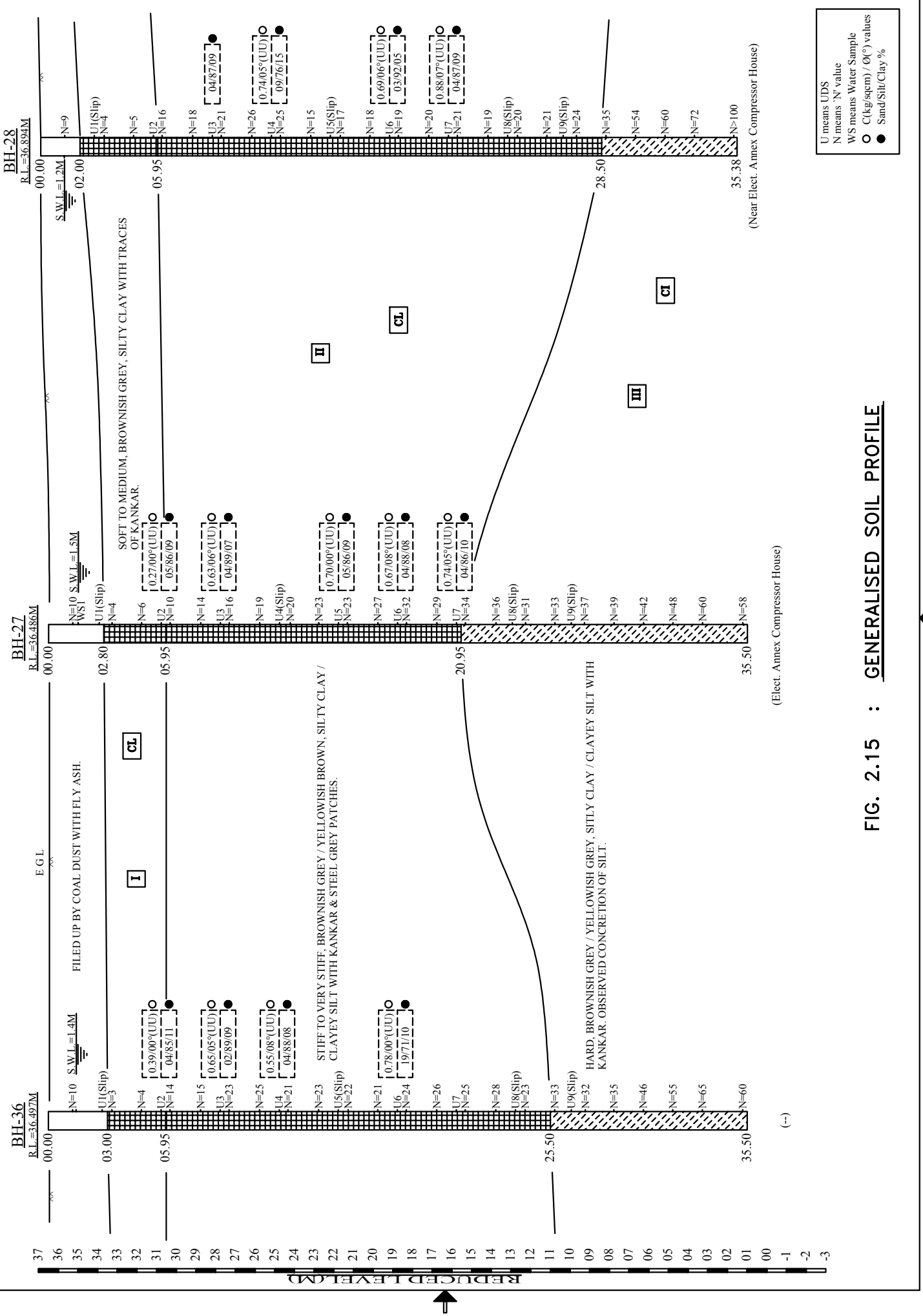


FIG. 2.15 : GENERALISED SOIL PROFILE

Project :	Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
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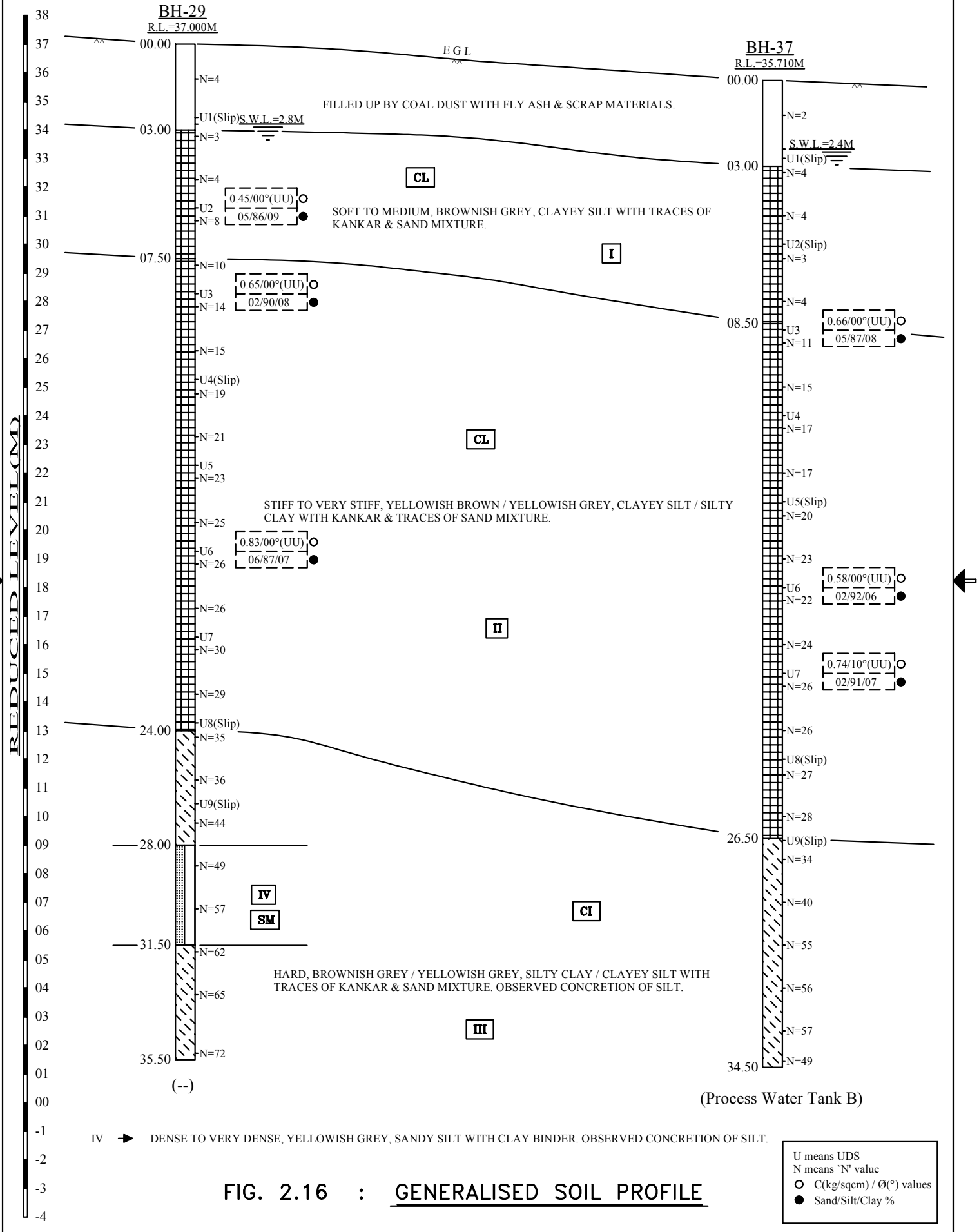


FIG. 2.16 : GENERALISED SOIL PROFILE

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Job No : 4388	Created by : SKD	Created on : 03 / 02 / 2021	Sheet No:	

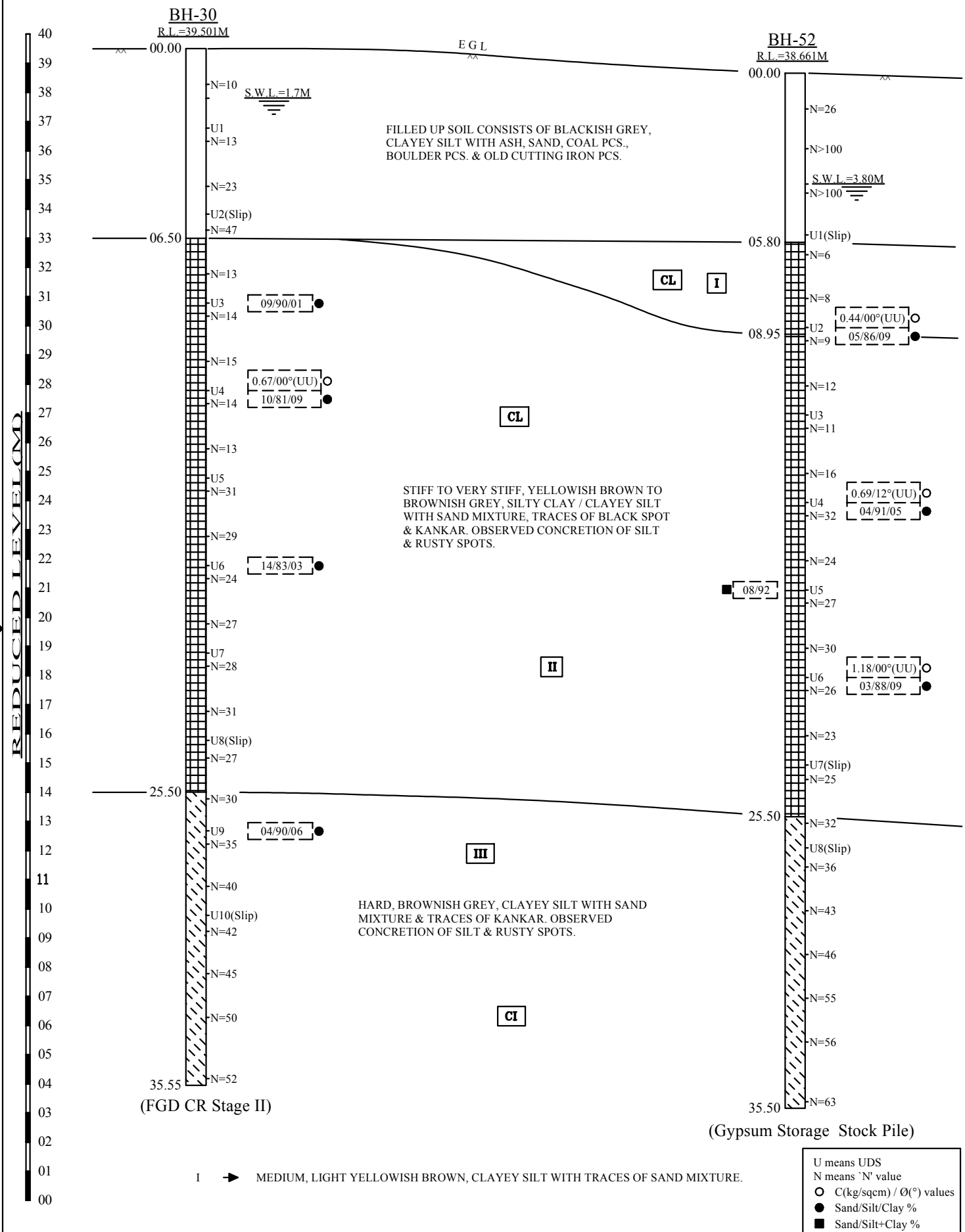
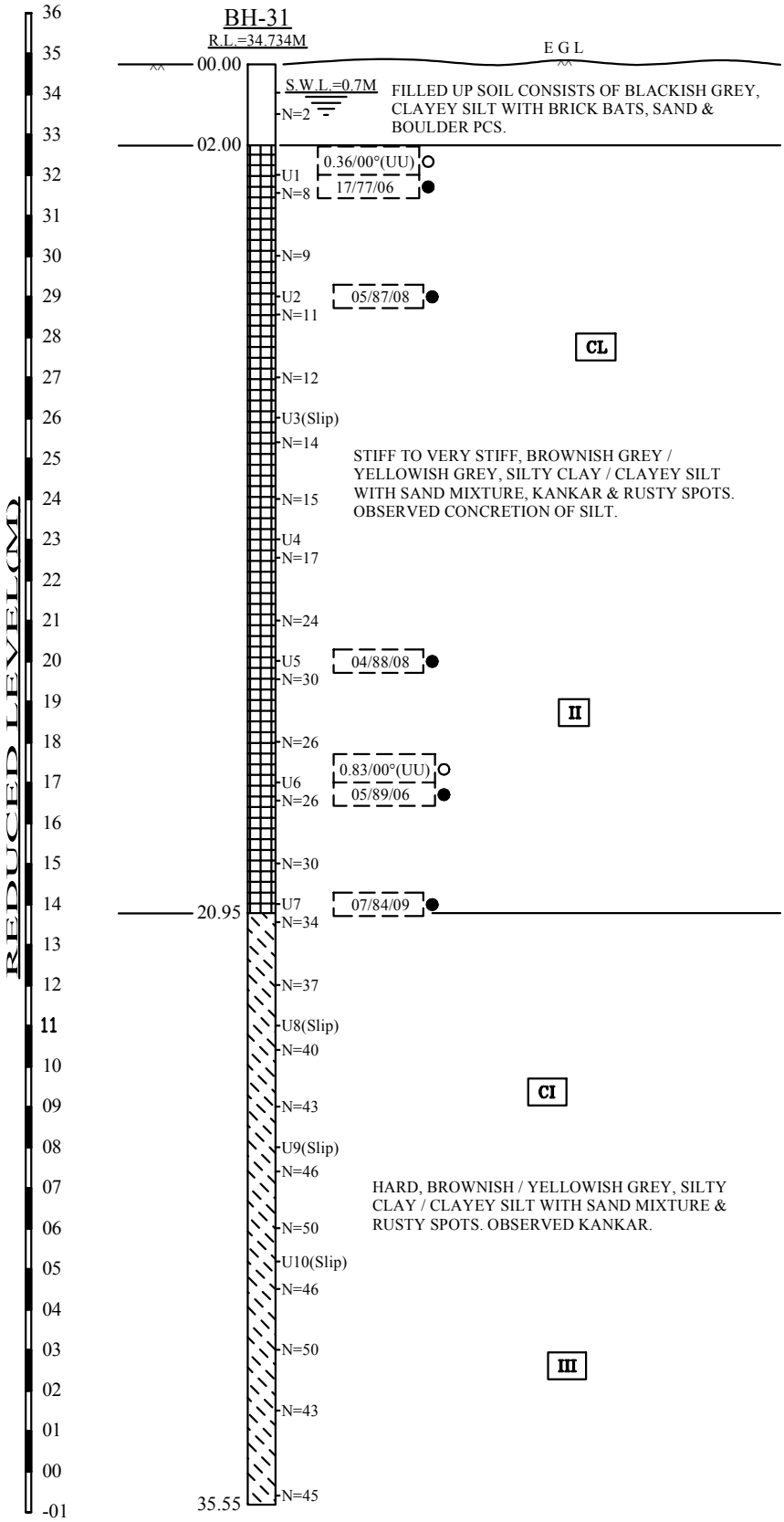


FIG. 2.17 : GENERALISED SOIL PROFILE

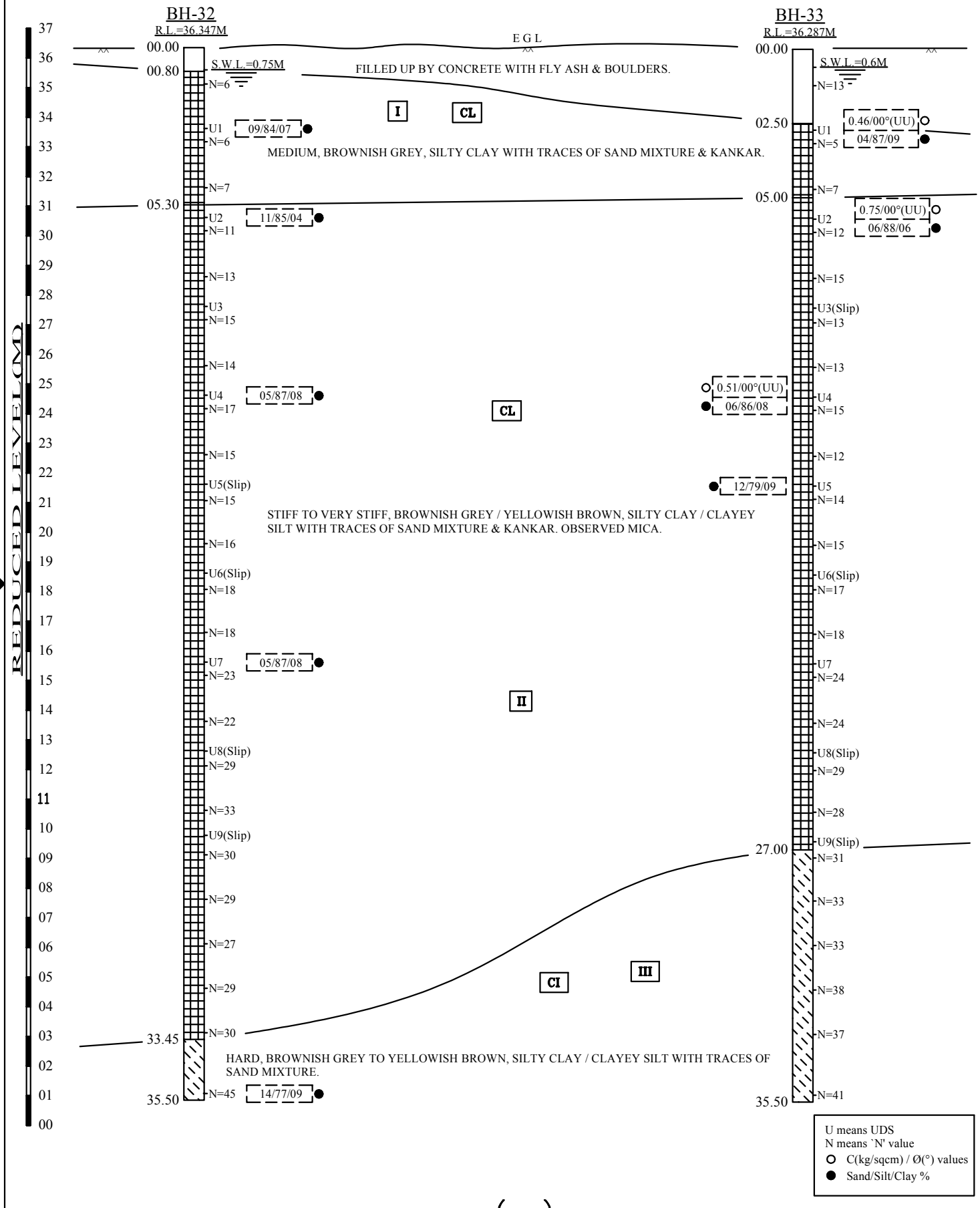
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Job No : 4388	Created by : SKD	Created on : 08 / 12 / 2020	Sheet No:	



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FIG. 2.18 : SUB-SOIL PROFILE

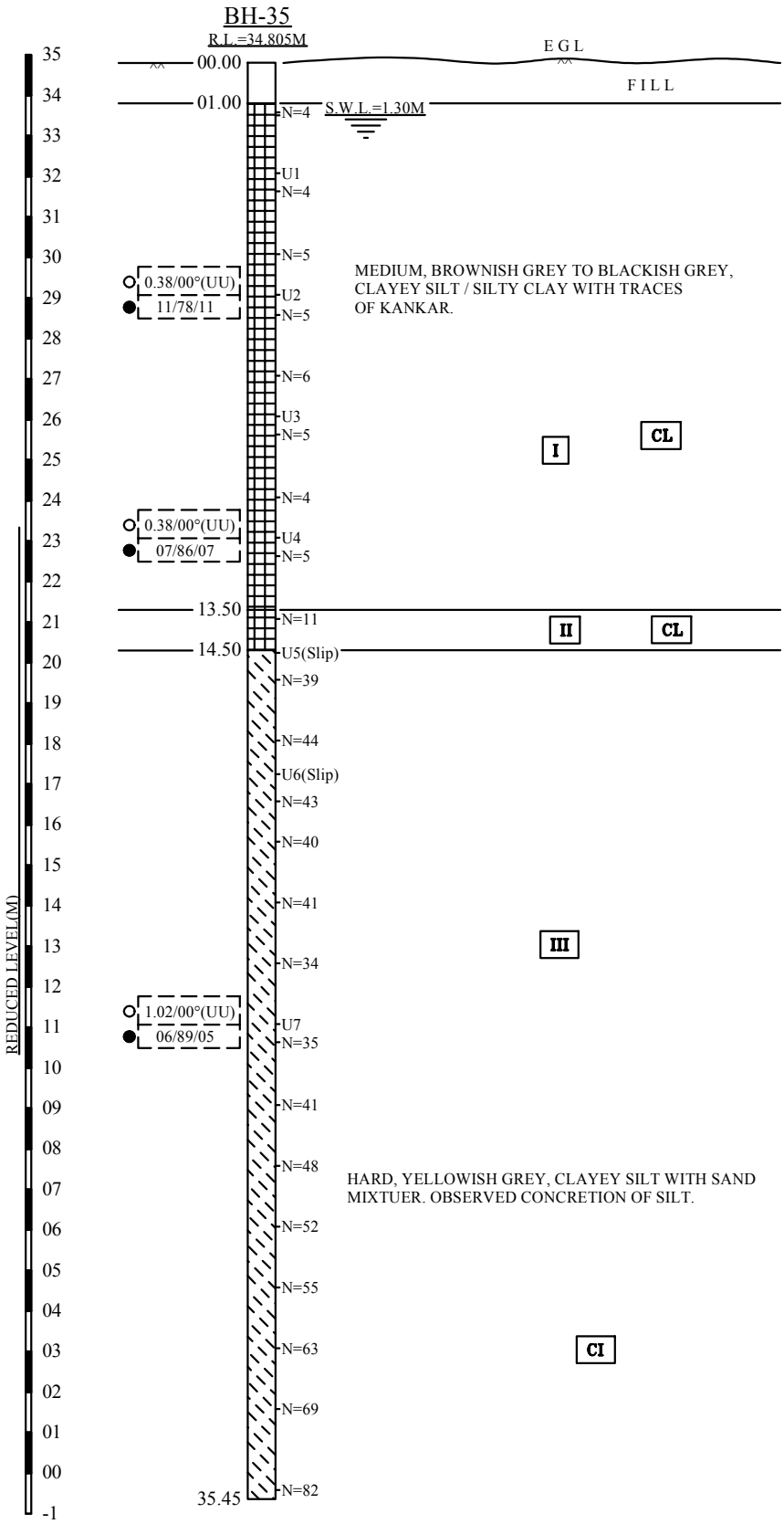
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Job No : 4388	Created by : SKD	Created on : 08 / 12 / 2020	Sheet No:



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FIG. 2.19 : GENERALISED SOIL PROFILE

Project :	Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar					CETEST
Job No :	4388	Created by :	SKD	Created on :	22 / 12 / 2020	Sheet No:



FILL → FILLED UP SOIL CONSISTS OF CLAYEY SILT WITH ASH & BOULDERS.

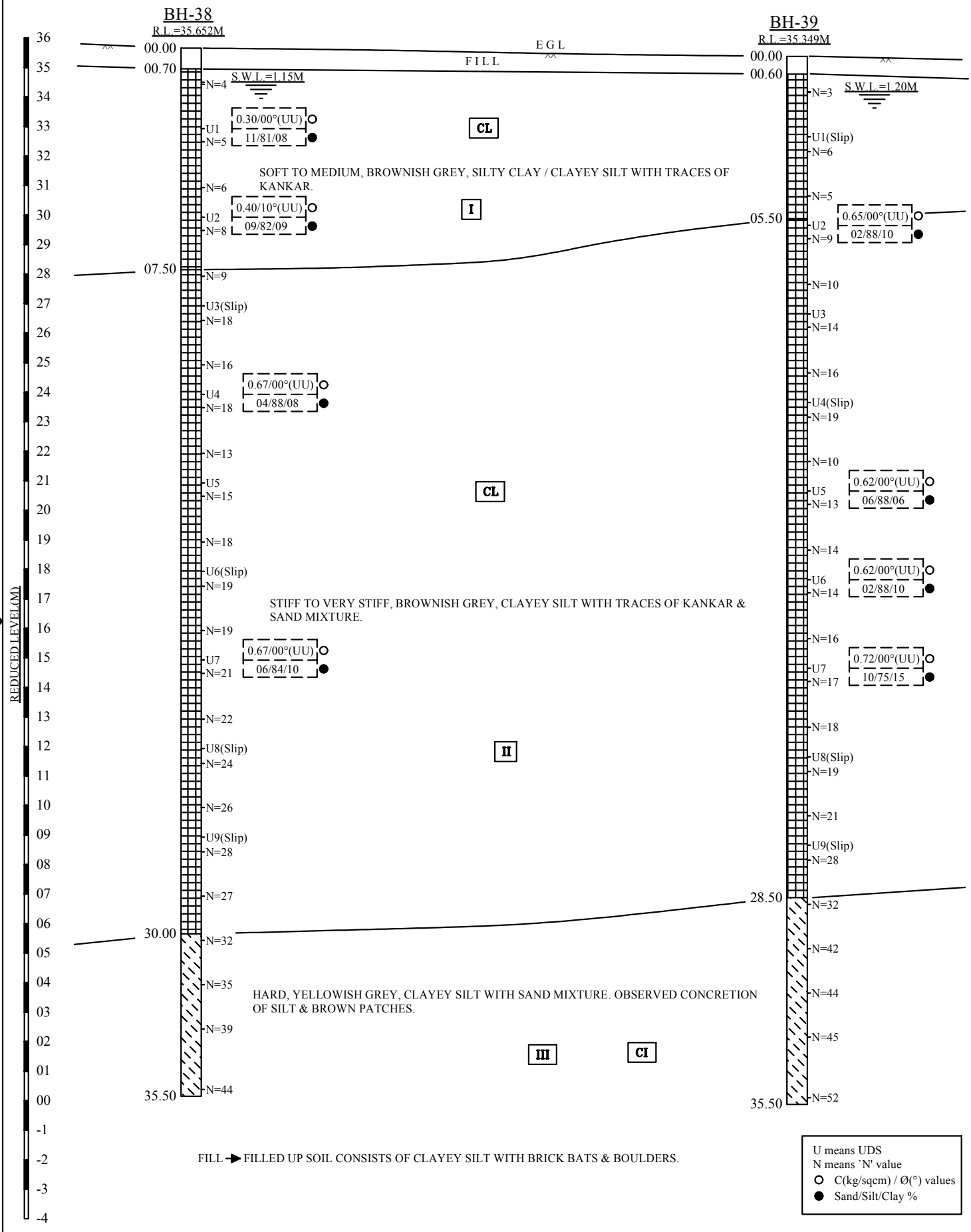
II → STIFF, BLACKISH GREY, CLAYEY SILT / SILTY CLAY. OBSERVED KANKAR.

U means UDS
N means `N' value
O C(kg/sqcm) / Ø(°) values
● Sand/Silt/Clay %

(Space for SWGR)

FIG. 2.20 : SUB-SOIL PROFILE

Project :	Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 04 / 02 / 2021	Sheet No:	



(Chimney Stage II)

FIG. 2.21 : GENERALISED SOIL PROFILE

Project :	Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 04 / 02 / 2021	Sheet No:	

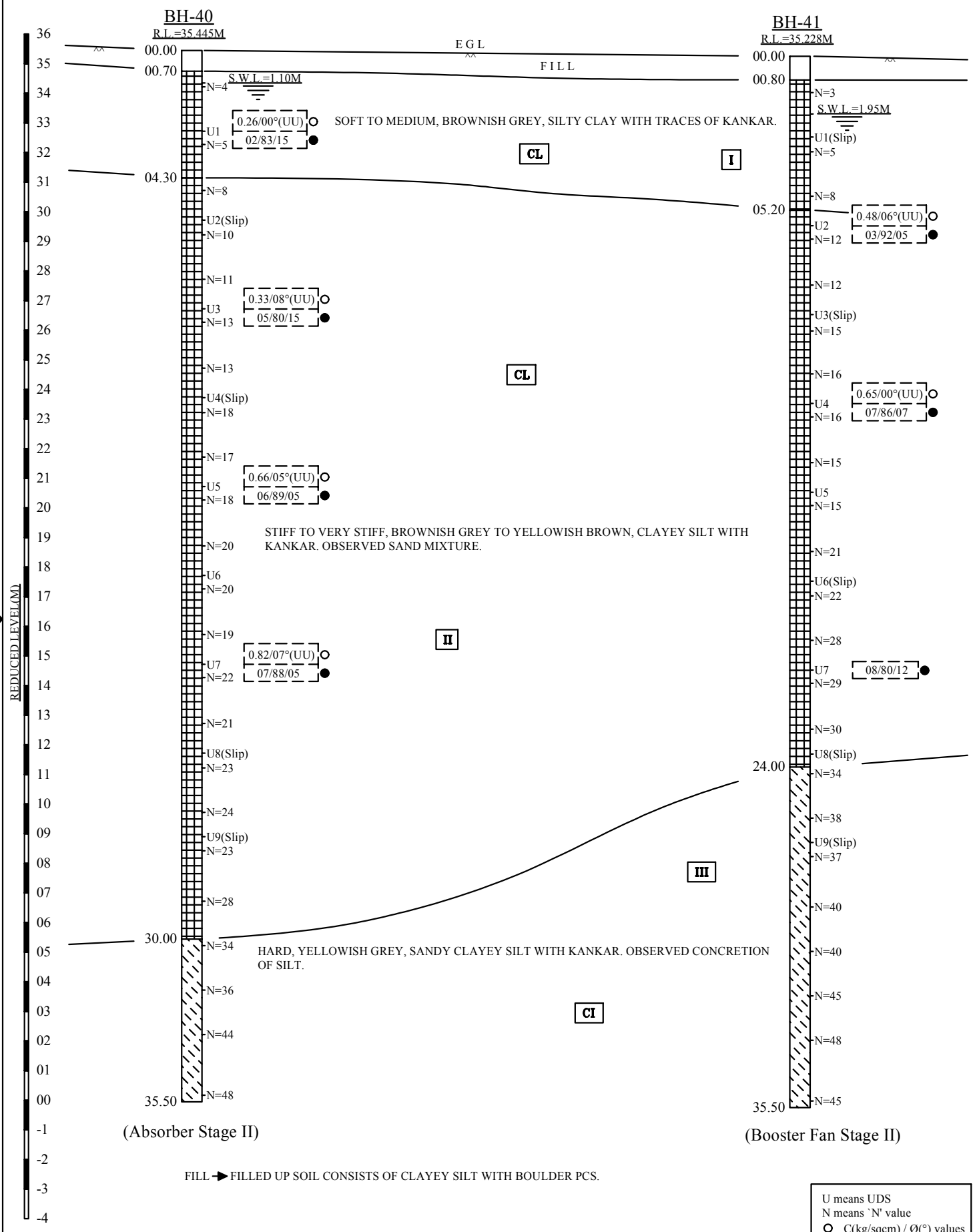
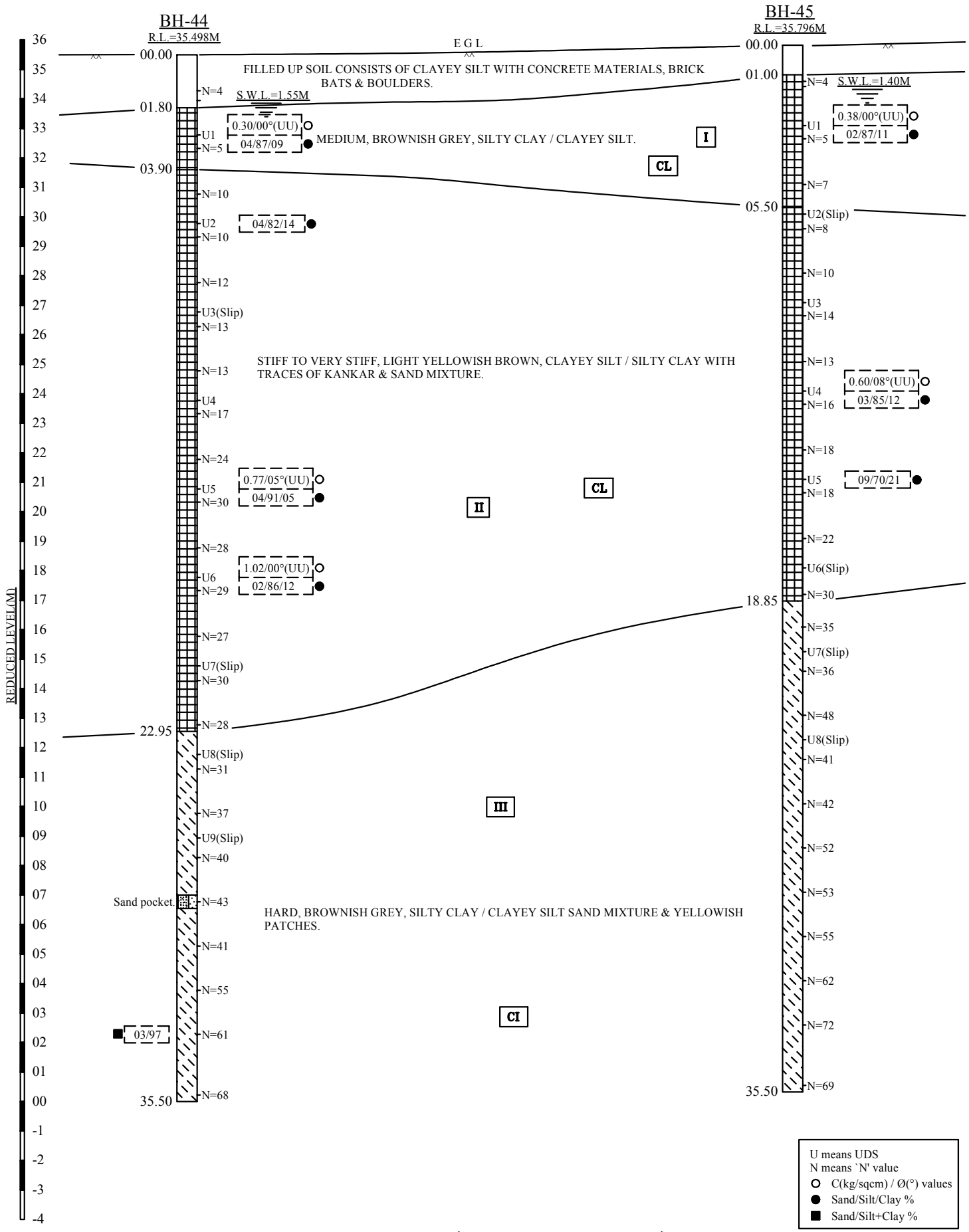


FIG. 2.22 : GENERALISED SOIL PROFILE

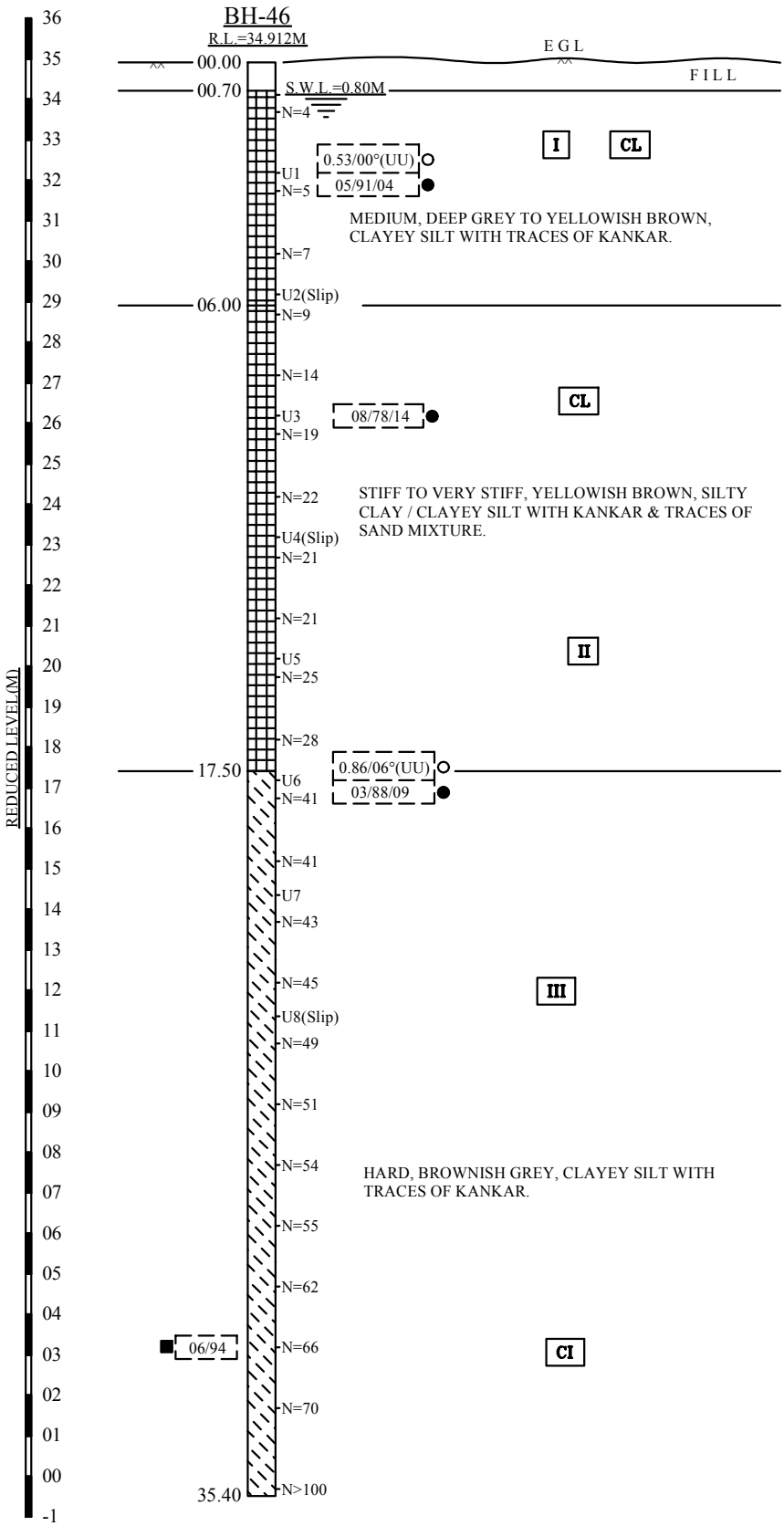
Project :	Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 04 / 02 / 2021	Sheet No:	



(Chimney Stage I)

FIG. 2.23 : GENERALISED SOIL PROFILE

Project :	Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 04 / 02 / 2021	Sheet No:	



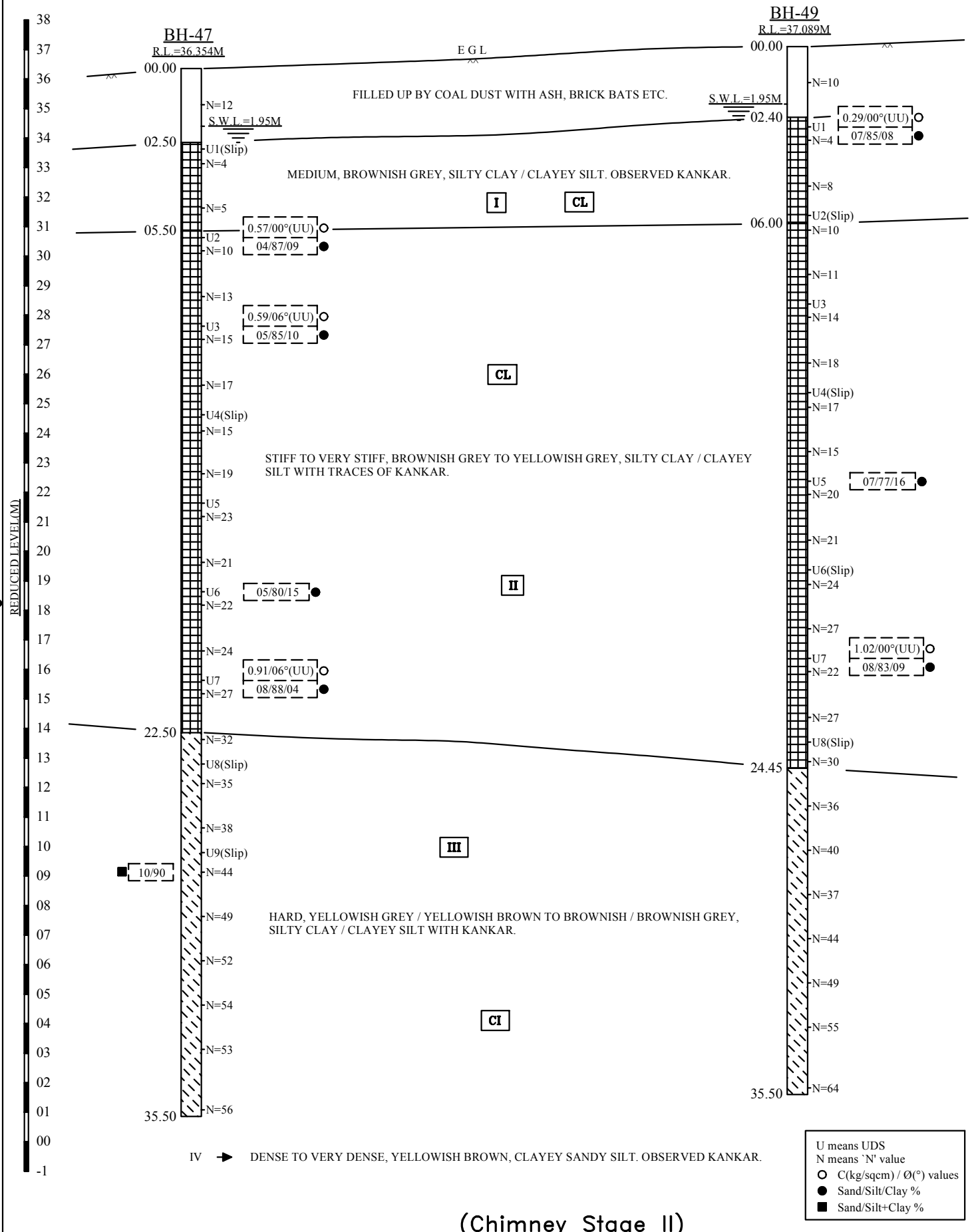
U means UDS
N means `N' value
○ C(kg/sqcm) / Ø(°) values
● Sand/Silt/Clay %
■ Sand/Silt+Clay %

FILL → FILLED UP SOIL CONSISTS OF SILTY CLAY WITH BRICK BATS & BOULDELR PCS.

(Absorber Stage I)

FIG. 2.24 : SUB-SOIL PROFILE

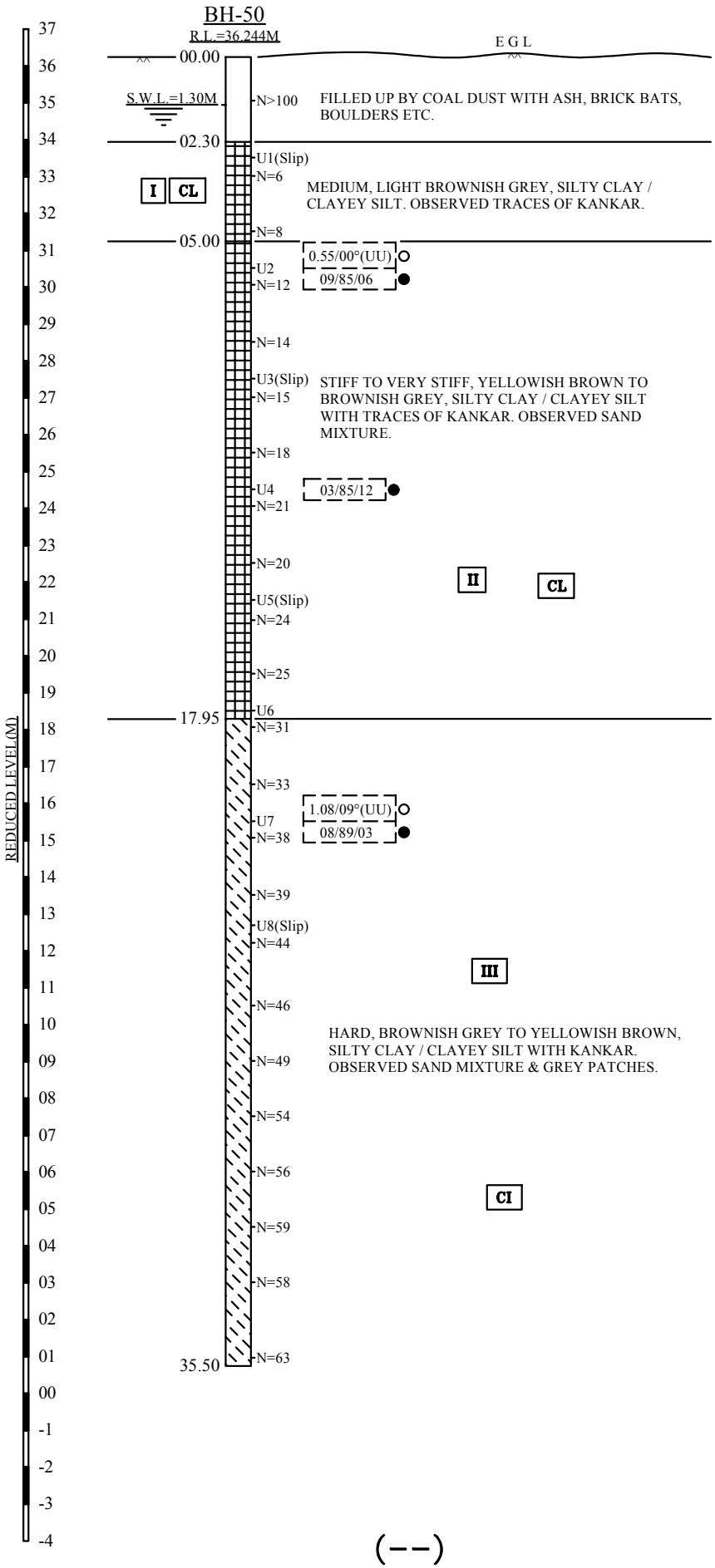
Project :	Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 04 / 02 / 2021	Sheet No:	



(Chimney Stage II)

FIG. 2.25 : GENERALISED SOIL PROFILE

Project :	Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 04 / 02 / 2021	Sheet No:	



(--)

FIG. 2.26 : SUB-SOIL PROFILE

Project :	Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 04 / 02 / 2021	Sheet No:	

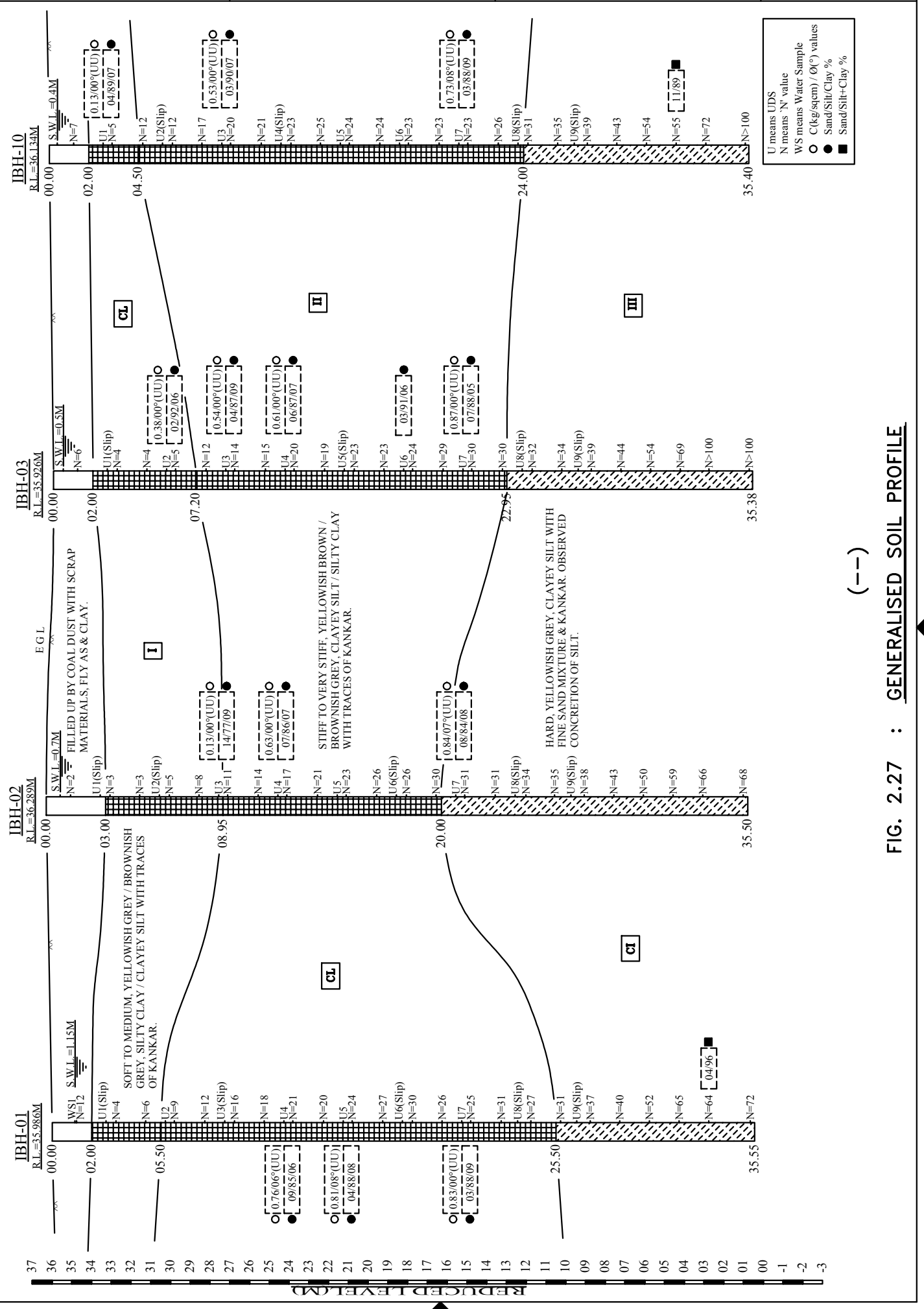
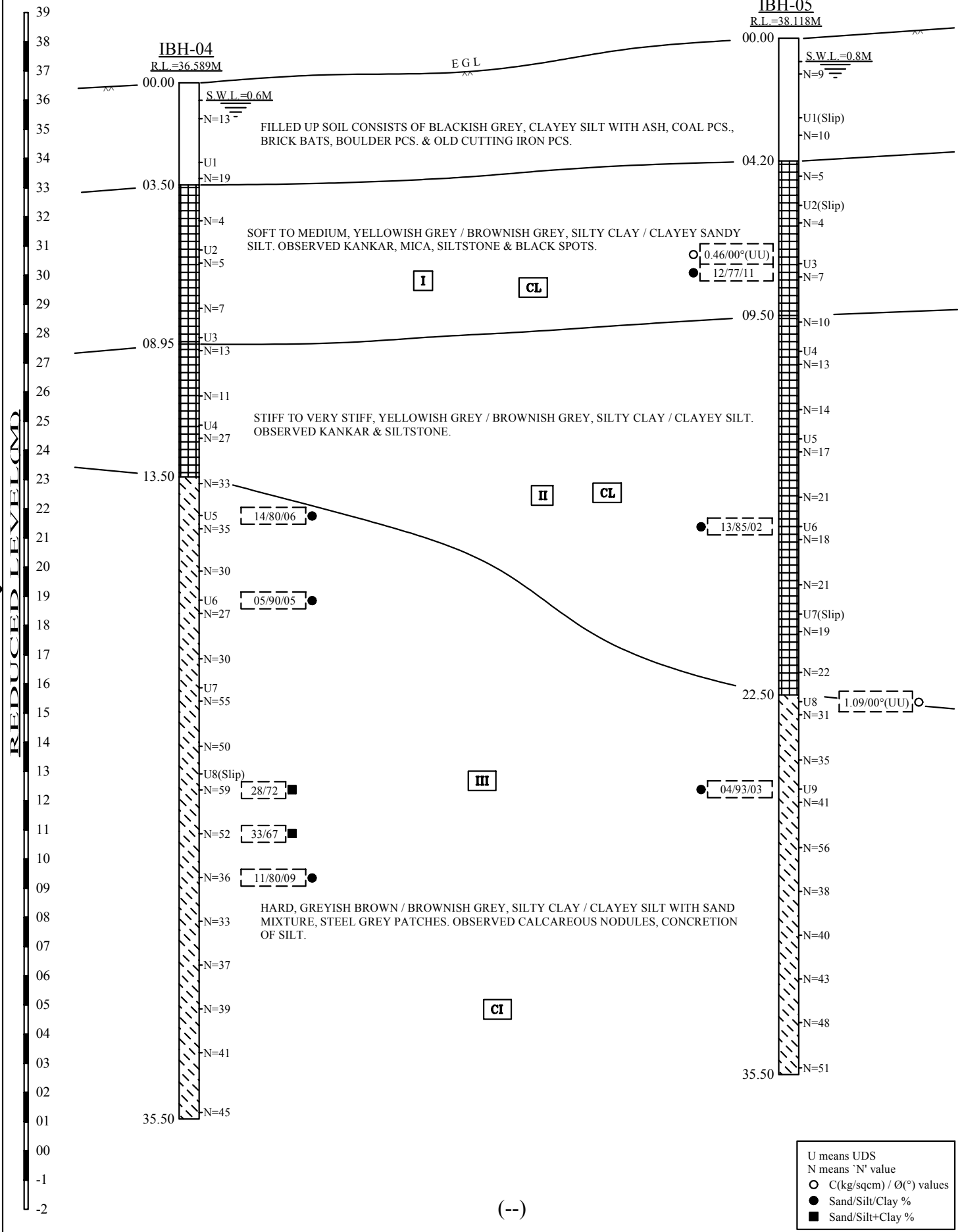


FIG. 2.27 : GENERALISED SOIL PROFILE

(--)

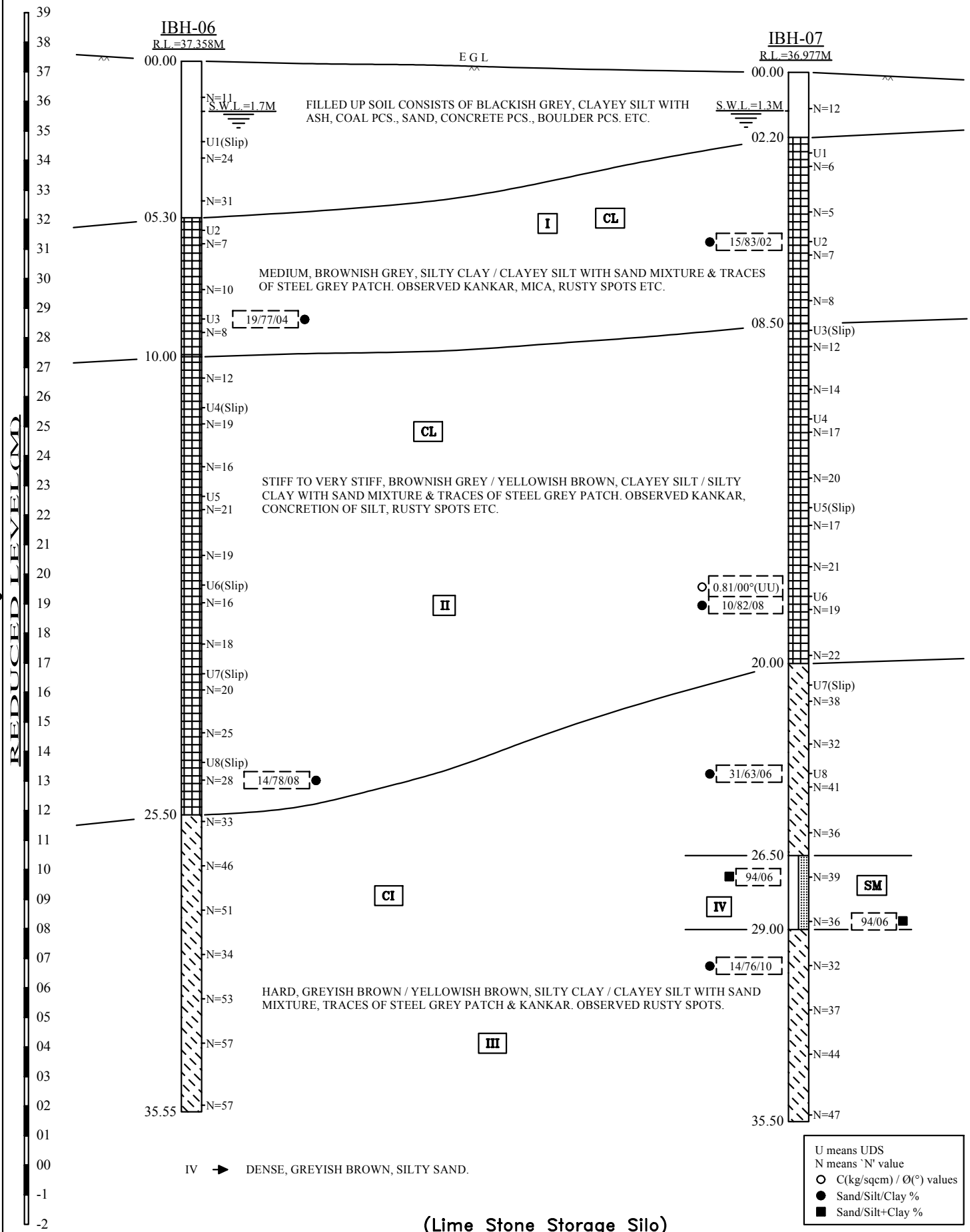
Project :	Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar		
Job No : 4388	Created by : SKD	Created on : 09 / 12 / 2020	Sheet No:



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FIG. 2.28 : GENERALISED SOIL PROFILE

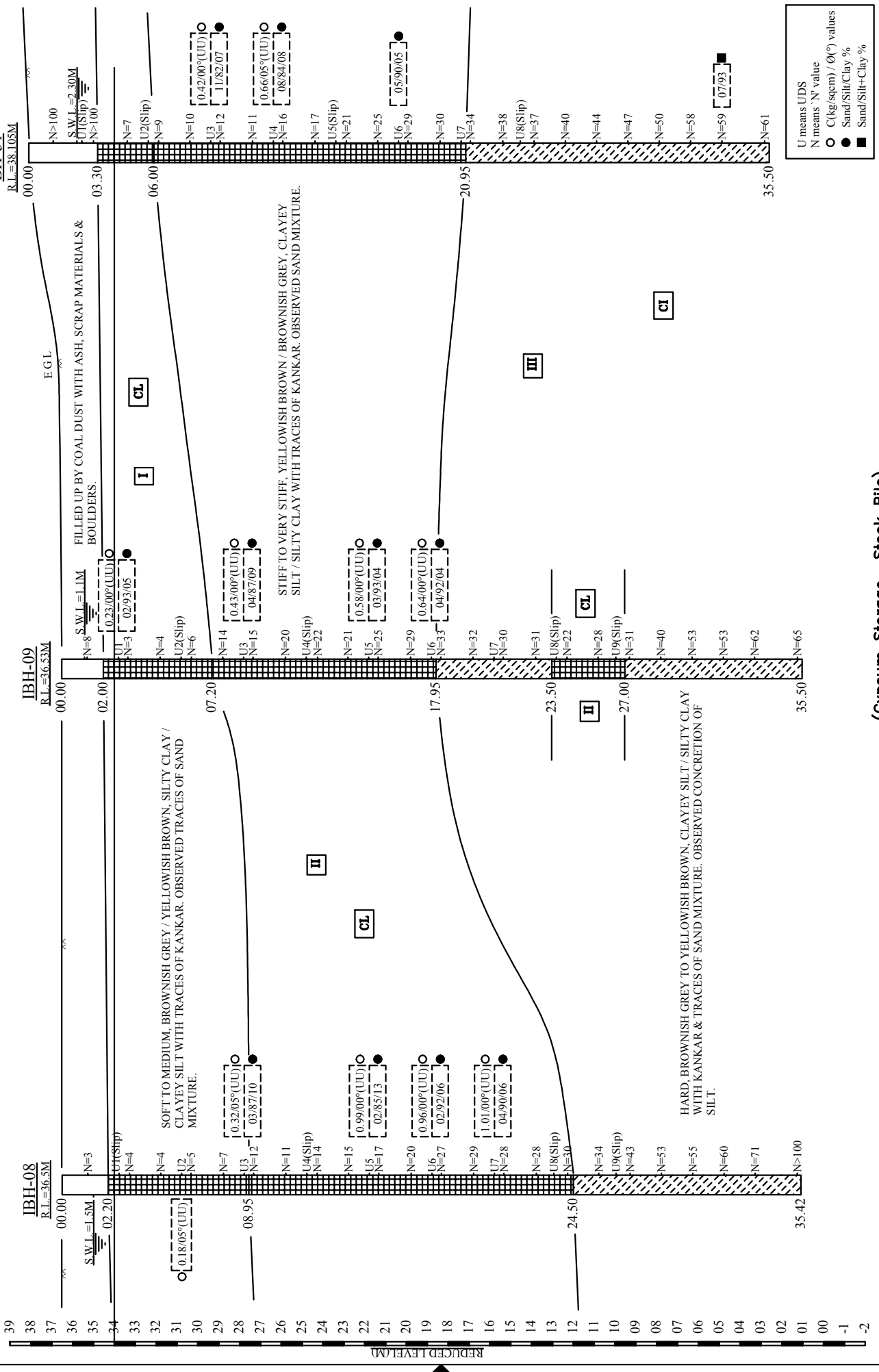
Project :	Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar		
Job No : 4388	Created by : SKD	Created on : 09 / 12 / 2020	Sheet No:



(Lime Stone Storage Silo)

FIG. 2.29 : GENERALISED SOIL PROFILE

Project :	Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar		
Job No : 4388	Created by : SKD	Created on : 05 / 02 / 2021	Sheet No:



(Gypsum Storage Stock Pile)

FIG. 2.30 : GENERALISED SOIL PROFILE

4.2.3. STRATUM - II:

This is also clay layer and it consists of stiff to very stiff, brownish / yellowish grey, silty clay silt with kankar & rusty spots. Routine laboratory tests conducted on the "UDS" and “SPT” samples that could be collected from this layer show the following average properties.

Bulk Density, gms/cc	2.02	Specific gravity	2.68
Dry Density, gms/cc	1.64	Void Ratio	0.600
Natural Water Content %	23	Liquid limit %	34
TRSH-UU:		Plastic Limit %	18
Cohesion kg/sqcm	0.68	Shrinkage Limit %	16
Friction angle °	3°	**GRAIN SIZE**	
UNCONFD “C” kg/sqcm	0.61	Sand %	07
REMOULD “C” kg/sqcm	0.46	Silt %	85
Sensitivity	1.32	Clay %	08

4.2.4. STRATUM - III:

The soil in this layer consists of hard, brownish / yellowish grey / greyish brown, silty clay / clayey silt with sand mixture & rusty spots. Concretion of silt have also been observed in this layer. Routine laboratory tests conducted on the "UDS" and “SPT” samples that could be collected from this layer show the following average properties.

Bulk Density, gms/cc	2.03	Specific gravity	2.66
Dry Density, gms/cc	1.66	Void Ratio	0.467
Natural Water Content %	22	Liquid limit %	36
TRSH-UU:		Plastic Limit %	18
Cohesion kg/sqcm	0.96	Shrinkage Limit %	15
Friction angle °	5°	**GRAIN SIZE**	
UNCONFD “C” kg/sqcm	1.27	Sand %	10
REMOULD “C” kg/sqcm	0.91	Silt %	82
Sensitivity	1.40	Clay %	08

4.2.5. STRATUM - IV:

This is a sand layer and present few borehole location, consists of dense to very dense yellowish brown / greyish brown silty sand. Traces of mica & concretion of silt have also been observed in this layer. Routine laboratory tests conducted on the “SPT” samples that could be collected from this layer show the following average properties.

GRAIN SIZE	
Sand %	84
(Silt +Clay) %	16

4.3. GRAPHICAL PRESENTATION:

The detailed Laboratory Test Results in tabular form are given in the Appendix. The back up sheets are also presented there as given in below:

1. ***Strength envelopes from Triaxial Tests (UU).***
2. ***Standard Proctor Compaction Curves.***
3. ***CBR Curves.***
4. ***e-log p curves from Consolidation Tests.***
5. ***Grain size distribution curves for sieve and hydrometer tests.***

The consolidation test results are analysed by numerical methods and only the final output in a tabular form is given. The m_{vc} indicates the time dependent component of m_v and c_v is the co-efficient of consolidation.

5. DISCUSSION

5.01. PLATE LOAD TEST:

Total Five nos. (5) Plate Load Tests were conducted in the site (2 nos. is of routine type & the rest 3 nos. is of cyclic type) at specified depths using 600mm square plate Load (vs.) settlement plots is made to calculate Allowable Bearing Capacity, Young's modulus. The calculations are presented below separately.

DETERMINATION OF SAFE BEARING CAPACITY:

PLT-01:

B_f = Width of footing = 2m (say), B_p = Size of test plate = 0.60m

S_f = Limiting Settlement of footing = 25mm and S_p = Settlement of test plate.

Now As per IS : 1888, in case of clayey soil, we can write $(S_p/ S_f) = (B_p/B_f)$

Hence, S_p = 7.50mm < 25mm

So, from load-settlement curve, safe load = 18.80 t/sqm, say 18 t/sqm

Based on the above data, the safe bearing capacity value for different footing size is presented below.

Test Location	Depth (M)	Recommended Safe Bearing Capacity, T/M^2			
		Foundation width = 2m	Foundation width = 3m	Foundation width = 4m	Foundation width = 5m
		S= 25mm	S= 25mm	S= 25mm	S= 25mm
PLT-01	1.80	18	15	13	11
PLT-02	1.20	22	20	19	17

Where S = limiting settlement

SUBGRADE MODULUS:

Subgrade Modulus is obtained from Plate Load Tests as K = P/S. Where P = Plate Load corresponding to settlement S under working load. The final results values are presented in a tabular form below.

Test No.	Depth (M)	Subgrade Modulus for Plate as per IS 9214, Kg/cm^3	Subgrade Modulus for Plate, correcting as per IS 9214, Kg/cm^3
PLT-01	1.80	5.20	4.00
PLT-02	1.20	8.00	5.60

The Subgrade modulus value is inversely proportional to the square root of the foundation area up to a base area of 10 sqm and then remains constant. The calculated subgrade modulus values for different foundation areas are presented afterwards.

PLATE LOAD TEST NO.-01 AT TP-07

Commenced on: 18/10/2020
Completed on:18/10/2020
Pit size: 3.00mX3.00mX1.80m(depth)
Load on pr.guage/divn.=10Kg/sq.cm
Load on jack/divn. = 0.7091t
Plate size: 0.60mX0.60m
Load on plate/divn.=1.969/sq.m.
Test Type: Routine PLT

Co-ordinates:
E = 3340.000M.
S = 1683.000M.
RL = 37.318M.

S.W.L.= 1.80m.

EGL-1.80m:- Blackish grey, clayey silt with coal pcs., sand & boulder pcs.

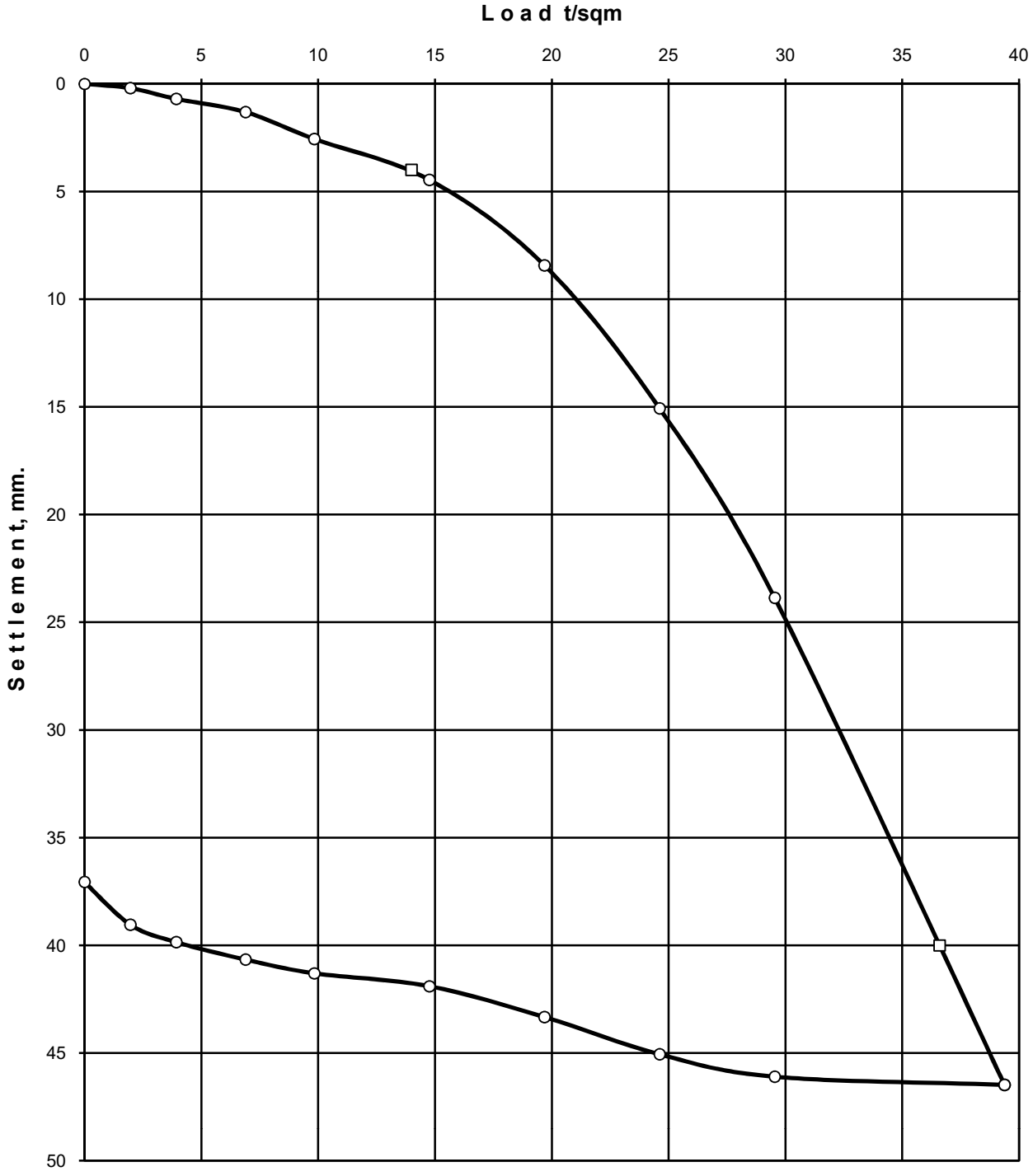


FIG. 3.01 LOAD VS SETTLEMENT GRAPH FOR PLT-01 AT TP-07

PLATE LOAD TEST NO.02 AT ITP-01

Commenced on: 26/12/2020
Completed on:26/12/2020
Pit size: 3.00mX3.00mX1.20m(depth)
Load on pr.guage/divn.=10Kg/sq.cm
Load on jack/divn. = 0.709t
Plate size: 0.60mX0.60m
Load on plate/divn.=1.969t/sq.m.
Test Type: Routine PLT

Co-ordinates:
E = 3925.000M.
S = 2087.000M.
RL = 36.470M.

S.W.L.= 1.20m.

EGL-1.20m:- Blackish grey, clayey silt with sand mixture, ash & kankar.

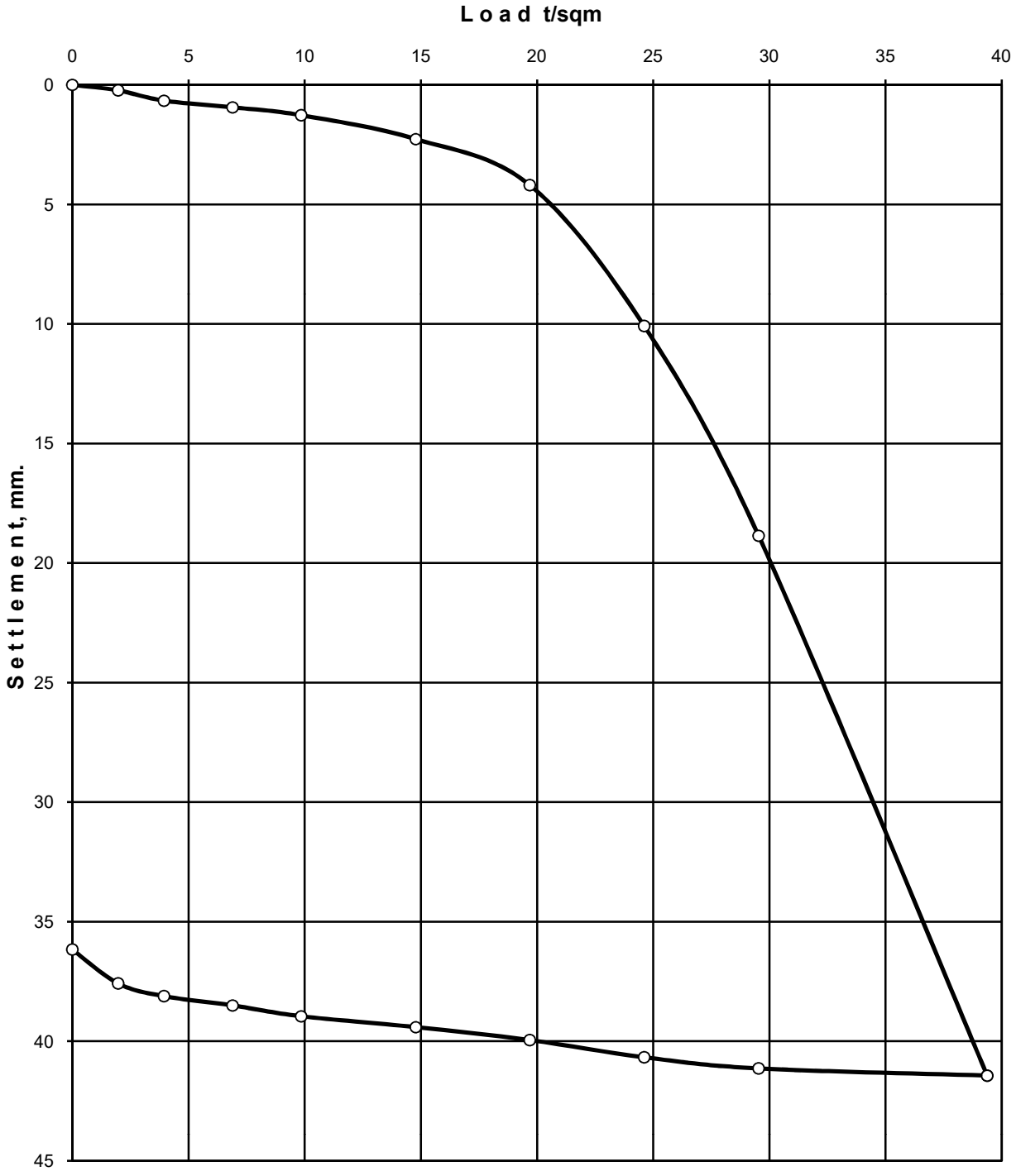


FIG. 3.02. LOAD VS SETTLEMENT GRAPH FOR PLT-02 AT ITP-02

CYCLIC PLATE LOAD TEST NO.1 AT TP-02

Commenced on: 23/12/2020
Completed on: 24/12/2020
Pit size: 3.00mx 3.00mx3.00m(depth)
Load on pr.guage/divn.=10Kg/sq.cm
Load on jack/divn. = 0.7091te
Plate size: 0.60mX0.60m
Load on plate/divn.=1.969te/sq.m.
Test Type: Cyclic PLT

Co-ordinates:
E = 3871.000M.
S = 1882.000M.
RL = 36.257M.

S.W.L.= 3.00m.

Description of Soil :-
(0.00m-2.60m):- Blackish grey, clayey silt with brick bats, coal coal pcs & stone pcs.
(2.60m-3.00m):- Brownish grey clayey silt with traces of sand mixture.

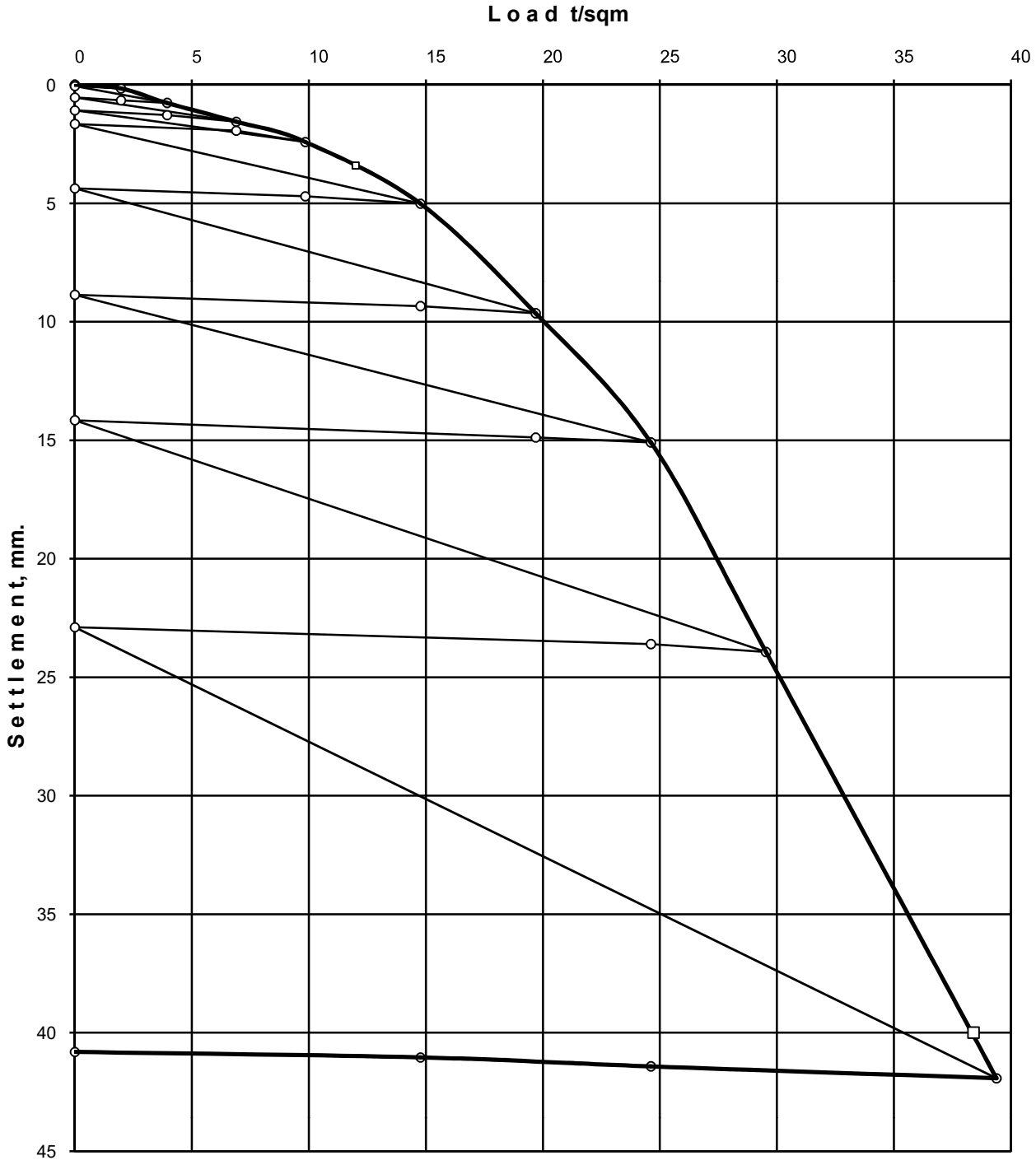


FIG.3.03. LOAD VS SETTLEMENT GRAPH FOR CPLT-1 AT TP-02

CYCLIC PLATE LOAD TEST NO.2 AT TP-04

Commenced on: 30/12/2020
Completed on: 31/12/2020
Pit size: 3.00mx 3.00mx1.60m(depth)
Load on pr.guage/divn.=10Kg/sq.cm
Load on jack/divn. = 0.7091te
Plate size: 0.60mX0.60m
Load on plate/divn.=1.969te/sq.m.
Test Type: Cyclic PLT

Co-ordinates:
E = 3186.980M.
S = 1919.554M.
RL = 34.908M.

S.W.L.= 1.50m.

Description of Soil :-
(0.00m-0.40m):- Brownish grey, clayey silt with ash, boulders etc.
(0.40m-1.60m):- Brownish grey clayey silt with traces of sand mixture.

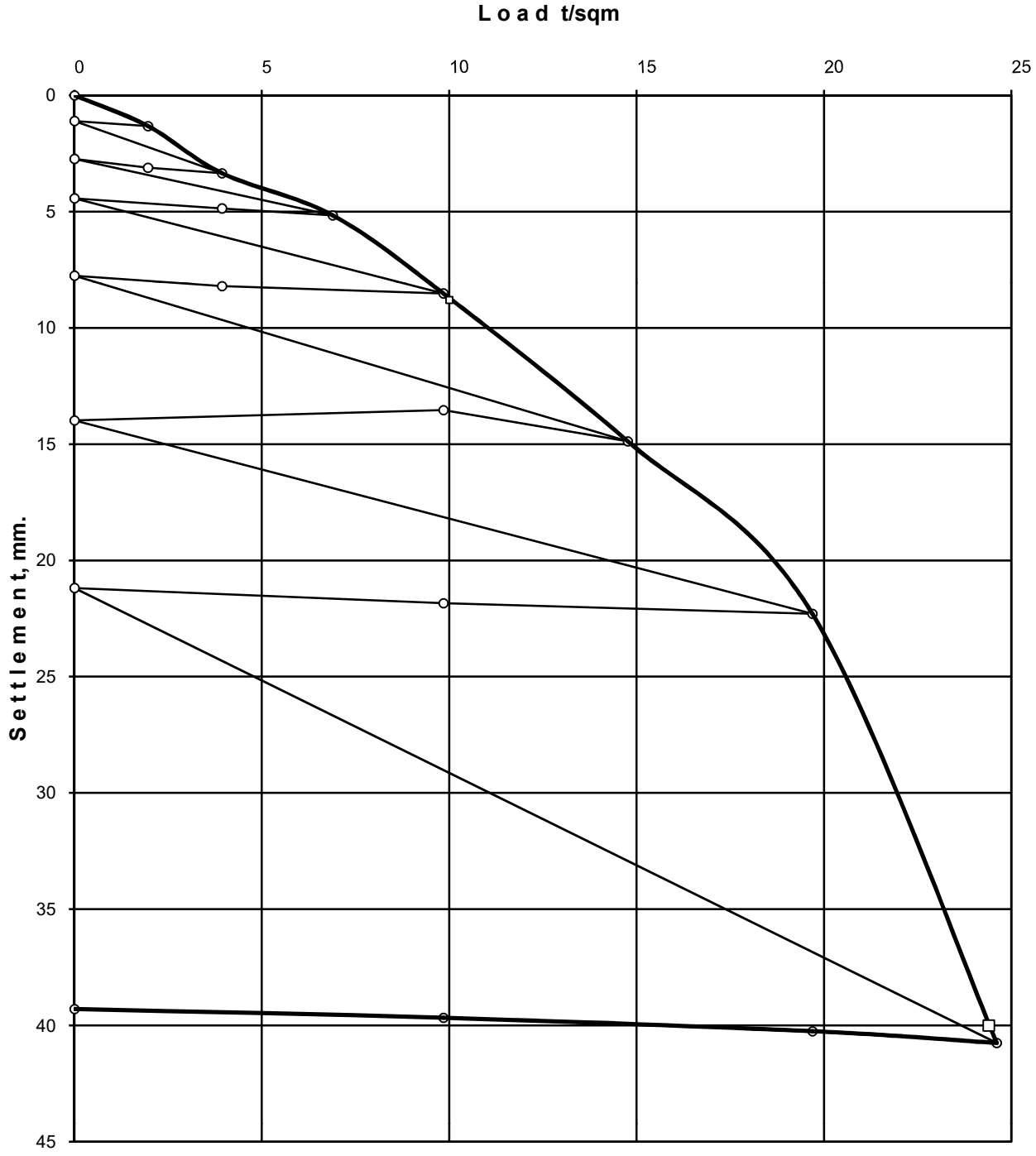


FIG. 3.04. LOAD VS SETTLEMENT GRAPH FOR CPLT-2 AT TP-04

CYCLIC PLATE LOAD TEST NO - 03 AT TP-06

Commenced on: 20/10/2020
Completed on: 21/10/2020
Pit size: 3.00mx 3.00mx2.60m(depth)
Load on pr.guage/divn.=10Kg/sq.cm
Load on jack/divn. = 0.7091t
Plate size: 0.60mX0.60m
Load on plate/divn.=1.969te/sq.m.
Test Type: Cyclic PLT

Co-ordinates:
E = 3433.000M.
S = 1660.000M.
RL = 37.004M.

S.W.L.= 2.60m.

Description of Soil :-
(0.00m-0.90m):- Filled up soil consists of blackish grey, clayey silt with brick bats, coal pcs & concrete pcs.
(0.90m-2.60m):- Brownish grey clayey silt with sand mixture.

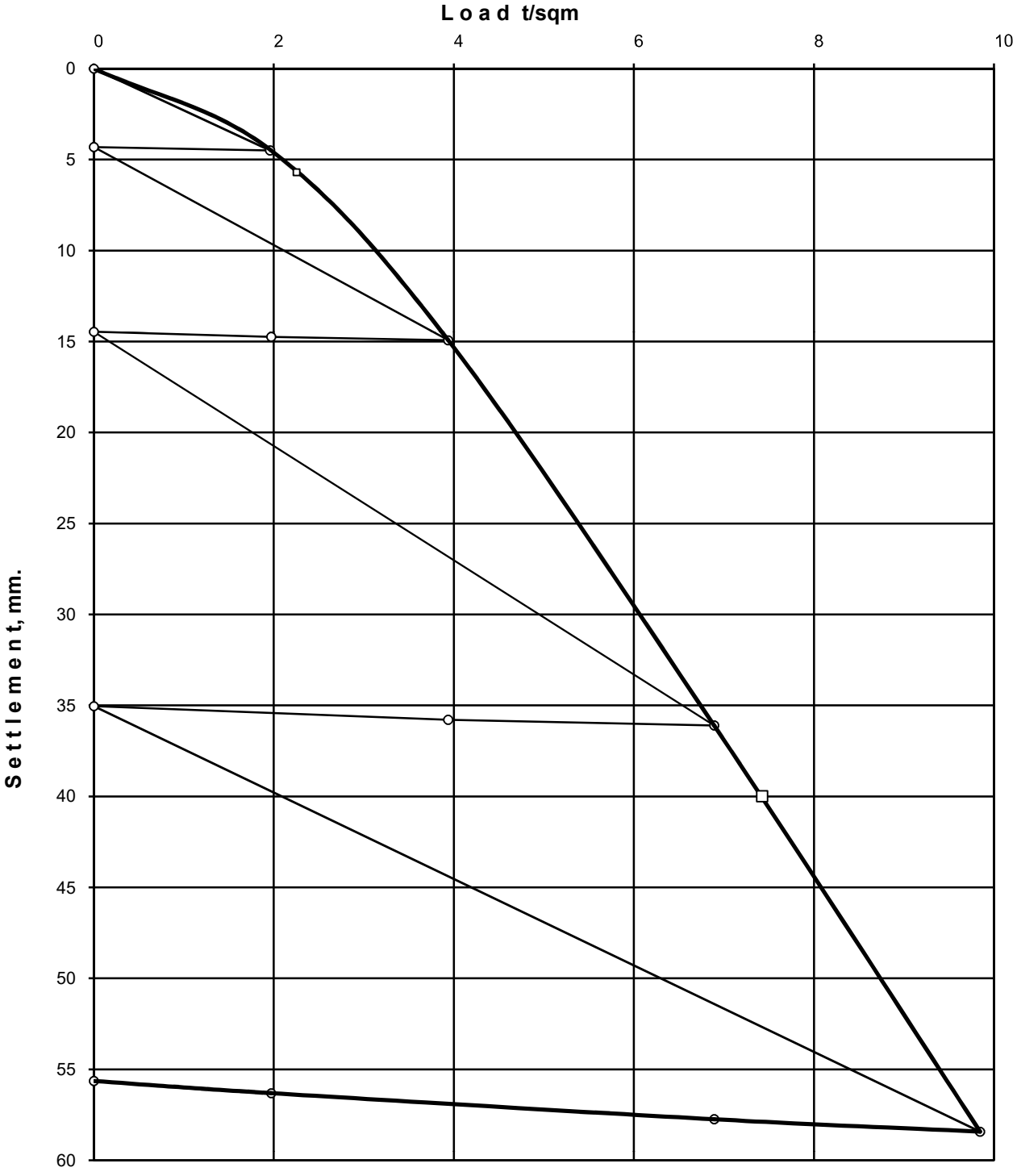


FIG. 3.05 LOAD VS SETTLEMENT GRAPH FOR CPLT-03 AT TP-06

Test No.	Depth (M)	Subgrade Modulus, (kg/cucm)			
		Foundation Area = 1 sqm	Foundation Area = 4 sqm	Foundation Area = 5 sqm	Foundation Area = 10 sqm or above
PLT-01	1.80	2.40	1.20	1.07	0.76
PLT-02	1.20	3.36	1.68	1.50	1.06

Sample Calculation of Subgrade Modulus for foundation area 4 Sq.m for PLT-01

For Plate

Safe Load, corresponding to 1.25mm settlement = 6.50 t/sqm

Subgrade Modulus for Plate, K = P/S = 6.50/1.25 = 5.20 Kg/cm^3

Applying correction for plate bending, as per Clause 5.1.3 & Fig.5 of IS:9214, corrected Subgrade Modulus = 5.13 Kg/cm^3

Since the test was conducted on 600mm square plate (i.e. smaller than 75cm dia,), corrected Subgrade Modulus as per Clause 5.1.1 & Fig.3 of IS: 9214 = 5.13 / 1.80 = 4.00 Kg/cm3

For Foundation

Corrected Subgrade Modulus of plate = 4.00 Kg/cm^3

Area of plate = 60 x 60 sq.cm = 0.60 x 0.60 sq.m

Area of footing = 4 sq.m

Subgrade Modulus of foundation = $4.00 \times \sqrt{(0.60 \times 0.60)/4}$ Kg/cm^3 = 1.20 Kg/cm^3

ELASTIC COMPRESSION:

For Cyclic Plate Load Tests, after application of each load increment and full stabilisation of plate settlement, the applied load was reduced to zero and the settlement records were noted till full stabilisation. Thereafter, the next load increment was applied.

The elastic rebounds at these load intensities are calculated from the field data and are graphically presented in graph (Ref. fig. no. 3.06 to 3.08). The coefficient of elastic uniform compression, C_u is obtained as $C_u = P / S_e$ (kg/cucm).

CPLT-03:

From the load vs elastic rebound plot, the slope of the trend line = C_u = (6-3)/(1.11-0.55) = 5.36 kg/cucm

Now, for a foundation size of 10 sqm (3m x 3.33m, say), the corresponding value will be,

$C_{u10sqm} = 5.36 \times \sqrt{[(0.600 \times 0.600) / 10]} = 1.02$ kg/cucm

Test No.	Depth (M)	C_u (kg/cucm)	$C_{u\ (10sqm\ fdn.size)}$ (kg/cucm)
CPLT-01	3.00	24.39	4.63
CPLT-02	1.60	17.24	3.27
CPLT-03	2.60	5.36	1.02

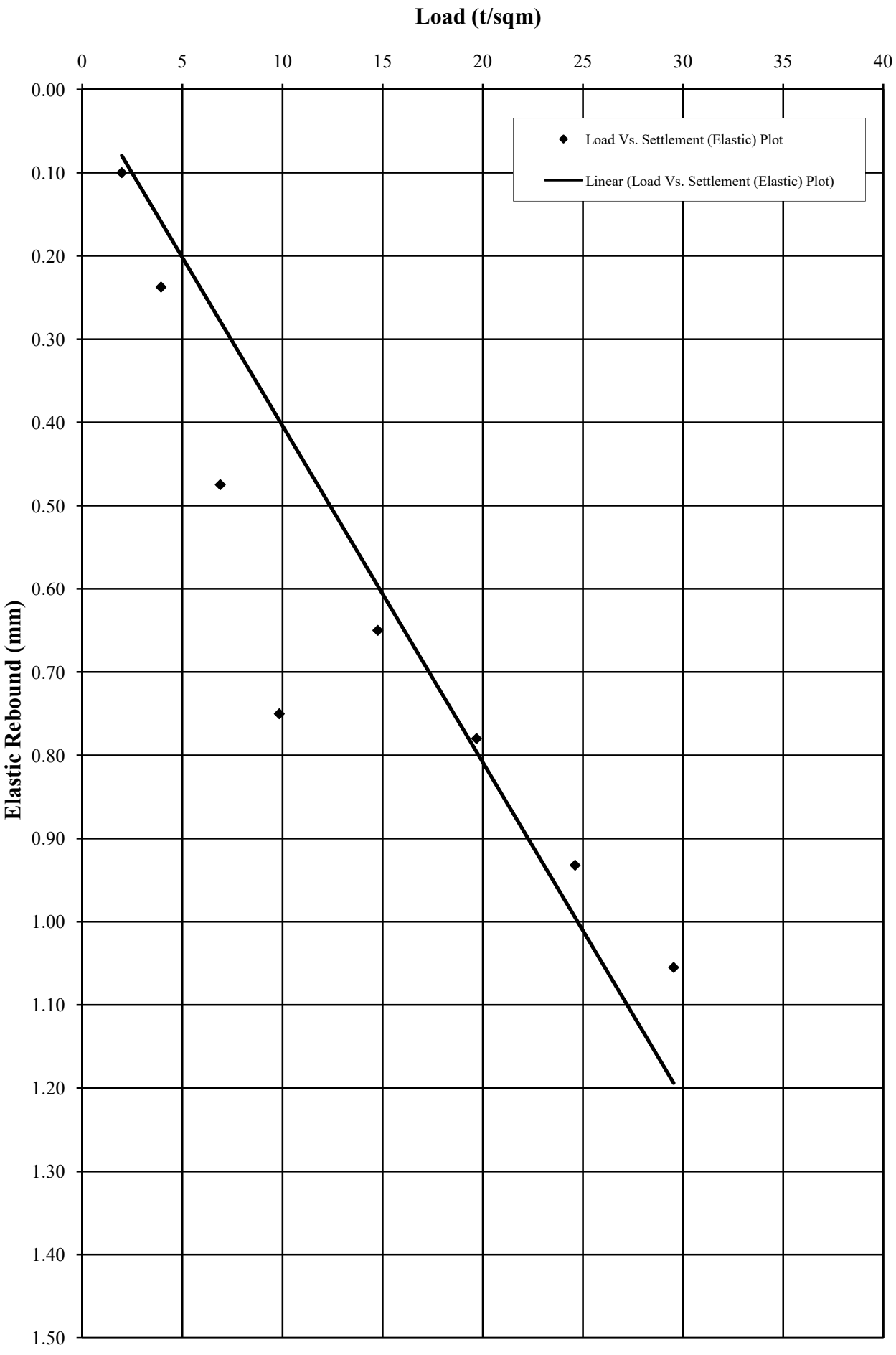


Fig. 3.06. Load vs. Elastic Rebound Plot (CPLT-01 AT TP-02)

as per IS 5249 : 1992, Pg - 6

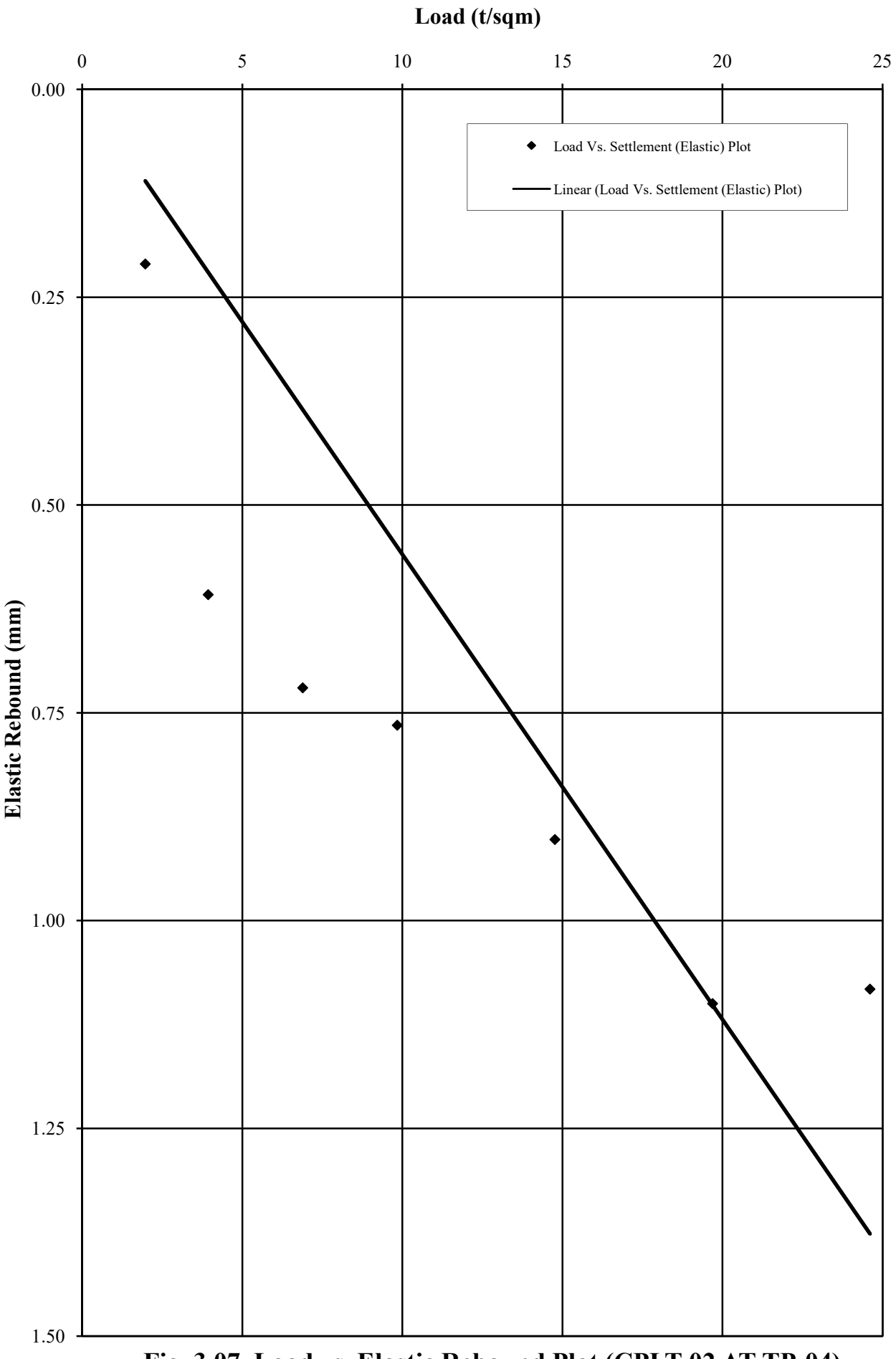


Fig. 3.07. Load vs. Elastic Rebound Plot (CPLT-02 AT TP-04)

as per IS 5249 : 1992, Pg - 6

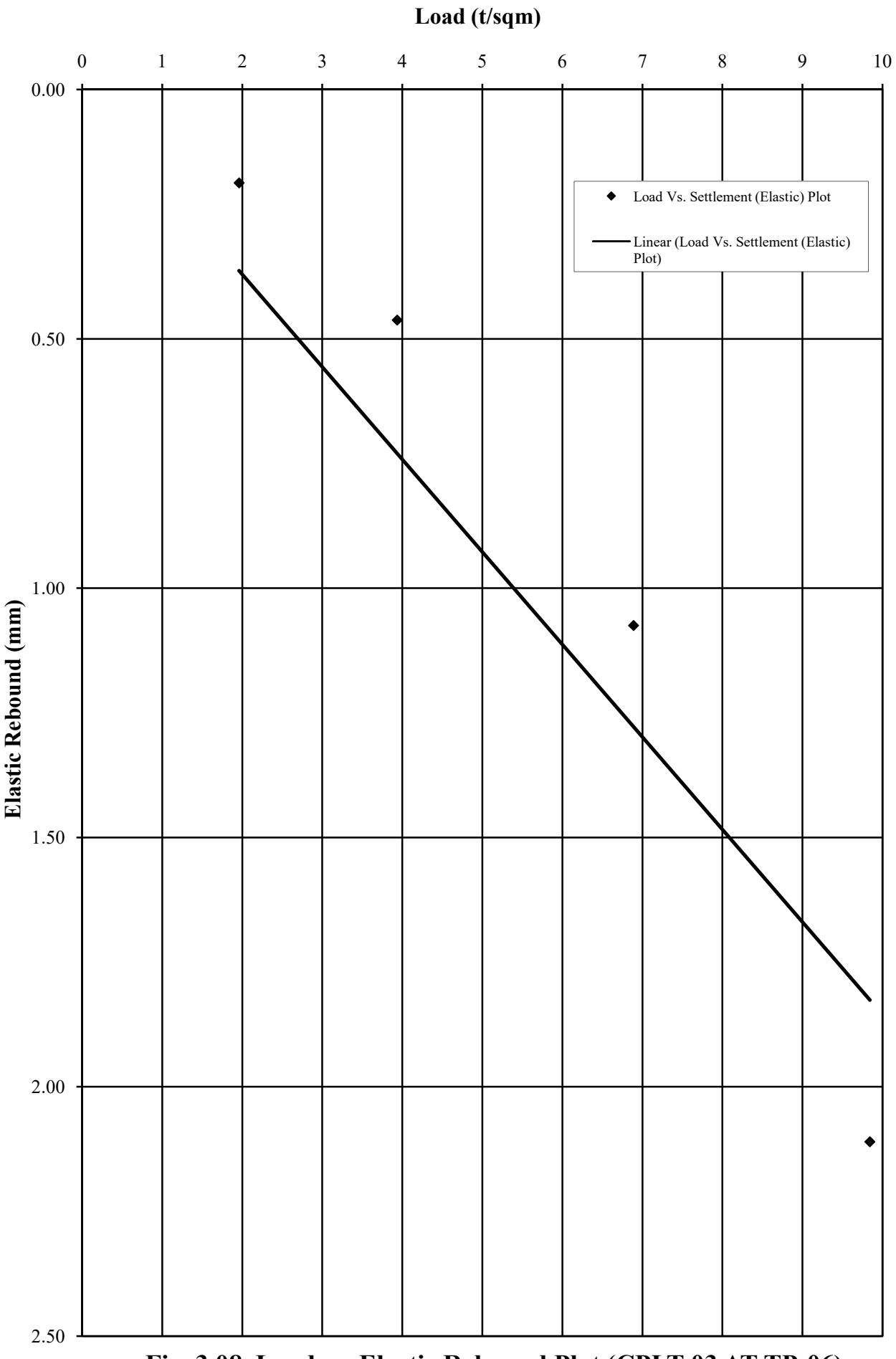


Fig. 3.08. Load vs. Elastic Rebound Plot (CPLT-03 AT TP-06)
as per IS 5249 : 1992, Pg - 6

5.02. CHOICE OF FOUNDATION AND FOUNDING LEVEL:

While determining the pile capacity, the following considerations are made.

a) Assume grade of concrete = M30

b) Assume cut-off = 6.50m for Chimney Stage I & 5.00m for Chimney Stage II and 2.00m & 3.00m below FGL for other structures.

c) Diameter of pile used = 600 and 760mm

With reference to the above, following pile capacity calculations are presented below.

5.2.1. VERTICAL & UPLIFT PILE CAPACITY AROUND CHIMNEY STAGE I (BH-10, 44, 45 & 48) :

While calculating pile capacity following design layer stratification is used.

Layer II – 6.50m to 20.95m

Layer IIIA – 20.95m to 28.00m

Layer IIIB – 28.00m to Termination depth

Stratum II

Average N = 19, corresponding cohesion from N value = 1.18 kg/sqcm[1]

---

1 ***Relation between SPT "N" and Shear Strength***

Widely used relationship is due to Terzagi and Peck recommending C = N/16
However, it has been seen over the years with stiffness in clay the shear strength does not increase as rapidly as proposed by Terzagi.
Our experience also shows that for clays at medium to higher depth, the above relation does not hold good.
For Static Cone Penetration Tests, the recommendations for cone factor N_k generally are

$C = q_c/N_k$ where C = Cohesion in kg/sqcm and q_c = Cone resistance in Static Cone and

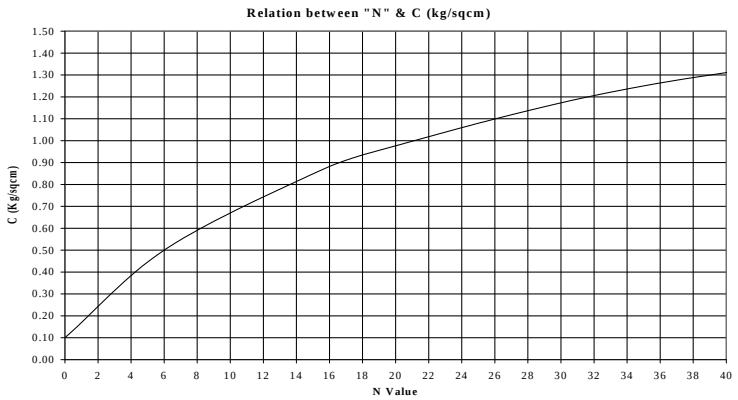
N_k = 17 , 21 & 27 for normally consolidated clay, partly over consolidated clay and heavily over consolidated clay respectively

[Ref. Meigh, A.C (1987) : Cone Penetration Testing Methods and Interpretation, Butterworths, London, pp-43-47]

Taveres, A.X [Penetration Testing 1988, ISOPT-1, Volume-I, J.De Ruiter Editor, pp-375-379] has shown very clearly that a better correlation can be obtained with stiffness of the clay. From his experimental results he obtained,

Range of SPT 'N'	K = N/C
N < 10	12.50
10 < N < 20	14.20
20 < N < 30	16.25
30 < N < 40	20.00

Over the years on the basis of the laboratory test results we have been using the following relations. However, for "N" value greater than 40, we use C = N/27



From Laboratory TRSH-UU test results, we get, C = 0.90 kg/sqcm & Φ = 0°

Thus average C = 1.04 kg/sqcm & Φ = 0°

Use, C = 1.00 kg/sqcm & Φ = 0°

Use Adhesion factor, α = 0.446

Stratum IIIA (FROM 20.95M TO 28.00M)

Average N = 42, corresponding cohesion from N value = 2.63 kg/sqcm

Use, C = 2.50 kg/sqcm & Φ = 0°

Use Adhesion factor, α = 0.268

Stratum IIIB (FROM 28.00M TO TERMINATION DEPTH)

Average N = 57

Use, C = 3.00 kg/sqcm & Φ = 0°

Use Adhesion factor, α = 0.268

5.2.2. LATERAL PILE CAPACITY:

Assume cut-off = 6.50m below FGL.

Average N = 14, corresponding cohesion from N value = 0.875 kg/sqcm

From laboratory test results, C = 0.88 kg/sqcm

Thus average C = 0.88 kg/sqcm

Hence use C = 0.85 kg/sqm for lateral pile capacity calculation.

Refer to IS : 2911 (Part I/Sec 2) - 2010, Appendix - C

Modulus of Subgrade reaction, k_1 = 3.06 kg/cucm corresponding to Cohesion = 0.85 kg/sqcm

Now, K = (k_1/1.5) x (30/D) which is coming as 0.81 kg/cucm [D = Pile dia in cm]

Stiffness factor, R = $[EI/KD]^{1/4}$

Now, I = 1.64 x 10^6 cm^4 [for 760mm dia pile]

E = 5000 x $(f_{ck})^{0.5}$ = 5000 x $(30)^{0.5}$ = 27386 N/sqmm = 2.74 x 10^5 kg/sqcm

Hence, R = 292.58 cm

From Graph (Fig.4), L_f = 1.95 x R = 570.54 cm [Assuming Fixed Head Piles]

Pile Head deflection, Y = H x L_f^3 / 12EI = 0.3451mm for 1T load

So, for 5mm horizontal deflection at Cut-off level, H = 14.49T

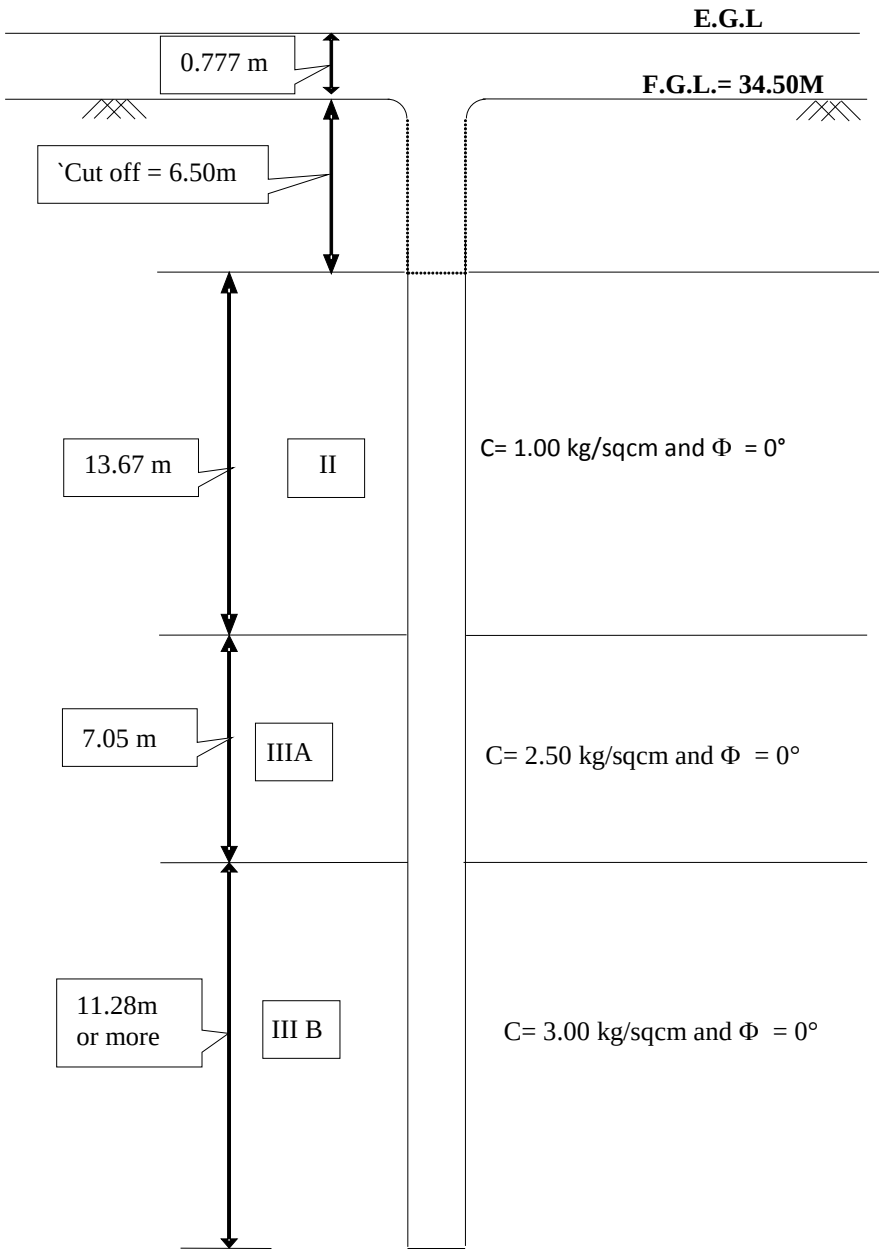


FIG. 4.01. PILE FOUNDATION DESIGN MODEL AROUND CHIMNEY STAGE- I (BH – 10, 44, 45 & 48)

(***Not to Scale***)

SAMPLE PILE CAPACITY CALCULATION AROUND CHIMNEY STAGE - I (BH-10, 44, 45 & 48)

Bottom depth of Pile = 39.277 m below EGL i.e. 38.50m below FGL (FGL = 34.500M)
FGL is 0.777m below EGL.
Cut-off Length = 6.50 m below FGL
Diameter of Pile = 760 mm
FOS of Shaft Resistance = 2.50
FOS for End Bearing = 2.50 Critical depth 15.00 D
So, maximum Depth upto which pressure will increase = 11.40 m Maximum OVP = 10.26 t/sqm

Layer No.	Top Depth (M)	Bottom Depth (M)	Eff. Depth (M)	Cohesion (kg/sqcm)	Φ (Degree)	Adhesion Factor (α)	K_0	Eff. Density (gm/cc)	Mean Pressure (t/sqm)
II	7.277	20.95	13.67	1.00	0	0.446	1.00	0.90	9.47
IIIA	20.95	28.00	7.05	2.50	0	0.268	1.00	0.90	10.26
IIIB	28.00	39.277	11.28	3.00	0	0.268	1.00	0.90	10.26

Layer No.	Eff. Depth (M)	Effective σ_z (t/sqm)	$f_{s1} = \alpha C$	$f_{s2} = K_0\sigma_z\tan\Phi$	$fs = f_{s1} + f_{s2}$ (t/sqm)	Ultimate Shaft Resistance (T)	Safe Shaft Resistance (T)
II	13.67	9.47	4.46	0.00	4.46	145.67	58.27
IIIA	7.05	10.26	6.69	0.00	6.69	112.61	45.04
IIIB	11.28	10.26	8.03	0.00	8.03	216.15	86.46
	32.00					474.44	189.78

For End Bearing

Cohesion C= 3 kg/sqcm
Friction Angle = 0 °
So, Nc = 9
Nq = 1.00
Nγ = 0.00 [Refer to Table 1 of IS: 6403 : 1981]
Eff. Ovp. Pressure=p(tip) 10.26 t/sqm
q(tip) =C.Nc+p(tip).Nq+0.5γDNγ= 280.26 t/sqm
Ultimate End Bearing = 127.14 T
Safe End Bearing = 50.86 T
Safe Shaft Resistance= 189.78 T
So, Total Pile Capacity = 240.63 T

So, Recommended Pile Capacity = 240T

Uplift Pile Capacity:
Uplift capacity = 1/3 x [(Shaft Resistance in Vertical Capacity) + self weight of pile (Buoyant)]
= 1/3x[474.44+(3.1415/4)x(760/1000)2 x (38.50-6.50) x (2.5-1)]
= 165.4048065 **, Recommended Uplift Capacity = 165 ton**

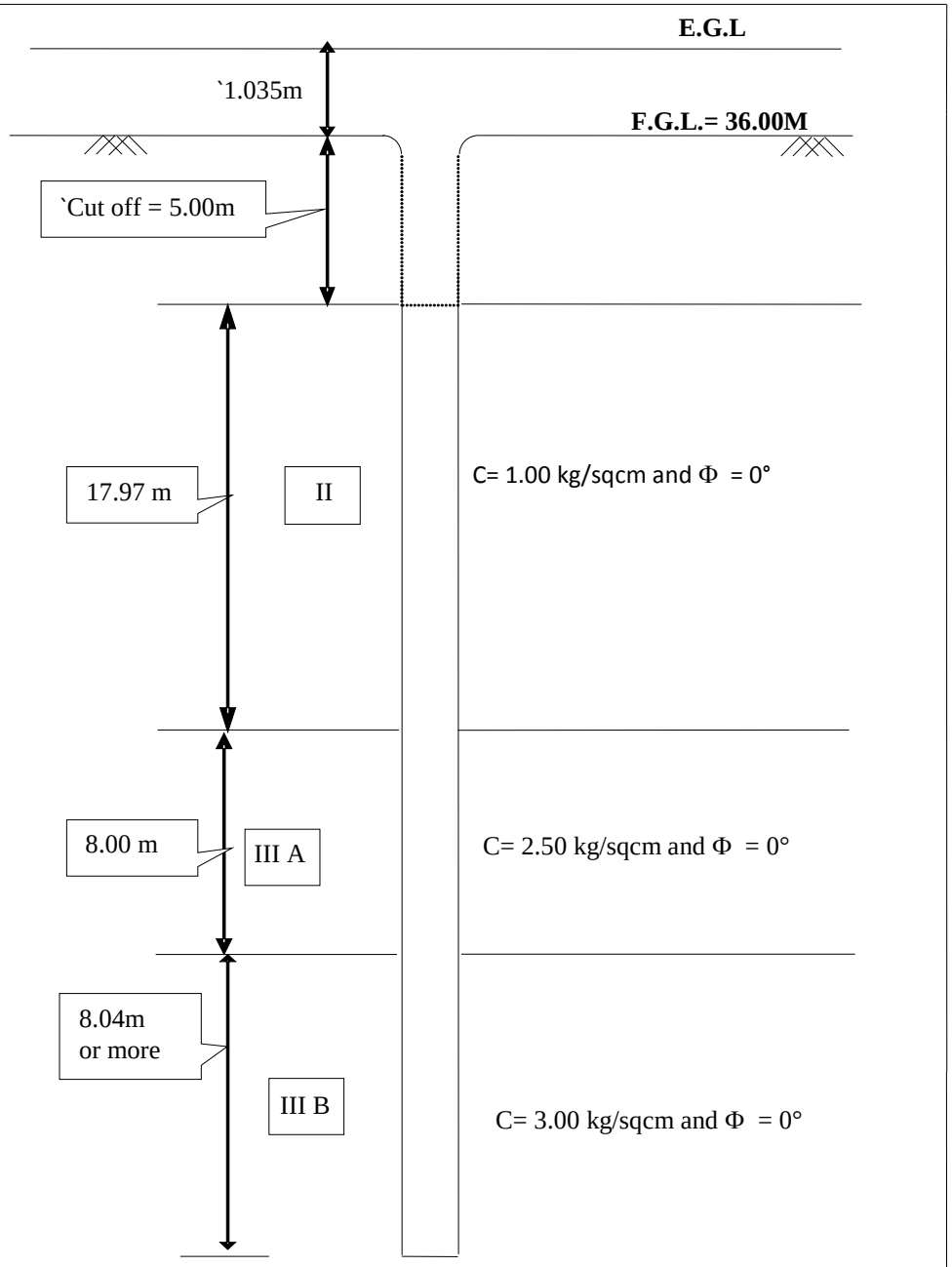


FIG. 4.02. PILE FOUNDATION DESIGN MODEL AROUND CHIMNEY STAGE- II (BH – 18, 19, 47 & 49)

(***Not to Scale***)

SAMPLE PILE CAPACITY CALCULATION AROUND CHIMNEY STAGE - II (BH-18, 19, 47 & 49)

Bottom depth of Pile = 40.035 m below EGL i.e. 39.00m below FGL (FGL = 36.000M)
FGL is 1.035m below EGL.
Cut-off Length = 5.00 m below FGL
Diameter of Pile = 760 mm
FOS of Shaft Resistance = 2.50
FOS for End Bearing = 2.50 Critical depth 15.00 D
So, maximum Depth upto which pressure will increase = 11.40 m Maximum OVP = 10.26 t/sqm

Layer No.	Top Depth (M)	Bottom Depth (M)	Eff. Depth (M)	Cohesion (kg/sqcm)	Φ (Degree)	Adhesion Factor (α)	K_0	Eff. Density (gm/cc)	Mean Pressure (t/sqm)
II	6.035	24.00	17.97	1.00	0	0.446	1.00	0.90	9.23
IIIA	24.00	32.00	8.00	2.50	0	0.268	1.00	0.90	10.26
IIIB	32.00	40.035	8.04	3.00	0	0.268	1.00	0.90	10.26

Layer No.	Eff. Depth (M)	Effective σ_z (t/sqm)	$f_{s1} = \alpha C$	$f_{s2} = K_0\sigma_z\tan\Phi$	fs $=f_{s1}+f_{s2}$ (t/sqm)	Ultimate Shaft Resistance (T)	Safe Shaft Resistance (T)
II	17.97	9.23	4.46	0.00	4.46	191.40	76.56
IIIA	8.00	10.26	6.69	0.00	6.69	127.78	51.11
IIIB	8.04	10.26	8.03	0.00	8.03	154.01	61.61
	34.00					473.20	189.28

For End Bearing

Cohesion C= 3 kg/sqcm
Friction Angle = 0 °
So, Nc = 9
Nq = 1.00
Nγ = 0.00 [Refer to Table 1 of IS: 6403 : 1981]
Eff. Ovp. Pressure=p(tip) 10.26 t/sqm
q(tip) =C.Nc+p(tip).Nq+0.5γDNγ= 280.26 t/sqm
Ultimate End Bearing = 127.14 T
Safe End Bearing = 50.86 T
Safe Shaft Resistance= 189.28 T
So, Total Pile Capacity = 240.14 T

So, Recommended Pile Capacity = 240T

Uplift Pile Capacity:
Uplift capacity = 1/3 x [(Shaft Resistance in Vertical Capacity) + self weight of pile (Buoyant)]
= 1/3x[473.20+(3.1415/4)x(760/1000)2 x (39-5.0) x (2.5-1)]
= 165.44523 **, Recommended Uplift Capacity = 165 ton**

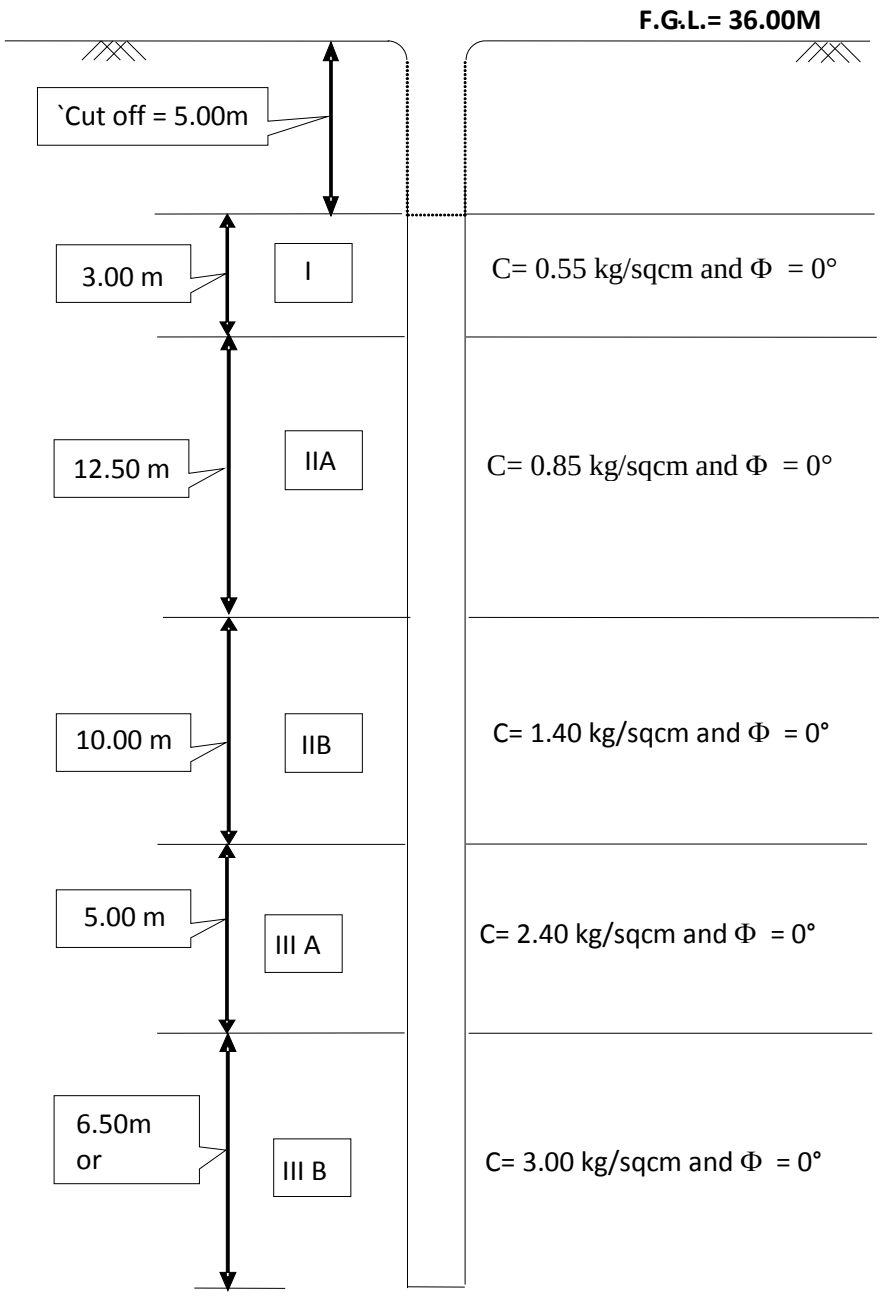


FIG. 4.03. PILE FOUNDATION DESIGN MODEL AROUND CHIMNEY STAGE- II

(BH – 38 & 39)
(***Not to Scale***)

SAMPLE PILE CAPACITY CALCULATION AROUND CHIMNEY STAGE - II (BH-38 & 39)

Bottom depth of Pile = 41.50 m below EGL i.e. 42.00m below FGL (FGL = 36.000M)
FGL is 0.500m above EGL.
Cut-off Length = 5.00 m below FGL
Diameter of Pile = 760 mm
FOS of Shaft Resistance = 2.50
FOS for End Bearing = 2.50 Critical depth 15.00 D
So, maximum Depth upto which pressure will increase = 11.40 m Maximum OVP = 10.26 t/sqm

Layer No.	Top Depth (M)	Bottom Depth (M)	Eff. Depth (M)	Cohesion (kg/sqcm)	Φ (Degree)	Adhesion Factor (α)	K_0	Eff. Density (gm/cc)	Mean Pressure (t/sqm)
I	4.50	7.50	3.00	0.55	0	0.807	1.00	0.90	5.85
IIA	7.50	20.00	12.50	0.85	0	0.532	1.00	0.90	9.84
IIB	20.00	30.00	10.00	1.40	0	0.316	1.00	0.90	10.26
IIIA	30.00	35.00	5.00	2.40	0	0.268	1.00	0.90	10.26
IIIB	35.00	41.50	6.50	3.00	0	0.268	1.00	0.90	10.26

Layer No.	Eff. Depth (M)	Effective σ_z (t/sqm)	$f_{s1} = \alpha C$	$f_{s2} = K_0\sigma_z\tan\Phi$	$fs = f_{s1} + f_{s2}$ (t/sqm)	Ultimate Shaft Resistance (T)	Safe Shaft Resistance (T)
I	3.00	5.85	4.44	0.00	4.44	31.80	12.72
IIA	12.50	9.84	4.52	0.00	4.52	134.84	53.93
IIB	10.00	10.26	4.42	0.00	4.42	105.64	42.26
IIIA	5.00	10.26	6.42	0.00	6.42	76.67	30.67
IIIB	6.50	10.26	8.03	0.00	8.03	124.59	49.84
	37.00					473.54	189.42

For End Bearing

Cohesion C= 3 kg/sqcm
Friction Angle = 0 °
So, Nc = 9
Nq = 1.00
Nγ = 0.00 [Refer to Table 1 of IS: 6403 : 1981]
Eff. Ovp. Pressure=p(tip) 10.26 t/sqm
q(tip) =C.Nc+p(tip).Nq+0.5γDNγ= 280.26 t/sqm
Ultimate End Bearing = 127.14 T
Safe End Bearing = 50.86 T
Safe Shaft Resistance= 189.42 T
So, Total Pile Capacity = 240.27 T

So, Recommended Pile Capacity = 240T

Uplift Pile Capacity:
Uplift capacity = 1/3 x [(Shaft Resistance in Vertical Capacity) + self weight of pile (Buoyant)]
= 1/3x[473.54+(3.1415/4)x(1000/1000)2 x (42-5.0) x (2.5-1)]
= 166.2399414 **, Recommended Uplift Capacity = 165 ton**

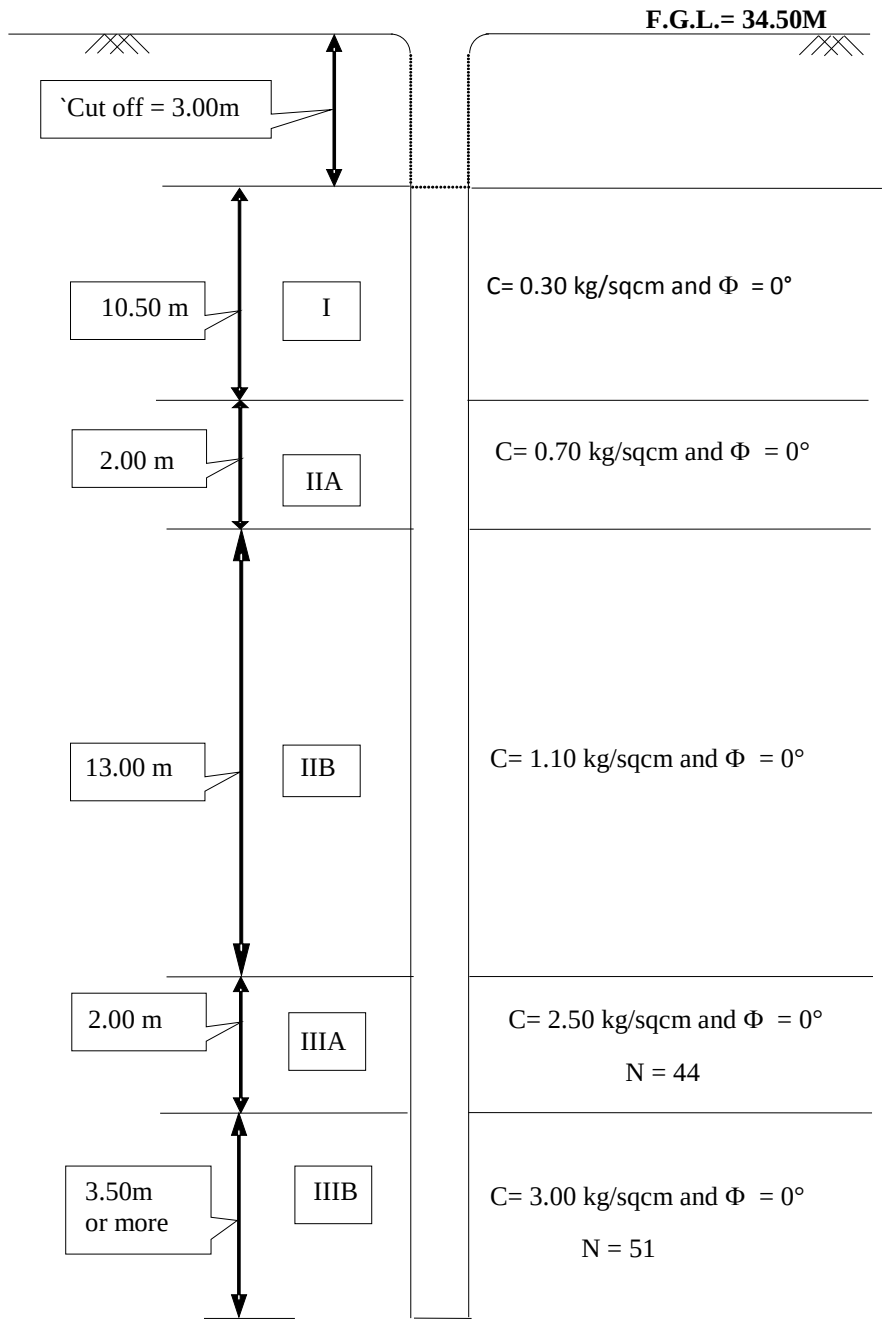


FIG. 4.04. PILE FOUNDATION DESIGN MODEL AROUND BH-01, 05, 06, 08, 09, 35, 43 & 46

(***Not to Scale***)

SAMPLE PILE CAPACITY CALCULATION AROUND BH-01, 05, 06, 08, 09, 35, 43 & 46

Bottom depth of Pile =	34.00 m below FGL (FGL = 34.500M)			
Cut-off Length =	3.00 m below FGL			
Diameter of Pile =	600 mm			
FOS of Shaft Resistance =	2.50			
FOS for End Bearing =	2.50	Critical depth	15.00 D	
So, maximum Depth upto which pressure will increase =	9.00 m	Maximum OVP =	8.1 t/sqm	

Layer No.	Top Depth (M)	Bottom Depth (M)	Eff. Depth (M)	Cohesion (kg/sqcm)	Φ (Degree)	Adhesion Factor (α)	K_0	Eff. Density (gm/cc)	Mean Pressure (t/sqm)
I	3.00	13.50	10.50	0.30	0	1.000	1.00	0.90	6.56
IIA	13.50	15.50	2.00	0.70	0	0.649	1.00	0.90	8.10
IIB	15.50	28.50	13.00	1.10	0	0.403	1.00	0.90	8.10
IIIA	28.50	30.50	2.00	2.50	0	0.268	1.00	0.90	8.10
IIIB	30.50	34.00	3.50	3.00	0	0.268	1.00	0.90	8.10

Layer No.	Eff. Depth (M)	Effective σ_z (t/sqm)	$f_{s1} = \alpha C$	$f_{s2} = K_0\sigma_z \tan\Phi$	$fs = f_{s1} + f_{s2}$ (t/sqm)	Ultimate Shaft Resistance (T)	Safe Shaft Resistance (T)
I	10.50	6.56	3.00	0.00	3.00	59.38	23.75
IIA	2.00	8.10	4.54	0.00	4.54	17.12	6.85
IIB	13.00	8.10	4.43	0.00	4.43	108.62	43.45
IIIA	2.00	8.10	6.69	0.00	6.69	25.22	10.09
IIIB	3.50	8.10	8.03	0.00	8.03	52.96	21.19
	31.00					263.30	105.32

For End Bearing

Cohesion C=	3 kg/sqcm
Friction Angle =	0 °
So, Nc =	9
Nq =	1.00
Eff. Ovp. Pressure=p(tip)	8.10 t/sqm
q(tip) =C.Nc+p(tip).Nq+0.5γDNγ=	278.10 t/sqm
Ultimate End Bearing =	78.63 T
Safe End Bearing =	31.45 T
Safe Shaft Resistance=	105.32 T
So, Total Pile Capacity =	136.77 T

So, Recommended Pile Capacity = 130T

Uplift Pile Capacity:

Uplift capacity = 1/3 x [(Shaft Resistance in Vertical Capacity) + self weight of pile (Buoyant)]

= 1/3x[263.30+(3.1415/4)x(600/1000)2 x (34-3.0) x (2.5-1)]

= 92.14921038 **, Restricted Uplift Capacity = 46T**

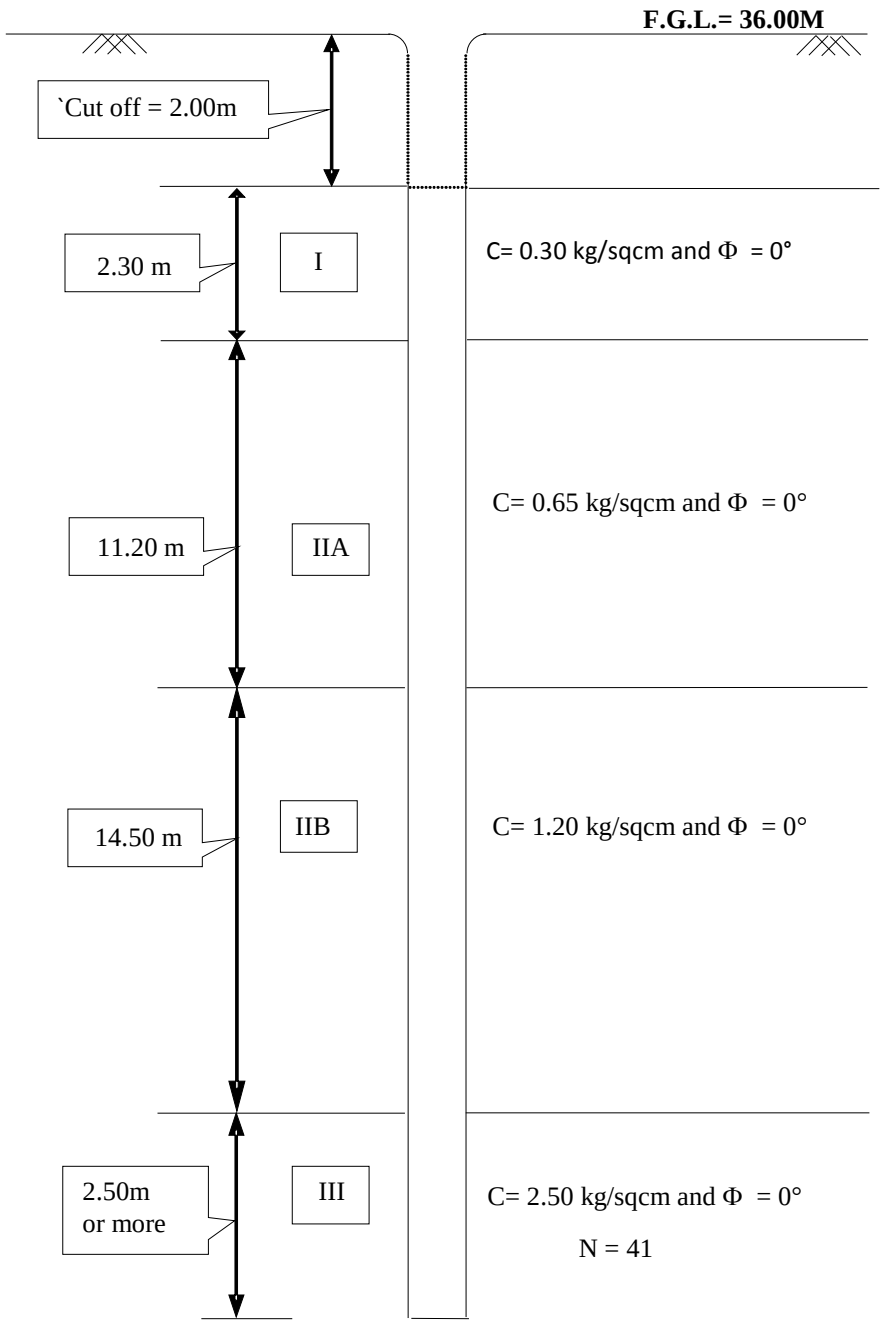


FIG. 4.05. PILE FOUNDATION DESIGN MODEL AROUND BH-17, 28, 32, 33, 40 & 42

(***Not to Scale***)

SAMPLE PILE CAPACITY CALCULATION AROUND BH-17, 28, 32, 33, 40 & 42

Bottom depth of Pile = 21.00 m below FGL (FGL = 36.00M)
Cut-off Length = 2.00 m below FGL
Diameter of Pile = 600 mm
FOS of Shaft Resistance = 2.50
FOS for End Bearing = 2.50 Critical depth 15.00 D
So, maximum Depth upto which pressure will increase = 9.00 m Maximum OVP = 8.1 t/sqm

Layer No.	Top Depth (M)	Bottom Depth (M)	Eff. Depth (M)	Cohesion (kg/sqcm)	Φ (Degree)	Adhesion Factor (α)	K_0	Eff. Density (gm/cc)	Mean Pressure (t/sqm)
I	2.00	4.30	2.30	0.30	0	1.000	1.00	0.90	2.84
IIA	4.30	15.50	11.20	0.65	0	0.697	1.00	0.90	7.21
IIB	15.50	21.00	5.50	1.20	0	0.368	1.00	0.90	8.10

Layer No.	Eff. Depth (M)	Effective σ_z (t/sqm)	$f_{s1} = \alpha C$	$f_{s2} = K_0\sigma_z\tan\Phi$	$fs = f_{s1} + f_{s2}$ (t/sqm)	Ultimate Shaft Resistance (T)	Safe Shaft Resistance (T)
I	2.30	2.84	3.00	0.00	3.00	13.01	5.20
IIA	11.20	7.21	4.53	0.00	4.53	95.59	38.23
IIB	5.50	8.10	4.42	0.00	4.42	45.78	18.31
	19.00					154.38	61.75

For End Bearing

Cohesion C= 1.2 kg/sqcm
Friction Angle = 0 °
So, Nc = 9
Nq = 1.00
Nγ = 0.00 [Refer to Table 1 of IS: 6403 : 1981]
Eff. Ovp. Pressure=p(tip) 8.10 t/sqm
q(tip) =C.Nc+p(tip).Nq+0.5γDNγ= 116.10 t/sqm
Ultimate End Bearing = 32.83 T
Safe End Bearing = 13.13 T
Safe Shaft Resistance= 61.75 T
So, Total Pile Capacity = 74.88 T

So, Recommended Pile Capacity = 70T

Uplift Pile Capacity:
Uplift capacity = 1/3 x [(Shaft Resistance in Vertical Capacity) + self weight of pile (Buoyant)]
= 1/3x[154.38+(3.1415/4)x(600/1000)2 x (21-2.0) x (2.5-1)]
= 54.14473218 **, Restricted to Uplift Capacity = 25T**

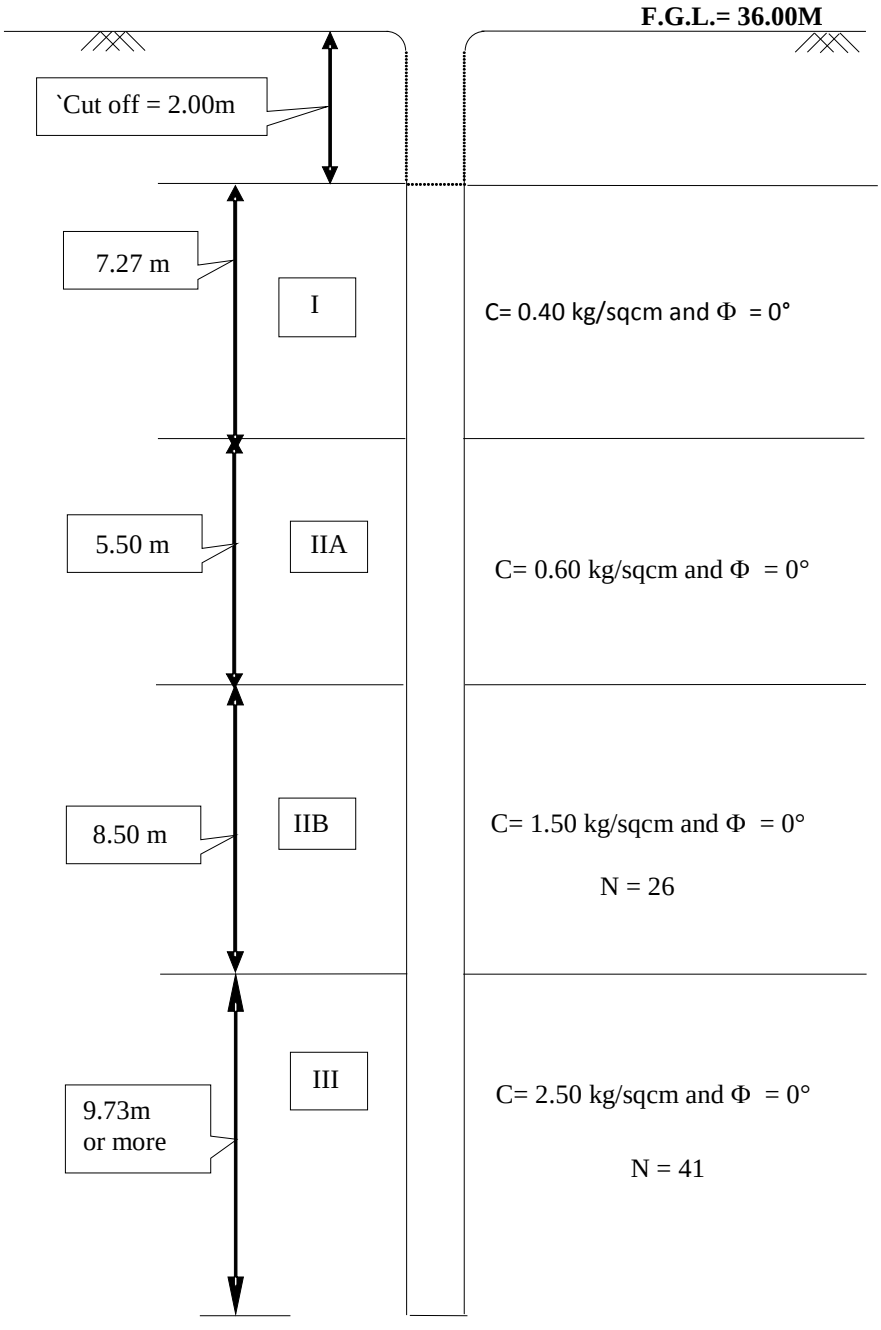


FIG. 4.06. PILE FOUNDATION DESIGN MODEL AROUND BH-12 to 16, 20 to 26, 29, 30, 36, 37, 41. 50 & 52
(***Not to Scale***)

SAMPLE PILE CAPACITY CALCULATION AROUND BH-12 to 16, 20 to 26, 29, 30, 36, 37, 41. 50 & 52

Bottom depth of Pile = 33.73 m below EGL i.e. 33.00m below FGL (FGL = 36.000M)
FGL is 0.728m below EGL.
Cut-off Length = 2.00 m below FGL
Diameter of Pile = 600 mm
FOS of Shaft Resistance = 2.50
FOS for End Bearing = 2.50 Critical depth 15.00 D
So, maximum Depth upto which pressure will increase = 9.00 m Maximum OVP = 8.1 t/sqm

Layer No.	Top Depth (M)	Bottom Depth (M)	Eff. Depth (M)	Cohesion (kg/sqcm)	Φ (Degree)	Adhesion Factor (α)	K_0	Eff. Density (gm/cc)	Mean Pressure (t/sqm)
I	2.73	10.00	7.27	0.40	0	1.000	1.00	0.90	5.07
IIA	10.00	15.50	5.50	0.60	0	0.749	1.00	0.90	8.10
IIB	15.50	24.00	8.50	1.50	0	0.297	1.00	0.90	8.10
III	24.00	33.73	9.73	2.50	0	0.268	1.00	0.90	8.10

Layer No.	Eff. Depth (M)	Effective σ_z (t/sqm)	$f_{s1} = \alpha C$	$f_{s2} = K_0\sigma_z \tan\Phi$	fs $=f_{s1}+f_{s2}$ (t/sqm)	Ultimate Shaft Resistance (T)	Safe Shaft Resistance (T)
I	7.27	5.07	4.00	0.00	4.00	54.83	21.93
IIA	5.50	8.10	4.50	0.00	4.50	46.61	18.64
IIB	8.50	8.10	4.45	0.00	4.45	71.29	28.52
III	9.73	8.10	6.69	0.00	6.69	122.67	49.07
	31.00					295.40	118.16

For End Bearing

Cohesion C= 2.5 kg/sqcm
Friction Angle = 0 °
So, Nc = 9
Nq = 1.00
Nγ = 0.00 [Refer to Table 1 of IS: 6403 : 1981]
Eff. Ovp. Pressure=p(tip) 8.10 t/sqm
q(tip) =C.Nc+p(tip).Nq+0.5γDNγ= 233.10 t/sqm
Ultimate End Bearing = 65.91 T
Safe End Bearing = 26.36 T
Safe Shaft Resistance= 118.16 T
So, Total Pile Capacity = 144.52 T

So, Recommended Pile Capacity = 130T

Uplift Pile Capacity:
Uplift capacity = 1/3 x [(Shaft Resistance in Vertical Capacity) + self weight of pile (Buoyant)]
= 1/3x[295.40+(3.1415/4)x(600/1000)2 x (33-2.0) x (2.5-1)]
= 102.8499396 **, Restricted to Uplift Capacity = 46T**

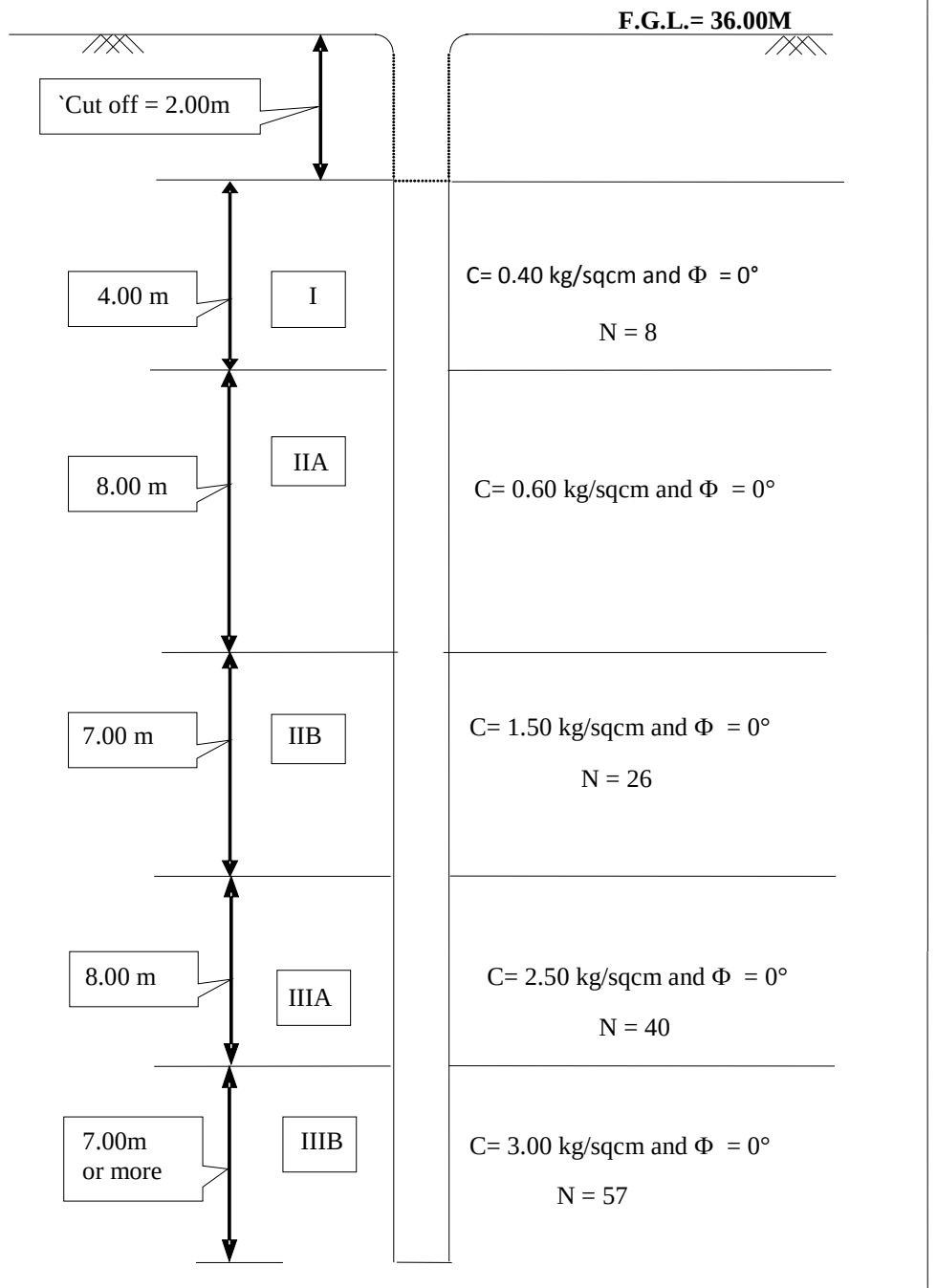


FIG. 4.07. PILE FOUNDATION DESIGN MODEL AROUND BH-04, 27, 34 & 51

(***Not to Scale***)

SAMPLE PILE CAPACITY CALCULATION AROUND BH-04, 27, 34 & 51

Bottom depth of Pile =	25.00 m below FGL (FGL = 36.00M)			
Cut-off Length =	3.00 m below FGL			
Diameter of Pile =	600 mm	Critical depth	15.00 D	
FOS of Shaft Resistance =	2.50	Max unit friction on shaft f_s	11 t/sqm	
FOS for End Bearing =	2.50	Maximum q(tip) =	500 t/sqm	
So, maximum Depth upto which pressure will increase =	9.00 m	Maximum OVP =	8.1 t/sqm	

Layer No.	Top Depth (M)	Bottom Depth (M)	Eff. Depth (M)	Cohesion (kg/sqcm)	Φ (Degree)	Adhesion Factor (α)	K_0	Eff. Density (gm/cc)	Mean Pressure (t/sqm)
I	3.00	6.00	3.00	0.40	0	1.000	1.00	0.90	4.05
IIA	6.00	14.00	8.00	0.60	0	0.749	1.00	0.90	7.59
IIB	14.00	21.00	7.00	1.50	0	0.297	1.00	0.90	8.10
IIIA	21.00	25.00	4.00	2.50	0	0.268	1.00	0.90	8.10

Layer No.	Eff. Depth (M)	Effective σ_z (t/sqm)	$f_{s1} = \alpha C$	$f_{s2} = K_0\sigma_z\tan\Phi$	$fs = f_{s1} + f_{s2}$ (t/sqm)	Ultimate Shaft Resistance (T)	Safe Shaft Resistance (T)
I	3.00	4.05	4.00	0.00	4.00	22.62	9.05
IIA	8.00	7.59	4.50	0.00	4.50	67.79	27.12
IIB	7.00	8.10	4.45	0.00	4.45	58.71	23.48
IIIA	4.00	8.10	6.69	0.00	6.69	50.44	20.18
	22.00					199.56	79.83

For End Bearing

Cohesion C=	2.5	kg/sqcm
Friction Angle =	0	°
So, Nc =	9	
Nq =	1.00	
Nγ =	0.00	[Refer to Table 1 of IS: 6403 : 1981]
Eff. Ovp. Pressure=p(tip)	8.10	t/sqm
q(tip) =C.Nc+p(tip).Nq+0.5γDNγ=	233.10	t/sqm
Ultimate End Bearing =	65.91	T
Safe End Bearing =	26.36	T
Safe Shaft Resistance=	79.83	T
So, Total Pile Capacity =	106.19	T

So, Recommended Pile Capacity = 100T

Uplift Pile Capacity:

Uplift capacity = 1/3 x [(Shaft Resistance in Vertical Capacity) + self weight of pile (Buoyant)]

= 1/3x[199.56+(3.1415/4)x(600/1000)2 x (25-3.0) x (2.5-1)]

= 69.63183031 **, Restricted to Uplift Capacity = 35T**

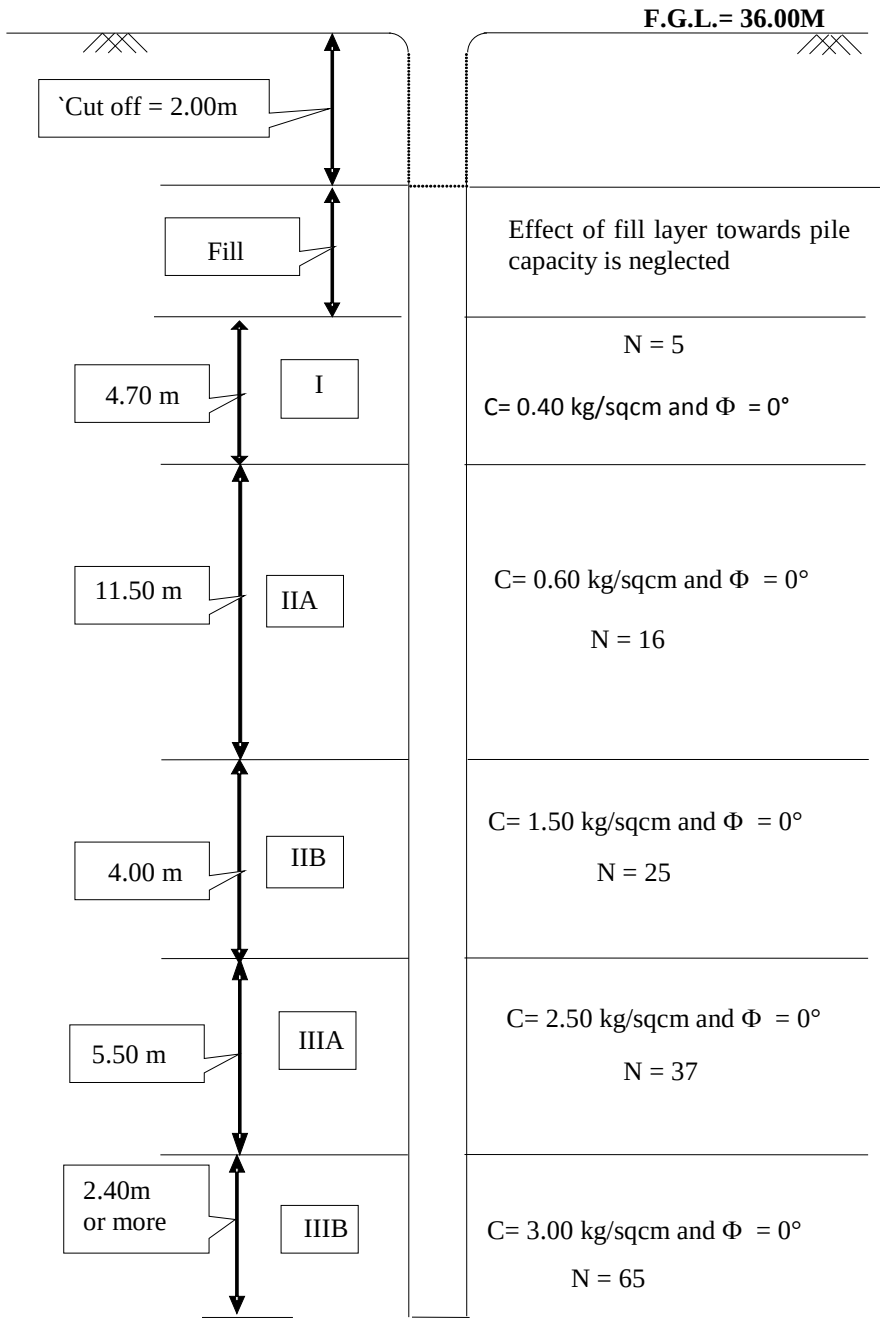


FIG. 4.08. PILE FOUNDATION DESIGN MODEL AROUND IBH-01 to 10

(***Not to Scale***)

SAMPLE PILE CAPACITY CALCULATION AROUND IBH-01 to 10

Bottom depth of Pile = 33.40 m below EGL i.e. 32.00m below FGL (FGL = 36.000M)
FGL is 1.40m below EGL.
Cut-off Length = 2.00 m below FGL
Diameter of Pile = 600 mm
FOS of Shaft Resistance = 2.50
FOS for End Bearing = 2.50 Critical depth 15.00 D
So, maximum Depth upto which pressure will increase = 9.00 m Maximum OVP = 8.1 t/sqm

Layer No.	Top Depth (M)	Bottom Depth (M)	Eff. Depth (M)	Cohesion (kg/sqcm)	Φ (Degree)	Adhesion Factor (α)	K_0	Eff. Density (gm/cc)	Mean Pressure (t/sqm)
Fill	3.40	5.30	1.90	0.00	0	1.000	1.00	0.90	2.66
I	5.30	10.00	4.70	0.35	0	1.000	1.00	0.90	5.63
IIA	10.00	21.50	11.50	0.75	0	0.606	1.00	0.90	8.09
IIB	21.50	25.50	4.00	0.90	0	0.500	1.00	0.90	8.10
IIIA	25.50	31.00	5.50	2.50	0	0.268	1.00	0.90	8.10
IIIB	31.00	33.40	2.40	3.00	0	0.268	1.00	0.90	8.10

Layer No.	Eff. Depth (M)	Effective σ_z (t/sqm)	$f_{s1} = \alpha C$	$f_{s2} = K_0\sigma_z\tan\Phi$	$fs = f_{s1} + f_{s2}$ (t/sqm)	Ultimate Shaft Resistance (T)	Safe Shaft Resistance (T)
Fill	1.90	2.66	0.00	0.00	0.00	0.00	0.00
I	4.70	5.63	3.50	0.00	3.50	31.01	12.40
IIA	11.50	8.09	4.54	0.00	4.54	98.45	39.38
IIB	4.00	8.10	4.50	0.00	4.50	33.93	13.57
IIIA	5.50	8.10	6.69	0.00	6.69	69.36	27.74
IIIB	2.40	8.10	8.03	0.00	8.03	36.32	14.53
	30.00					269.06	107.63

For End Bearing

Cohesion C= 3 kg/sqcm
Friction Angle = 0 °
So, Nc = 9
Nq = 1.00
Nγ = 0.00 [Refer to Table 1 of IS: 6403 : 1981]
Eff. Ovp. Pressure=p(tip) 8.10 t/sqm
q(tip) =C.Nc+p(tip).Nq+0.5γDNγ= 278.10 t/sqm
Ultimate End Bearing = 78.63 T
Safe End Bearing = 31.45 T
Safe Shaft Resistance= 107.63 T
So, Total Pile Capacity = 139.08 T

So, Recommended Pile Capacity = 130 T

Uplift Pile Capacity:

Uplift capacity = 1/3 x [(Shaft Resistance in Vertical Capacity) + self weight of pile (Buoyant)]
= 1/3x[269.06+(3.1415/4)x(600/1000)2 x (32-2.0) x (2.5-1)]
= 93.92897585 **, Restricted to Uplift Capacity = 46T**

So, Recommended Uplift Capacity = ton

5.2.3. RECOMMENDED PILE CAPACITY:

With reference to the above, the recommended pile capacity values are presented below.

Name of Structure	Borehole	Cut-off below FGL (M)	Dia of Pile (mm)	Pile Shaft Length below Cut-off (M)	Pile Capacity (T)		
					Vertical	Uplift	Lateral
Chimney Stage I	BH-10 & 48 and 44 & 45 FGL = 34.50M	6.50	600	25.50	140	49	7.00
			760	27.00	200	70	10.00
			760	31.00	230	81	11.50
			760	32.00	240	84	12.00
			900	30.00	275	96	13.75
Chimney Stage II (Unit - 5 & 7)	BH-47 & 49 and 18 & 19 FGL = 36.00M	5.00	600	28.00	140	49	7.00
			760	29.00	200	70	10.00
			760	33.00	230	81	11.50
			760	34.00	240	84	12.00
			600	27.00	140	49	7.00
			760	33.00	230	81	11.50
			760	34.00	240	84	12.00
			900	30.00	255	89	12.75
Chimney Stage II (Unit 6)	BH-38 & 39 FGL = 36.00M	5.00	600	31.00	140	49	7.00
			760	32.00	200	70	10.00
			760	36.00	230	81	11.50
			760	37.00	240	84	12.00
			600	30.00	140	49	7.00
			760	35.00	230	81	11.50
			760	37.00	240	84	12.00
			900	30.00	230	81	11.50
			900	31.00	240	84	12.00
Booster Fan Stage I, Absorber Stage I	BH-01. 05, 06, 08, 09, 35, 43 & 46 FGL = 34.50M	3.00	600	31.00	130	46	5.2
Absorber Stage II, Near Elect. Annex Compressor House, Absorber Stage II	BH-17, 28, 32, 33, 40 & 42 FGL = 36.00M	2.00	600	19.00	70	25	3.5
		3.00	600	19.00	70	25	3.5
			600	31.00	130	46	6.5
Booster Fan Stage II, Compressor House, Absorber Stage II, Near Ball Mill Building, Near Lime Stone	BH-12 to 16, 20 to 26, 29, 30, 36, 37, 41. 50, 52 FGL = 36.00M	2.00	600	19.00	70	25	3.5
			600	31.00	130	46	6.5
		3.00	600	19.00	70	25	3.5
			600	31.00	130	46	6.5
Space for FGD (Lot 3), Elect. Annex Compressor House Stage II , Gypsum Storage Stock Pile	BH-04, 27, 34 & 51 FGL = 36.00M	2.00	600	19.00	70	25	3.5
		3.00	600	19.00	70	25	3.5
Lime Stone Crusher House, Lime Stone Storage Silo, Gypsum Storage Stock Pile	IBH-01 to 10 FGL = 36.00M	2.00	600	22.00	70	25	3.5
			600	25.00	100	35	5.0
			600	30.00	130	46	5.8
		2.00	760	28.00	150	53	7.50
			760	33.00	200	70	8.00
		3.00	600	21.00	70	25	3.5
			600	25.00	100	35	5.0
			600	29.00	130	46	5.8
		3.00	760	27.00	150	53	7.50
			760	32.00	200	70	8.00

5.03. USE OF OPEN FOUNDATION:

Alternatively, for minor / less-important structures, it is suggested to go for open foundation. The determination of bearing capacity is presented below.

5.3.1. DETERMINATION OF BEARING CAPACITY AROUND BOOSTER FAN STAGE I (BH-01 & BH-08):

Let us place the foundation at 3.00m below NGL i.e. 3.61m below FGL (where, NGL = 33.891 M, FGL = 34.500 M)

Founding level falls inside Stratum -I.

This layer consists of medium silty clay.

Design N = 3, corresponding cohesion from N value = 0.32 kg/sqcm

Considering the above, use C = 0.30 kg/sqcm & $\Phi = 0°$ for bearing capacity calculation.

EVALUATION OF STRENGTH AND DEFORMATION PARAMETERS:

For Stratum I

Design N = 4, corresponding cohesion from N value = 0.38 kg/sqcm

Considering the above, use C = 0.35 kg/sqcm & $\Phi = 0°$ for settlement calculation.

Total soil modulus, $E_s = 4.4 \times N = 17.60$ kg/sqcm

[Ref. to "History of Soil penetration testing" by B. B. Broms & N. Flodin in "Penetration Testing 1988", ISPOT-1: vol.1, p – 185]

Undrained Young's modulus, $E_u = K \times C = 300 \times 0.35 = 105$ kg/sqcm

Again, $1/E_s = 1/E_u + 1/E_d$ giving drained young's modulus, $E_d = 21.14$ kg/sqcm

Now, we have, $E_d = E_u/3 = 35$ kg/sqcm

[Refer to "Cone Penetration Testing" by A.C.Meigh, pp. No. – 53]

Considering the above, let us use $E_d = 25$ kg/sqcm

From E_d, $m_{vc} = 1/G.E_d = 0.0444$ sqcm/kg [Geological Factor, G = 0.90 & $\mu = 0.35$]

Again from SPT "N", $m_{vc} = 1/5N = 0.0500$ sqcm/kg

[Refer to "Standard Penetration Test, State-of-the-art-Report" by Ivan K. Nixon in "Penetration testing 1" Edited by A.Verrujt, F.L.beringen & E.H.De Leeuw, pp. No. 11]

Now, let us consider the m_{vc} value for the pressure range between 0.50 to 2.00 kg/sqcm

Sample No.	0.50 – 1.00kg/sqcm	1.00 – 2.00kg/sqcm
BH-01/UDS-01	0.0181	0.0107
Average weighted m_{vc}, sqcm/kg over entire pressure range	**0.0132**	

Giving more weightage to the laboratory test results,

Use $m_{vc} = [2 \times 0.0132 + 0.0444 + 0.0500]/4 = 0.0302$ sqcm/kg

For Stratum II

Average N = 24, corresponding C = 1.06 kg/sqcm

Use C = 1.00 kg/sqcm

Total soil modulus, E_s = 4.4 x N = 105.60 kg/sqcm

Undrained Young's modulus, E_u = K x C = 500 x 1.00 = 500 kg/sqcm

Again, $1/E_s = 1/E_u + 1/E_d$ giving drained young's modulus, E_d = 133.87 kg/sqcm

Now, we have, $E_d = E_u/3$ = 166.67 kg/sqcm

Considering the above, let us use E_d = 150 kg/sqcm

From E_d, $m_{vc} = 1/G.E_d$ = 0.0111 sqcm/kg [Geological Factor, G = 0.60 & μ = 0.35]

Again from SPT "N", m_{vc} = 1/5N = 0.0083 sqcm/kg

Thus average m_{vc} = [0.0111 + 0.0083]/2 = 0.0097 sqcm/kg

CALCULATION OF NET SAFE BEARING CAPACITY:

The Net Ultimate Bearing Capacity is given as:

$$q_{nu} = C.N_c.S_c.D_c + q.N_q.S_q.D_q + 0.5\gamma.B.N_\gamma.S_\gamma.D_\gamma - q$$

Where,

N_c, N_q and N_γ are bearing capacity factors,
S_c, S_q and S_γ are shape factors,
D_c, D_q and D_γ are depth factors,

And

C = Cohesion
q = Overburden pressure,
B = Width of foundation,
γ = Effective density below foundation.

For 10m x 20m Footing Placed at 3.00m below NGL

Cohesion, C = 3.00 t/sqm

Using ϕ = 0 degree, the bearing capacity factors are:

N_c = 5.14
N_q = 1.00
N_γ = 0.00

Use,

Depth of Foundation = D_f = 3 M (Below Natural Ground level)
Width of Foundation = B = 10 M
Length of Foundation = L = 20 M

Overburden Pressure = q =3.000 (Depth) x 0.90 (Submerged density) = 2.70 t/sqm (Assuming the ground water table is flushing with the ground level)

The Shape factors are [IS:6403 - 1981]

S_c = 1.10 S_q = 1.10 S_γ = 0.80

The Depth factors are [IS:6403 - 1981]

D_c = 1.06 D_q = 1.00 D_γ = 1.00

Computed Net Ultimate Bearing Capacity = 18.27 t/sqm

Using a factor of safety of 2.5, Net Safe Bearing Capacity = 7.31 t/sqm

The above bearing capacity should be checked against settlement criteria.

Settlement Analysis

A) General Data:

Width of foundation =	10.0	m
Length of foundation =	20.0	m
Depth of foundation =	3.0	m
Net Base Pressure =	0.40	kg/sqcm

B) Subsoil Properties:

Layer - I			Layer - II		
Young's Modulus =	105	kg/sqcm	Young's Modulus =	500	kg/sqcm
Poisson Ratio, μ =	0.35		Poisson Ratio, μ =	0.35	
Top of Stratum =	3.00	m	Top of Stratum =	14.30	m
End of Stratum =	14.30	m	End of Stratum =	23.00	m
Geological factor, G =	0.90		Geological factor, G =	0.60	
m_{vc} =	0.0302	sqcm/kg	m_{vc} =	0.0097	sqcm/kg

C) Calculation of Immediate Settlement:

Settlement at center

M = L' / B' =	2.0000			
N = H / B' =	2.2600			
I_1 =	0.3231			
I_2 =	0.0976			
$I_s = I_1 + \{(1-2\mu)/(1-\mu)\}I_2$		0.368		
Immediate settlement S_i = $[q_o \times B' \times (1-\mu^2) \times m \times I_s] / E_s$		2.461	cm	

Settlement at center

M = L' / B' =	1.4695			
N = H / B' =	0.8169			
I_1 =	0.0981			
I_2 =	0.0967			
$I_s = I_1 + \{(1-2\mu)/(1-\mu)\}I_2$		0.1427		
Immediate settlement S_i = $[q_o \times B' \times (1-\mu^2) \times m \times I_s] / E_s$		0.1280	cm	

Settlement at corner

M = L' / B' =	2.0000			
N = H / B' =	1.1300			
I_1 =	0.1486			
I_2 =	0.1106			
$I_s = I_1 + \{(1-2\mu)/(1-\mu)\}I_2$		0.1997		
Immediate settlement S_i =		0.668	cm	

Settlement at corner

M = L' / B' =	1.4695			
N = H / B' =	0.4085			
I_1 =	0.0297			
I_2 =	0.0716			
$I_s = I_1 + \{(1-2\mu)/(1-\mu)\}I_2$		0.0628		
Immediate settlement S_i =		0.028	cm	

Average Si for Layer - I = 15.64 mm

Average Si for Layer - II = 0.78 mm

Total immediate settlement = 16.43 mm

(for all the two layers) 0.00

D) Calculation of Consolidation Settlement:

Strata	From (M)	To (M)	Thickness (M)	Mid depth (M)	Δ P (kg/sqcm)	m_{vc}, sqcm/kg	G	S_c (cm)
Layer - I	3.00	8.65	5.65	2.83	0.27	0.0302	0.90	4.20
	8.65	14.30	5.65	8.48	0.15	0.0302	0.90	2.34
Layer - II	14.30	18.65	4.35	13.47	0.10	0.0097	0.60	0.26
	18.65	23.00	4.35	17.82	0.08	0.0097	0.60	0.19

Hence, Total Consolidation Settlement = 69.82 mm

So, Total Settlement = 86.25 mm

Fox's Depth correction Factor = 0.95

Applying Rigidity correction Factor = 0.80

Corrected total settlement = 65.27 mm

Maximum depth existing fill = 0.80m below EGL

FGL = 34.500M

Min of Average EGL & Lowest Spot Level = 34.691M

Hence there will be no engineered fill. Therefore no surcharge weight due to engineered fill is expected.

Hence, use a net allowable bearing capacity of 4t/sqm for a limiting settlement of 75mm at foundation depth of 3.00m below NGL.

Based on the above, the structure wise recommended bearing capacity values have been presented in Sec. 5.3.2.

5.3.2. RECOMMENDATION:

Name of Structure	Borehole Location	Average EGL (M)	Existing Fill	Surchage Weight due to engineered fill	Natural Ground Level (M)	Lowest Spot Level	FGL (M)	Lowest of NGL / FGL (M)	Founding RL (M)	D_f below NGL / FGL (M)	D_f below FGL (M)	Size of foundation (m)	Recommended NABC (t/sqm) as per soil condition		
													S = 25mm	S = 40mm	S = 75mm
Booster Fan Stage I	BH-01 & 08	34.691	0.80	0.00	33.891	34.832	34.500	33.891	32.9	1.00	1.61	1≤B≤3	3	5	--
												3<B<6	2	3	--
												B≥ 6	--	--	4
									30.9	3.00	3.61	1≤B≤3	4	6	--
												3<B<6	2	3	--
												B≥ 6	--	--	4
Space for FGD (Lot 3)	BH-04 & 34	37.955	1.50	0.00	34.804	36.336	36.000	34.804	33.8	1.00	2.20	1≤B≤3	4	6	--
												3<B<6	--	4	--
												B≥ 6	--	--	4
									31.8	3.00	4.20	1≤B≤3	14	22	--
												3<B<6	7	11	--
												B≥ 6	--	--	13
FGD Control Room Stage I	BH-05 & 06	34.7795	0.80	0.10	33.980	34.446	34.500	33.980	33.0	1.00	1.52	1≤B≤3	4	6	--
												3<B<6	2	3	--
												B≥ 6	--	--	6
									31.0	3.00	3.52	1≤B≤3	5	8	--
												3<B<6	3	5	--
												B≥ 6	--	--	7
Chimney Stage I	BH-10 & 48	34.8915	2.50	0.00	32.392	34.967	34.500	32.392	31.4	1.00	3.11	1≤B≤3	4	6	--
												3<B<6	3	5	--
												B≥ 6	--	--	5
												30m dia	--	--	4
									29.4	3.00	5.11	1≤B≤3	5	8	--
												3<B<6	4	6	--
												B≥ 6	--	--	5
												30m dia	--	--	4
Booster Fan Stage II	BH-15 & 16	37.4165	2.00	0.00	35.178	37.038	36.000	35.178	34.2	1.00	1.82	1≤B≤3	4	6	--
												3<B<6	3	5	--
												B≥ 6	--	--	4
									32.2	3.00	3.82	1≤B≤3	5	8	--
												3<B<6	4	6	--
												B≥ 6	--	--	5
Absorber Stage II	BH-17 & 42	37.219	1.00	0.00	35.998	36.729	36.000	35.998	35.0	1.00	1.00	1≤B≤3	4	6	--
												3<B<6	--	4	--
												B≥ 6	--	--	4
									33.0	3.00	3.00	1≤B≤3	5	8	--
												3<B<6	--	4	--
												B≥ 6	--	--	4
Chimney Stage II	BH-18 & 19	37.3485	0.00	0.00	37.833	37.794	36.000	36.000	35.0	1.00	1.00	1≤B≤3	3	5	--
												3<B<6	2	3	--
												B≥ 6	--	--	4
									33.0	3.00	3.00	1≤B≤3	3	5	--
												3<B<6	2	3	--
												B≥ 6	--	--	5
Compressor House	BH-20	36.048	0.80	0.00	35.248	36.027	36.000	35.248	34.2	1.00	1.75	1≤B≤3	4	6	--
												3<B<6	3	5	--
												B≥ 6	--	--	4
									32.2	3.00	3.75	1≤B≤3	5	8	--
												3<B<6	4	6	5
												B≥ 6	--	--	3
Absorber Stage II	BH-22, 23 & 24	36.3995	2.70	0.00	33.421	36.154	36.000	33.421	32.4	1.00	3.58	1≤B≤3	3	5	--
												3<B<6	2	3	--
												B≥ 6	--	--	4
												30m dia	--	--	3
									30.4	3.00	5.58	1≤B≤3	3	5	--
												3<B<6	2	3	--
												B≥ 6	--	--	5
												30m dia	--	--	4
Near Ball Mill Building	BH-25	37.452	2.80	0.00	34.652	37.275	36.000	34.652	33.7	1.00	2.35	1≤B≤3	4	6	--
												3<B<6	3	5	--
												B≥ 6	--	--	4
									31.7	3.00	4.35	1≤B≤3	5	8	--
												3<B<6	4	6	--
												B≥ 6	--	--	5
Near Lime Stone Slurry Slurry Storage Tank	BH-26	36.883	2.40	0.00	34.483	36.781	36.000	34.483	33.5	1.00	2.52	1≤B≤3	4	6	--
												3<B<6	3	5	--
												B≥ 6	--	--	4
									31.5	3.00	4.52	1≤B≤3	5	8	--
												3<B<6	4	6	--
												B≥ 6	--	--	5
Elect. Annex Compressor House	BH-27	36.486	2.80	0.00	33.686	36.568	36.000	33.686	32.7	1.00	3.31	1≤B≤3	4	6	--
												3<B<6	3	5	--
												B≥ 6	--	--	6
									30.7	3.00	5.31	1≤B≤3	7	7	--
												3<B<6	6	6	--
												B≥ 6	--	--	6
Elect. Annex Compressor House	BH-28	36.894	2.00	0.00	34.894	36.516	36.000	34.894	33.9	1.00	2.11	1≤B≤3	5	8	--
												3<B<6	4	6	--
												B≥ 6	--	--	6
									31.9	3.00	4.11	1≤B≤3	6	10	--
												3<B<6	5	8	--
												B≥ 6	--	--	7
FGD CR Stage II	BH-30	39.501	6.50	0.00	33.001	39.512	36.000	33.001	32.0	1.00	4.00	1≤B≤3	4	10	--
												3<B<6	2	7	--
												B≥ 6	--	--	6

Name of Structure	Borehole Location	Average EGL (M)	Existing Fill	Surchage Weight due to engineered fill	Natural Ground Level (M)	Lowest Spot Level	FGL (M)	Lowest of NGL / FGL (M)	Founding RL (M)	D_f below NGL / FGL (M)	D_f below FGL (M)	Size of foundation (m)	Recommended NABC (t/sqm) as per soil condition		
													S = 25mm	S = 40mm	S = 75mm
FGD CR Stage II	BH-30	39.501	6.50	0.00	33.001	39.512	36.000	33.001	30.0	3.00	6.00	1≤B≤3	6	13	--
												3<B<6	4	10	--
												B≥ 6	--	--	8
Space for SWGR	BH-35	34.805	1.00	0.00	33.805	34.745	34.500	33.805	32.8	1.00	1.70	1≤B≤3	4	6	--
												3<B<6	3	5	--
												B≥ 6	--	--	5
									30.8	3.00	3.70	1≤B≤3	5	8	--
												3<B<6	4	6	--
												B≥ 6	--	--	6
Process Water Tank B	BH-37	35.71	3.00	0.84	32.710	35.559	36.000	32.710	31.7	1.00	4.29	1≤B≤3	3	5	--
												3<B<6	2	4	--
												B≥ 6	--	--	4
									29.7	3.00	6.29	1≤B≤3	5	8	--
												3<B<6	4	6	--
												B≥ 6	--	--	5
Chimney Stage II	BH-38 & 39	35.5005	0.70	0.95	34.952	35.617	36.000	34.952	34.0	1.00	2.05	1≤B≤3	3	5	--
												3<B<6	2	4	--
												B≥ 6	--	--	4
												30m dia	--	--	3
									32.0	3.00	4.05	1≤B≤3	4	7	--
												3<B<6	3	5	--
												B≥ 6	--	--	5
												30m dia	--	--	3
Absorber Stage II	BH-40	35.445	0.70	1.20	34.745	35.366	36.000	34.745	33.7	1.00	2.26	1≤B≤3	3	5	--
												3<B<6	2	4	--
												B≥ 6	--	--	3
									31.7	3.00	4.26	1≤B≤3	4	7	--
												3<B<6	3	5	--
												B≥ 6	--	--	4
Booster Fan Stage II	BH-41	35.228	0.80	1.47	34.428	35.235	36.000	34.428	33.4	1.00	2.57	1≤B≤3	3	5	--
												3<B<6	2	4	--
												B≥ 6	--	--	3
									31.4	3.00	4.57	1≤B≤3	4	7	--
												3<B<6	3	5	--
												B≥ 6	--	--	4
Absorber Stage I	BH-43	34.732	0.60	0.00	34.132	34.696	34.500	34.132	33.1	1.00	1.37	1≤B≤3	4	6	--
												3<B<6	3	5	--
												B≥ 6	--	--	5
									31.1	3.00	3.37	1≤B≤3	5	8	--
												3<B<6	4	6	--
												B≥ 6	--	--	6
Chimney Stage I	BH-44 & 45	35.647	1.80	0.00	33.698	35.498	34.500	33.698	32.7	1.00	1.80	1≤B≤3	4	6	--
												3<B<6	3	5	--
												B≥ 6	--	--	5
												30m dia	--	--	4
									30.7	3.00	3.80	1≤B≤3	5	8	--
												3<B<6	4	6	--
												B≥ 6	--	--	6
												30m dia	--	--	5
Absorber Stage I	BH-46	34.912	0.70	0.00	34.212	34.946	34.500	34.212	33.2	1.00	1.29	1≤B≤3	4	6	--
												3<B<6	3	5	--
												B≥ 6	--	--	5
									31.2	3.00	3.29	1≤B≤3	5	8	--
												3<B<6	4	6	--
												B≥ 6	--	--	6
Chimney Stage II	BH-47 & 49	36.7215	2.50	0.00	33.854	36.153	36.000	33.854	32.9	1.00	3.15	1≤B≤3	5	8	--
												3<B<6	4	6	--
												B≥ 6	--	--	5
												30m dia	--	--	4
									30.9	3.00	5.15	1≤B≤3	6	10	--
												3<B<6	5	8	--
												B≥ 6	--	--	5
												30m dia	--	--	4
Space for TRF	BH-52	38.661	5.80	0.00	32.861	37.868	36.000	32.861	31.9	1.00	4.14	1≤B≤3	--	4	--
												3<B<6	--	--	--
												B≥ 6	--	--	4
									29.9	3.00	6.14	1≤B≤3	3	6	--
												3<B<6	--	5	--
												B≥ 6	--	--	4
Lime Stone Storage Silo	IBH-06 & 07	37.1765	5.30	0.00	32.058	37.248	36.000	32.058	31.1	1.00	4.94	1≤B≤3	--	3	--
												3<B<6	--	--	--
												B≥ 6	--	--	--
									29.1	3.00	6.94	1≤B≤3	--	4	--
												3<B<6	--	3	--
												B≥ 6	--	--	--
Gypsum Storage Stock Pile	IBH-08, 09 BH-51	37.045	2.20	0.00	34.300	36.170	34.500	34.300	33.3	1.00	1.20	1≤B≤3	5	8	--
												3<B<6	4	6	--
												B≥ 6	--	--	5
									31.3	3.00	3.20	1≤B≤3	6	10	--
												3<B<6	5	8	--
												B≥ 6	--	--	6

DETERMINATION OF BEARING CAPACITY AROUND FGD CONTROL ROOM STAGE I (BH-05 & 06):

Let us place the foundation at 3.00m below NGL i.e. 3.52m below FGL (where, NGL = 33.980 M, FGL = 34.500 M)

Founding level falls inside Stratum -I.

This layer consists of medium silty clay.

Design N = 6, corresponding cohesion from N value = 0.50 kg/sqcm

From laboratory test results, average C = 0.64 kg/sqcm & $\Phi = 0°$

Thus average C = 0.57 kg/sqcm & $\Phi = 0°$

Considering the above, use C = 0.55 kg/sqcm & $\Phi = 0°$ for bearing capacity calculation.

EVALUATION OF STRENGTH AND DEFORMATION PARAMETERS:

For Stratum I

Total soil modulus, $E_s = 4.4 \times N = 26.40$ kg/sqcm

Undrained Young's modulus, $E_u = K \times C = 350 \times 0.55 = 192.50$ kg/sqcm

Again, $1/E_s = 1/E_u + 1/E_d$ giving drained young's modulus, $E_d = 30.60$ kg/sqcm

Now, we have, $E_d = E_u/3 = 64.17$ kg/sqcm

Considering the above, let us use $E_d = 45$ kg/sqcm

From E_d, $m_{vc} = 1/G.E_d = 0.0278$ sqcm/kg [Geological Factor, G = 0.80 & $\mu = 0.35$]

Again from SPT "N", $m_{vc} = 1/5N = 0.0333$ sqcm/kg

Now, let us consider the m_{vc} value for the pressure range between 0.50 to 2.00 kg/sqcm

Sample No.	0.50 – 1.00kg/sqcm	1.00– 2.00kg/sqcm
BH-06/UDS-02	0.0350	0.0203
Average weighted m_{vc}, sqcm/kg over entire pressure range	**0.0252**	

Giving more weightage to the laboratory test results,

Use $m_{vc} = [2 \times 0.0252 + 0.0278 + 0.0333]/4 = 0.0279$ sqcm/kg

For 4m x 6m Footing Placed at 3.00m below NGL

Depth of Foundation = Df = 3 M (Below Natural Ground level)
Width of Foundation = B = 3 M
Length of Foundation = L = 6 M

Computed Net Ultimate Bearing Capacity = 37.62 t/sqm

Using a factor of safety of 2.5, Net Safe Bearing Capacity = 15.05 t/sqm

The above bearing capacity should be checked against settlement criteria.

Settlement Analysis

A) General Data:

Width of foundation =	3.00	m
Length of foundation =	6.00	m
Depth of foundation =	3.0	m
Net Base Pressure =	0.5	kg/sqcm

B) Subsoil Properties:

Layer - I

Young's Modulus =	192.5	kg/sqcm
Poisson Ratio, μ =	0.35	
Top of Stratum =	3.00	m
End of Stratum =	9.00	m
Geological factor, G =	0.80	
m_{vc} =	0.0279	sqcm/kg

C) Calculation of Immediate Settlement:

Settlement at center

M = L' / B' = 2.0000
N = H / B' = 4.0000
I_1 = 0.4758
I_2 = 0.0692
$I_s = I_1 + \{(1-2\mu)/(1-\mu)\} I_2$ = 0.508
Immediate settlement S_i = 0.694 cm
$[q_o \times B' \times (1-\mu^2) \times m \times I_s] / E_s$

Settlement at corner

M = L' / B' = 2.0000
N = H / B' = 2.0000
I_1 = 0.2891
I_2 = 0.1024
$I_s = I_1 + \{(1-2\mu)/(1-\mu)\} I_2$ = 0.3364
Immediate settlement S_i = 0.230 cm

Average Si for Layer - I = 4.62 mm

Total immediate settlement = 4.62 mm (for all the two layers) 0.00

D) Calculation of Consolidation Settlement:

Strata	From (M)	To (M)	Thickness (M)	Mid depth (M)	Δ P (kg/sqcm)	m_{vc}, sqcm/kg	G	S_c (cm)
Layer - I	3.00	6.00	3.00	1.50	0.27	0.0279	0.80	1.79
	6.00	9.00	3.00	4.50	0.11	0.0279	0.80	0.77

Hence, Total Consolidation Settlement = 25.51 mm

So, Total Settlement = 30.13 mm
Fox's Depth correction Factor = 0.79
Corrected total settlement = 23.74 mm

Maximum depth existing fill = 0.80m below EGL

FGL = 34.500M, Min of Average EGL & Lowest Spot Level = 34.446M

Assume density of fill = 1.90 t/sqm

So, surcharge weight due to engineered fill = (34.500-34.446) x 1.90 = 0.10t/qm

Therefore net allowable bearing capacity = (5-0.10) = 4.90t/sqm, say 4t/sqm

Hence, use a net allowable bearing capacity of 4t/sqm for a limiting settlement of 25mm at foundation depth of 3.00m below NGL.

5.04. LIQUEFACTION ANALYSIS:

As per H. B. Seed and I.M. Idriss (1982) a clayey soil is said to be non-liquefiable if any one of the following three criteria is satisfied.

a) the soil contains fine grained soils with clay contents greater than 15%,
b) liquid limit greater than 35% or
c) moisture content less than 90% of the liquid limit.

Based on the above criteria, it is seen that the soft to medium (layer I) and stiff to very stiff (layer II) silty clay / clayey silt layer at the present site is non-liquefiable as the moisture content (23% for layer I and II) is less than 90% of the liquid limit.

Similarly, it is also seen that the hard, clayey silt layer (layer-III) is also non-liquefiable as the liquid limit (36%) is greater than 35% and the moisture content (22%) is less than 90% of the liquid limit.

A dense to very dense (layer IV) sand layer appears which is non-liquefiable. So, the soil is non-liquefiable.

5.05. SWELLING CHARACTERISTICS:

The swelling pressure and Free Swell Index tests were performed on a few samples and the test results are presented at the end of the Appendix. The average swelling pressure and Free Swell Index as found from the tests are 0.01kg/sqcm and 9.41% respectively.

5.06. FIELD PERMEABILITY TEST RESULTS:

Field permeability test was conducted at different depths by falling head method and the test results are presented below. Sample calculations are also enclosed at the end of the Appendix.

Test Locations	Type of Test	Depth of Test (M)	Permeability (cm/sec)
BH-05	Falling Head	0.80 – 1.50	1.403×10^{-6}
	Falling Head	2.85 – 3.50	7.271×10^{-7}
	Falling Head	4.90 – 5.60	6.538×10^{-7}
	Falling Head	7.70 – 8.40	9.807×10^{-7}
	Falling Head	11.85 – 12.50	9.707×10^{-7}
BH-15	Falling Head	0.80 – 1.50	1.464×10^{-5}
	Falling Head	2.80 – 3.50	1.059×10^{-5}
	Falling Head	4.70 – 5.40	1.261×10^{-5}
	Falling Head	7.80 – 8.50	1.010×10^{-5}
	Falling Head	11.70 – 12.40	7.638×10^{-6}
BH-29	Falling Head	0.70 – 1.50	1.754×10^{-5}
	Falling Head	2.80 – 3.50	1.405×10^{-6}
	Falling Head	4.60 – 5.30	9.337×10^{-7}
	Falling Head	7.70 – 8.40	4.666×10^{-7}
	Falling Head	11.80 – 12.50	4.661×10^{-7}
IBH-10	Falling Head	0.75 – 1.50	2.732×10^{-6}
	Falling Head	2.70 – 3.40	1.403×10^{-6}
	Falling Head	4.80 – 5.50	1.871×10^{-6}
	Falling Head	7.70 – 8.50	1.307×10^{-6}
	Falling Head	11.80 – 12.50	1.405×10^{-6}

5.07. STANDARD PROCTOR COMPACTION & CBR TEST:

Standard Proctor Compaction tests were carried out in the laboratory to determine the Optimum Moisture Content (OMC) and Maximum Dry Density (MDD). Thereafter, CBR (4 days soaked) tests were carried out on the samples prepared at 95% of MDD. The test results and graphs are presented in the Appendix.

5.08. CHEMICAL TESTS:

Chemical tests were performed on few soil and water samples for determining the pH value, Sulphate, Chloride content, organic matter, carbonate etc.

CHEMICAL TEST RESULTS ON SOIL SAMPLES:-

BH/Sample No.	Depth (m)	pH value	Sulphate as SO_3 (%)	Chloride as Cl (%)	Organic Matter (%)	Carbonate as CO_3 (%)
BH-03/ UDS01	2.50	6.40	B.D.L.*	0.004	0.2907	1.284
BH-10 / UDS02	5.50	6.72	B.D.L.*	0.007	0.3273	1.344
BH-24 / UDS02	5.50	7.31	B.D.L.*	0.005	0.3170	1.788
BH-26 / UDS01	2.50	6.22	B.D.L.*	0.004	0.3570	1.536
BH-30 / UDS03	8.50	7.17	B.D.L.*	0.006	0.4311	1.596
IBH-01 / UDS2	5.50	5.69	B.D.L.*	0.003	0.3909	1.788

CHEMICAL TEST RESULTS ON WATER SAMPLES:-

BH No.	Depth (M)	pH value	Sulphate as SO_4 (mg/litre)	Chloride as Cl (mg/litre)	Carbonate (mg/litre)	Nitrate (mg/litre)	Organic Matter (mg/litre)
BH-06	1.10	6.66	61.12	25.55	10.31	0.16	8.88
BH-16	1.60	7.02	70.34	60.14	20.66	0.12	6.64
BH-27	1.50	7.34	90.15	34.74	17.41	0.14	10.81
IBH-01	1.15	6.88	88.12	88.45	18.22	0.15	6.15

Note: * - **B.D.L.** = **B**elow **D**etection **L**imit (i.e. below 0.050%)

It is seen that the values are on a safer side and so no special cement will be required for foundation concrete. **Either Ordinary Portland cement or Portland slag cement or Portland Pozzolana cement can be used for the purpose.**

5.09. SUITABILITY OF EXISTING SOIL FOR FILLING AND BACK-FILLING:

The subsoil at the site is inorganic in nature & consists of silty clay (CL type soil) with sand having low swelling properties. The average swelling pressure and Free Swell Index as found are 0.010kg/sqcm and 9.41% respectively. So, the soil can be used for filling and backfilling purposes with necessary compaction as required.

5.10. SUITABILITY OF SOIL FOR CONSTRUCTION OF ROADS & PAVEMENT:

In the laboratory, standard proctor compaction tests were performed, using samples collected at a depth varying from 1.00-4.00m below ground level. The MDD ranges between 1.680 gm/cc to 1.945 gm/cc.

Laboratory CBR tests were performed on remoulded soil samples (compacted at 95% of MDD) under soaked (4days soaking) condition. The CBR values are in the range of 2% to 9% for soaked condition. However, at the top in some boreholes we are having filled up soil consists of brick bats and coal dust which shall not be used for construction of roads and pavement and backfilling.

6. SUMMARY & RECOMMENDATIONS

Based on the field and laboratory tests and the foregoing discussion the following are summarised.

1. The subsoil is characterised by a layer of filled up soil at top followed by soft to medium silty clay layer. Below this stiff to very stiff silty clay layer was found. After that hard silty clay layer was found and that continues upto the terminating depth of all the boreholes. However, dense to very dense silty sand layers have also been observed at few borehole locations.

2. Five nos. (5) Plate Load Tests were conducted around plant area (2 nos. are of routine type & rest 3 nos. are of cyclic type). The safe load & corresponding plate settlement, subgrade modulus & settlement for foundation and the dynamic properties using the elastic rebound as we obtain from CPLT-01 to 03 have been discussed in the Section 5.1.

3. **Use of Pile Foundation:** The determination of pile capacity is discussed in the previous section. The recommended pile capacity values are presented in Section. 5.2.3.

4. **Use of Open Foundation:** The recommended bearing capacity values at different depth of foundation are presented in Section 5.3.2.

5. The discussion on swelling characteristics is given in Section 5.05**.**

6. Chemical tests were carried out on few soil and water samples so as to detect the **pH value, Sulphate, Chloride etc**. It is seen that the values are on a safe side. So, any cement can be used for foundation concrete. **Either Ordinary Portland cement or Portland slag cement or Portland Pozzolana cement can be used for the purpose.**

7. The suitability of existing soil for filling and back-filling is given in Section 5.09.

8. The suitability of soil for construction of roads & pavement is discussed in Section 5.10.

9. 17 (Seventeen) nos. ERT were performed at the site and the test results are discussed and presented in Section -7.

10. 3 (Three) nos. Cross Hole Test was performed at the site and the test results are discussed and presented in Section-8. For dynamic properties of subsoil strata, Cross Hole Shear test results shall be referred. Further the values of poission's ratio, dynamic young's modulus and shear modulus are also mentioned there.

11. The geological report of zone of the investigation is presented in Section 9.

For C. E. Testing Company Private Limited,

Prepared By	Checked By	Approved By
(S. SARKAR)	(S. NATH)	(DR. M. NAYAK)

7. ELECTRICAL RESISTIVITY TEST

REPORT ON
ELECTRICAL RESISTIVITY TEST
FOR FGD SYSTEM 4 x 210MW STAGE-I + 3x 500 MW STAGE –II, KAHALGAON STPP, BIHAR

INTRODUCTION:

Electrical Resistivity Test was carried out for construction of FGD system 4 x 210MW STAGE-I + 3x 500 MW STAGE –II, Kahalgaon STPP, Bihar from 02/12/2020 to 05/12/2020 at seventeen (17) locations as per IS 3043 : 1987.

METHODOLOGY:

The Soil Resistivity Survey is a method to find out the Electrical Resistivity (Specific Resistance) of a medium. It is the resistance offered by a unit cube of a particular medium (so called strata below the ground level) when a unit current passes perpendicular to the surface of a cross-sectional area A. The relation is given by Ohm's Law is –

$$\rho = R \text{ ohm} \frac{A}{l} = \text{ohm} \frac{m^2}{m} = \text{ohm} - m$$ where

ρ= Resistivity, R = resistance offered by the medium of length L and Cross-sectional area A.

In electrical resistivity survey a known current I (direct current or low frequency alternating current) is sent into the ground through a pair of current electrodes A & B and the potential difference (ΔV) created in the medium is measured between another pair of electrodes M & N. The resistivity of the formation is then given

by $\rho = K \frac{\Delta V}{I}$ where ρ is the apparent resistivity, K is the geometric factor.

In the Earth Resistivity Test, the Wenner configuration was followed. In this configuration two potential electrodes M & N are placed in a line with the current electrodes A & B, all four being situated equidistance from one to another and disposed symmetrically with respect to a central point such that AM=MN=NB=a . The outer two electrodes A & B were used for

sending current (I) and inner two M & N were used for measuring the potential differences (ΔV). The distance between each consecutive electrode (a) was kept constant and was progressively increased to reach the depth at which resistivity information are wanted. Suitable electrode spacing determines the conductivity of the top soil as well as the various subsurface layers occurring in the area under study. At each location, 4 sets of observations were taken for each of the electrode spacing (a) in eight directions (N-S, E-W, NE-SW & NW-SE) and in ten different electrode spacing viz,: a = 0.50m, 1.0m, 2.0m, 3.0m, 4.0m, 5.0m, 6.0m, 7.0m, 8.0m and 10.0m were used to know the nature of change of resistivity.

The apparent resistivity was determined by the formula –

$$\rho = 6.28\, a \frac{\Delta V}{I}$$

where 'a' is the distance between the two consecutive Electrodes and $\frac{\Delta V}{I}$ is R which is the observed resistance for measuring resistivity.

A Resistivity Meter model DDR-2 of GEOSENSOR make was used during the operation. The mean value of the resistivity estimated was taken as the representative one.

The depth of investigation in an isotropic and homogeneous formation can be approximated to the distance between the consecutive two electrodes (a).

TEST RESULTS:

The overall mean resistivity values at each ERT locations are presented below

APPARENT RESISTIVITY VALUES

Sl. No.	ERT Location	Co-ordinate (M)		Overall Mean Resistivity (Ohm-m)
		Easting	Southing	
1.	ERT-1	3883.00	2098.00	34.50
2.	ERT-2	3829.00	2017.00	49.91
3.	ERT-3	3952.00	1947.00	89.17
4.	ERT-4	3905.00	1915.00	107.89
5.	ERT-5	3650.00	1932.00	102.10
6.	ERT-6	3163.00	1884.00	98.81
7.	ERT-7	3253.90	1944.480	82.02
8.	ERT-8	2943.526	1932.308	89.91
9.	ERT-9	2948.172	1900.304	77.86
10.	ERT-10	3322.00	1711.00	46.56
11.	ERT-11	3382.00	1691.00	65.99
12.	ERT-12	3442.00	1666.00	89.75

Sl. No.	ERT Location	Co-ordinate (M)		Overall Mean Resistivity (Ohm-m)
		Easting	Southing	
13.	ERT-13	3477.00	1623.00	102.84
14.	ERT-14	3235.00	2289.00	94.57
15.	ERT-15	3858.00	2149.00	112.37
16.	ERT-16	2787.30	2470.70	114.02
17.	IERT-1	3970.00	1911.00	102.21

ERT No. 01

Sl No.	S (M)	Apparent Electrical Resistivity (Ohm-m)				
		(N - S)	(E - W)	(NE - SW)	(NW - SE)	Mean
1	0.50	20.133	20.117	20.133	20.102	20.12
2	1.0	36.472	36.441	36.567	36.535	36.50
3	2.0	38.954	39.142	38.954	38.954	39.00
4	3.0	41.938	41.844	41.938	41.655	41.84
5	4.0	40.462	40.462	40.462	40.587	40.49
6	5.0	38.169	38.483	37.698	38.012	38.09
7	6.0	37.698	37.699	37.887	37.322	37.65
8	7.0	33.426	34.085	33.645	33.646	33.70
9	8.0	30.912	30.159	30.159	30.41	30.41
10	10.0	27.645	27.331	26.703	27.107	27.20

Mean Resistivity at ERT-01 is 34.50 Ohm - m.

ERT No. 02

Sl No.	S (M)	Apparent Electrical Resistivity (Ohm-m)				
		(N - S)	(E - W)	(NE - SW)	(NW - SE)	Mean
1	0.50	110.249	110.092	110.249	109.935	110.13
2	1.0	101.156	101.156	101.156	101.47	101.23
3	2.0	74.139	75.395	74.767	74.139	74.61
4	3.0	56.546	56.547	57.489	56.546	56.78
5	4.0	37.698	37.446	37.446	37.823	37.60
6	5.0	24.503	24.66	24.503	24.66	24.58
7	6.0	26.577	26.954	26.766	26.577	26.72
8	7.0	20.891	21.331	20.671	20.671	20.89
9	8.0	21.613	21.362	21.864	21.864	21.68
10	10.0	24.818	25.132	25.132	24.503	24.90

Mean Resistivity at ERT-02 is 49.91 Ohm - m.

ERT No. 03

Sl No.	S (M)	Apparent Electrical Resistivity (Ohm-m)				
		(N - S)	(E - W)	(NE - SW)	(NW - SE)	Mean
1	0.50	171.498	171.341	171.341	171.184	171.34
2	1.0	154.561	154.561	154.875	154.875	154.72
3	2.0	131.943	133.827	131.942	131.943	132.41
4	3.0	112.151	114.036	113.094	112.151	112.86
5	4.0	91.731	91.731	89.218	90.475	90.79
6	5.0	59.688	59.688	62.83	67.542	62.44
7	6.0	56.736	56.925	55.982	56.359	56.50
8	7.0	47.50	47.94	47.94	47.94	47.83
9	8.0	40.211	39.96	40.212	40.463	40.21
10	10.0	22.619	22.933	22.304	22.619	22.62

Mean Resistivity at ERT-03 is 89.17 Ohm - m.

ERT No. 04

Sl No.	S (M)	Apparent Electrical Resistivity (Ohm-m)				
		(N - S)	(E - W)	(NE - SW)	(NW - SE)	Mean
1	0.50	193.485	193.171	193.171	193.328	193.29
2	1.0	187.861	187.861	188.49	187.547	187.94
3	2.0	152.676	152.676	152.048	152.048	152.36
4	3.0	141.367	142.309	143.252	140.424	141.84
5	4.0	105.559	103.041	101.784	105.554	103.98
6	5.0	81.678	84.82	80.108	83.249	82.46
7	6.0	54.663	54.663	54.663	58.433	55.61
8	7.0	56.516	56.736	57.176	56.736	56.79
9	8.0	50.767	50.013	50.767	50.767	50.58
10	10.0	54.348	54.348	53.72	53.72	54.03

Mean Resistivity at ERT-04 is 107.89 Ohm - m.

ERT No. 05

Sl No.	S (M)	Apparent Electrical Resistivity (Ohm-m)				
		(N - S)	(E - W)	(NE - SW)	(NW - SE)	Mean
1	0.50	175.11	174.953	--	--	175.03
2	1.0	157.075	157.389	--	--	157.23
3	2.0	126.288	127.544	--	--	126.92
4	3.0	105.554	108.381	--	--	106.97
5	4.0	100.527	99.271	--	--	99.90
6	5.0	92.674	84.82	--	--	88.75
7	6.0	73.513	75.397	--	--	74.46
8	7.0	68.172	61.574	--	--	64.87
9	8.0	62.579	61.071	--	--	61.83
10	10.0	65.658	64.401	--	--	65.03

Mean Resistivity at ERT-05 is 102.10 Ohm - m.

ERT No. 06

Sl No.	S (M)	Apparent Electrical Resistivity (Ohm-m)				
		(N - S)	(E - W)	(NE - SW)	(NW - SE)	Mean
1	0.50	--	--	219.87	220.027	219.95
2	1.0	--	--	161.787	162.101	161.94
3	2.0	--	--	150.792	150.791	150.79
4	3.0	--	--	136.654	138.539	137.60
5	4.0	--	--	100.528	100.527	100.53
6	5.0	--	--	61.259	62.83	62.04
7	6.0	--	--	45.238	47.123	46.18
8	7.0	--	--	34.745	34.745	34.75
9	8.0	--	--	35.185	35.939	35.56
10	10.0	--	--	38.64	38.955	38.80

Mean Resistivity at ERT-06 is 98.81 Ohm - m.

ERT No. 07

Sl No.	S (M)	Apparent Electrical Resistivity (Ohm-m)				
		(N - S)	(E - W)	(NE - SW)	(NW - SE)	Mean
1	0.50	137.104	136.633	--	--	136.87
2	1.0	120.005	120.005	--	--	120.01
3	2.0	124.403	126.288	--	--	125.35
4	3.0	106.496	103.669	--	--	105.08
5	4.0	79.165	74.139	--	--	76.65
6	5.0	--	64.40	--	--	64.40
7	6.0	--	56.548	--	--	56.55
8	7.0	--	48.819	--	--	48.82
9	8.0	--	44.735	--	--	44.74
10	10.0	--	41.782	--	--	41.78

Mean Resistivity at ERT-07 is 82.02 Ohm - m.

ERT No. 08

Sl No.	S (M)	Apparent Electrical Resistivity (Ohm-m)				
		(N - S)	(E - W)	(NE - SW)	(NW - SE)	Mean
1	0.50	141.03	141.345	141.03	141.816	141.31
2	1.0	125.974	126.288	125.345	125.031	125.66
3	2.0	148.907	148.906	148.278	149.535	148.91
4	3.0	150.792	154.561	154.561	156.446	154.09
5	4.0	104.297	103.041	103.041	103.041	103.36
6	5.0	69.113	69.112	73.825	69.113	70.29
7	6.0	45.238	47.123	50.893	47.123	47.59
8	7.0	44.421	43.982	43.542	43.322	43.82
9	8.0	35.688	36.441	35.436	36.442	36.00
10	10.0	27.645	28.587	27.645	28.587	28.12

Mean Resistivity at ERT-08 is 89.91 Ohm - m.

ERT No. 09

Sl No.	S (M)	Apparent Electrical Resistivity (Ohm-m)				
		(N - S)	(E - W)	(NE - SW)	(NW - SE)	Mean
1	0.50	95.486	95.80	95.643	95.80	95.68
2	1.0	82.935	83.563	84.506	83.563	83.64
3	2.0	91.731	89.846	91.731	90.474	90.95
4	3.0	114.036	114.978	116.863	114.978	115.21
5	4.0	108.067	109.323	109.324	108.067	108.70
6	5.0	95.815	92.674	91.103	91.103	92.67
7	6.0	67.858	73.513	69.743	67.858	69.74
8	7.0	48.82	49.919	48.819	49.259	49.20
9	8.0	39.96	40.965	40.212	40.965	40.53
10	10.0	32.043	32.043	32.357	32.672	32.28

Mean Resistivity at ERT-09 is 77.86 Ohm - m.

ERT No. 10

Sl No.	S (M)	Apparent Electrical Resistivity (Ohm-m)				
		(N - S)	(E - W)	(NE - SW)	(NW - SE)	Mean
1	0.50	80.095	80.252	80.252	79.938	80.13
2	1.0	76.024	76.024	76.024	76.338	76.10
3	2.0	62.83	62.201	62.829	62.83	62.67
4	3.0	53.719	52.777	55.604	55.604	54.43
5	4.0	37.698	41.467	41.467	42.724	40.84
6	5.0	32.514	32.671	32.357	33.456	32.75
7	6.0	26.389	26.954	26.577	27.331	26.81
8	7.0	27.488	27.928	28.148	28.368	27.98
9	8.0	29.656	29.656	29.404	29.907	29.66
10	10.0	33.614	34.242	34.242	34.871	34.24

Mean Resistivity at ERT-10 is 46.56 Ohm - m.

ERT No. 11

Sl No.	S (M)	Apparent Electrical Resistivity (Ohm-m)				
		(N - S)	(E - W)	(NE - SW)	(NW - SE)	Mean
1	0.50	123.127	122.97	122.97	122.813	122.97
2	1.0	103.355	103.669	103.669	103.355	103.51
3	2.0	96.129	97.386	97.386	99.271	97.54
4	3.0	105.554	109.324	105.554	112.151	108.15
5	4.0	57.803	59.059	59.059	60.316	59.06
6	5.0	39.111	38.797	39.268	38.483	38.91
7	6.0	29.97	29.97	30.347	29.97	30.06
8	7.0	30.347	30.567	30.567	30.347	30.46
9	8.0	32.923	32.672	32.923	32.923	32.86
10	10.0	35.87	36.499	35.30	37.698	36.34

Mean Resistivity at ERT-11 is 65.99 Ohm - m.

ERT No. 12

Sl No.	S (M)	Apparent Electrical Resistivity (Ohm-m)				
		(N - S)	(E - W)	(NE - SW)	(NW - SE)	Mean
1	0.50	157.992	157.678	157.835	157.992	157.87
2	1.0	147.336	147.336	146.707	146.707	147.02
3	2.0	126.288	126.288	127.544	126.916	126.76
4	3.0	148.907	149.849	146.079	148.907	148.44
5	4.0	123.146	128.173	123.146	126.916	125.35
6	5.0	49.164	48.693	48.379	48.536	48.69
7	6.0	34.306	34.871	34.306	34.306	34.45
8	7.0	33.206	33.426	32.766	33.206	33.15
9	8.0	35.939	34.933	35.185	35.185	35.31
10	10.0	40.525	41.154	39.897	40.211	40.45

Mean Resistivity at ERT-12 is 89.75 Ohm - m.

ERT No. 13

Sl No.	S (M)	Apparent Electrical Resistivity (Ohm-m)				
		(N - S)	(E - W)	(NE - SW)	(NW - SE)	Mean
1	0.50	230.235	230.235	229.921	230.078	230.12
2	1.0	181.578	182.207	181.892	182.521	182.05
3	2.0	140.11	139.482	141.367	141.367	140.58
4	3.0	159.273	163.043	160.216	164.928	161.87
5	4.0	139.482	141.995	141.995	141.995	141.37
6	5.0	42.096	41.781	41.624	41.938	41.86
7	6.0	31.29	31.478	31.29	31.855	31.48
8	7.0	31.007	31.447	30.567	31.007	31.01
9	8.0	32.421	32.923	32.17	32.923	32.61
10	10.0	35.499	35.813	35.499	35.185	35.50

Mean Resistivity at ERT-13 is 102.84 Ohm - m.

ERT No. 14

Sl No.	S (M)	Apparent Electrical Resistivity (Ohm-m)				
		(N - S)	(E - W)	(NE - SW)	(NW - SE)	Mean
1	0.50	124.54	124.697	124.383	124.54	124.54
2	1.0	113.094	113.408	112.779	113.408	113.17
3	2.0	130.057	129.429	128.801	128.173	129.12
4	3.0	115.92	114.978	115.92	114.978	115.45
5	4.0	103.041	103.041	101.784	104.297	103.04
6	5.0	86.391	92.674	84.82	89.532	88.35
7	6.0	71.628	77.282	71.628	75.398	73.98
8	7.0	68.172	70.371	61.574	63.773	65.97
9	8.0	63.333	63.584	63.082	63.333	63.33
10	10.0	68.799	69.114	68.171	68.799	68.72

Mean Resistivity at ERT-14 is 94.57 Ohm - m.

ERT No. 15

Sl No.	S (M)	Apparent Electrical Resistivity (Ohm-m)				
		(N - S)	(E - W)	(NE - SW)	(NW - SE)	Mean
1	0.50	166.315	166.473	166.158	166.158	166.28
2	1.0	134.455	134.77	133.827	135.398	134.61
3	2.0	150.792	152.048	151.42	152.048	151.58
4	3.0	74.453	78.222	71.626	76.338	75.16
5	4.0	74.139	79.165	72.882	75.396	75.40
6	5.0	94.245	94.244	94.244	98.957	95.42
7	6.0	99.902	98.017	90.477	96.132	96.13
8	7.0	103.357	107.755	98.959	101.158	102.81
9	8.0	100.529	100.529	100.53	98.016	99.90
10	10.0	125.662	128.803	122.52	128.803	126.45

Mean Resistivity at ERT-15 is 112.37 Ohm - m.

ERT No. 16

Sl No.	S (M)	Apparent Electrical Resistivity (Ohm-m)				
		(N - S)	(E - W)	(NE - SW)	(NW - SE)	Mean
1	0.50	196.94	197.097	197.254	197.097	197.10
2	1.0	188.175	188.49	189.118	188.804	188.65
3	2.0	152.676	152.676	150.792	152.048	152.05
4	3.0	138.539	140.424	137.597	137.597	138.54
5	4.0	123.146	125.66	123.146	125.659	124.40
6	5.0	100.527	98.957	98.957	97.386	98.96
7	6.0	77.282	77.282	75.397	73.513	75.87
8	7.0	57.176	59.375	57.176	57.176	57.73
9	8.0	49.51	50.265	49.762	50.516	50.01
10	10.0	56.861	57.49	56.233	56.861	56.86

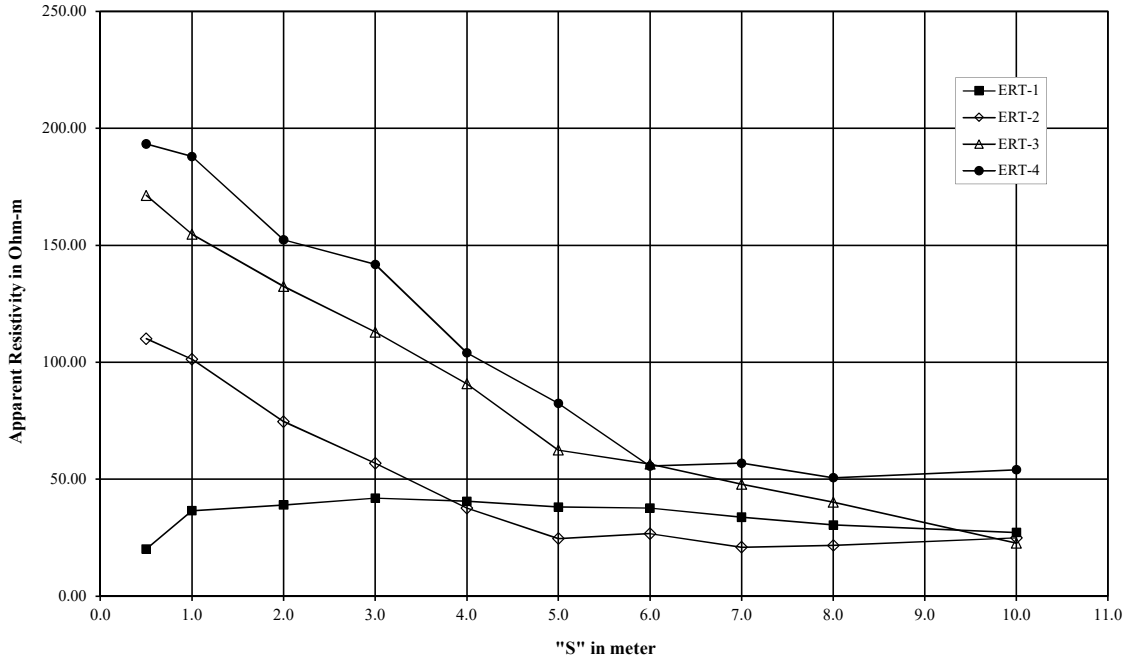
Mean Resistivity at ERT-16 is 114.02 Ohm - m.

IERT No. 1

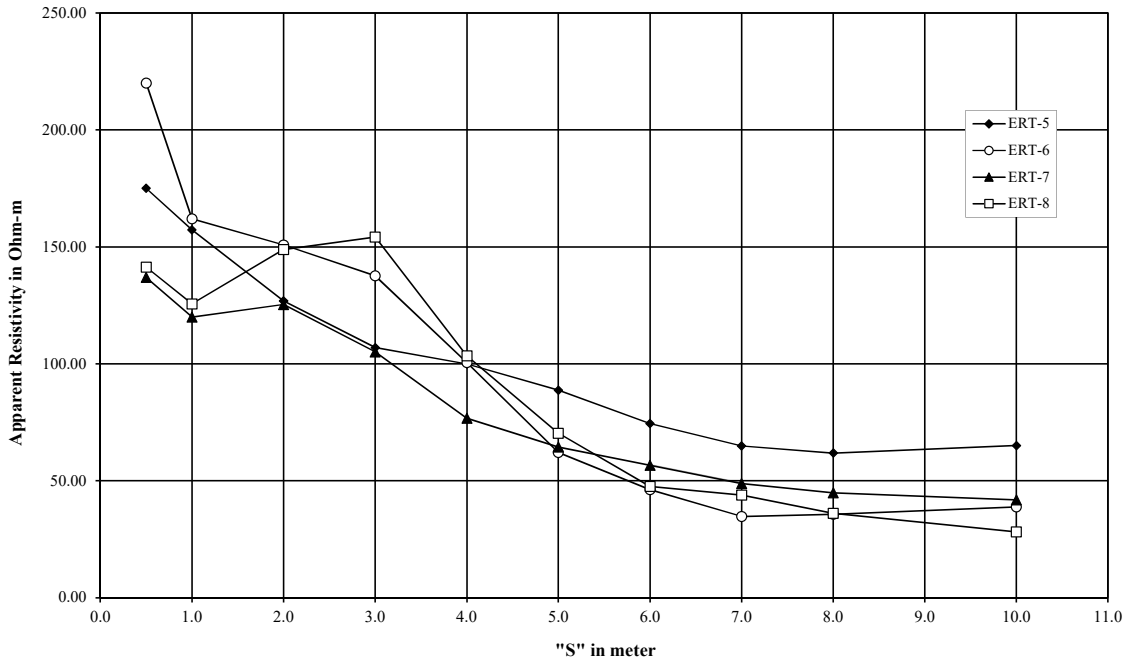
Sl No.	S (M)	Apparent Electrical Resistivity (Ohm-m)				
		(N - S)	(E - W)	(NE - SW)	(NW - SE)	Mean
1	0.50	197.254	197.411	197.097	197.568	197.33
2	1.0	189.118	189.118	188.489	188.49	188.80
3	2.0	150.792	152.048	151.42	152.676	151.73
4	3.0	126.288	129.173	126.288	127.23	127.24
5	4.0	100.528	100.527	99.271	99.271	99.90
6	5.0	80.108	81.679	78.537	81.678	80.50
7	6.0	56.925	56.736	56.925	56.736	56.83
8	7.0	44.201	44.641	43.542	44.641	44.26
9	8.0	35.436	35.688	35.939	35.939	35.75
10	10.0	39.583	39.897	39.269	40.211	39.74

Mean Resistivity at IERT-1 is 102.21 Ohm - m.

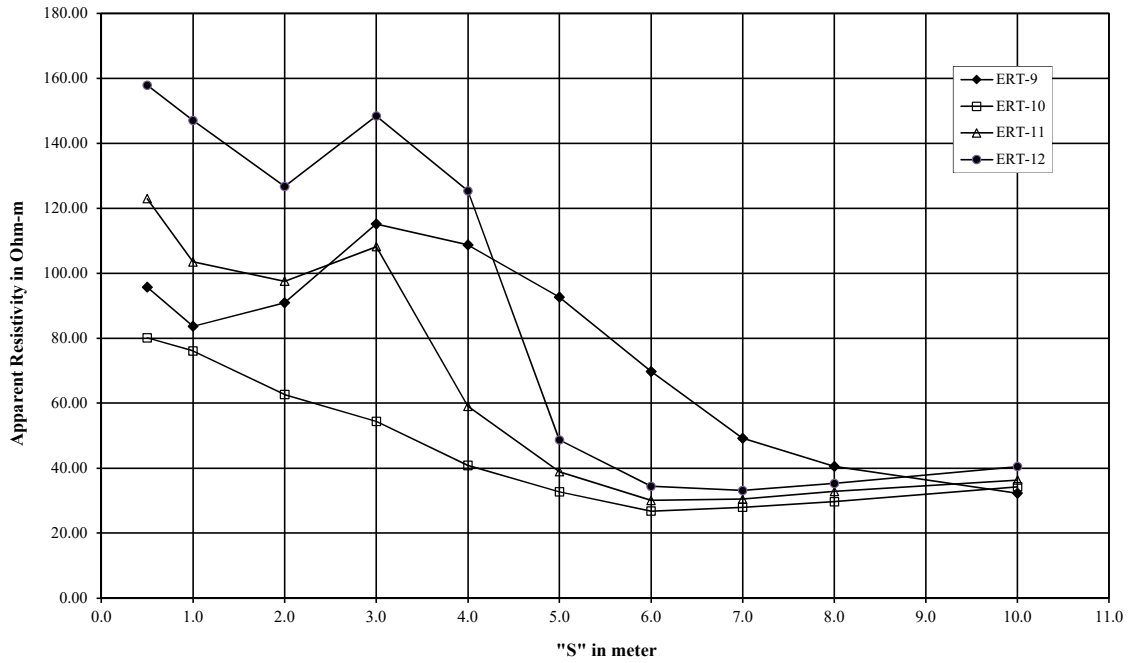
APPARENT RESISTIVITY CURVES



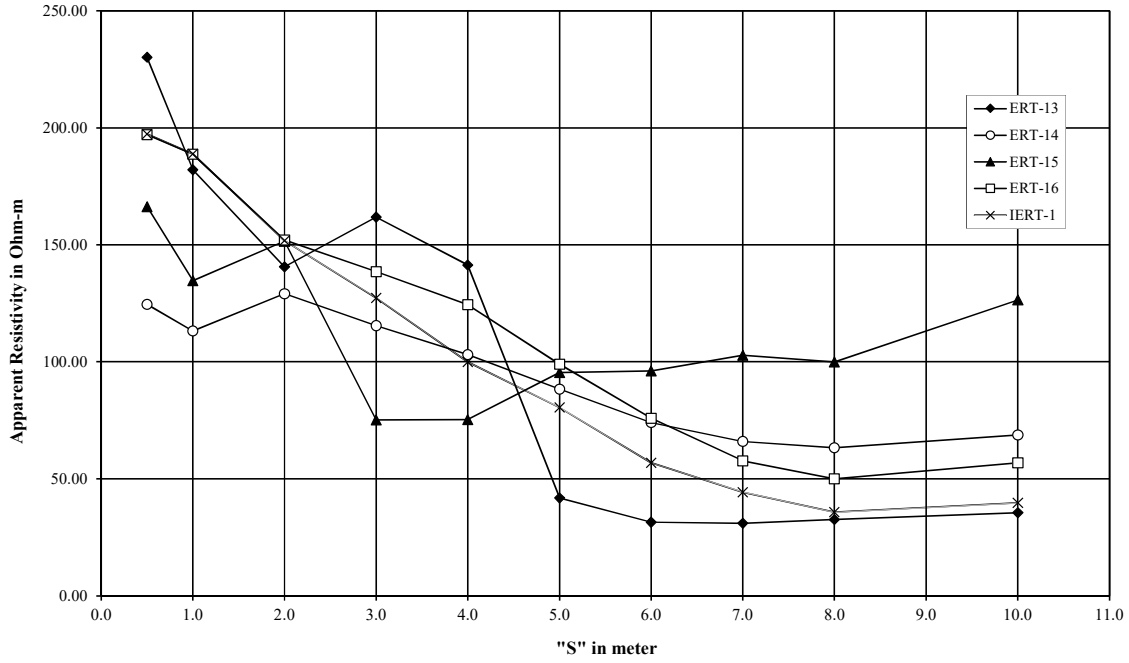
Apparent Resistivity Curves



Apparent Resistivity Curves



Apparent Resistivity Curves



Apparent Resistivity Curves

8. CROSS HOLE TEST RESULTS

REPORT ON
CROSS HOLE SHEAR WAVE TEST FOR
FGD SYTEM AREA OF 4x210MW STAGE-I + 3x500MW STAGE-II, KAHALGAON STPP, BIHAR

1. INTRODUCTION

M/s. C E Testing Company (P) Limited carried out the work of Geotechnical Investigation Work for the proposed FGD system area of 4 x 210 MW Stage-I + 3 x 500 MW Stage-II at Kahalgaon STPP, Bihar. As a part of the investigation, cross hole shear wave tests were carried out to determine the dynamic properties of the subsoil at the proposed area. Present report deals with the findings of these tests.

2. SCOPE OF WORK

Three nos. Cross Hole Tests were conducted down up to a maximum depth of 35 meters.

3. PURPOSE OF INVESTIGATIONS

The aim of the investigation was to determine the soil parameters. The Cross hole Tests were conducted to determine dynamic soil properties.

4. GENERAL SITE DESCRIPTION

The subsoil, in general, is characterized by medium / stiff silty clay followed by very stiff to hard silty clay. Traces of sand pockets are also observed.

5. CROSS HOLE SHEAR WAVE TEST

5.1. LOCATION

The test locations are given below.

Test No.	Co-ordinates		R.L. (M)
	Easting	Southing	
CST-1	3057	1920	34.830
CST-2	3398	1700	36.609
CST-3	3829	1958	36.759

5.2. EQUIPMENT AND ACCESSORIES

Following equipment and accessories were used:

1. Seismograph : PASI model GEA24
   Signal enhancement type fully digital 24 channel seismograph,
2. Geophones : Moving-coil type digital grade vertical &
   Horizontal geophones, natural frequency 10 Hertz.
3. Cable : Geophone spread cables, water proof joints
   made in Italy

5.2.1. Energy Source:

Cross hole tests, Shear Wave Hammer was used for generating waves in the Source borehole. The hammer generates waves in both the directions i.e. Up and Down, resulting in polarized energy.





5.2.2. Down Hole Sensors:

Down hole sensors will be used to receive the waves which is to be placed inside the hole. The sensors will have two Horizontal components and one Vertical component Geophones, encased in a steel tube and having water tight arrangement. The sensors will be lowered at a particular depth inflated so as to make them fixed with the borehole wall.





5.2.3. Seismograph:

PASI model GEA24 Seismograph will be used to record field data. The seismograph has the signal enhancement or stacking capability. The seismograph records the arrival of seismic waves through 3 channels. The seismic waves detected by geophone will be displayed on the screen.

5.3 WAVE TESTS

The Cross Hole Test consists of generation of horizontally traveling P and S waves at a particular level in one borehole (Source hole) and recording their arrivals at same level in two nearby boreholes (Receiver holes).

5.4 DATA INTERPRETATION

5.4.1. DATA PROCESSING

The data is stored in the hard disk of the Seismograph at the time of data acquisition. The data was transferred to the computer for further processing.

The processing involves picking the first arrivals. In case of noisy data there are intermediate steps of data processing using filtering, amplitude corrections etc.

5.4.2. PICKING OF FIRST ARRIVALS

The picking was done manually to see arrival of P and S waves on the respective Geophones. The time of travel from Source to Receiver is used to determine the velocities of P & Shear waves, as distance is known.

5.4.3. VELOCITY CALCULATION

Velocity calculation was done using the travel time of P & S waves from source to receiver was determined and the distance between source & receiver.

5.5. CALCULATION OF SOIL PARAMETERS:

The dynamic soil parameters are calculated from seismic wave and the bulk density of the corresponding of the subsurface strata. The calculations are based on IS Code 13372 (Part-1 & 2). The Poisson's Ratio is determined directly from the compressional (P) wave and shear (S) wave data. It is expressed by the ratio of transverse strain to longitudinal strain. Its dynamic determination is expressed as:

$$\sigma = (m^2-2)/[2*(m^2-1)] \text{ where } m= V_P / V_s$$

Young's Modulus E is the uni-axial stress-strain ratio. Its dynamic value is expressed by the following equation:

$$E = \rho V_P^2 (1+\sigma)(1-2\sigma)/(1-\sigma)$$

The shear Modulus **G** is the stress-strain ratio for simple shear. Its dynamic value is obtained by the following:

$$G = E/2 (1+ \sigma) = \rho V_s^2$$

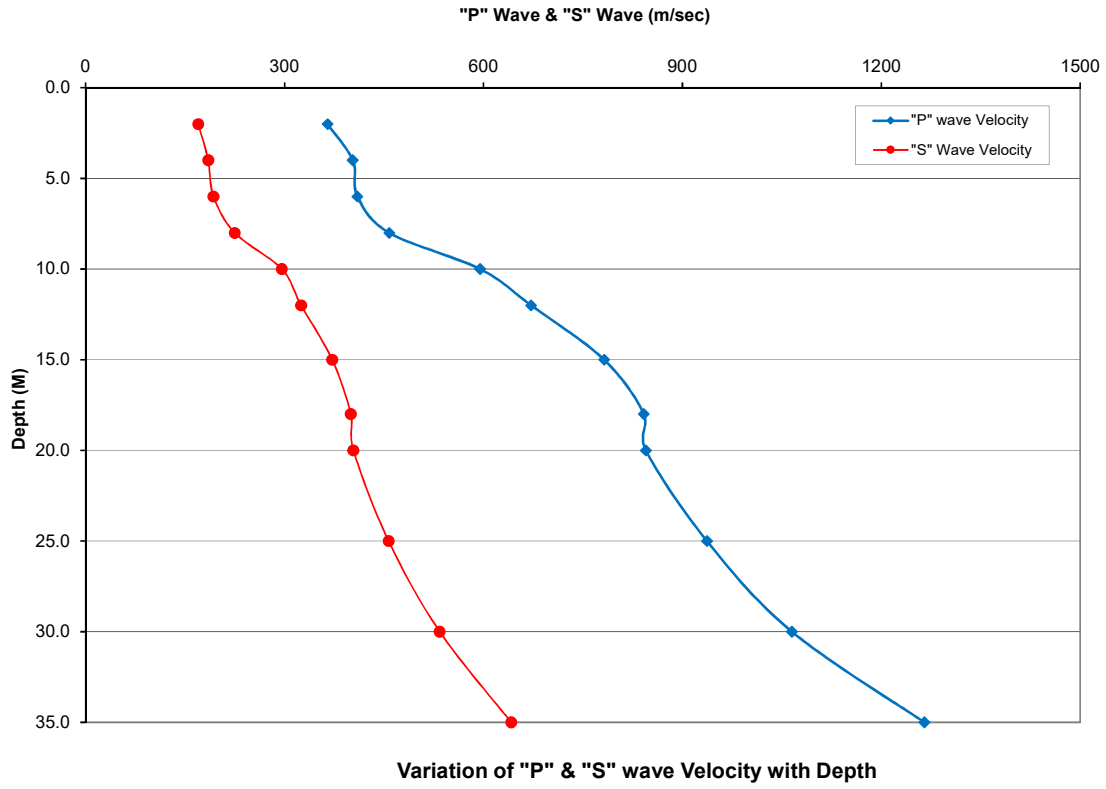
Where ρ is mass density in $kN.s^2/m^4$, σ is Poisson's ratio and V_P is P-wave velocity in m/sec, **E** & **G** are in kN/m^2.

TEST RESULTS

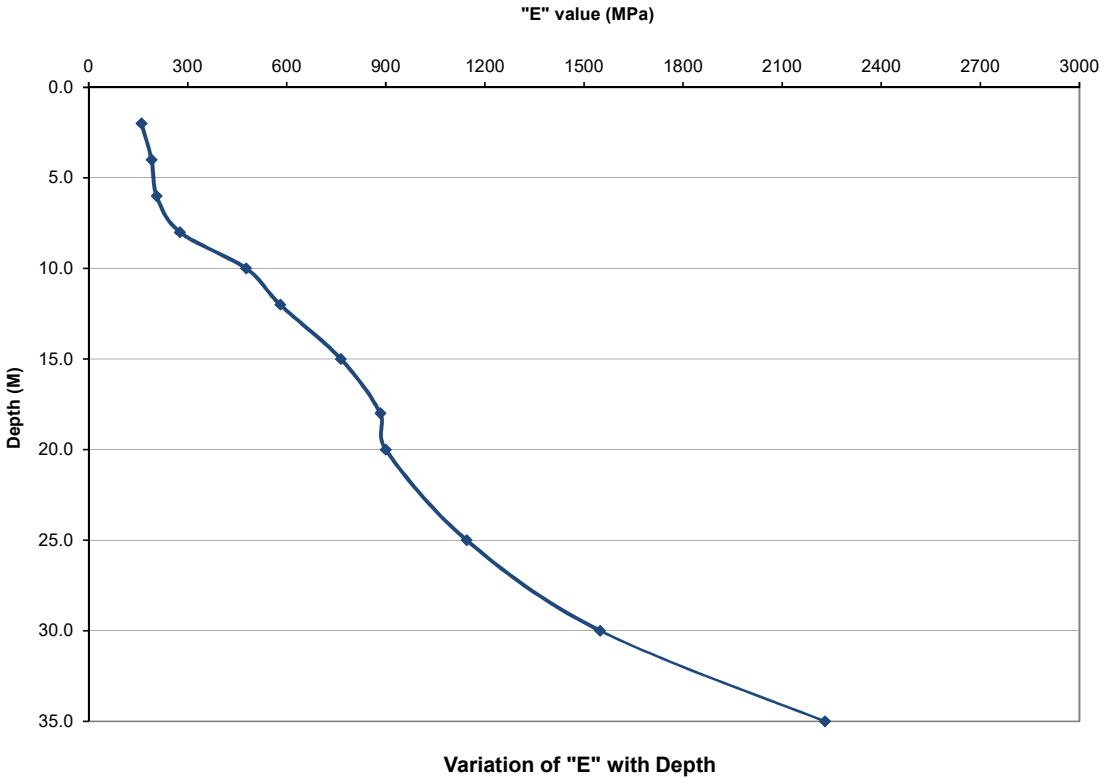
Cross Hole Test : CST-1

Calculated Values of Dynamic Parameters

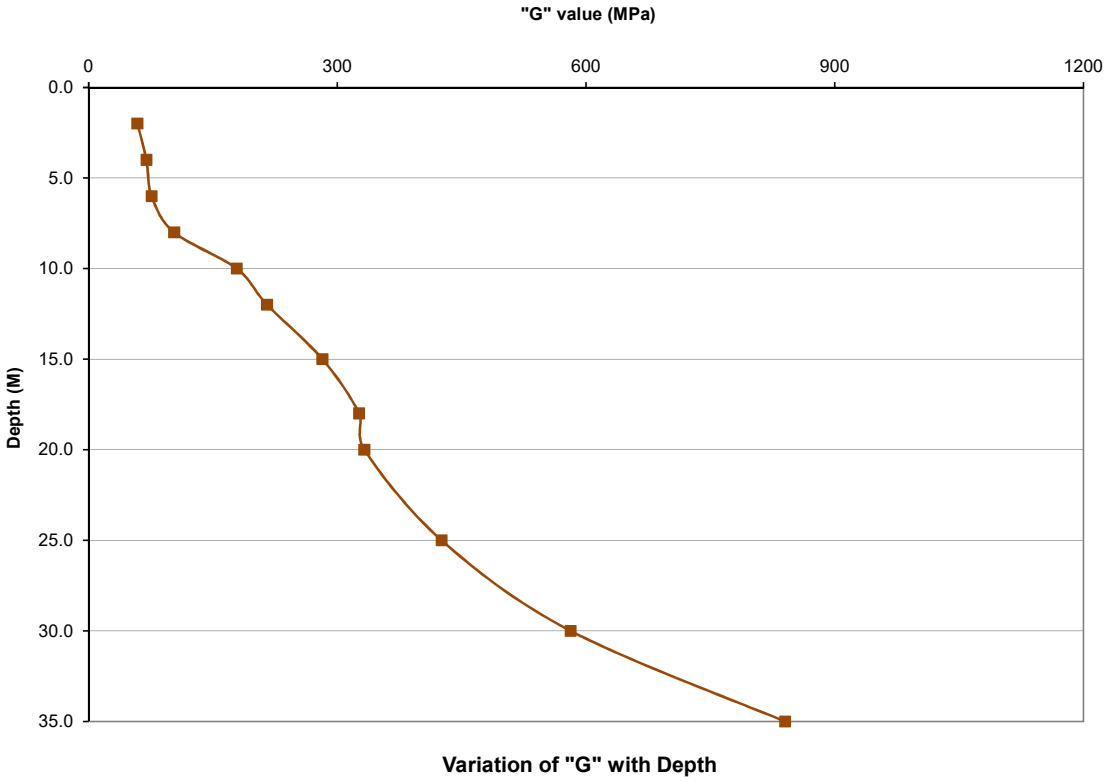
Depth (M) BGL	V_p (m/s)	V_s (m/s)	Mass Density ($kN.s^2/m^4$)	m = V_p/V_s	Poisson Ratio, σ	Young's Modulus (kN/m^2)	Young's Modulus (MPa)	Shear Modulus (kN/m^2)	Shear Modulus (MPa)
2.0	365	170	2.04	2.1471	0.361	160437	160.4	58919	58.9
4.0	403	185	2.04	2.1784	0.367	190697	190.7	69776	69.8
6.0	410	193	2.04	2.1244	0.358	206205	206.2	75941	75.9
8.0	458	225	2.04	2.0356	0.341	276800	276.8	103211	103.2
10.0	595	296	2.04	2.0101	0.336	477132	477.1	178626	178.6
12.0	672	325	2.04	2.0677	0.347	580278	580.3	215341	215.3
15.0	782	372	2.04	2.1022	0.354	763868	763.9	282128	282.1
18.0	842	400	2.04	2.1050	0.354	883520	883.5	326198	326.2
20.0	845	404	2.04	2.0916	0.352	899661	899.7	332754	332.8
25.0	937	457	2.04	2.0503	0.344	1144465	1144.5	425788	425.8
30.0	1065	534	2.04	1.9944	0.332	1548827	1548.8	581358	581.4
35.0	1265	642	2.04	1.9704	0.327	2229365	2229.4	840294	840.3



Variation of "P" & "S" wave Velocity with Depth



Variation of "E" with Depth

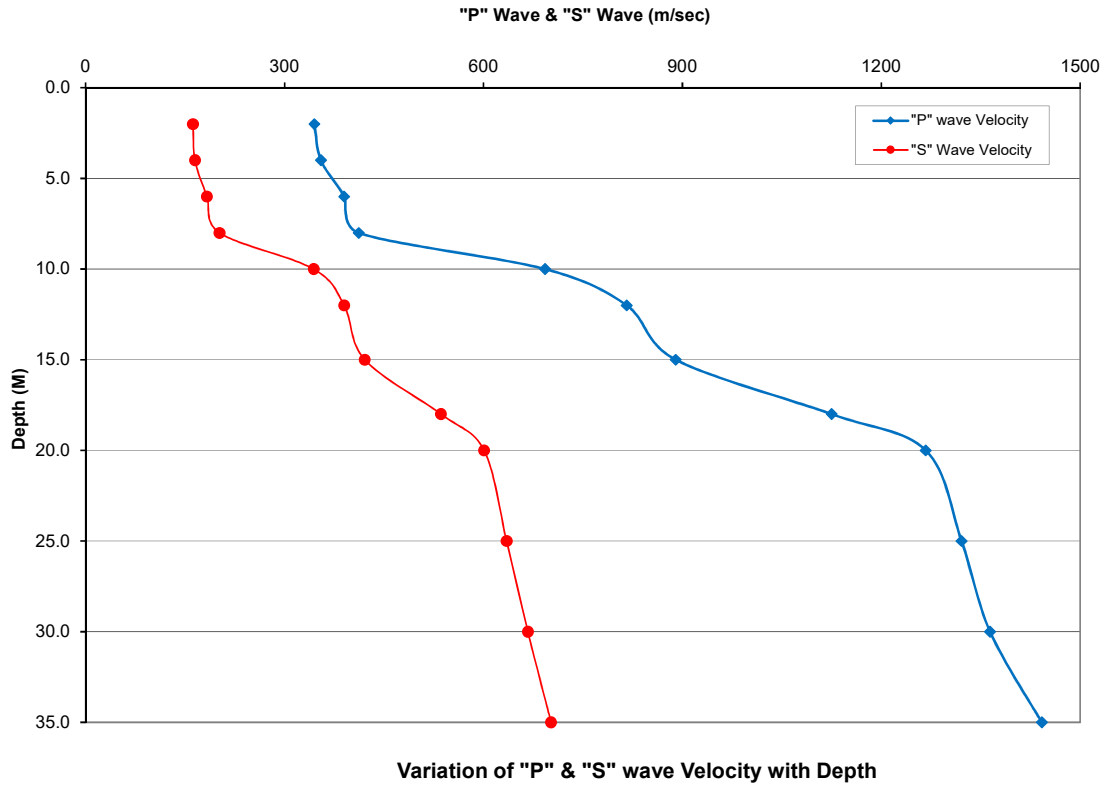


Variation of "G" with Depth

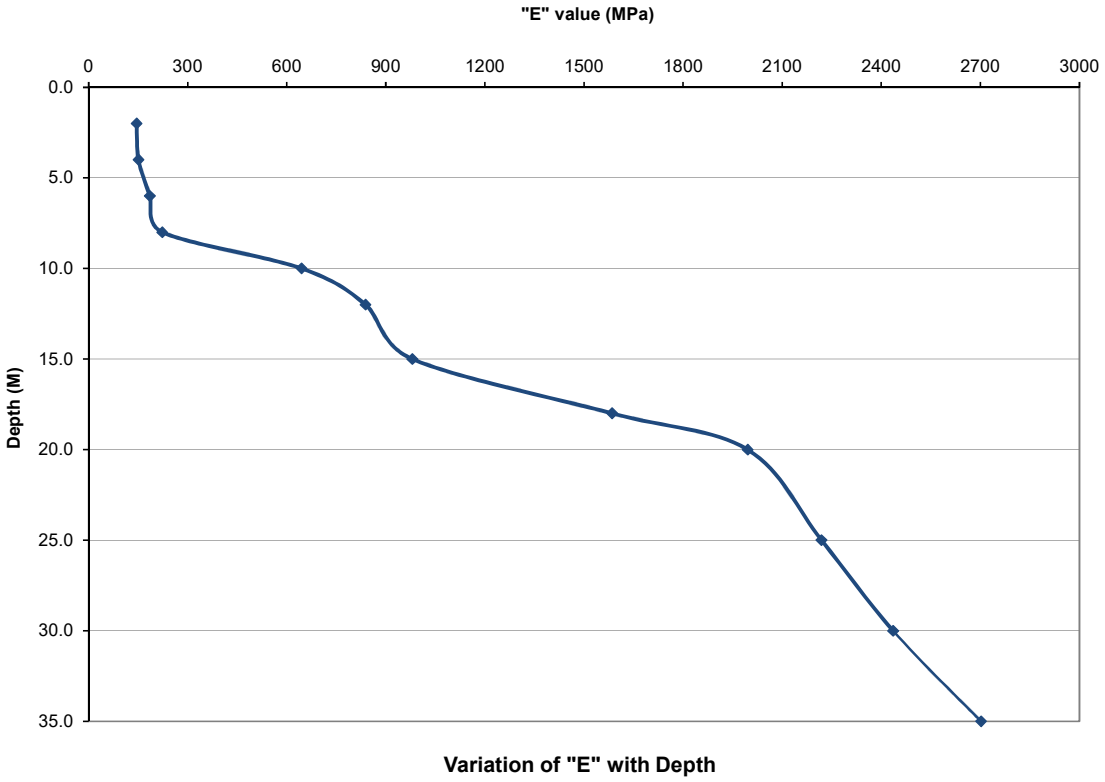
Cross Hole Test : CST-2

Calculated Values of Dynamic Parameters

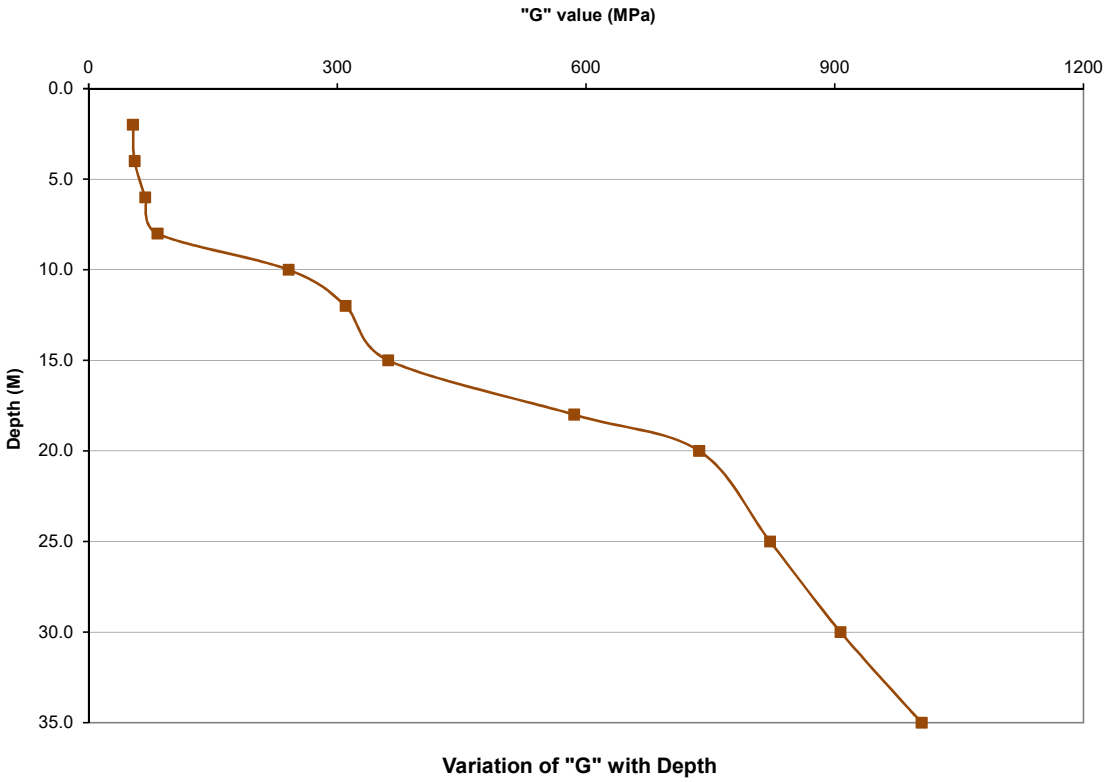
Depth (M) BGL	V_p (m/s)	V_s (m/s)	Mass Density ($kN.s^2/m^4$)	m = V_p/V_s	Poisson Ratio, σ	Young's Modulus (kN/m^2)	Young's Modulus (MPa)	Shear Modulus (kN/m^2)	Shear Modulus (MPa)
2.0	345	162	2.04	2.1296	0.359	145379	145.4	53505	53.5
4.0	355	165	2.04	2.1515	0.362	151219	151.2	55505	55.5
6.0	390	183	2.04	2.1311	0.359	185549	185.5	68275	68.3
8.0	412	202	2.04	2.0396	0.342	223240	223.2	83189	83.2
10.0	693	344	2.04	2.0145	0.337	644883	644.9	241256	241.3
12.0	816	390	2.04	2.0923	0.352	838471	838.5	310092	310.1
15.0	890	421	2.04	2.1140	0.356	979880	979.9	361348	361.3
18.0	1125	536	2.04	2.0989	0.353	1585159	1585.2	585721	585.7
20.0	1267	601	2.04	2.1082	0.355	1995380	1995.4	736393	736.4
25.0	1321	635	2.04	2.0803	0.350	2219170	2219.2	822069	822.1
30.0	1364	667	2.04	2.0450	0.343	2435983	2436.0	907011	907.0
35.0	1442	702	2.04	2.0541	0.345	2702021	2702.0	1004697	1004.7



Variation of "P" & "S" wave Velocity with Depth



Variation of "E" with Depth

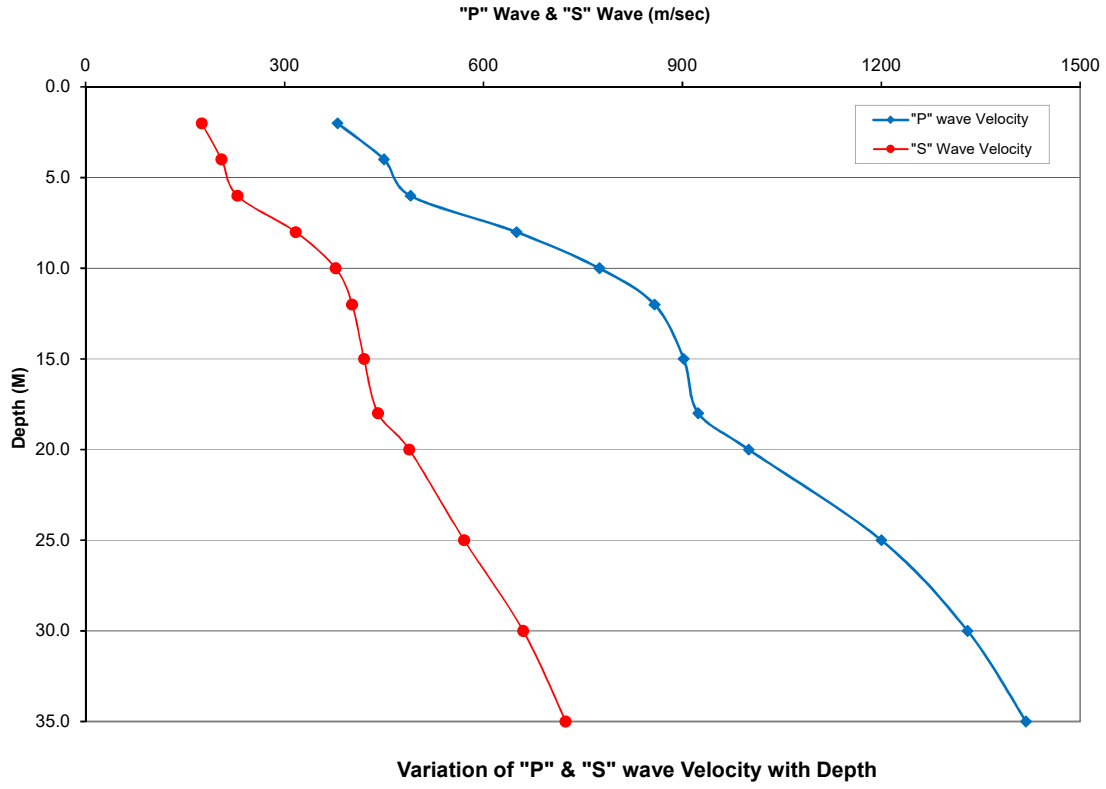


Variation of "G" with Depth

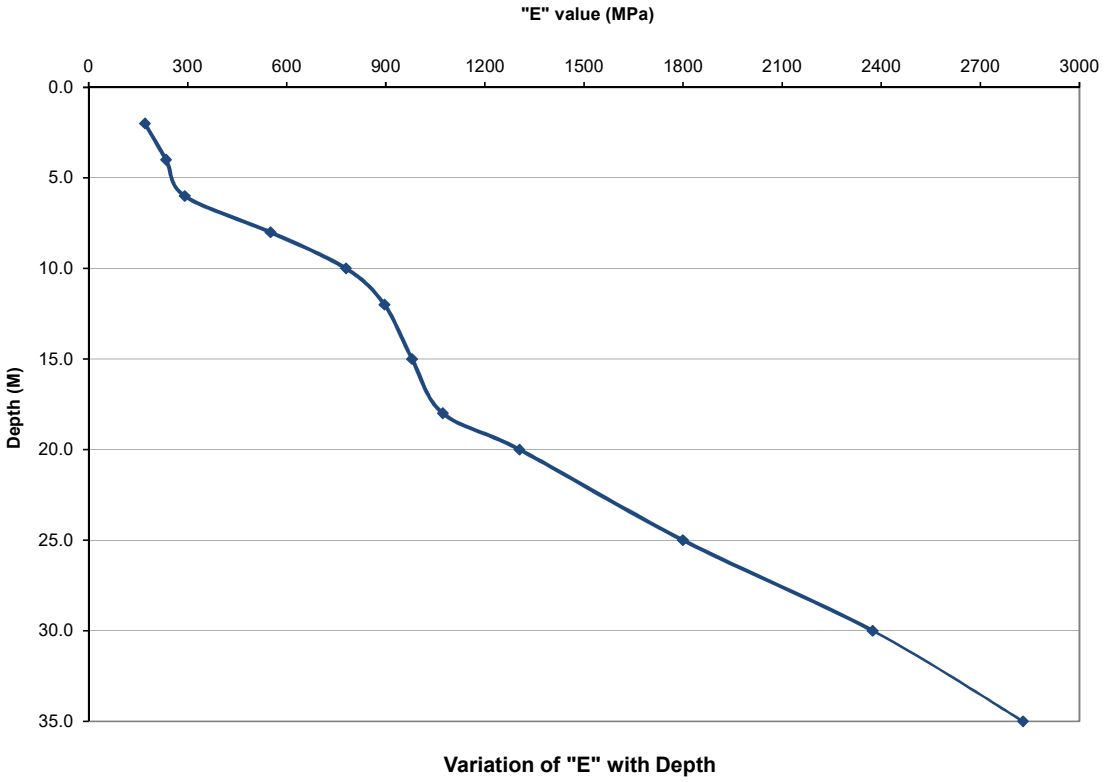
Cross Hole Test : CST-3

Calculated Values of Dynamic Parameters

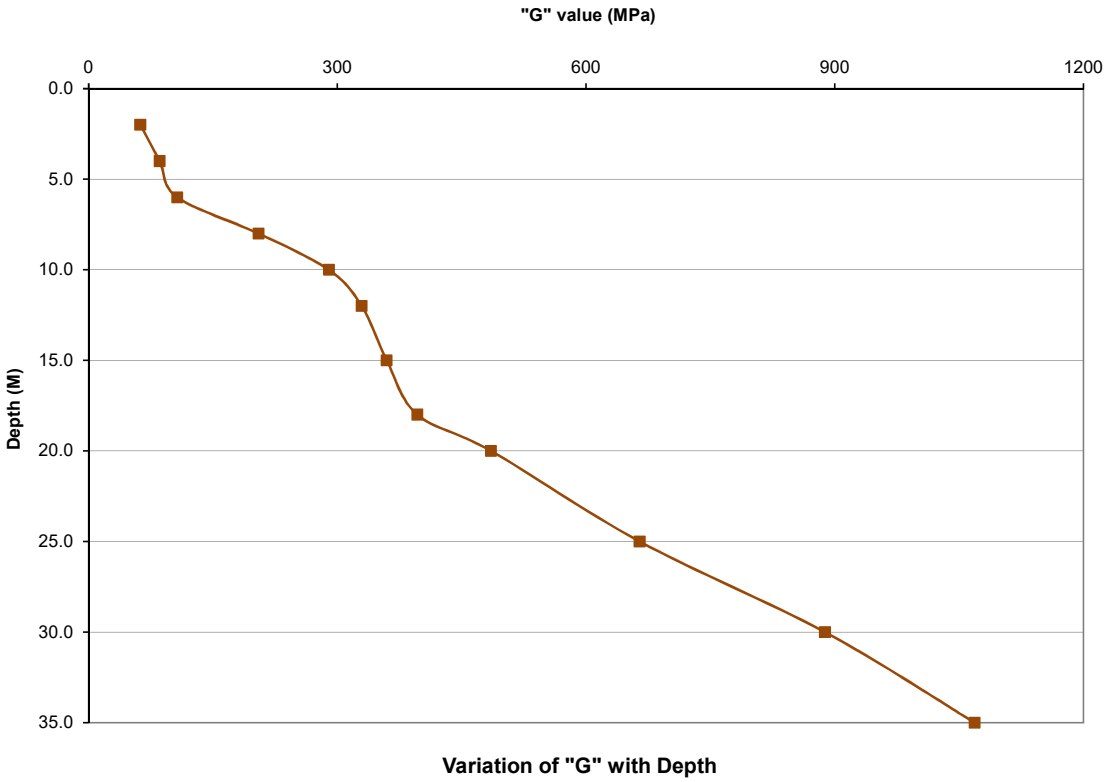
Depth (M) BGL	V_p (m/s)	V_s (m/s)	Mass Density ($kN.s^2/m^4$)	m = V_p/V_s	Poisson Ratio, σ	Young's Modulus (kN/m^2)	Young's Modulus (MPa)	Shear Modulus (kN/m^2)	Shear Modulus (MPa)
2.0	380	175	2.04	2.1714	0.365	170503	170.5	62436	62.4
4.0	450	205	2.04	2.1951	0.369	234596	234.6	85678	85.7
6.0	490	229	2.04	2.1397	0.360	290863	290.9	106913	106.9
8.0	650	317	2.04	2.0505	0.344	550678	550.7	204871	204.9
10.0	775	377	2.04	2.0557	0.345	779467	779.5	289764	289.8
12.0	858	402	2.04	2.1343	0.359	895736	895.7	329468	329.5
15.0	902	420	2.04	2.1476	0.362	979340	979.3	359633	359.6
18.0	924	441	2.04	2.0952	0.353	1072527	1072.5	396495	396.5
20.0	1000	488	2.04	2.0492	0.344	1304775	1304.8	485513	485.5
25.0	1200	571	2.04	2.1016	0.354	1799582	1799.6	664712	664.7
30.0	1330	660	2.04	2.0152	0.337	2374079	2374.1	888073	888.1
35.0	1418	724	2.04	1.9586	0.324	2829147	2829.1	1068656	1068.7



Variation of "P" & "S" wave Velocity with Depth



Variation of "E" with Depth



Variation of "G" with Depth

9. GEOLOGICAL REPORT

INTRODUCTION

M/s. NTPC has proposed the construction of FGD system for 4 x 210 MW Stage-I + 3 x 500 MW Stage-II at Kahalgaon STPP, Bihar and the job was awarded to M/s. Bharat Heavy Electricals Limited. Kahalgaon Super Thermal Power Station is located in Kahalgaon in Bhagalpur district of Bihar. The power plant is one of the coal based power plants of NTPC. The coal for the power plant is sourced from Rajmahal coalfield of Eastern Coalfields Limited. Source of water for the power plant is Ganga River. The area can be well approached by Kahalgaon railway station, one of the oldest station of Bihar, serves the Howrah-Kiul loop line. Kahalgaon is well connected to all cities by train. Depth of standing ground water levels are observed very close to the ground surface. In general a warm and humid climate prevails in the district. Winter starts from November and extends up to February. Temperature usually does not drop below 15°C but during the coldest months (late December to early January) temperature even comes down to 8°C. During this period, wind blows from northwest and west. The summer period begins from March with the peak temperature of 40 – 45°C in May. The month of March and April are the driest months of the year with the relative humidity of 50 – 55 % in the morning and 35 – 40 %

in the afternoon. The humidity increases in May and June to 80 % or more. About 80 % of the rainfall is under the influence of southwest monsoon, which normally breaks in the second fortnight of June. The monsoon lasts till the later part of the September. Generally the eastern and northeastern part of the district receives higher amount of rainfall. The annual normal rainfall in the district remains above 1148 mm.

GEOLOGICAL BACKGROUND OF THE AREA

The Ganga river originated from the Himalayas is fed both by rain and snow. During June to September the rivers of the Himalayan dominantly fed by rainwater whereas, warmer half of the year it is fed by snow. In their course through the mountains they have good gradient and carry much coarse materials including pebbles and boulders, brought in by glaciers and also torn off from the beds and banks. It carries enormous quantities of fine sand and silt derived from the Himalayas as well as from the higher peninsular up-lands. Much of the coarse sediments are deposited near its debaucher into the plains.

The Ganga Basin is an asymmetric pericratonic depression commencing from the foothill of north-eastern Himalayan. The Basin covers the major portions of the alluvium low land of Ganga-Brahmaputra river systems and sandwich between extra peninsular Himalayan region at north and stable shield area of peninsular in the south. The Rajmahal hills and the extension of the Chotanagpur plateau demarcate the western boundary and the Bangladesh

high marked the extremity of eastern border of the Basin. The Basin ultimately reached into the open Bay of Bengal at south to around the 10° latitude. However, there are several rivers like Chambal, Betwa, Tons, Sone etc., which rise from the highlands of the central part of India also deposited their sediments into this domain. The mountain barrier of the Himalayas at the north of the basin influencing the distribution of rain in Northern India which in turn control the sediments budget of the basin through different river system. It also preventing this region from the cool dries breeze from the Tibetan Highlands and forces the monsoon current to pour down all their contents to the southern slope.

STRUCTURAL SET-UP

The origin of the Ganga Basin is related with the beginning of drifting of the Indian plate towards the Eurasian plate in the north and north-east. It is an asymmetrical peri-cratonic basin, bounded to the west by the exposed Precambrian rocks of the Indian shield and to the north partly by Himalayas foothills and partly by Precambrian rocks of the elevated Shillong Plateau. The basin extends to the south under the Bay of Bengal and the Indian Ocean. The eastern margin of the Bengal Basin is provided by the north-south trending Assam-Arakan orogenic belt and the Java-Andaman trench. The Duars trough and the Himalayan foredeep in West Bengal and the Sylhet trough of the Surma valley in Bangladesh respectively constitute the northern and north-eastern extension of the Basin. The entire basin has been subdivided into I) Upper Ganga Plain, ii) Middle Ganga Plain and iii) Lower Ganga Plain (Bengal basin) (Fig. 1).

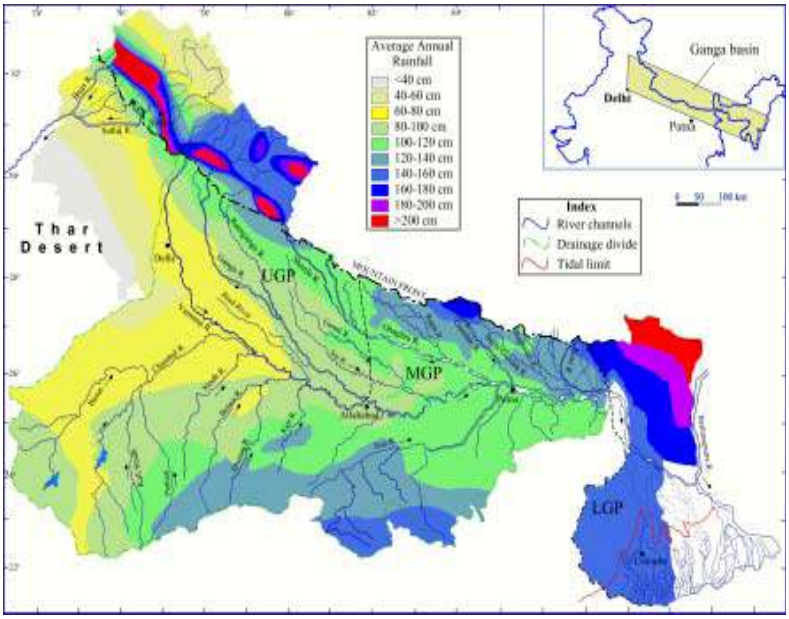


Fig. 1. Major drainage and rainfall distribution across the Upper (UGP), Middle (MGP) and Lower (LGP) Ganga plains.

GEOMORPHOLOGY OF THE STUDIED AREA

Geomorphologically, the district Bhagalpur forms a part of the Mid-Ganga Foreland Basin. The north and central Bhagalpur towards the north and south of Ganga respectively forms a flat Indo-Gangetic alluvium tract (parts of the North Bihar Plains and Central Bihar Plains respectively). The southern part of the district forms a marginal alluvial tract. The general elevation of the alluvium tract remains within 45 m above mean sea level (amsl). The master slope of region at both north and south is towards the river Ganga. There are some detached hard rock bodies of pre-cambrian age, which stand out as prominent peaks (inliers) within the alluvial plains. Among these, the highest one is at Shahkund with a height of 143 m.

SOILS OF THE STUDUED AREA

The soils in the district are mainly derived from the older and newer alluvium. These alluvial plain soils are light grey to dark grey in colour, rather heavy and texturally fine in nature. The pH values range from neutral to acidic and the acidity of the soil gradually increases from north to south. The hilly soils are acidic with low nitrogen, medium to high potash. The soils derived from older alluvium are mainly loamy in character with moderate to heavy texture and well drained. In low lands these are poorly drained with heavy texture. These soils comprise an association of vertisols, entisols, alfisols, and ultisols. Black soils found in Shahkund, Sonhaulia, and Sultanganj belong to vertisols category.

A P P E N D I X

SUBJECT	*SHEET NUMBER*
PART I: FIELD TEST RESULTS	**A1**
Bore Log Data Sheet	A2 – A143
Pit Log of PLT, CPLT & TP	A144 – A156
Correction for Standard Penetration Test Values	A157 – A190
Corrected “N” vs. Depth plot	A191 – A206
Field Permeability Test Results	A207
PART II: LABORATORY TEST RESULTS	**A208**
Laboratory Soil Test Results	A209 – A256
Swelling Test Results	A257
Summerised Compaction & CBR Test Results	A258
PART III: CHARTS & GRAPHS	**A259**
Strength Curves	A260 – A295
e – Logp Curves	A296 – A356
Grain Size Distribution Curves	A357 – A418
Compaction & CBR Curves	A419 – A425
PART IV: SAMPLE CALCULATION	**A426**
PART V: PHOTOGRAPHS	**A428**

PART I: FIELD TEST RESULTS

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 07/10/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.1

Co-ordinates E=2996 S=1975

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	10
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	14
		Water Sample (WS)	0

Commencement Date : 30/09/2020
Completion Date : 02/10/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 34.657 M.
Water Struck At :
Standing Water Level : 0.8 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES Ref. No	SAMPLES Depth (m)
0.00m. Filled up with blackish grey, clayey silt, brick pcs. & boulder pcs. 0.50m.						DS-1	0.50
		3	4	5	9	SPT-1	1.00-1.45
						DS-2	2.00
Stiff, brownish grey, silty clay with rusty spots & kankar.						UDS-1	2.50-2.95
		2	3	4	7	SPT-2	2.95-3.40
						DS-3	4.00
4.50m.		2	3	5	8	SPT-3	4.50-4.95
						UDS-2	5.50-5.95
Stiff, yellowish / dark greyish, silty clay with rusty spots & kankar.		3	4	4	8	SPT-4	5.95-6.40
						DS-4	7.00
		4	5	6	11	SPT-5	7.50-7.95
8.50m.						UDS-3	8.50-8.95
		5	7	8	15	SPT-6	8.95-9.40
						DS-5	10.00
		6	8	8	16	SPT-7	10.50-10.95
						UDS-4	11.50-11.95
		6	8	9	17	SPT-8	11.95-12.40
Stiff to very stiff, brownish / yellowish grey, silty clay with kankar & rusty spots.						DS-6	13.00
		6	7	9	16	SPT-9	13.50-13.95
						*UDS-5	14.50-14.95
		7	8	11	19	SPT-10	15.10-15.55
						DS-7	16.00
		8	10	14	24	SPT-11	16.50-16.95
17.90m.						UDS-6	17.50-17.95

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 07/10/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.1

Co-ordinates E=2996 S=1975

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	10
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	14
		Water Sample (WS)	0

Commencement Date : 30/09/2020
Completion Date : 02/10/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 34.657 M.
Water Struck At :
Standing Water Level : 0.8 m.

DESCRIPTION	SYMBOL	N-VALUE EACH DIVN. = 15cm				SAMPLES Ref. No	SAMPLES Depth (m)
	17.90m.						
Stiff to very stiff, brownish / yellowish grey, silty clay with kankar & rusty spots.		8	11	14	25	SPT-12	17.95-18.40
	19.00m.					DS-8	19.00
Very stiff, greyish brown, silty clay / clayey silt with sand mixture & rusty spots.		10	13	15	28	SPT-13	19.50-19.95
						*UDS-7	20.50-20.95
	21.10m.				31		
		12	14	17		SPT-14	21.10-21.55
						DS-9	22.00
		11	14	20	34	SPT-15	22.50-22.95
Hard, greyish brown, silty clay / clayey silt with sand mixture & rusty spots.					37	UDS-8	23.50-23.95
		12	16	21		SPT-16	23.95-24.40
						DS-10	25.00
		16	19	26	45	SPT-17	25.50-25.95
						*UDS-9	26.50-26.65
	27.00m.				49		
		17	21	28		SPT-18	27.10-27.55
						DS-11	28.00
		18	22	29	51	SPT-19	28.50-28.95
						*UDS-10	29.50-29.65
		16	19	27	46	SPT-20	30.10-30.55
Hard, greyish brown, clayey sandy silt. Observed mica.						DS-12	31.00
		15	18	30	48	SPT-21	31.50-31.95
						DS-13	32.50
		15	17	29	46	SPT-22	33.00-33.45
						DS-14	34.00
N.B. - '*' means sample could not be recovered.		17	21	22	43	SPT-23	35.10-35.55
	35.55m.						

BH-1/Sheet-2

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 07/10/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.2

Co-ordinates E=2980 S=2014

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 05/10/2020
Completion Date : 06/10/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 34.526 M.
Water Struck At :
Standing Water Level : 0.7 m.

DESCRIPTION	SYMBOL	N-VALUE EACH DIVN. = 15cm				SAMPLES Ref. No	SAMPLES Depth (m)
0.00m. Filled up with blackish grey, clayey silt, bricks & boulder pcs. 0.60m.						DS-1	0.50
		1	1	1	2	SPT-1	1.00-1.45
						DS-2	2.00
					3	UDS-1	2.50-2.95
		1	1	2		SPT-2	2.95-3.40
Soft to medium, brownish grey, silty clay with rusty spots.						DS-3	4.00
		2	2	3	5	SPT-3	4.50-4.95
						UDS-2	5.50-5.95
		3	3	4	7	SPT-4	5.95-6.40
7.00m.						DS-4	7.00
		4	4	5	9	SPT-5	7.50-7.95
						UDS-3	8.50-8.95
		5	6	6	12	SPT-6	8.95-9.40
						DS-5	10.00
		5	6	7	13	SPT-7	10.50-10.95
						UDS-4	11.50-11.95
Stiff to very stiff, yellowish grey, silty clay with rusty spots & kankar.		6	7	8	15	SPT-8	11.95-12.40
						DS-6	13.00
		6	8	10	18	SPT-9	13.50-13.95
						*UDS-5	14.50-14.95
		5	9	12	21	SPT-10	15.10-15.55
						DS-7	16.00
		6	10	14	24	SPT-11	16.50-16.95
17.90m.						UDS-6	17.50-17.95

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 07/10/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.2

Co-ordinates E=2980 S=2014

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 05/10/2020
Completion Date : 06/10/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 34.526 M.
Water Struck At :
Standing Water Level : 0.7 m.

DESCRIPTION	SYMBOL	N-VALUE EACH DIVN. = 15cm				SAMPLES Ref. No	SAMPLES Depth (m)
17.90m. Stiff to very stiff, yellowish grey, silty clay with rusty spots & kankar. 19.00m.		7	12	16	28	SPT-12	17.95-18.40
						DS-8	19.00
		9	14	18	32	SPT-13	19.50-19.95
						UDS-7	20.50-20.95
		12	15	20	35	SPT-14	20.95-21.40
						DS-9	22.00
		12	15	22	37	SPT-15	22.50-22.95
						*UDS-8	23.50-23.63
		14	17	24	41	SPT-16	24.00-24.45
						DS-10	25.00
		14	17	25	42	SPT-17	25.50-25.95
						*UDS-9	26.50-26.60
Hard, brownish / yellowish grey, silty clay / clayey silt with sand mixture & rusty spots.		15	18	25	43	SPT-18	27.00-27.45
						DS-11	28.00
		18	24	28	52	SPT-19	28.50-28.95
						DS-12	29.50
		16	24	26	50	SPT-20	30.00-30.45
						DS-13	31.00
		14	22	23	45	SPT-21	31.50-31.95
						DS-14	32.50
		14	23	24	47	SPT-22	33.00-33.45
						DS-15	34.00
N.B. - '*' means sample could not be recovered. 35.50m.		16	20	24	44	SPT-23	35.05-35.50

BH-2/Sheet-2

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 07/10/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.3

Co-ordinates E=3010 S=2013

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 02/10/2020
Completion Date : 04/10/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 35.523 M.
Water Struck At :
Standing Water Level : 0.6 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES Ref. No	SAMPLES Depth (m)
0.00m. Filled up with blackish grey, clayey silt, bricks & boulder pcs. 0.60m.						DS-1	0.50
		2	2	2	4	SPT-1	1.00-1.45
						DS-2	2.00
						UDS-1	2.50-2.95
Medium, brownish grey, silty clay with rusty spots & kankar.		2	2	3	5	SPT-2	2.95-3.40
						DS-3	4.00
		3	3	4	7	SPT-3	4.50-4.95
5.50m.						UDS-2	5.50-5.95
		3	4	5	9	SPT-4	5.95-6.40
						DS-4	7.00
Stiff, yellowish grey, silty clay with rusty spots & kankar.		4	5	5	10	SPT-5	7.50-7.95
						UDS-3	8.50-8.95
		5	6	7	13	SPT-6	8.95-9.40
						DS-5	10.00
10.50m.		5	7	8	15	SPT-7	10.50-10.95
						UDS-4	11.50-11.95
		6	8	9	17	SPT-8	11.95-12.40
						DS-6	13.00
		7	10	12	22	SPT-9	13.50-13.95
Stiff to very stiff, brownish grey, silty clay with kankar.						UDS-5	14.50-14.95
		7	12	14	26	SPT-10	14.95-15.40
						DS-7	16.00
		7	14	16	30	SPT-11	16.50-16.95
17.90m.						*UDS-6	17.50-17.95

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 07/10/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.3

Co-ordinates E=3010 S=2013

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
		Disturbed (DS)	15
Vane (V)		Water Sample (WS)	0

Commencement Date : 02/10/2020
Completion Date : 04/10/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 35.523 M.
Water Struck At :
Standing Water Level : 0.6 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES	
						Ref. No	Depth (m)
17.90m							
Stiff to very stiff, brownish grey, silty clay with kankar.		6	11	15	26	SPT-12	18.10-18.55
						DS-8	19.00
		7	13	17	30	SPT-13	19.50-19.95
						UDS-7	20.50-20.95
21.40m		10	12	18	30	SPT-14	20.95-21.40
						DS-9	22.00
Hard, brownish grey, silty clay / clayey silt with sand mixture & rusty spots.		10	13	19	32	SPT-15	22.50-22.95
						*UDS-8	23.50-23.95
		12	24	40	64	SPT-16	24.10-24.55
						DS-10	25.00
		14	18	25	43	SPT-17	25.50-25.95
						*UDS-9	26.50-26.65
		16	20	26	46	SPT-18	27.10-27.55
28.00m						DS-11	28.00
		18	23	27	50	SPT-19	28.50-28.95
						DS-12	29.50
		15	17	26	43	SPT-20	30.00-30.45
						DS-13	31.00
Hard, greyish brown, clayey silt. Observed traces of mica.		16	18	27	45	SPT-21	31.50-31.95
						DS-14	32.50
		17	19	29	48	SPT-22	33.00-33.45
						DS-15	34.00
N.B. - '*' means sample could not be recovered.		17	20	29	49	SPT-23	35.05-35.50
35.50m							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 07/10/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.4

Co-ordinates E=4059 S=1962

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	16
		Water Sample (WS)	0

Commencement Date : 25/09/2020
Completion Date : 26/09/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.304 M.
Water Struck At :
Standing Water Level : 2.4 m.

DESCRIPTION	SYMBOL	N-VALUE EACH DIVN. = 15cm				SAMPLES Ref. No	Depth (m)
0.00m.							
Filled up with fly ash & boulders.					30	DS-1	0.50
		9	16	14		SPT-1	1.00-1.45
1.50m.						DS-2	2.00
					8	UDS-1	2.50-2.95
		3	3	5		SPT-2	2.95-3.40
Stiff, yellowish grey, silty clay. Observed traces of kankar.						DS-3	4.00
					11		
		3	6	5		SPT-3	4.50-4.95
					11	UDS-2	5.50-5.95
		4	4	7		SPT-4	5.95-6.40
6.50m.						DS-4	7.00
					15		
		5	8	7		SPT-5	7.50-7.95
					17	*UDS-3	8.50-8.95
		6	7	10		SPT-6	9.00-9.45
Stiff to very stiff, yellowish brown, clayey silt with traces of sand mixture.						DS-5	10.00
					15		
		6	7	8		SPT-7	10.50-10.95
					16	UDS-4	11.50-11.95
		6	7	9		SPT-8	11.95-12.40
						DS-6	13.00
					15		
		6	8	7		SPT-9	13.50-13.95
14.00m.							
					16	*UDS-5	14.50-14.95
		5	8	8		SPT-10	15.05-15.50
Very stiff, light yellowish grey, silty clay / clayey silt. Observed sand mixture.						DS-7	16.00
					23		
		8	10	13		SPT-11	16.50-16.95
17.90m.						UDS-6	17.50-17.95

BH-4/Sheet-1

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 07/10/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.4

Co-ordinates E=4059 S=1962

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	16
		Water Sample (WS)	0

Commencement Date : 25/09/2020
Completion Date : 26/09/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.304 M.
Water Struck At :
Standing Water Level : 2.4 m.

DESCRIPTION	SYMBOL	N-VALUE EACH DIVN. = 15cm				SAMPLES Ref. No	SAMPLES Depth (m)
	17.90m						
Very stiff, light yellowish grey, silty clay / clayey silt. Observed sand mixture.	17.95m	12	14	19	33	SPT-12	17.95-18.40
						DS-8	19.00
		13	14	21	35	SPT-13	19.50-19.95
						UDS-7	20.50-20.95
		12	16	23	39	SPT-14	20.95-21.40
						DS-9	22.00
Hard, light yellowish grey, silty clay / clayey silt. Observed sand mixture.		13	18	24	42	SPT-15	22.50-22.95
						UDS-8	23.50-23.95
		13	18	27	45	SPT-16	23.95-24.40
						DS-10	25.00
	25.50m	16	20	21	41	SPT-17	25.50-25.95
						*UDS-9	26.50-26.63
		18	23	28	51	SPT-18	27.00-27.45
						DS-11	28.00
		16	25	30	55	SPT-19	28.50-28.95
						DS-12	29.50
Hard, yellowish grey, clayey silt with traces of sand mixture & mica. Observed concretion of silt.		14	21	26	47	SPT-20	30.00-30.45
						DS-13	31.00
		15	22	25	47	SPT-21	31.50-31.95
						DS-14	32.50
		12	25	30	55	SPT-22	33.00-33.45
						DS-15	34.00
						DS-16	34.70
N.B. - '*' means sample could not be recovered.		14	23	29	52	SPT-23	35.10-35.55
	35.55m						

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 07/10/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.5

Co-ordinates E=3057 S=1935

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	16
		Water Sample (WS)	0

Commencement Date : 02/10/2020
Completion Date : 05/10/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 34.651 M.
Water Struck At :
Standing Water Level : 0.5 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES Ref. No	SAMPLES Depth (m)
0.00m.							
Filled up by boulders with fly ash.						DS-1	0.50
0.80m.					5		
		2	3	2		SPT-1	1.00-1.45
						DS-2	2.00
Medium, deep grey, silty clay with traces of kankar.					7	UDS-1	2.50-2.95
		3	3	4		SPT-2	2.95-3.40
						DS-3	4.00
4.30m.					9		
		3	4	5		SPT-3	4.50-4.95
					8	UDS-2	5.60-6.05
		4	4	4		SPT-4	6.05-6.50
						DS-4	7.00
					11		
		4	6	5		SPT-5	7.50-7.95
Stiff to very stiff, yellowish brown, silty clay / clayey silt. Observed grey patches.						*UDS-3	8.50-8.95
					12		
		4	6	6		SPT-6	9.00-9.45
						DS-5	10.00
					18		
		5	9	9		SPT-7	10.50-10.95
					17	UDS-4	11.50-11.95
		5	8	9		SPT-8	11.95-12.40
12.50m.							
						DS-6	13.00
					18		
		5	9	9		SPT-9	13.50-13.95
Very stiff, deep brown, clayey silt with traces of sand mixture.						*UDS-5	14.50-14.95
					19		
		6	8	11		SPT-10	15.05-15.50
						DS-7	16.00
16.40m.					20		
		8	11	9		SPT-11	16.50-16.95
Very stiff, yellowish grey, silty clay with kankar. Observed grey patches.							
						UDS-6	17.50-17.95
17.90m.							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 07/10/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.5

Co-ordinates E=3057 S=1935

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
		Disturbed (DS)	16
Vane (V)		Water Sample (WS)	0

Commencement Date : 02/10/2020
Completion Date : 05/10/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 34.651 M.
Water Struck At :
Standing Water Level : 0.5 m.

DESCRIPTION	SYMBOL	N-VALUE EACH DIVN. = 15cm				SAMPLES Ref. No	SAMPLES Depth (m)
17.90m.		10	12	11	23	SPT-12	17.95-18.40
						DS-8	19.00
		9	9	12	21	SPT-13	19.50-19.95
Very stiff, yellowish grey, silty clay with kankar. Observed grey patches.						*UDS-7	20.50-20.95
		10	12	13	25	SPT-14	21.00-21.45
						DS-9	22.00
		8	12	11	23	SPT-15	22.50-22.95
23.50m.						UDS-8	23.50-23.95
Very stiff, light yellowish brown, clayey silt with sand mixture.		9	10	13	23	SPT-16	23.95-24.40
						DS-10	25.00
25.50m.		10	14	19	33	SPT-17	25.50-25.95
						*UDS-9	26.50-26.64
Hard, light yellowish brown, clayey silt with sand mixture.		10	14	20	34	SPT-18	27.00-27.45
						DS-11	28.00
		10	15	20	35	SPT-19	28.50-28.95
29.20m.						DS-12	29.50
		9	16	21	37	SPT-20	30.00-30.45
						DS-13	31.00
		12	15	22	37	SPT-21	31.50-31.95
Hard, brownish grey, silty clay with sand mixture & kankar.						DS-14	32.50
		13	19	20	39	SPT-22	33.00-33.45
						DS-15	34.00
						DS-16	34.70
N.B. - '*' means sample could not be recovered.		11	18	22	40	SPT-23	35.05-35.50
35.50m.							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 22/10/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.6

Co-ordinates E=3119.308 S=1903.545

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	1

Commencement Date : 16/10/2020
Completion Date : 18/10/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 34.908 M.
Water Struck At :
Standing Water Level : 1.1 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES Ref. No	SAMPLES Depth (m)
0.00m. Filled up soil consists of silty clay with boulders.						DS-1	0.50
0.80m.					8	WS-1	1.10
		1	3	5		SPT-1	1.00-1.45
						DS-2	2.00
					5	UDS-1	2.50-2.95
		1	2	3		SPT-2	2.95-3.40
Medium, brownish grey, silty clay with kankar.						DS-3	4.00
					6		
		2	3	3		SPT-3	4.50-4.95
					7	UDS-2	5.50-5.95
		2	3	4		SPT-4	5.95-6.40
						DS-4	7.00
7.50m.					5		
		2	2	3		SPT-5	7.50-7.95
Medium, greyish brown, silty clay with rusty spots.					7	UDS-3	8.50-8.95
		2	3	4		SPT-6	8.95-9.40
						DS-5	10.00
10.50m.					18		
		5	8	10		SPT-7	10.50-10.95
Very stiff, greyish brown, silty clay with rusty spots.						*UDS-4	11.50-11.95
12.10m.					22		
		7	10	12		SPT-8	12.10-12.55
						DS-6	13.00
Very stiff, light grey, silty clay / clayey silt with kankar & traces of sand mixture.					28		
		9	13	15		SPT-9	13.50-13.95
					33	UDS-5	14.50-14.95
14.95m.		11	15	18		SPT-10	14.95-15.40
Hard, light grey, silty clay / clayey silt with kankar & traces of sand mixture.						DS-7	16.00
					31		
16.95m.		10	14	17		SPT-11	16.50-16.95
17.80m.						UDS-6	17.50-17.95

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Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 22/10/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.6

Co-ordinates E=3119.308 S=1903.545

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
		Disturbed (DS)	15
Vane (V)		Water Sample (WS)	1

Commencement Date : 16/10/2020
Completion Date : 18/10/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 34.908 M.
Water Struck At :
Standing Water Level : 1.1 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES Ref. No	SAMPLES Depth (m)
17.80m							
Very stiff, light grey, silty clay / clayey silt with kankar & traces of sand mixture.		8	11	13	24	SPT-12	17.95-18.40
						DS-8	19.00
		10	12	15	27	SPT-13	19.50-19.95
						*UDS-7	20.50-20.95
21.10m		12	14	18	32	SPT-14	21.10-21.55
						DS-9	22.00
		10	15	21	36	SPT-15	22.50-22.95
						*UDS-8	23.50-23.62
Hard, light grey, silty clay / clayey silt with kankar & traces of sand mixture.		9	13	20	33	SPT-16	24.00-24.45
						DS-10	25.00
		11	15	22	37	SPT-17	25.50-25.95
						*UDS-9	26.50-26.63
28.00m		12	17	23	40	SPT-18	27.00-27.45
						DS-11	28.00
		18	35	43	78	SPT-19	28.50-28.95
						DS-12	29.50
		16	28	32	60	SPT-20	30.00-30.45
						DS-13	31.00
Hard, brownish grey, silty clay with kankar. Observed sand mixture.		12	18	24	42	SPT-21	31.50-31.95
						DS-14	32.50
		14	20	28	48	SPT-22	33.00-33.45
						DS-15	34.00
N.B. - '*' means sample could not be recovered.		14	22	30	52	SPT-23	35.05-35.50
35.50m							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 22/10/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.7

Co-ordinates E=3105.600 S=1978.700

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 18/10/2020
Completion Date : 20/10/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 34.842 M.
Water Struck At :
Standing Water Level : 0.7 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES Ref. No	SAMPLES Depth (m)
0.00m.							
Filled up soil consists of blackish grey, silty clay with brick bats & boulder pcs.						DS-1	0.50
0.80m.		2	2	3	5	SPT-1	1.00-1.45
						DS-2	2.00
						UDS-1	2.50-2.95
		2	3	3	6	SPT-2	2.95-3.40
						DS-3	4.00
Medium, brownish grey, silty clay with rusty spots.		2	2	2	4	SPT-3	4.50-4.95
						UDS-2	5.50-5.95
		2	3	3	6	SPT-4	5.95-6.40
						DS-4	7.00
		3	3	4	7	SPT-5	7.50-7.95
						*UDS-3	8.50-8.95
9.00m.		4	4	5	9	SPT-6	9.10-9.55
						DS-5	10.00
		4	5	6	11	SPT-7	10.50-10.95
						UDS-4	11.50-11.95
		6	7	9	16	SPT-8	11.95-12.40
						DS-6	13.00
Stiff to very stiff, brownish grey, silty clay with kankar & rusty spots.		7	8	11	19	SPT-9	13.50-13.95
						UDS-5	14.50-14.95
		7	8	13	21	SPT-10	14.95-15.40
						DS-7	16.00
		8	9	15	24	SPT-11	16.50-16.95
17.80m.						*UDS-6	17.50-17.95

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Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 22/10/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.7

Co-ordinates E=3105.600 S=1978.700

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 18/10/2020
Completion Date : 20/10/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 34.842 M.
Water Struck At :
Standing Water Level : 0.7 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)	SAMPLES Ref. No	SAMPLES Depth (m)
17.80m 18.00m Stiff to very stiff, brownish grey, silty clay with kankar & rusty spots.		9 12 18 (30)	SPT-12	18.10-18.55
			DS-8	19.00
		11 13 20 (33)	SPT-13	19.50-19.95
			UDS-7	20.50-20.95
		13 16 23 (39)	SPT-14	21.10-21.55
			DS-9	22.00
		12 14 23 (37)	SPT-15	22.50-22.95
Hard, greyish brown, silty clay / clayey silt with sand mixture.			*UDS-8	23.50-23.62
		10 11 19 (30)	SPT-16	24.00-24.45
			DS-10	25.00
		12 14 21 (35)	SPT-17	25.50-25.95
			*UDS-9	26.50-26.62
		11 13 20 (33)	SPT-18	27.00-27.45
			DS-11	28.00
28.50m		12 15 22 (37)	SPT-19	28.50-28.95
			DS-12	29.50
		13 16 24 (40)	SPT-20	30.00-30.45
			DS-13	31.00
Hard, yellowish grey, silty clay with traces of mica.		15 17 25 (42)	SPT-21	31.50-31.95
			DS-14	32.50
		17 19 24 (43)	SPT-22	33.00-33.45
			DS-15	34.00
N.B. - '*' means sample could not be recovered.		14 16 29 (45)	SPT-23	35.05-35.50
35.50m				

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 13/10/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.8

Co-ordinates E=3194.987 S=1919.554

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	16
		Water Sample (WS)	0

Commencement Date : 09/10/2020
Completion Date : 10/10/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 34.725 M.
Water Struck At :
Standing Water Level : 0.6 m.

DESCRIPTION	SYMBOL	N-VALUE EACH DIVN. = 15cm				SAMPLES Ref. No	SAMPLES Depth (m)
0.00m. Filled up soil consists of sand with boulders.						DS-1	0.50
0.80m.					2		
		1	1	1		SPT-1	1.00-1.45
						DS-2	2.00
Soft, grey, clayey silt with traces of sand mixture.						UDS-1	2.50-2.95
					3		
		1	1	2		SPT-2	3.00-3.45
						DS-3	4.00
4.20m.					4		
		2	2	2		SPT-3	4.50-4.95
Medium, brownish grey, silty clay with kankar.						UDS-2	5.50-5.95
					5		
		2	3	2		SPT-4	5.95-6.40
6.50m.						DS-4	7.00
					2		
		1	1	1		SPT-5	7.50-7.95
						UDS-3	8.50-8.95
					3		
		1	2	1		SPT-6	8.95-9.40
Soft to medium, deep grey, clayey silt with traces of sand mixture. Observed decomposed wood.						DS-5	10.00
					4		
		2	2	2		SPT-7	10.50-10.95
						*UDS-4	11.50-11.95
					7		
		3	3	4		SPT-8	12.05-12.50
						DS-6	13.00
13.50m.					20		
		8	10	10		SPT-9	13.50-13.95
						*UDS-5	14.50-14.95
					20		
Very stiff, light grey, silty clay / clayey silt with kankar & traces of sand mixture.		8	9	11		SPT-10	15.05-15.50
						DS-7	16.00
					21		
		9	9	12		SPT-11	16.50-16.95
17.80m.						UDS-6	17.50-17.95

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 13/10/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.8

Co-ordinates E=3194.987 S=1919.554

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
		Disturbed (DS)	16
Vane (V)		Water Sample (WS)	0

Commencement Date : 09/10/2020
Completion Date : 10/10/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 34.725 M.
Water Struck At :
Standing Water Level : 0.6 m.

DESCRIPTION	SYMBOL	N-VALUE EACH DIVN. = 15cm	SAMPLES Ref. No	SAMPLES Depth (m)
		24	SPT-12	17.95-18.40
		7 10 14	DS-8	19.00
		25	SPT-13	19.50-19.95
		8 11 14	*UDS-7	20.50-20.95
		25	SPT-14	21.00-21.45
		8 11 14	DS-9	22.00
		27	SPT-15	22.50-22.95
17.80m.		9 12 15		
Very stiff, light grey, silty clay / clayey silt with kankar & traces of sand mixture.			*UDS-8	23.50-23.95
		28	SPT-16	24.05-24.50
23.00m.		8 12 16	DS-10	25.00
Very stiff, yellowish brown, clayey silt with sand mixture. Observed concretion of silt.		34	SPT-17	25.50-25.95
		10 15 19	*UDS-9	26.50-26.63
		36	SPT-18	27.00-27.45
25.50m.		12 15 21	DS-11	28.00
Hard, yellowish brown, clayey silt with sand mixture. Observed concretion of silt.		38	SPT-19	28.50-28.95
		11 16 22	DS-12	29.50
29.80m.		38	SPT-20	30.00-30.45
		12 15 23	DS-13	31.00
		40	SPT-21	31.50-31.95
		12 17 23	DS-14	32.50
Hard, brownish grey, silty clay with kankar. Observed sand mixture.		42	SPT-22	33.00-33.45
		12 18 24	DS-15	34.00
			DS-16	34.50
		45	SPT-23	35.05-35.50
N.B. - '*' means sample could not be recovered.		14 20 25		
35.50m.				

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

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BORE LOG DATA SHEET

BORE HOLE NO.9

Co-ordinates E=3253.950 S=1942.489

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	10
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	14
		Water Sample (WS)	0

Commencement Date : 07/10/2020
Completion Date : 08/10/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 35.321 M.
Water Struck At :
Standing Water Level : 0.6 m.

DESCRIPTION	SYMBOL	N-VALUE EACH DIVN. = 15cm				SAMPLES Ref. No	Depth (m)
0.00m. Filled up soil consists of silty clay with brick bats & boulders.						DS-1	0.50
0.80m.		2	2	2	4	SPT-1	1.00-1.45
						DS-2	2.00
						UDS-1	2.50-2.95
		2	3	3	6	SPT-2	2.95-3.40
Medium, greyish, silty clay / clayey silt. Observed kankar & rusty spots.						DS-3	4.00
		2	2	3	5	SPT-3	4.50-4.95
						UDS-2	5.50-5.95
		2	3	3	6	SPT-4	5.95-6.40
						DS-4	7.00
7.50m.		4	4	5	9	SPT-5	7.50-7.95
Stiff, greyish, silty clay / clayey silt. Observed kankar & rusty spots.						UDS-3	8.50-8.95
		4	6	6	12	SPT-6	8.95-9.40
						DS-5	10.00
10.50m.		7	10	13	23	SPT-7	10.50-10.95
						UDS-4	11.50-11.95
		8	12	15	27	SPT-8	11.95-12.40
						DS-6	13.00
Very stiff, brownish grey, silty clay / clayey silt with traces of sand mixture.		6	11	13	24	SPT-9	13.50-13.95
						*UDS-5	14.50-14.95
		7	12	14	26	SPT-10	15.10-15.55
						DS-7	16.50
		7	13	14	27	SPT-11	16.50-16.95
17.80m.						UDS-6	17.50-17.95

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 13/10/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.9

Co-ordinates E=3253.950 S=1942.489

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	10
Cone (Pc)		Penetrometer (SPT)	23
		Disturbed (DS)	14
Vane (V)		Water Sample (WS)	0

Commencement Date : 07/10/2020
Completion Date : 08/10/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 35.321 M.
Water Struck At :
Standing Water Level : 0.6 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES	
						Ref. No	Depth (m)
17.80m.							
Very stiff, brownish grey, silty clay / clayey silt with traces of sand mixture.		6	10	14	24	SPT-12	17.95-18.40
						DS-8	19.00
		5	9	12	21	SPT-13	19.50-19.95
						*UDS-7	20.50-20.95
		7	10	13	23	SPT-14	21.10-21.55
22.00m.						DS-9	22.00
		5	8	12	20	SPT-15	22.50-22.95
						UDS-8	23.50-23.95
		6	12	15	27	SPT-16	23.95-24.40
Very stiff, yellowish brown, clayey silt with sand mixture. Observed kankar.						DS-10	25.00
		7	16	19	35	SPT-17	25.50-25.95
						*UDS-9	26.50-26.62
		8	14	16	30	SPT-18	27.00-27.45
						DS-11	28.00
28.50m.		8	17	20	37	SPT-19	28.50-28.95
						*UDS-10	29.50-29.60
		9	20	23	43	SPT-20	30.00-30.45
						DS-12	31.00
Hard, yellowish brown, clayey silt with sand mixture. Observed kankar.		12	24	26	50	SPT-21	31.50-31.95
						DS-13	32.50
		12	22	23	45	SPT-22	33.00-33.45
						DS-14	34.00
N.B. - '*' means sample could not be recovered.		19	25	33	58	SPT-23	35.05-35.50
35.50m.							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 07/10/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.10

Co-ordinates E=3292 S=1906

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	10
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	14
		Water Sample (WS)	0

Commencement Date : 08/09/2020
Completion Date : 10/09/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 34.738 M.
Water Struck At :
Standing Water Level : 0.3 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)	SAMPLES Ref. No	SAMPLES Depth (m)
0.00m.				
Filled up soil consists of brownish grey, silty clay / clayey silt with brick bats & kankar.		2 2 3 — 5	DS-1	0.50
			SPT-1	1.00-1.45
			DS-2	2.00
2.50m.			UDS-1	2.50-2.95
		3 4 5 — 9	SPT-2	2.95-3.40
			DS-3	4.00
Stiff, brownish grey, clayey silt with traces of yellow spot.		4 5 5 — 10	SPT-3	4.50-4.95
			UDS-2	5.50-5.95
		4 5 6 — 11	SPT-4	5.95-6.40
7.00m.			DS-4	7.00
		5 6 7 — 13	SPT-5	7.50-7.95
			UDS-3	8.50-8.95
		5 6 8 — 14	SPT-6	8.95-9.40
			DS-5	10.00
Stiff to very stiff, yellowish brown, clayey sandy silt with traces of rusty spot & kankar.		6 8 10 — 18	SPT-7	10.50-10.95
			UDS-4	11.50-11.95
		8 10 12 — 22	SPT-8	11.95-12.40
			DS-6	13.00
		9 11 14 — 25	SPT-9	13.50-13.95
14.00m.			UDS-5	14.50-14.95
		8 12 17 — 29	SPT-10	14.95-15.40
Very stiff, brownish grey, silty clay / clayey silt with sand mixture, rusty spots & traces of kankar.			DS-7	16.00
		9 13 17 — 30	SPT-11	16.50-16.95
			UDS-6	17.50-17.95
17.90m.				

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 07/10/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.10

Co-ordinates E=3292 S=1906

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	10
Cone (Pc)		Penetrometer (SPT)	23
		Disturbed (DS)	14
Vane (V)		Water Sample (WS)	0

Commencement Date : 08/09/2020
Completion Date : 10/09/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 34.738 M.
Water Struck At :
Standing Water Level : 0.3 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES	
						Ref. No	Depth (m)
17.90m. Very stiff, brownish grey, silty clay / clayey silt with sand mixture, rusty spots & traces of kankar.		8	12	16	28	SPT-12	17.95-18.40
						DS-8	19.00
19.50m.		10	15	29	44	SPT-13	19.50-19.95
						*UDS-7	20.50-20.95
		12	16	25	41	SPT-14	21.10-21.55
						DS-9	22.00
		8	15	24	39	SPT-15	22.50-22.95
						*UDS-8	23.50-23.95
		10	18	27	45	SPT-16	24.10-24.55
						DS-10	25.00
		11	19	29	48	SPT-17	25.50-25.95
						*UDS-9	26.50-26.95
Hard, brownish grey, clayey silt with sand mixture & traces of rusty spot. Observed concretion of silt.		12	22	31	53	SPT-18	27.10-27.55
						DS-11	28.00
		13	25	34	59	SPT-19	28.50-28.95
						*UDS-10	29.50-29.95
		15	27	37	64	SPT-20	30.05-30.50
						DS-12	31.00
		11	19	26	45	SPT-21	31.50-31.95
						DS-13	32.50
		15	20	28	48	SPT-22	33.00-33.45
						DS-14	34.00
N.B. - '*' means sample could not be recovered.		17	21	30	51	SPT-23	35.00-35.45
35.45m.							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 07/10/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.11

Co-ordinates E=3292 S=1941

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	10
Cone (Pc)		Penetrometer (SPT)	23
		Disturbed (DS)	15
Vane (V)		Water Sample (WS)	0

Commencement Date : 03/10/2020
Completion Date : 04/10/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 35.309 M.
Water Struck At :
Standing Water Level : 0.3 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES Ref. No	SAMPLES Depth (m)
0.00m.							
Filled up soil consists of silty clay with boulder pcs.						DS-1	0.50
		9	12	8	20	SPT-1	1.00-1.45
1.50m.							
						DS-2	2.00
						UDS-1	2.50-2.95
		3	3	2	5	SPT-2	2.95-3.40
Medium, yellowish grey, silty clay with traces of kankar.						DS-3	4.00
		3	3	4	7	SPT-3	4.50-4.95
						*UDS-2	5.50-5.95
6.00m.		3	5	5	10	SPT-4	6.00-6.45
						DS-4	7.00
		4	5	4	9	SPT-5	7.50-7.95
Stiff, yellowish grey, silty clay with traces of kankar.						UDS-3	8.50-8.95
		3	5	6	11	SPT-6	8.95-9.40
						DS-5	10.00
		5	5	8	13	SPT-7	10.50-10.95
11.50m.							
						UDS-4	11.50-11.95
		8	7	9	16	SPT-8	11.95-12.40
						DS-6	13.00
		8	7	8	15	SPT-9	13.50-13.95
Very stiff, brownish grey, silty clay / clayey silt with traces of sand mixture.						*UDS-5	14.50-14.95
		9	10	9	19	SPT-10	15.00-15.45
						DS-7	16.00
		5	9	9	18	SPT-11	16.50-16.95
						UDS-6	17.50-17.95
17.90m.							

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Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 07/10/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.11

Co-ordinates E=3292 S=1941

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	10
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 03/10/2020
Completion Date : 04/10/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 35.309 M.
Water Struck At :
Standing Water Level : 0.3 m.

DESCRIPTION	SYMBOL	N-VALUE EACH DIVN. = 15cm				SAMPLES Ref. No	SAMPLES Depth (m)
17.90m. Very stiff, brownish grey, silty clay / clayey silt with traces of sand mixture.		8	10	10	20	SPT-12	17.95-18.40
19.00m.						DS-8	19.00
		6	8	13	21	SPT-13	19.50-19.95
						*UDS-7	20.50-20.95
Very stiff, light yellowish brown, silty clay with traces of sand mixture. Observed kankar.		6	8	13	21	SPT-14	21.05-21.50
						DS-9	22.00
		8	10	12	22	SPT-15	22.50-22.95
						*UDS-8	23.50-23.95
24.00m.		6	8	8	16	SPT-16	24.10-24.55
						DS-10	25.00
Very stiff, yellowish brown, clayey silt with sand mixture. Observed traces of kankar.		7	9	11	20	SPT-17	25.50-25.95
						*UDS-9	26.50-26.95
		8	9	10	19	SPT-18	27.05-27.50
						DS-11	28.00
28.50m.		10	13	19	32	SPT-19	28.50-28.95
						*UDS-10	29.50-29.62
		11	14	18	32	SPT-20	29.80-30.25
						DS-12	31.00
Hard, brownish grey, silty clay / clayey silt with kankar.		11	15	19	34	SPT-21	31.50-31.95
						DS-13	32.50
		10	16	20	36	SPT-22	33.00-33.45
						DS-14	34.00
						DS-15	34.70
N.B. - '*' means sample could not be recovered.		12	17	20	37	SPT-23	35.05-35.50
35.50m.							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 07/10/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.12

Co-ordinates E=3330 S=1701

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	11
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	14
		Water Sample (WS)	0

Commencement Date : 15/09/2020
Completion Date : 18/09/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 37.986 M.
Water Struck At :
Standing Water Level : 1.9 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES Ref. No	SAMPLES Depth (m)
0.00m.							
Filled up by fly ash with brick dust etc.		3	3	5	8	DS-1	0.50
						SPT-1	1.00-1.45
2.00m.						DS-2	2.00
						UDS-1	2.50-2.95
		3	4	6	10	SPT-2	2.95-3.40
Stiff, brownish grey, silty clay / clayey silt with sand mixture & kankar.						DS-3	4.00
		4	6	7	13	SPT-3	4.50-4.95
5.50m.							
						UDS-2	5.50-5.95
		5	5	7	12	SPT-4	5.95-6.40
						DS-4	7.00
		6	7	7	14	SPT-5	7.50-7.95
						UDS-3	8.50-8.95
		4	5	8	13	SPT-6	8.95-9.40
						DS-5	10.00
		5	5	9	14	SPT-7	10.50-10.95
Stiff to very stiff, brownish grey, clayey silt with sand mixture. Observed kankar & steel grey patches.						UDS-4	11.50-11.95
		6	8	9	17	SPT-8	11.95-12.40
						DS-6	13.00
		7	9	9	18	SPT-9	13.50-13.95
						*UDS-5	14.50-14.95
		7	9	11	20	SPT-10	15.10-15.55
						DS-7	16.00
		7	9	12	21	SPT-11	16.50-16.95
17.00m.							
Very stiff, yellowish grey, clayey silt. Observed sand mixture, mica & siltstone.						*UDS-6	17.45-17.90
17.90m.							

BH-12/Sheet-1

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 07/10/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.12

Co-ordinates E=3330 S=1701

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	11
Cone (Pc)		Penetrometer (SPT)	23
		Disturbed (DS)	14
Vane (V)		Water Sample (WS)	0

Commencement Date : 15/09/2020
Completion Date : 18/09/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 37.986 M.
Water Struck At :
Standing Water Level : 1.9 m.

DESCRIPTION	SYMBOL	N-VALUE EACH DIVN. = 15cm				SAMPLES Ref. No	SAMPLES Depth (m)
17.90m.							
		7	11	14	25	SPT-12	18.00-18.45
						DS-8	19.00
		8	12	12	24	SPT-13	19.50-19.95
						UDS-7	20.50-20.95
		8	13	16	29	SPT-14	20.95-21.40
Very stiff, yellowish grey, clayey silt. Observed sand mixture, mica & siltstone.						DS-9	22.00
		8	14	17	31	SPT-15	22.50-22.95
						*UDS-8	23.50-23.95
		9	11	17	28	SPT-16	24.10-24.55
						DS-10	25.00
		9	12	16	28	SPT-17	25.50-25.95
26.95m.						*UDS-9	26.50-26.95
Hard, yellowish grey, clayey silt. Observed sand mixture, mica & siltstone.		9	14	18	32	SPT-18	27.10-27.55
28.00m.						DS-11	28.00
		10	16	23	39	SPT-19	28.50-28.95
						*UDS-10	29.50-29.95
		11	18	26	44	SPT-20	30.10-30.55
						DS-12	31.00
Hard, light yellowish grey, clayey silt with traces of sand mixture & mica. Observed siltstone.		11	19	28	47	SPT-21	31.50-31.95
						*UDS-11	32.50-32.95
		13	22	29	51	SPT-22	33.05-33.50
						DS-13	34.00
						DS-14	34.50
N.B. - '*' means sample could not be recovered.		16	25	33	58	SPT-23	35.15-35.60
35.60m.							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 07/10/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.13

Co-ordinates E=3305 S=1684

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	10
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 12/09/2020
Completion Date : 15/09/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 37.263 M.
Water Struck At :
Standing Water Level : 1.7 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)			SAMPLES Ref. No	SAMPLES Depth (m)
0.00m.						
Filled up soil consists of blackish grey, clayey silt with sand & coal pcs.					DS-1	0.50
		2	2	3 (5)	SPT-1	1.00-1.45
1.50m.					DS-2	2.00
					UDS-1	2.50-2.95
Medium, brownish grey, silty clay / clayey silt with sand mixture. Observed kankar & rusty spots.		3	3	4 (7)	SPT-2	2.95-3.40
					DS-3	4.00
		3	4	4 (8)	SPT-3	4.50-4.95
5.40m.						
					UDS-2	5.50-5.95
		4	4	5 (9)	SPT-4	5.95-6.40
					DS-4	7.00
		4	5	6 (11)	SPT-5	7.50-7.95
					UDS-3	8.50-8.95
		4	5	7 (12)	SPT-6	8.95-9.40
Stiff to very stiff, brownish grey, clayey silt with sand mixture.					DS-5	10.00
		5	6	7 (13)	SPT-7	10.50-10.95
					UDS-4	11.50-11.95
		6	7	7 (14)	SPT-8	11.95-12.40
					DS-6	13.00
		7	9	9 (18)	SPT-9	13.50-13.95
14.20m.						
					UDS-5	14.50-14.95
		8	9	11 (20)	SPT-10	14.95-15.40
Very stiff, yellowish brown, silty clay / clayey silt with sand mixture & traces of calcareous nodule.					DS-7	16.00
		8	9	13 (22)	SPT-11	16.50-16.95
17.90m.					*UDS-6	17.50-17.95

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 07/10/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.13

Co-ordinates E=3305 S=1684

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	10
Cone (Pc)		Penetrometer (SPT)	23
		Disturbed (DS)	15
Vane (V)		Water Sample (WS)	0

Commencement Date : 12/09/2020
Completion Date : 15/09/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 37.263 M.
Water Struck At :
Standing Water Level : 1.7 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES	
						Ref. No	Depth (m)
17.90m							
		9	9	15	24	SPT-12	18.10-18.55
						DS-8	19.00
		8	11	15	26	SPT-13	19.50-19.95
						UDS-7	20.50-20.95
Very stiff, yellowish brown, silty clay / clayey silt with sand mixture & traces of calcareous nodule.		9	13	16	29	SPT-14	20.95-21.40
						DS-9	22.00
		8	11	17	28	SPT-15	22.50-22.95
						*UDS-8	23.50-23.95
		9	13	17	30	SPT-16	24.05-24.50
24.50m							
Hard, yellowish brown, silty clay / clayey silt with sand mixture & traces of calcareous nodule.						DS-10	25.00
		8	15	18	33	SPT-17	25.50-25.95
26.00m							
						*UDS-9	26.50-26.85
		11	19	26	45	SPT-18	26.95-27.40
						DS-11	28.00
		12	21	24	45	SPT-19	28.50-28.95
						*UDS-10	29.50-29.95
		14	23	27	50	SPT-20	30.05-30.50
Hard, yellowish brown to light brown, clayey silt. Observed sand mixture, mica & siltstone.						DS-12	31.00
		15	24	29	53	SPT-21	31.50-31.95
						DS-13	32.50
		16	26	31	57	SPT-22	33.00-33.45
						DS-14	34.00
						DS-15	34.50
N.B. - '*' means sample could not be recovered.		15	27	33	60	SPT-23	35.15-35.60
35.60m							

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Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 07/10/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.14

Co-ordinates E=3292 S=1709

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	22	Undisturbed (UDS)	10
Cone (Pc)		Penetrometer (SPT)	22
Vane (V)		Disturbed (DS)	17
		Water Sample (WS)	0

Commencement Date : 10/09/2020
Completion Date : 12/09/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.899 M.
Water Struck At :
Standing Water Level : 1.8 m.

DESCRIPTION	SYMBOL	N-VALUE EACH DIVN. = 15cm				SAMPLES Ref. No	Depth (m)
0.00m. Filled up with blackish grey, clay, sand & coal pcs. 0.70m.						DS-1	0.50
		5	4	6	10	SPT-1	1.00-1.45
						DS-2	2.00
Medium, light brown, clayey silt. Observed sand mixture & mica.						UDS-1	2.50-2.95
		3	3	3	6	SPT-2	2.95-3.40
						DS-3	4.00
4.50m.							
		4	5	5	10	SPT-3	4.50-4.95
						DS-4	5.20
						UDS-2	5.50-5.95
		4	4	5	9	SPT-4	5.95-6.40
						DS-5	7.00
		4	5	6	11	SPT-5	7.50-7.95
						DS-6	8.30
						UDS-3	8.50-8.95
		5	5	6	11	SPT-6	8.95-9.40
						DS-7	10.00
Stiff to very stiff, light brown, clayey silt. Observed sand mixture & mica.		5	6	8	14	SPT-7	10.50-10.95
						UDS-4	11.50-11.95
		4	6	7	13	SPT-8	11.95-12.40
						DS-8	13.00
		5	5	7	12	SPT-9	13.50-13.95
						UDS-5	14.50-14.95
		4	6	7	13	SPT-10	14.95-15.40
						DS-9	16.00
		5	7	8	15	SPT-11	16.50-16.95
17.90m.						*UDS-6	17.50-17.95

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 07/10/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.14

Co-ordinates E=3292 S=1709

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	22	Undisturbed (UDS)	10
Cone (Pc)		Penetrometer (SPT)	22
Vane (V)		Disturbed (DS)	17
		Water Sample (WS)	0

Commencement Date : 10/09/2020
Completion Date : 12/09/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.899 M.
Water Struck At :
Standing Water Level : 1.8 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)	SAMPLES Ref. No	SAMPLES Depth (m)
17.90m. Stiff to very stiff, light brown, clayey silt. Observed sand mixture & mica.		6 7 9 = 16	SPT-12	18.10-18.55
19.00m.			DS-10	19.20
			*UDS-7	19.50-19.95
Very stiff, greyish brown to light brown, clayey silt. Observed sand mixture, mica, siltstone & black spots.		7 12 15 = 27	SPT-13	20.20-20.65
			DS-11	21.00
21.50m.		8 14 17 = 31	SPT-14	21.50-21.95
Hard, greyish brown to light brown, clayey silt. Observed sand mixture, mica, siltstone & black spots.			UDS-8	22.50-22.95
		7 14 17 = 31	SPT-15	22.95-23.40
23.40m.			DS-12	24.00
Very stiff, greyish brown to light brown, clayey silt. Observed sand mixture, mica, siltstone & black spots.		6 11 19 = 30	SPT-16	24.50-24.95
			*UDS-9	25.50-25.95
25.95m.		8 14 18 = 32	SPT-17	25.95-26.40
Hard, greyish brown to light brown, clayey silt. Observed sand mixture, mica, siltstone & black spots.			DS-13	27.00
		8 15 17 = 32	SPT-18	27.50-27.95
27.95m.			DS-14	28.50
Very stiff, greyish brown to light brown, clayey silt. Observed sand mixture, mica, siltstone & black spots.		8 14 15 = 29	SPT-19	29.00-29.45
			DS-15	30.00
			*UDS-10	30.50-30.95
32.00m.		9 16 21 = 37	SPT-20	32.00-32.45
			DS-16	33.00
Hard, greyish brown to light brown, clayey silt. Observed sand mixture, mica, siltstone & black spots.		11 17 22 = 39	SPT-21	33.50-33.95
			DS-17	34.50
N.B. - '*' means sample could not be recovered.		13 19 27 = 46	SPT-22	35.05-35.50
35.50m.				

BH-14/Sheet-2

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 08/10/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.15

Co-ordinates E=3398 S=1685

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	22	Undisturbed (UDS)	7
Cone (Pc)		Penetrometer (SPT)	22
		Disturbed (DS)	18
Vane (V)		Water Sample (WS)	0

Commencement Date : 21/09/2020
Completion Date : 24/09/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 37.655 M.
Water Struck At :
Standing Water Level : 1.7 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)			SAMPLES Ref. No	SAMPLES Depth (m)
0.00m. Filled up with blackish grey, coal pcs. & brick bats.					DS-1	0.50
1.00m.		4	5	6 (11)	SPT-1	1.00-1.45
					DS-2	2.00
				(4)	UDS-1	2.50-2.95
Medium, brownish grey, silty clay with rusty spots.		2	2	2	SPT-2	2.95-3.40
					DS-3	4.00
		2	2	3 (5)	SPT-3	4.50-4.95
5.95m.					UDS-2	5.50-5.95
		3	4	5 (9)	SPT-4	5.95-6.40
Stiff, brownish grey, silty clay with rusty spots.					DS-4	7.00
7.50m.		4	5	5 (10)	SPT-5	7.50-7.95
					UDS-3	8.50-8.95
		5	7	8 (15)	SPT-6	8.95-9.40
					DS-5	10.00
Stiff to very stiff, blackish grey, clayey silt / silty clay with sand mixture.					*UDS-4	11.40-11.85
		6	8	9 (17)	SPT-7	11.95-12.40
					DS-6	13.00
		7	9	11 (20)	SPT-8	13.50-13.95
					UDS-5	14.50-14.95
		8	11	14 (25)	SPT-9	14.95-15.40
16.00m.					DS-7	16.00
Very stiff, brownish grey, silty clay / clayey silt with sand mixture.		6	8	11 (19)	SPT-10	16.50-16.95
17.90m.					*UDS-6	17.50-17.95

BH-15/Sheet-1

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 08/10/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.15

Co-ordinates E=3398 S=1685

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	22	Undisturbed (UDS)	7
Cone (Pc)		Penetrometer (SPT)	22
Vane (V)		Disturbed (DS)	18
		Water Sample (WS)	0

Commencement Date : 21/09/2020
Completion Date : 24/09/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 37.655 M.
Water Struck At :
Standing Water Level : 1.7 m.

DESCRIPTION	SYMBOL	N-VALUE EACH DIVN. = 15cm				SAMPLES Ref. No	SAMPLES Depth (m)
17.90m							
		8	10	13	23	SPT-11	18.10-18.55
						DS-8	19.00
		9	11	14	25	SPT-12	19.50-19.95
Very stiff, brownish grey, silty clay / clayey silt with sand mixture.						*UDS-7	20.50-20.95
		8	12	14	26	SPT-13	21.10-21.55
						DS-9	22.00
22.50m		12	14	20	34	SPT-14	22.50-22.95
						DS-10	23.50
		14	16	22	38	SPT-15	24.00-24.45
						DS-11	25.00
		16	18	23	41	SPT-16	25.50-25.95
						DS-12	26.50
		18	20	25	45	SPT-17	27.00-27.45
						DS-13	28.00
		16	18	23	41	SPT-18	28.50-28.95
Hard, brownish grey, silty clay / clayey silt with sand mixture.						DS-14	29.50
		10	16	22	38	SPT-19	30.00-30.45
						DS-15	31.00
		11	17	22	39	SPT-20	31.50-31.95
						DS-16	32.50
		12	17	23	40	SPT-21	33.00-33.45
						DS-17	34.00
						DS-18	34.50
N.B. - '*' means sample could not be recovered.							
		10	18	24	42	SPT-22	35.05-35.50
35.50m							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 07/10/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.16

Co-ordinates E=3433 S=1676

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	8
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	17
		Water Sample (WS)	1

Commencement Date : 16/09/2020
Completion Date : 18/09/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 37.178 M.
Water Struck At :
Standing Water Level : 1.6 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)	SAMPLES Ref. No	SAMPLES Depth (m)
0.00m.				
Filled up with blackish grey, clayey silt, coal pcs., brick bats & boulder pcs.		3 5 8 — 13	DS-1	0.50
			SPT-1	1.00-1.45
			WS-1	1.60
2.00m.			DS-2	2.00
		1 1 2 — 3	UDS-1	2.50-2.95
			SPT-2	2.95-3.40
			DS-3	4.00
Soft to medium, yellowish grey, clayey silt / silty clay with sand mixture.		2 2 2 — 4	SPT-3	4.50-4.95
		2 2 3 — 5	UDS-2	5.50-5.95
			SPT-4	5.95-6.40
			DS-4	7.00
7.95m.		3 4 4 — 8	SPT-5	7.50-7.95
		4 5 6 — 11	UDS-3	8.50-8.95
			SPT-6	8.95-9.40
			DS-5	10.00
		5 7 8 — 15	SPT-7	10.50-10.95
Stiff to very stiff, brownish grey, silty clay with kankar & rusty spots.		7 9 10 — 19	*UDS-4	11.50-11.95
			SPT-8	12.10-12.55
			DS-6	13.00
		8 11 14 — 25	SPT-9	13.50-13.95
		7 10 15 — 25	*UDS-5	14.50-14.95
			SPT-10	15.10-15.55
			DS-7	16.00
		7 9 13 — 22	SPT-11	16.50-16.95
17.00m.				
Very stiff, brownish grey, silty clay / clayey silt with sand mixture & rusty spots.			*UDS-6	17.50-17.95
17.90m.				

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 07/10/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.16

Co-ordinates E=3433 S=1676

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	8
Cone (Pc)		Penetrometer (SPT)	23
		Disturbed (DS)	17
Vane (V)		Water Sample (WS)	1

Commencement Date : 16/09/2020
Completion Date : 18/09/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 37.178 M.
Water Struck At :
Standing Water Level : 1.6 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)			SAMPLES Ref. No	SAMPLES Depth (m)
17.90m.						
Very stiff, brownish grey, silty clay / clayey silt with sand mixture & rusty spots. Observed a sand pocket in SPT-13.		8	10	15 (25)	SPT-12	18.05-18.50
					DS-8	19.00
		10	12	18 (30)	SPT-13	19.50-19.95
					*UDS-7	20.50-20.95
20.95m.						
Hard, brownish grey, silty clay / clayey silt with sand mixture & rusty spots.		12	14	20 (34)	SPT-14	21.15-21.60
					DS-9	22.00
22.00m.						
		14	16	22 (38)	SPT-15	22.50-22.95
					*UDS-8	23.50-23.95
		17	19	24 (43)	SPT-16	24.10-24.55
					DS-10	25.00
		18	20	25 (45)	SPT-17	25.50-25.95
					DS-11	26.50
		19	22	27 (49)	SPT-18	27.00-27.45
					DS-12	28.00
Hard, greyish brown, clayey sandy silt. Observed kankar & steel grey spots.		16	20	22 (42)	SPT-19	28.50-28.95
					DS-13	29.50
		10	17	23 (40)	SPT-20	30.00-30.45
					DS-14	31.00
		12	19	24 (43)	SPT-21	31.50-31.95
					DS-15	32.50
		13	18	23 (41)	SPT-22	33.00-33.45
					DS-16	34.00
					DS-17	34.50
N.B. - '*' means sample could not be recovered.		14	19	22 (41)	SPT-23	35.05-35.50
35.50m.						

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 07/10/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.17

Co-ordinates E=3468 S=1634

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 12/09/2020
Completion Date : 15/09/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 37.440 M.
Water Struck At :
Standing Water Level : 2.1 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES Ref. No	SAMPLES Depth (m)
0.00m.							
						DS-1	0.50
					4		
Soft/medium, brownish grey, silty clay / clayey silt with kankar.		2	2	2		SPT-1	1.00-1.45
						DS-2	2.00
					9	UDS-1	2.50-2.95
3.00m.		3	4	5		SPT-2	2.95-3.40
						DS-3	4.00
					9		
		4	4	5		SPT-3	4.50-4.95
Stiff, brownish grey, silty clay with traces of yellow spot.							
					8	UDS-2	5.50-5.95
		3	4	4		SPT-4	5.95-6.40
						DS-4	7.00
7.50m.					9		
		3	4	5		SPT-5	7.50-7.95
						UDS-3	8.50-8.95
					17		
		7	7	10		SPT-6	8.95-9.40
						DS-5	10.00
					20		
		8	8	12		SPT-7	10.50-10.95
Stiff to very stiff, yellowish brown, clayey sandy silt with traces of rusty spot & kankar.							
					24	UDS-4	11.50-11.95
		8	9	15		SPT-8	11.95-12.40
						DS-6	13.00
					21		
		7	8	13		SPT-9	13.50-13.95
						UDS-5	14.50-14.95
					23		
		7	9	14		SPT-10	14.95-15.40
16.00m.						DS-7	16.00
					26		
Very stiff, brownish grey, silty clay / clayey silt with sand mixture & rusty spots. Observed concretion of silt.		8	11	15		SPT-11	16.50-16.95
						*UDS-6	17.50-17.95
17.90m.							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 07/10/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.17

Co-ordinates E=3468 S=1634

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
		Disturbed (DS)	15
Vane (V)		Water Sample (WS)	0

Commencement Date : 12/09/2020
Completion Date : 15/09/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 37.440 M.
Water Struck At :
Standing Water Level : 2.1 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES Ref. No	SAMPLES Depth (m)
17.90m							
Very stiff, brownish grey, silty clay / clayey silt with sand mixture & rusty spots. Observed concretion of silt.		7	10	13	23	SPT-12	18.10-18.55
						DS-8	19.00
		8	12	15	27	SPT-13	19.50-19.95
						UDS-7	20.50-20.95
20.95m		9	15	20	35	SPT-14	20.95-21.40
						DS-9	22.00
		7	15	19	34	SPT-15	22.50-22.95
						UDS-8	23.50-23.95
		9	17	21	38	SPT-16	23.95-24.40
						DS-10	25.00
Hard, brownish grey, silty clay / clayey silt with sand mixture & rusty spots. Observed concretion of silt.		14	18	30	48	SPT-17	25.50-25.95
						*UDS-9	26.50-26.95
		17	22	33	55	SPT-18	27.10-27.55
						DS-11	28.00
		15	20	31	51	SPT-19	28.50-28.95
						DS-12	29.50
		14	18	34	52	SPT-20	30.00-30.45
						DS-13	31.00
32.00m		11	16	21	37	SPT-21	31.50-31.95
						DS-14	32.50
Hard, yellowish grey, clayey silt with traces of rusty spot & kankar.		12	18	23	41	SPT-22	33.00-33.45
						DS-15	34.00
N.B. - '*' means sample could not be recovered.		15	22	27	49	SPT-23	35.10-35.55
35.55m							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 07/10/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.18

Co-ordinates E=3515 S=1630

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	6
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	19
		Water Sample (WS)	0

Commencement Date : 16/09/2020
Completion Date : 19/09/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.864 M.
Water Struck At :
Standing Water Level : 2.0 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES Ref. No	SAMPLES Depth (m)
0.00m.							
					3	DS-1	0.50
		1	1	2		SPT-1	1.00-1.45
Soft to medium, brownish grey, silty clay / clayey silt with kankar.						DS-2	2.00
					6	UDS-1	2.50-2.95
		3	3	3		SPT-2	2.95-3.40
4.00m.						DS-3	4.00
					7		
Medium, brownish grey, silty clay with traces of yellow spot.		3	3	4		SPT-3	4.50-4.95
						UDS-2	5.50-5.95
5.95m.					9		
		4	4	5		SPT-4	5.95-6.40
						DS-4	7.00
Stiff, brownish grey, silty clay with traces of yellow spot.					11		
		5	5	6		SPT-5	7.50-7.95
						UDS-3	8.50-8.95
9.00m.					14		
		6	6	8		SPT-6	8.95-9.40
						DS-5	10.00
					17		
		5	6	11		SPT-7	10.50-10.95
						UDS-4	11.50-11.95
Stiff to very stiff, yellowish brown, clayey sandy silt with traces of rusty spot & kankar.					21		
		6	8	13		SPT-8	11.95-12.40
						DS-6	13.00
					25		
		8	10	15		SPT-9	13.50-13.95
						*UDS-5	14.50-14.95
					28		
		10	12	16		SPT-10	15.15-15.60
15.60m.							
Hard, yellowish brown, clayey silt with traces of rusty spot & kankar.						DS-7	16.00
					31		
		12	14	17		SPT-11	16.50-16.95
17.00m.							
Hard, brownish grey, silty clay / clayey silt with kankar & rusty spots. Observed concretion of silt.						*UDS-6	17.50-17.95
17.90m.							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 07/10/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.18

Co-ordinates E=3515 S=1630

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	6
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	19
		Water Sample (WS)	0

Commencement Date : 16/09/2020
Completion Date : 19/09/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.864 M.
Water Struck At :
Standing Water Level : 2.0 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)			SAMPLES	
					Ref. No	Depth (m)
17.90m						
		10	11	19 (30)	SPT-12	18.15-18.60
					DS-8	19.00
		11	13	21 (34)	SPT-13	19.50-19.95
					DS-9	20.50
		12	15	23 (38)	SPT-14	21.00-21.45
					DS-10	22.00
		7	11	19 (30)	SPT-15	22.50-22.95
					DS-11	23.50
		7	10	17 (27)	SPT-16	24.00-24.45
Hard, brownish grey, silty clay / clayey silt with kankar & rusty spots. Observed concretion of silt.					DS-12	25.00
		8	12	18 (30)	SPT-17	25.50-25.95
					DS-13	26.50
		10	14	20 (34)	SPT-18	27.00-27.45
					DS-14	28.00
		11	15	20 (35)	SPT-19	28.50-28.95
					DS-15	29.50
		12	16	22 (38)	SPT-20	30.00-30.45
					DS-16	31.00
		12	16	21 (37)	SPT-21	31.50-31.95
32.50m					DS-17	32.50
		13	17	23 (40)	SPT-22	33.00-33.45
Hard, yellowish grey, clayey silt with traces of rusty spot & kankar.					DS-18	34.00
					DS-19	34.50
N.B. – '*' means sample could not be recovered.		16	21	30 (51)	SPT-23	35.05-35.50
35.50m						

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 07/10/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.19

Co-ordinates E=3496 S=1652

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	10
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	16
		Water Sample (WS)	0

Commencement Date : 12/09/2020
Completion Date : 15/09/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 37.833 M.
Water Struck At :
Standing Water Level : 1.8 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES	
						Ref. No	Depth (m)
0.00m.							
						DS-1	0.50
					2		
		1	1	1		SPT-1	1.00-1.45
						DS-2	2.00
						UDS-1	2.50-2.95
					3		
		1	1	2		SPT-2	2.95-3.40
Soft to medium, brownish grey, silty clay with traces of yellow spot.						DS-3	4.00
					4		
		2	2	2		SPT-3	4.50-4.95
						UDS-2	5.50-5.95
					5		
		2	2	3		SPT-4	5.95-6.40
						DS-4	7.00
7.50m.					11		
		3	5	6		SPT-5	7.50-7.95
						UDS-3	8.50-8.95
					13		
		4	6	7		SPT-6	8.95-9.40
						DS-5	10.00
					18		
		5	8	10		SPT-7	10.50-10.95
						UDS-4	11.50-11.95
Stiff to very stiff, brownish grey, silty clay with kankar & rusty spots.					20		
		5	9	11		SPT-8	11.95-12.40
						DS-6	13.00
					28		
		7	12	16		SPT-9	13.50-13.95
						DS-7	14.30
						*UDS-5	14.50-14.95
					26		
		8	11	15		SPT-10	15.10-15.55
						DS-8	16.00
					27		
		8	10	17		SPT-11	16.50-16.95
17.00m.							
Hard, brownish grey, silty clay / clayey silt with sand mixture & rusty spots.						UDS-6	17.50-17.95
17.90m.							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 07/10/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.19

Co-ordinates E=3496 S=1652

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	10
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	16
		Water Sample (WS)	0

Commencement Date : 12/09/2020
Completion Date : 15/09/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 37.833 M.
Water Struck At :
Standing Water Level : 1.8 m.

DESCRIPTION	SYMBOL	N-VALUE EACH DIVN. = 15cm				SAMPLES Ref. No	SAMPLES Depth (m)
17.90m.							
		10	12	18	30	SPT-12	17.95-18.40
						DS-9	19.00
		11	13	19	32	SPT-13	19.50-19.95
						UDS-7	20.50-20.95
		8	12	17	29	SPT-14	20.95-21.40
						DS-10	22.00
						*UDS-8	22.50-22.95
		12	16	22	38	SPT-15	23.10-23.55
Hard, brownish grey, silty clay / clayey silt with sand mixture & rusty spots.						DS-11	24.00
		15	18	27	45	SPT-16	24.50-24.95
						UDS-9	25.50-25.95
		17	21	30	51	SPT-17	26.10-26.55
						DS-12	27.00
		16	23	32	55	SPT-18	27.50-27.95
						UDS-10	28.50-28.95
		14	17	29	46	SPT-19	28.95-29.40
30.00m.						DS-13	30.00
		12	16	27	43	SPT-20	30.50-30.95
						DS-14	31.50
		13	16	26	42	SPT-21	32.00-32.45
Hard, brownish / yellowish grey, clayey silt with traces of rusty spot & kankar.						DS-15	33.00
		14	19	24	43	SPT-22	33.50-33.95
						DS-16	34.00
N.B. - '*' means sample could not be recovered.							
35.50m.		12	20	25	45	SPT-23	35.05-35.50

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 07/10/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.20

Co-ordinates E=3650 S=1918

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	10
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 23/09/2020
Completion Date : 25/09/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.048 M.
Water Struck At :
Standing Water Level : 1.55 m.

DESCRIPTION	SYMBOL	N-VALUE EACH DIVN. = 15cm				SAMPLES Ref. No	Depth (m)
0.00m. Filled up soil consists of silty clay with boulders.						DS-1	0.50
0.80m.		3	3	2	5	SPT-1	1.00-1.45
						DS-2	2.00
Medium, grey, silty clay / clayey silt. Observed sand mixture.						UDS-1	2.50-2.95
		2	2	3	5	SPT-2	2.95-3.40
						DS-3	4.00
4.50m.							
Stiff, grey, silty clay / clayey silt. Observed sand mixture.		2	4	5	9	SPT-3	4.50-4.95
5.50m.						UDS-2	5.50-5.95
		3	5	5	10	SPT-4	5.95-6.40
						DS-4	7.00
		3	6	6	12	SPT-5	7.50-7.95
						*UDS-3	8.50-8.95
Stiff to very stiff, yellowish grey, silty clay with kankar.		3	5	8	13	SPT-6	9.00-9.45
						DS-5	10.00
		5	8	8	16	SPT-7	10.50-10.95
						UDS-4	11.50-11.95
		6	8	9	17	SPT-8	11.95-12.40
						DS-6	13.00
13.50m.							
		8	9	10	19	SPT-9	13.50-13.95
						UDS-5	14.50-14.95
Very sitff, yellowish grey, silty clay / clayey silt with traces of sand mixture.		9	11	14	25	SPT-10	14.95-15.40
						DS-7	16.00
		6	8	9	17	SPT-11	16.50-16.95
17.90m.						*UDS-6	17.50-17.95

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 07/10/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.20

Co-ordinates E=3650 S=1918

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	10
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 23/09/2020
Completion Date : 25/09/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.048 M.
Water Struck At :
Standing Water Level : 1.55 m.

DESCRIPTION	SYMBOL	N-VALUE EACH DIVN. = 15cm				SAMPLES Ref. No	SAMPLES Depth (m)
17.90m. Very sitff, yellowish grey, silty clay / clayey silt with traces of sand mixture. 18.70m.		8	9	12	21	SPT-12	18.10-18.55
						DS-8	19.00
		8	13	12	25	SPT-13	19.50-19.95
Very sitff, light brownish grey, clayey silt. Observed concretion of silt.						*UDS-7	20.50-20.95
		10	12	13	25	SPT-14	21.00-21.45
						DS-9	22.00
22.50m.		14	27	34	61	SPT-15	22.50-22.95
Hard, light yellowish grey, clayey silt with sand mixture & kankar.						*UDS-8	23.50-23.63
		13	25	34	59	SPT-16	23.80-24.25
						DS-10	24.80
25.20m. Very stiff, yellowish grey, silty clay with traces of sand mixture. Observed concretion of silt & grey patches.		9	11	14	25	SPT-17	25.50-25.95
						*UDS-9	26.50-26.95
27.10m.		10	12	19	31	SPT-18	27.10-27.55
						DS-11	28.00
Hard, yellowish grey, silty clay with traces of sand mixture. Observed concretion of silt & grey patches.		12	20	24	44	SPT-19	28.50-28.95
						*UDS-10	29.50-29.61
		15	27	36	63	SPT-20	30.00-30.45
30.50m.						DS-12	31.00
		10	15	26	41	SPT-21	31.50-31.95
Hard, yellowish brown, clayey silt with traces of sand mixture, mica. Observed concretion of silt.						DS-13	32.50
		10	17	25	42	SPT-22	33.00-33.45
						DS-14	34.00
						DS-15	34.60
N.B. - '*' means sample could not be recovered. 35.50m.		10	12	18	30	SPT-23	35.05-35.50

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
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BORE LOG DATA SHEET

BORE HOLE NO.21

Co-ordinates E=3833 S=1958

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	16
		Water Sample (WS)	0

Commencement Date : 20/09/2020
Completion Date : 23/09/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.682 M.
Water Struck At :
Standing Water Level : 0.9 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES	
						Ref. No	Depth (m)
0.00m.							
Filled up soil consists of clayey silt with brick bats, boulders etc.		6	4	8	12	DS-1	0.50
						SPT-1	1.00-1.45
1.60m.						DS-2	2.00
						UDS-1	2.50-2.95
Medium, grey, clayey silt with sand mixture.		2	3	3	6	SPT-2	2.95-3.40
						DS-3	4.00
		2	4	4	8	SPT-3	4.50-4.95
4.95m.							
						*UDS-2	5.50-5.95
		2	5	4	9	SPT-4	6.15-6.60
Stiff, brownish grey, clayey silt with traces of kankar. Observed sand mixture.						DS-4	7.00
		3	5	7	12	SPT-5	7.50-7.95
						UDS-3	8.50-8.95
9.00m.		4	6	9	15	SPT-6	8.95-9.40
						DS-5	10.00
Stiff to very stiff, yellowish brown, clayey silt / silty clay with sand mixture.		4	8	10	18	SPT-7	10.50-10.95
						UDS-4	11.50-11.95
		4	9	12	21	SPT-8	11.95-12.40
12.50m.							
						DS-6	13.00
		5	8	12	20	SPT-9	13.50-13.95
						*UDS-5	14.50-14.95
Very stiff, yellowish brown, clayey silt with traces of sand mixture.		6	9	14	23	SPT-10	15.05-15.50
						DS-7	16.00
		6	10	13	23	SPT-11	16.50-16.95
17.90m.						UDS-6	17.50-17.95

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 07/10/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.21

Co-ordinates E=3833 S=1958

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	16
		Water Sample (WS)	0

Commencement Date : 20/09/2020
Completion Date : 23/09/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.682 M.
Water Struck At :
Standing Water Level : 0.9 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES	
						Ref. No	Depth (m)
17.90m							
		5	11	13	24	SPT-12	17.95-18.40
						DS-8	19.00
		5	10	12	22	SPT-13	19.50-19.95
Very stiff, yellowish brown, clayey silt with traces of sand mixture.						UDS-7	20.50-20.95
		6	11	13	24	SPT-14	20.95-21.40
						DS-9	22.00
		7	14	15	29	SPT-15	22.50-22.95
23.50m							
						*UDS-8	23.50-23.95
		8	15	18	33	SPT-16	24.05-24.50
						DS-10	25.00
		8	14	18	32	SPT-17	25.50-25.95
						*UDS-9	26.50-26.95
Hard, light yellowish brown, clayey silt with traces of sand mixture.		9	13	18	31	SPT-18	27.05-27.50
						DS-11	28.00
		10	16	26	42	SPT-19	28.50-28.95
						DS-12	29.50
30.00m							
		14	23	30	53	SPT-20	30.00-30.45
						DS-13	31.00
		13	23	30	53	SPT-21	31.50-31.95
Hard, brownish grey, clayey silt with traces of sand mixture. Observed concretion of silt.						DS-14	32.50
		13	25	33	58	SPT-22	33.00-33.45
						DS-15	34.00
						DS-16	34.60
N.B. - '*' means sample could not be recovered.		16	26	35	61	SPT-23	35.10-35.55
35.55m							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 21/12/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.22

Co-ordinates E=3834 S=2017

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 11/12/2020
Completion Date : 13/12/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.877 m.
Water Struck At :
Standing Water Level : 2.1 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES Ref. No	SAMPLES Depth (m)
0.00m.							
						DS-1	0.50
					10		
Filled up by coal dust with fly ash.		7	7	3		SPT-1	1.00-1.45
						DS-2	2.00
2.50m.							
						*UDS-1	2.50-2.95
					4		
		1	2	2		SPT-2	3.00-3.45
Medium, brownish grey, silty clay / clayey silt. Observed kankar.						DS-3	4.00
					5		
		2	3	2		SPT-3	4.50-4.95
5.20m.							
						UDS-2	5.50-5.95
					4		
		2	2	2		SPT-4	5.95-6.40
						DS-4	7.00
Medium, brownish grey, clayey silt with traces of kankar.					5		
		2	2	3		SPT-5	7.50-7.95
						*UDS-3	8.50-8.95
					7		
		2	3	4		SPT-6	9.00-9.45
10.00m.							
						DS-5	10.00
					12		
		3	5	7		SPT-7	10.50-10.95
Stiff, yellowish brown, clayey silt / silty clay with sand mixture.						UDS-4	11.50-11.95
					14		
		4	6	8		SPT-8	11.95-12.40
						DS-6	13.00
13.20m.							
					13		
		3	7	6		SPT-9	13.50-13.95
						UDS-5	14.50-14.95
					16		
Stiff to very stiff, light yellowish brown, clayey silt with traces of sand mixture.		4	7	9		SPT-10	14.95-15.40
						DS-7	16.00
					20		
		5	8	12		SPT-11	16.50-16.95
17.80m.							
						*UDS-6	17.50-17.95

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 21/12/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.22

Co-ordinates E=3834 S=2017

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 11/12/2020
Completion Date : 13/12/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.877 m.
Water Struck At :
Standing Water Level : 2.1 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES	
						Ref. No	Depth (m)
17.80m.		6	11	15	26	SPT-12	18.00-18.45
						DS-8	19.00
Stiff to very stiff, light yellowish brown, clayey silt with traces of sand mixture.		7	10	17	27	SPT-13	19.50-19.95
						UDS-7	20.50-20.95
		7	12	14	26	SPT-14	20.95-21.40
						DS-9	22.00
22.50m.		8	13	18	31	SPT-15	22.50-22.95
Hard, light yellowish brown, clayey silt with traces of sand mixture.							
23.50m.						*UDS-8	23.50-23.95
		8	14	21	35	SPT-16	24.05-24.50
						DS-10	25.00
		10	16	24	40	SPT-17	25.50-25.95
						*UDS-9	26.50-26.64
Dense, yellowish brown, silty sand with clay binder.		12	17	25	42	SPT-18	27.00-27.45
						DS-11	28.00
		10	17	29	46	SPT-19	28.50-28.95
						DS-12	29.50
		12	19	29	48	SPT-20	30.00-30.45
30.50m.							
						DS-13	31.00
		12	22	32	54	SPT-21	31.50-31.95
						DS-14	32.50
Hard, brownish grey, clayey silt with sand mixture. Observed concretion of silt.		13	24	35	59	SPT-22	33.00-33.45
						DS-15	34.50
N.B. - '*' means sample could not be recovered.		12	22	39	61	SPT-23	35.05-35.50
35.50m.							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
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BORE LOG DATA SHEET

BORE HOLE NO.23

Co-ordinates E=3831 S=2037

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	8
Cone (Pc)		Penetrometer (SPT)	23
		Disturbed (DS)	17
Vane (V)		Water Sample (WS)	0

Commencement Date : 16/09/2020
Completion Date : 19/09/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.678 M.
Water Struck At :
Standing Water Level : 1.1 m.

DESCRIPTION	SYMBOL	N-VALUE EACH DIVN. = 15cm				SAMPLES Ref. No	Depth (m)
0.00m.							
Filled up soil consists of clayey silt with brick bats, boulders etc.					11	DS-1	0.50
		5	6	5		SPT-1	1.00-1.45
1.40m.							
						DS-2	2.00
Medium, deep grey, clayey silt with sand mixture.					6	UDS-1	2.50-2.95
		2	2	4		SPT-2	2.95-3.40
						DS-3	4.00
4.10m.							
Medium, brownish grey, silty clay / clayey silt with sand mixture & traces of kankar.					6		
		3	3	3		SPT-3	4.50-4.95
						UDS-2	5.50-5.95
5.95m.					9		
		2	4	5		SPT-4	5.95-6.40
						DS-4	7.00
Stiff, brownish grey, silty clay / clayey silt with sand mixture & traces of kankar.					10		
		3	4	6		SPT-5	7.50-7.95
8.40m.							
					12	UDS-3	8.50-8.95
		4	5	7		SPT-6	8.95-9.40
						DS-5	10.00
Stiff, yellowish brown, clayey silt with sand mixture. Observed kankar.					11		
		4	5	6		SPT-7	10.50-10.95
11.50m.							
					14	UDS-4	11.50-11.95
		5	6	8		SPT-8	11.95-12.40
						DS-6	13.00
					16		
		4	7	9		SPT-9	13.50-13.95
Stiff to very stiff, yellowish brown, silty clay / clayey silt. Observed sand mixture.							
					17	*UDS-5	14.50-14.95
		5	7	10		SPT-10	15.05-15.50
						DS-7	16.00
					20		
		6	8	12		SPT-11	16.50-16.95
						UDS-6	17.50-17.95
17.90m.							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 07/10/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.23

Co-ordinates E=3831 S=2037

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	8
Cone (Pc)		Penetrometer (SPT)	23
		Disturbed (DS)	17
Vane (V)		Water Sample (WS)	0

Commencement Date : 16/09/2020
Completion Date : 19/09/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.678 M.
Water Struck At :
Standing Water Level : 1.1 m.

DESCRIPTION	SYMBOL	N-VALUE EACH DIVN. = 15cm				SAMPLES Ref. No	SAMPLES Depth (m)
17.90m.							
Stiff to very stiff, yellowish brown, silty clay / clayey silt. Observed sand mixture.		6	10	14	24	SPT-12	17.95-18.40
						DS-8	19.00
		9	12	15	27	SPT-13	19.50-19.95
						*UDS-7	20.50-20.95
		8	11	15	26	SPT-14	21.05-21.50
						DS-9	22.00
22.50m.							
Hard, yellowish brown, silty clay / clayey silt. Observed sand mixture.		11	15	17	32	SPT-15	22.50-22.95
						UDS-8	23.50-23.95
23.95m.							
Very dense to dense, yellowish brown, silty sand. Observed concretion of silt & clay binder.		12	23	30	53	SPT-16	23.95-24.40
						DS-10	25.00
		13	20	28	48	SPT-17	25.50-25.95
						DS-11	26.50
		10	16	25	41	SPT-18	27.00-27.45
						DS-12	28.00
		12	20	27	47	SPT-19	28.50-28.95
29.50m.							
Hard, brownish grey, clayey silt with sand mixture. Observed concretion of silt.		21	29	33	62	SPT-20	30.00-30.45
						DS-14	31.00
		18	25	30	55	SPT-21	31.50-31.95
						DS-15	32.50
		13	19	25	44	SPT-22	33.00-33.45
						DS-16	34.00
						DS-17	34.50
N.B. - '*' means sample could not be recovered.		19	23	31	54	SPT-23	35.05-35.50
35.50m.							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

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BORE LOG DATA SHEET

BORE HOLE NO.24

Co-ordinates E=3860 S=2036

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	16
		Water Sample (WS)	0

Commencement Date : 26/09/2020
Completion Date : 28/09/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.608 M.
Water Struck At :
Standing Water Level : 0.6 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)			SAMPLES Ref. No	SAMPLES Depth (m)
0.00m.						
Filled up soil consists of silty clay with sand & boulders.		9	6	10 (16)	DS-1	0.50
					SPT-1	1.00-1.45
					DS-2	2.00
					*UDS-1	2.50-2.61
2.70m.						
Medium, grey, clayey silt with traces of sand mixture.		2	2	2 (4)	SPT-2	3.00-3.45
					DS-3	4.00
4.50m.						
Medium, brownish grey, silty clay / clayey silt with traces of kankar. Observed sand mixture.		3	2	4 (6)	SPT-3	4.50-4.95
					UDS-2	5.50-5.95
5.95m.		3	5	5 (10)	SPT-4	5.95-6.40
Stiff, brownish grey, silty clay / clayey silt with traces of kankar. Observed sand mixture.					DS-4	7.00
		4	6	6 (12)	SPT-5	7.50-7.95
8.50m.						
					UDS-3	8.50-8.95
		3	5	7 (12)	SPT-6	8.95-9.40
Stiff, yellowish brown, clayey silt with sand mixture.					DS-5	10.00
		4	6	8 (14)	SPT-7	10.50-10.95
11.30m.						
					*UDS-4	11.50-11.95
		5	8	8 (16)	SPT-8	12.00-12.45
					DS-6	13.00
Stiff to very stiff, yellowish brown, silty clay / clayey silt with traces of sand mixture.		6	6	8 (14)	SPT-9	13.50-13.95
					UDS-5	14.50-14.95
		6	8	7 (15)	SPT-10	14.95-15.40
					DS-7	16.00
16.50m.						
		7	10	11 (21)	SPT-11	16.50-16.95
Very stiff, brownish grey, silty clay with kankar.						
					*UDS-6	17.50-17.95
17.90m.						

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
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BORE LOG DATA SHEET

BORE HOLE NO.24

Co-ordinates E=3860 S=2036

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	16
		Water Sample (WS)	0

Commencement Date : 26/09/2020
Completion Date : 28/09/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.608 M.
Water Struck At :
Standing Water Level : 0.6 m.

DESCRIPTION	SYMBOL	N-VALUE EACH DIVN. = 15cm				SAMPLES Ref. No	SAMPLES Depth (m)
17.90m.							
		7	10	14	24	SPT-12	18.00-18.45
						DS-8	19.00
		7	9	13	22	SPT-13	19.50-19.95
Very stiff, brownish grey, silty clay with kankar.						*UDS-7	20.50-20.95
		7	10	12	22	SPT-14	21.05-21.50
						DS-9	22.00
22.50m.							
		11	16	17	33	SPT-15	22.50-22.95
Hard, yellowish grey, clayey silt with sand mixture.						*UDS-8	23.50-23.95
		14	19	24	43	SPT-16	24.10-24.55
24.55m.							
						DS-10	25.00
		14	18	24	42	SPT-17	25.50-25.95
Dense, yellowish brown, silty sand with traces of mica. Observed concretion of silt.						*UDS-9	26.50-26.63
		18	20	26	46	SPT-18	27.00-27.45
						DS-11	28.00
		15	19	25	44	SPT-19	28.50-28.95
29.00m.							
						DS-12	29.50
		13	17	23	40	SPT-20	30.00-30.45
						DS-13	31.00
		15	20	30	50	SPT-21	31.50-31.95
Hard, brownish grey, clayey silt with high % of sand mixture.						DS-14	32.50
		16	25	33	58	SPT-22	33.00-33.45
						DS-15	34.00
						DS-16	34.60
N.B. - '*' means sample could not be recovered.		15	27	35	62	SPT-23	35.05-35.50
35.50m.							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
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BORE LOG DATA SHEET

BORE HOLE NO.25

Co-ordinates E=3889 S=1906

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 16/12/2020
Completion Date : 17/12/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 37.452 m.
Water Struck At :
Standing Water Level : 1.7 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)	SAMPLES Ref. No	SAMPLES Depth (m)
0.00m.				
			DS-1	0.50
Filled by coal dust with scrap materials & boulders.		15 41 50 (>100) 4.0 cm Pentn.	SPT-1	1.00-1.34
			DS-2	2.00
			*UDS-1	2.50-2.61
2.80m.		(5)		
		2 2 3	SPT-2	3.00-3.45
			DS-3	4.00
		(7)		
Medium, brownish grey, silty clay with traces of kankar.		2 3 4	SPT-3	4.50-4.95
			UDS-2	5.50-5.95
		(8)		
		3 4 4	SPT-4	5.95-6.40
			DS-4	7.00
7.50m.		(11)		
		3 5 6	SPT-5	7.50-7.95
Stiff, brownish grey, silty clay with traces of kankar.			UDS-3	8.50-8.95
		(13)		
		3 6 7	SPT-6	8.95-9.40
9.50m.				
			DS-5	10.00
		(14)		
		5 6 8	SPT-7	10.50-10.95
Stiff to very stiff, light yellowish brown, clayey silt / silty clay with traces of kankar.		(13)	*UDS-4	11.50-11.95
		4 6 7	SPT-8	12.00-12.45
			DS-6	13.00
		(16)		
		6 7 9	SPT-9	13.50-13.95
14.50m.				
		(24)	UDS-5	14.50-14.95
		8 10 14	SPT-10	14.95-15.40
Very stiff, brownish grey, clayey silt with traces of kankar.			DS-7	16.00
		(24)		
		7 9 15	SPT-11	16.50-16.95
17.80m.			*UDS-6	17.50-17.95

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
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BORE LOG DATA SHEET

BORE HOLE NO.25

Co-ordinates E=3889 S=1906

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
		Disturbed (DS)	15
Vane (V)		Water Sample (WS)	0

Commencement Date : 16/12/2020
Completion Date : 17/12/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 37.452 m.
Water Struck At :
Standing Water Level : 1.7 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				Ref. No	Depth (m)
17.80m.		8	10	16	26	SPT-12	18.00-18.45
						DS-8	19.00
		8	10	15	25	SPT-13	19.50-19.95
Very stiff, brownish grey, clayey silt with traces of kankar.						UDS-7	20.50-20.95
		9	11	16	27	SPT-14	20.95-21.40
						DS-9	22.00
		10	12	17	29	SPT-15	22.50-22.95
23.50m.						*UDS-8	23.50-23.95
		10	13	17	30	SPT-16	24.00-24.45
						DS-10	25.00
		11	12	19	31	SPT-17	25.50-25.95
						*UDS-9	26.50-26.63
Hard, light yellowish brown, clayey silt with traces of sand mixture.		12	14	20	34	SPT-18	27.00-27.45
						DS-11	28.00
		14	16	24	40	SPT-19	28.50-28.95
						DS-12	29.50
		13	17	27	44	SPT-20	30.00-30.45
30.80m.						DS-13	31.00
		12	16	25	41	SPT-21	31.50-31.95
						DS-14	32.50
Hard, brownish grey, silty clay / clayey silt with kankar & sand mixture.		11	15	25	40	SPT-22	33.00-33.45
						DS-15	34.20
N.B. - '*' means sample could not be recovered.		11	13	26	39	SPT-23	35.05-35.50
35.50m.							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

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BORE LOG DATA SHEET

BORE HOLE NO.26

Co-ordinates E=3904 S=1921

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 07/12/2020
Completion Date : 09/12/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.883 m.
Water Struck At :
Standing Water Level : 1.35 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES Ref. No	SAMPLES Depth (m)
0.00m.							
						DS-1	0.50
Filled up by coal dust with fly ash.		6	2	6	8	SPT-1	1.00-1.45
						DS-2	2.00
2.40m.							
						UDS-1	2.50-2.95
		2	2	2	4	SPT-2	2.95-3.40
						DS-3	4.00
Medium, brownish grey, silty clay with traces of kankar.		2	3	2	5	SPT-3	4.50-4.95
						*UDS-2	5.50-5.95
		3	3	4	7	SPT-4	6.00-6.45
6.45m.							
						DS-4	7.00
Stiff, brownish grey, silty clay with traces of kankar.		2	3	8	11	SPT-5	7.50-7.95
8.20m.							
						UDS-3	8.50-8.95
		4	5	10	15	SPT-6	8.95-9.40
						DS-5	10.00
		5	8	9	17	SPT-7	10.50-10.95
Stiff to very stiff, light yellowish brown, silty clay / clayey silt with kankar.							
						UDS-4	11.50-11.95
		6	7	10	17	SPT-8	11.95-12.40
						DS-6	13.00
		8	9	12	21	SPT-9	13.50-13.95
14.50m.							
						*UDS-5	14.50-14.95
		8	10	12	22	SPT-10	15.00-15.45
						DS-7	16.00
Very stiff, yellowish brown, clayey silt with kankar.		7	12	14	26	SPT-11	16.50-16.95
17.80m.						UDS-6	17.50-17.95

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Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 15/12/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.26

Co-ordinates E=3904 S=1921

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 07/12/2020
Completion Date : 09/12/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.883 m.
Water Struck At :
Standing Water Level : 1.35 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES	
						Ref. No	Depth (m)
17.80m							
Very stiff, yellowish brown, clayey silt with kankar.		8	12	15	27	SPT-12	17.95-18.40
						DS-8	19.00
		9	11	15	26	SPT-13	19.50-19.95
						UDS-7	20.50-20.95
		10	13	17	30	SPT-14	20.95-21.40
21.40m							
Hard, yellowish brown, clayey silt with kankar.						DS-9	22.00
		9	12	21	33	SPT-15	22.50-22.95
23.00m							
						*UDS-8	23.50-23.95
		10	11	20	31	SPT-16	24.00-24.45
						DS-10	25.00
		8	14	16	30	SPT-17	25.50-25.95
						*UDS-9	26.50-26.59
Hard, yellowish brown, clayey silt with grey patches. Observed sand mixture.		12	18	25	43	SPT-18	27.00-27.45
						DS-11	28.00
		10	19	27	46	SPT-19	28.50-28.95
						DS-12	29.50
		17	23	31	54	SPT-20	30.00-30.45
30.80m							
						DS-13	31.00
		15	24	33	57	SPT-21	31.50-31.95
						DS-14	32.50
Hard, brownish grey, silty clay / clayey silt with traces of kankar. Observed concretion of silt.		14	23	35	58	SPT-22	33.00-33.45
						DS-15	34.20
N.B. - '*' means sample could not be recovered.		13	26	37	63	SPT-23	35.05-35.50
35.50m							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

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BORE LOG DATA SHEET

BORE HOLE NO.27

Co-ordinates E=3921 S=1941

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	1

Commencement Date : 05/12/2020
Completion Date : 07/12/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.486 m.
Water Struck At :
Standing Water Level : 1.5 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES Ref. No	SAMPLES Depth (m)
0.00m.							
Filled up by coal dust with fly ash.		5	6	4	10	DS-1	0.50
						SPT-1	1.00-1.45
						WS-1	1.50
						DS-2	2.00
						*UDS-1	2.50-2.63
2.80m.					4		
Medium, light brownish grey, silty clay with traces of kankar.		1	2	2		SPT-2	3.00-3.45
						DS-3	4.00
		2	3	3	6	SPT-3	4.50-4.95
						UDS-2	5.50-5.95
5.95m.					10		
		3	4	6		SPT-4	5.95-6.40
Stiff, light brownish grey, silty clay with traces of kankar.						DS-4	7.00
		4	6	8	14	SPT-5	7.50-7.95
8.50m.							
						UDS-3	8.50-8.95
		6	6	10	16	SPT-6	8.95-9.40
						DS-5	10.00
		5	6	13	19	SPT-7	10.50-10.95
Very stiff, yellowish grey, clayey silt / silty clay. Observed kankar.						*UDS-4	11.50-11.95
		7	8	12	20	SPT-8	12.05-12.50
						DS-6	13.00
		6	8	15	23	SPT-9	13.50-13.95
						UDS-5	14.50-14.95
		7	9	14	23	SPT-10	14.95-15.40
15.50m.							
						DS-7	16.00
Very stiff, yellowish brown, clayey silt with kankar.		6	11	16	27	SPT-11	16.50-16.95
17.80m.						UDS-6	17.50-17.95

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Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 15/12/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.27

Co-ordinates E=3921 S=1941

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
		Disturbed (DS)	15
Vane (V)		Water Sample (WS)	1

Commencement Date : 05/12/2020
Completion Date : 07/12/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.486 m.
Water Struck At :
Standing Water Level : 1.5 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)	SAMPLES Ref. No	SAMPLES Depth (m)
		32	SPT-12	17.95-18.40
		7 13 19	DS-8	19.00
Very stiff, yellowish brown, clayey silt with kankar.		29	SPT-13	19.50-19.95
		8 12 17	UDS-7	20.50-20.95
17.80m.		34	SPT-14	20.95-21.40
		9 14 20	DS-9	22.00
Hard, yellowish brown, clayey silt with kankar.		36	SPT-15	22.50-22.95
		8 15 21	*UDS-8	23.50-23.62
20.95m.		31	SPT-16	24.00-24.45
		9 13 18	DS-10	25.00
		33	SPT-17	25.50-25.95
		8 13 20	*UDS-9	26.50-26.60
Hard, light yellowish brown, clayey silt with steel grey patches.		37	SPT-18	27.00-27.45
		10 15 22	DS-11	28.00
		39	SPT-19	28.50-28.95
		9 14 25	DS-12	29.50
		42	SPT-20	30.00-30.45
		12 17 25	DS-13	31.00
23.30m.		48	SPT-21	31.50-31.95
		10 19 29	DS-14	32.50
Hard, brownish grey, clayey silt / silty clay with kankar. Observed concreiton of silt.		60	SPT-22	33.00-33.45
		16 24 36	DS-15	34.10
		58	SPT-23	35.05-35.50
N.B. - '*' means sample could not be recovered.		14 23 35		
31.50m.				
35.50m.				

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
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BORE LOG DATA SHEET

BORE HOLE NO.28

Co-ordinates E=3947 S=1955

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 30/11/2020
Completion Date : 02/12/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.894 m.
Water Struck At :
Standing Water Level : 1.2 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES	
						Ref. No	Depth (m)
0.00m.							
Filled up by coal dust with fly ash.		5	3	6	9	DS-1	0.50
						SPT-1	1.00-1.45
2.00m.						DS-2	2.00
						*UDS-1	2.50-2.95
		2	2	2	4	SPT-2	3.00-3.45
Medium, brownish grey, silty clay. Observed kankar.						DS-3	4.00
		2	3	2	5	SPT-3	4.50-4.95
						UDS-2	5.50-5.95
5.95m.		3	8	8	16	SPT-4	5.95-6.40
Very stiff, brownish grey, silty clay. Observed kankar.						DS-4	7.00
		5	8	10	18	SPT-5	7.50-7.95
8.20m.							
						UDS-3	8.50-8.95
		7	9	12	21	SPT-6	8.95-9.40
						DS-5	10.00
		8	11	15	26	SPT-7	10.50-10.95
Very stiff, light yellowish brown, silty clay / clayey silt with kankar.						UDS-4	11.50-11.95
		7	11	14	25	SPT-8	11.95-12.40
						DS-6	13.00
		5	6	9	15	SPT-9	13.50-13.95
14.20m.							
						*UDS-5	14.50-14.95
		5	8	9	17	SPT-10	15.00-15.45
Very stiff, brownish grey, clayey silt with traces of kankar. Observed steel grey patches.						DS-7	16.00
		6	9	9	18	SPT-11	16.50-16.95
17.80m.						UDS-6	17.50-17.95

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 15/12/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.28

Co-ordinates E=3947 S=1955

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 30/11/2020
Completion Date : 02/12/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.894 m.
Water Struck At :
Standing Water Level : 1.2 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES	
						Ref. No	Depth (m)
17.80m.		7	10	9	19	SPT-12	17.95-18.40
						DS-8	19.00
		6	9	11	20	SPT-13	19.50-19.95
Very stiff, brownish grey, clayey silt with traces of kankar. Observed steel grey patches.						UDS-7	20.50-20.95
		8	10	11	21	SPT-14	20.95-21.40
						DS-9	22.00
23.00m.		7	9	10	19	SPT-15	22.50-22.95
						*UDS-8	23.50-23.95
		8	10	10	20	SPT-16	24.00-24.45
						DS-10	25.00
Very stiff, brownish grey, clayey silt with grey patches.		8	10	11	21	SPT-17	25.50-25.95
						*UDS-9	26.50-26.59
		8	11	13	24	SPT-18	27.00-27.45
						DS-11	28.00
28.50m.		9	12	23	35	SPT-19	28.50-28.95
						DS-12	29.50
Hard, brownish grey, clayey silt with grey patches.		15	21	33	54	SPT-20	30.00-30.45
						DS-13	31.00
31.50m.		14	25	35	60	SPT-21	31.50-31.95
						DS-14	32.50
Hard, yellowish grey, silty clay / clayey silt with kankar.		19	32	40	72	SPT-22	33.00-33.45
						DS-15	34.30
N.B. - '*' means sample could not be recovered.		27	46	27	>100	SPT-23	35.05-35.38
35.38m.				3.0 cm	Pentn.		

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
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BORE LOG DATA SHEET

BORE HOLE NO.29

Co-ordinates E=3884 S=2047

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 13/12/2020
Completion Date : 15/12/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 37.000 M.
Water Struck At :
Standing Water Level : 2.8 m.

DESCRIPTION	SYMBOL	N-VALUE EACH DIVN. = 15cm				SAMPLES Ref. No	Depth (m)
0.00m.							
						DS-1	0.50
					4		
Filled up by coal dust with fly ash & scrap materials.		4	1	3		SPT-1	1.00-1.45
						DS-2	2.00
						*UDS-1	2.50-2.62
3.00m.					3		
		2	1	2		SPT-2	3.00-3.45
						DS-3	4.00
					4		
		1	2	2		SPT-3	4.50-4.95
Soft to medium, brownish grey, clayey silt with traces of sand mixture.						UDS-2	5.50-5.95
					8		
		2	4	4		SPT-4	5.95-6.40
						DS-4	7.00
7.50m.					10		
Stiff, brownish grey, clayey silt with traces of sand mixture.		3	4	6		SPT-5	7.50-7.95
8.50m.							
						UDS-3	8.50-8.95
					14		
		4	6	8		SPT-6	8.95-9.40
						DS-5	10.00
					15		
		5	6	9		SPT-7	10.50-10.95
Stiff to very stiff, yellowish brown, clayey silt with sand mixture.						*UDS-4	11.50-11.95
					19		
		6	8	11		SPT-8	12.00-12.45
						DS-6	13.00
					21		
		6	9	12		SPT-9	13.50-13.95
14.50m.							
						UDS-5	14.50-14.95
					23		
		8	9	14		SPT-10	14.95-15.40
						DS-7	16.00
Very stiff, deep to yellowish brown, clayey silt with traces of sand mixture & kankar.					25		
		7	11	14		SPT-11	16.50-16.95
17.80m.						UDS-6	17.50-17.95

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 21/12/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.29

Co-ordinates E=3884 S=2047

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 13/12/2020
Completion Date : 15/12/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 37.000 M.
Water Struck At :
Standing Water Level : 2.8 m.

DESCRIPTION	SYMBOL	N-VALUE EACH DIVN. = 15cm				SAMPLES Ref. No	SAMPLES Depth (m)
17.80m							
		8	10	16	26	SPT-12	17.95-18.40
						DS-8	19.00
		8	11	15	26	SPT-13	19.50-19.95
Very stiff, deep to yellowish brown, clayey silt with traces of sand mixture & kankar.						UDS-7	20.50-20.95
		9	12	18	30	SPT-14	20.95-21.40
						DS-9	22.00
		8	11	18	29	SPT-15	22.50-22.95
						*UDS-8	23.50-23.95
24.00m		10	14	21	35	SPT-16	24.00-24.45
						DS-10	25.00
Hard, deep to yellowish brown, clayey silt with traces of sand mixture & kankar.		12	13	23	36	SPT-17	25.50-25.95
						*UDS-9	26.50-26.60
		14	19	25	44	SPT-18	27.00-27.45
28.00m						DS-11	28.00
		15	20	29	49	SPT-19	28.50-28.95
Dense to very dense, yellowish grey, sandy silt with clay binder. Observed concretion of silt.						DS-12	29.50
		20	26	31	57	SPT-20	30.00-30.45
						DS-13	31.00
31.50m		18	29	33	62	SPT-21	31.50-31.95
						DS-14	32.50
Hard, brownish grey, clayey silt with traces of kankar. Observed concretion of silt.		20	30	35	65	SPT-22	33.00-33.45
						DS-15	34.40
N.B. - '*' means sample could not be recovered.		23	32	40	72	SPT-23	35.05-35.50
35.50m							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 08/10/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.30

Co-ordinates E=3849 S=2151

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	10
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 01/09/2020
Completion Date : 06/09/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 39.501 M.
Water Struck At :
Standing Water Level : 1.7 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)	SAMPLES Ref. No	SAMPLES Depth (m)
0.00m.				
		10	DS-1	0.50
		3 4 6	SPT-1	1.00-1.45
			DS-2	2.00
Filled up soil consists of blackish grey, clayey silt with sand, ash, coal pcs., boulder pcs. & old cutting iron pcs.		13	UDS-1	2.50-2.95
		4 4 9	SPT-2	2.95-3.40
			DS-3	4.00
		23		
		7 10 13	SPT-3	4.50-4.95
			*UDS-2	5.50-5.85
		47		
		12 19 28	SPT-4	6.00-6.45
6.50m.				
			DS-4	7.00
		13		
		5 6 7	SPT-5	7.50-7.95
Stiff, yellowish brown, clayey silt with traces of black spot & kankar.		14	UDS-3	8.50-8.95
		6 7 7	SPT-6	8.95-9.40
			DS-5	10.00
		15		
		5 7 8	SPT-7	10.50-10.95
11.50m.				
		14	UDS-4	11.50-11.95
		6 6 8	SPT-8	11.95-12.40
Stiff, yellowish brown, clayey silt with sand mixture.			DS-6	13.00
		13		
		5 6 7	SPT-9	13.50-13.95
14.00m.				
		31	UDS-5	14.50-14.95
		11 14 17	SPT-10	14.95-15.40
Very stiff, brownish grey, silty clay / clayey silt with sand mixture, rusty spots & traces of kankar.			DS-7	16.00
		29		
		9 13 16	SPT-11	16.50-16.95
17.50m.				
17.80m.			UDS-6	17.50-17.95

BH-30/Sheet-1

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 08/10/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.30

Co-ordinates E=3849 S=2151

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	10
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 01/09/2020
Completion Date : 06/09/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 39.501 M.
Water Struck At :
Standing Water Level : 1.7 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES Ref. No	SAMPLES Depth (m)
						SPT-12	17.95-18.40
						DS-8	19.00
						SPT-13	19.50-19.95
						UDS-7	20.50-20.95
						SPT-14	20.95-21.40
						DS-9	22.00
						SPT-15	22.50-22.95
						*UDS-8	23.50-23.95
						SPT-16	24.10-24.55
						DS-10	25.00
						SPT-17	25.50-25.95
						UDS-9	26.60-27.05
						SPT-18	27.05-27.50
						DS-11	28.00
						SPT-19	28.50-28.95
						*UDS-10	29.50-29.95
						SPT-20	30.05-30.50
						DS-12	31.00
						SPT-21	31.50-31.95
						DS-13	32.50
						SPT-22	33.00-33.45
						DS-14	34.00
						DS-15	34.50
						SPT-23	35.10-35.55

17.80m.

Very stiff, brownish grey, clayey silt with sand mixture & traces of kankar. Observed concretion of silt & rusty spots.

25.50m.

Hard, brownish grey, clayey silt with sand mixture & traces of kankar. Observed concretion of silt & rusty spots.

N.B. – '*' means sample could not be recovered.

35.55m.

BH-30/Sheet-2

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 08/10/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.31

Co-ordinates E=3229 S=2287

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	10
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	14
		Water Sample (WS)	0

Commencement Date : 26/09/2020
Completion Date : 28/09/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 34.734 M.
Water Struck At :
Standing Water Level : 0.7 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES Ref. No	SAMPLES Depth (m)
0.00m.							
Filled up soil consists of blackish grey, clayey sitl with brick bats, sand & boulder pcs.		1	1	1	2	DS-1	0.50
						SPT-1	1.00-1.45
2.00m.						DS-2	2.00
		2	3	5	8	UDS-1	2.50-2.95
						SPT-2	2.95-3.40
						DS-3	4.00
Stiff, brownish grey, silty clay with kankar & rusty spots.		3	4	5	9	SPT-3	4.50-4.95
						UDS-2	5.50-5.95
		4	5	6	11	SPT-4	5.95-6.40
						DS-4	7.00
		4	6	6	12	SPT-5	7.50-7.95
8.00m.							
						*UDS-3	8.50-8.95
		5	7	7	14	SPT-6	9.10-9.55
						DS-5	10.00
		6	7	8	15	SPT-7	10.50-10.95
						UDS-4	11.50-11.95
Stiff to very stiff, yellowish grey, silty clay with kankar & rusty spots. Observed concretion of silt.		7	8	9	17	SPT-8	11.95-12.40
						DS-6	13.00
		8	10	14	24	SPT-9	13.50-13.95
						UDS-5	14.50-14.95
		7	12	18	30	SPT-10	14.95-15.40
						DS-7	16.00
		9	11	15	26	SPT-11	16.50-16.95
17.00m.							
17.80m.						UDS-6	17.50-17.95

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Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 08/10/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.31

Co-ordinates E=3229 S=2287

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	10
Cone (Pc)		Penetrometer (SPT)	23
		Disturbed (DS)	14
Vane (V)		Water Sample (WS)	0

Commencement Date : 26/09/2020
Completion Date : 28/09/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 34.734 M.
Water Struck At :
Standing Water Level : 0.7 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)	SAMPLES Ref. No	SAMPLES Depth (m)
17.80m.				
Very stiff, brownish grey, silty clay / clayey silt with sand mixture & rusty spots.		10 12 14 (26)	SPT-12	17.95-18.40
			DS-8	19.00
		10 14 16 (30)	SPT-13	19.50-19.95
			UDS-7	20.50-20.95
20.95m.		12 14 20 (34)	SPT-14	20.95-21.40
			DS-9	22.00
Hard, brownish grey, silty clay / clayey silt with sand mixture & rusty spots.		12 15 22 (37)	SPT-15	22.50-22.95
			*UDS-8	23.50-23.95
		13 17 23 (40)	SPT-16	24.10-24.55
25.00m.			DS-10	25.00
		15 18 25 (43)	SPT-17	25.50-25.95
			*UDS-9	26.50-26.95
		16 20 26 (46)	SPT-18	27.10-27.55
			DS-11	28.00
Hard, greyish brown, clayey silt. Observed kankar.		18 22 28 (50)	SPT-19	28.50-28.95
			*UDS-10	29.50-29.60
		14 17 29 (46)	SPT-20	30.00-30.45
			DS-12	31.00
		16 19 31 (50)	SPT-21	31.50-31.95
			DS-13	32.50
33.00m.		18 21 22 (43)	SPT-22	33.00-33.45
Hard, brownish / yellowish grey, silty clay / clayey silt with rusty spots. Observed sand mixture.			DS-14	34.00
N.B. - '*' means sample could not be recovered.		19 22 23 (45)	SPT-23	35.10-35.55
35.55m.				

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 08/10/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.32

Co-ordinates E=3419 S=1832

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	16
		Water Sample (WS)	0

Commencement Date : 30/09/2020
Completion Date : 01/10/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.347 M.
Water Struck At :
Standing Water Level : 0.75 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES	
						Ref. No	Depth (m)
0.00m.							
Filled up by concrete with boulders.						DS-1	0.50
0.80m.					6		
		2	2	4		SPT-1	1.00-1.45
						DS-2	2.00
Medium, brownish grey, silty clay with traces of kankar. Observed sand mixture.					6	UDS-1	2.50-2.95
		3	3	3		SPT-2	2.95-3.40
						DS-3	4.00
					7		
		3	4	3		SPT-3	4.50-4.95
5.30m.							
					11	UDS-2	5.50-5.95
		4	5	6		SPT-4	5.95-6.40
						DS-4	7.00
					13		
		5	6	7		SPT-5	7.50-7.95
Stiff, brownish grey, clayey silt with traces of sand mixture. Observed mica.					15	UDS-3	8.50-8.95
		6	7	8		SPT-6	8.95-9.40
						DS-5	10.00
					14		
		6	6	8		SPT-7	10.50-10.95
11.50m.							
					17	UDS-4	11.50-11.95
		6	9	8		SPT-8	11.95-12.40
						DS-6	13.00
					15		
Very stiff, brownish grey, silty clay with traces of kankar.		5	7	8		SPT-9	13.50-13.95
						*UDS-5	14.50-14.95
					15		
		6	6	9		SPT-10	15.05-15.50
						DS-7	16.00
16.50m.					16		
Very stiff, light yellowish brown, silty clay / clayey silt with traces of kankar.		4	7	9		SPT-11	16.50-16.95
17.80m.						*UDS-6	17.50-17.95

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Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 08/10/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.32

Co-ordinates E=3419 S=1832

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	16
		Water Sample (WS)	0

Commencement Date : 30/09/2020
Completion Date : 01/10/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.347 M.
Water Struck At :
Standing Water Level : 0.75 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES	
						Ref. No	Depth (m)
17.80m							
		6	9	9	18	SPT-12	18.05-18.50
						DS-8	19.00
		7	8	10	18	SPT-13	19.50-19.95
Very stiff, light yellowish brown, silty clay / clayey silt with traces of kankar.						UDS-7	20.50-20.95
		7	9	14	23	SPT-14	20.95-21.40
						DS-9	22.00
		8	9	13	22	SPT-15	22.50-22.95
23.50m							
						*UDS-8	23.50-23.95
		12	15	14	29	SPT-16	24.00-24.45
Very stiff, yellowish brown, clayey silt with traces of kankar & sand mixture.						DS-10	25.00
		10	16	17	33	SPT-17	25.50-25.95
						*UDS-9	26.50-26.63
27.00m		9	12	18	30	SPT-18	27.00-27.45
Very stiff, brownish grey, silty clay / clayey silt with sand mixture.						DS-11	28.00
		9	13	16	29	SPT-19	28.50-28.95
29.20m						DS-12	29.50
		10	13	14	27	SPT-20	30.00-30.45
						DS-13	31.00
Very stiff, yellowish brown, clayey silt. Observed sand mixture.		12	13	16	29	SPT-21	31.50-31.95
						DS-14	32.50
		10	12	18	30	SPT-22	33.00-33.45
33.45m							
						DS-15	34.00
						DS-16	34.70
Hard, yellowish brown, clayey silt. Observed sand mixture. N.B. - '*' means sample could not be recovered.		13	21	24	45	SPT-23	35.05-35.50
35.50m							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

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BORE LOG DATA SHEET

BORE HOLE NO.33

Co-ordinates E=3457 S=1909

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	16
		Water Sample (WS)	0

Commencement Date : 29/09/2020
Completion Date : 01/10/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.287 M.
Water Struck At :
Standing Water Level : 0.6 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)	SAMPLES Ref. No	SAMPLES Depth (m)
0.00m.				
Filled up by concrete with fly ash & boulders.		4 8 5 (13)	DS-1	0.50
			SPT-1	1.00-1.45
			DS-2	2.00
2.50m.			UDS-1	2.50-2.95
Medium, brownish grey, silty clay with traces of sand mixture. Observed kankar.		3 2 3 (5)	SPT-2	2.95-3.40
			DS-3	4.00
		3 3 4 (7)	SPT-3	4.50-4.95
5.00m.				
			UDS-2	5.50-5.95
		4 5 7 (12)	SPT-4	5.95-6.40
			DS-4	7.00
		5 8 7 (15)	SPT-5	7.50-7.95
Stiff, yellowish brown, silty clay with traces of kankar. Observed grey patches.			*UDS-3	8.50-8.95
		6 6 7 (13)	SPT-6	9.00-9.45
			DS-5	10.00
		7 7 6 (13)	SPT-7	10.50-10.95
			UDS-4	11.50-11.95
		6 8 7 (15)	SPT-8	11.95-12.40
12.50m.			DS-6	13.00
		6 5 7 (12)	SPT-9	13.50-13.95
Stiff, brownish grey, clayey silt with traces of sand mixture. Observed mica.			UDS-5	14.50-14.95
		4 6 8 (14)	SPT-10	14.95-15.40
			DS-7	16.00
		6 7 8 (15)	SPT-11	16.50-16.95
17.00m.				
Very stiff, light yellowish brown, silty clay / clayey silt with kankar.			*UDS-6	17.50-17.95
17.80m.				

BH-33/Sheet-1

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 08/10/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.33

Co-ordinates E=3457 S=1909

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	16
		Water Sample (WS)	0

Commencement Date : 29/09/2020
Completion Date : 01/10/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.287 M.
Water Struck At :
Standing Water Level : 0.6 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES	
						Ref. No	Depth (m)
17.80m.					17		
		6	8	9		SPT-12	18.00-18.45
						DS-8	19.00
					18		
		7	9	9		SPT-13	19.50-19.95
Very stiff, light yellowish brown, silty clay / clayey silt with kankar.						UDS-7	20.50-20.95
					24		
		8	10	14		SPT-14	20.95-21.40
						DS-9	22.00
					24		
		10	10	14		SPT-15	22.50-22.95
23.00m.							
						*UDS-8	23.50-23.95
					29		
		9	12	17		SPT-16	24.10-24.55
Very stiff, yellowish brown, clayey silt with traces of sand mixture. Observed kankar.						DS-10	25.00
					28		
		10	13	15		SPT-17	25.50-25.95
27.00m.							
						*UDS-9	26.50-26.95
					31		
		10	12	19		SPT-18	27.05-27.50
						DS-11	28.00
Hard, brownish grey, silty clay / clayey silt with traces of sand mixture.					33		
		10	13	20		SPT-19	28.50-28.95
						DS-12	29.50
30.00m.					33		
		12	15	18		SPT-20	30.00-30.45
						DS-13	31.00
					38		
		11	17	21		SPT-21	31.50-31.95
						DS-14	32.50
Hard, yellowish brown, clayey silt with traces of sand mixture.					37		
		10	15	22		SPT-22	33.00-33.45
						DS-15	34.00
						DS-16	34.50
					41		
N.B. - '*' means sample could not be recovered.		12	20	21		SPT-23	35.05-35.50
35.50m.							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 08/10/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.34

Co-ordinates E=4088 S=1900

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	8
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	17
		Water Sample (WS)	0

Commencement Date : 20/09/2020
Completion Date : 23/09/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 39.607 M.
Water Struck At :
Standing Water Level : 2.6 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)	SAMPLES Ref. No	SAMPLES Depth (m)
0.00m.				
			DS-1	0.50
		13		
		7 3 10	SPT-1	1.00-1.45
Filled up by fly ash with brick bats, boulders etc.			DS-2	2.00
			*UDS-1	2.50-2.62
		16		
		8 7 9	SPT-2	2.90-3.35
			DS-3	4.00
4.10m.				
		12		
		4 5 7	SPT-3	4.50-4.95
Stiff, yellowish grey, silty clay. Observed kankar.			UDS-2	5.50-5.95
		13		
		5 5 8	SPT-4	5.95-6.40
7.00m.			DS-4	7.00
		15		
		6 6 9	SPT-5	7.50-7.95
			UDS-3	8.50-8.95
		16		
		6 7 9	SPT-6	8.95-9.40
			DS-5	10.00
		18		
		5 7 11	SPT-7	10.50-10.95
Very stiff, yellowish brown, clayey silt with traces of sand mixture.			UDS-4	11.50-11.95
		16		
		5 6 10	SPT-8	11.95-12.40
			DS-6	13.00
		18		
		6 8 10	SPT-9	13.50-13.95
			*UDS-5	14.50-14.95
15.00m.		23		
		8 10 13	SPT-10	15.05-15.50
			DS-7	16.00
Very stiff, yellowish grey, silty clay / clayey silt. Observed sand mixture.		24		
		7 9 15	SPT-11	16.50-16.95
17.80m.			UDS-6	17.50-17.95

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 08/10/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.34

Co-ordinates E=4088 S=1900

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	8
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	17
		Water Sample (WS)	0

Commencement Date : 20/09/2020
Completion Date : 23/09/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 39.607 M.
Water Struck At :
Standing Water Level : 2.6 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES	
						Ref. No	Depth (m)
17.80m.		10	13	15	28	SPT-12	17.95-18.40
Very stiff, yellowish grey, silty clay / clayey silt. Observed sand mixture.						DS-8	19.00
		9	13	16	29	SPT-13	19.50-19.95
						UDS-7	20.50-20.95
20.95m.		11	15	17	32	SPT-14	20.95-21.40
						DS-9	22.00
Hard, yellowish grey, silty clay / clayey silt. Observed sand mixture.		10	14	19	33	SPT-15	22.50-22.95
						UDS-8	23.50-23.95
		12	16	20	36	SPT-16	23.95-24.40
						DS-10	25.00
26.00m.		13	18	19	37	SPT-17	25.50-25.95
						DS-11	26.50
		17	19	20	39	SPT-18	27.00-27.45
						DS-12	28.00
		14	20	25	45	SPT-19	28.50-28.95
						DS-13	29.50
Hard, light yellowish grey, clayey silt with traces of sand mixture. Observed mica.		15	22	25	47	SPT-20	30.00-30.45
						DS-14	31.00
		14	21	24	45	SPT-21	31.50-31.95
						DS-15	32.50
		16	24	28	52	SPT-22	33.00-33.45
						DS-16	34.00
						DS-17	34.70
N.B. - '*' means sample could not be recovered.		17	25	31	56	SPT-23	35.05-35.50
35.50m.							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 21/12/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.35

Co-ordinates E=2820 S=2447

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	7
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	17
		Water Sample (WS)	0

Commencement Date : 16/12/2020
Completion Date : 19/12/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 34.805 m.
Water Struck At :
Standing Water Level : 1.3 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES Ref. No	SAMPLES Depth (m)
0.00m.							
Filled up soil consists of clayey silt with ash & boulders.						DS-1	0.50
1.00m.		1	2	2	4	SPT-1	1.00-1.45
						DS-2	2.00
						UDS-1	2.50-2.95
		2	2	2	4	SPT-2	2.95-3.40
Medium, deep grey, clayey silt.						DS-3	4.00
		2	2	3	5	SPT-3	4.50-4.95
						UDS-2	5.50-5.95
6.00m.		2	2	3	5	SPT-4	6.00-6.45
Medium, brownish grey, clayey silt with traces of kankar.						DS-4	7.00
		2	3	3	6	SPT-5	7.50-7.95
8.00m.							
						UDS-3	8.50-8.95
		1	2	3	5	SPT-6	8.95-9.40
						DS-5	10.00
Medium, blackish grey, clayey silt / silty clay. Observed kankar.		1	2	2	4	SPT-7	10.50-10.95
						UDS-4	11.50-11.95
		2	3	2	5	SPT-8	11.95-12.40
						DS-6	13.00
13.50m.		4	6	5	11	SPT-9	13.50-13.95
Stiff, blackish grey, clayey silt / silty clay. Observed kankar.						*UDS-5	14.50-14.63
14.50m.		11	15	24	39	SPT-10	15.00-15.45
						DS-7	16.00
Hard, deep grey, clayey silt. Observed siltstone.		13	18	26	44	SPT-11	16.50-16.95
						*UDS-6	17.50-17.62
17.80m.							

BH-35/Sheet-1

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 21/12/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.35

Co-ordinates E=2820 S=2447

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	7
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	17
		Water Sample (WS)	0

Commencement Date : 16/12/2020
Completion Date : 19/12/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 34.805 m.
Water Struck At :
Standing Water Level : 1.3 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)	SAMPLES Ref. No	SAMPLES Depth (m)
17.80m.				
Hard, deep grey, clayey silt. Observed siltstone.		11 18 25 — 43	SPT-12	18.00-18.45
		10 17 23 — 40	SPT-13	19.00-19.45
			DS-8	20.00
		8 14 27 — 41	SPT-14	20.50-20.95
			DS-9	21.50
		6 16 18 — 34	SPT-15	22.00-22.45
23.00m.			DS-10	23.00
			UDS-7	23.50-23.95
		7 12 23 — 35	SPT-16	23.95-24.40
			DS-11	25.00
Hard, yellowish grey, clayey silt with sand mixture.		9 14 27 — 41	SPT-17	25.50-25.95
			DS-12	26.50
		11 17 31 — 48	SPT-18	27.00-27.45
			DS-13	28.00
28.50m.		13 18 34 — 52	SPT-19	28.50-28.95
			DS-14	29.50
		17 23 32 — 55	SPT-20	30.00-30.45
			DS-15	31.00
Hard, yellowish grey, clayey silt with sand mixture. Observed concretion of silt.		19 27 36 — 63	SPT-21	31.50-31.95
			DS-16	32.50
		18 29 40 — 69	SPT-22	33.00-33.45
			DS-17	34.00
N.B. - '*' means sample could not be recovered.		21 35 47 — 82	SPT-23	35.00-35.45
35.45m.				

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 15/12/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.36

Co-ordinates E=3910 S=1930

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 02/12/2020
Completion Date : 05/12/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.497 m.
Water Struck At :
Standing Water Level : 1.4 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES Ref. No	SAMPLES Depth (m)
0.00m.							
						DS-1	0.50
					10		
Filled up by coal dust with fly ash.		8	3	7		SPT-1	1.00-1.45
						DS-2	2.00
						*UDS-1	2.50-2.95
					3		
3.00m.		1	2	1		SPT-2	3.00-3.45
						DS-3	4.00
Soft to medium, brownish grey, silty clay. Observed kankar.					4		
		2	1	3		SPT-3	4.50-4.95
						UDS-2	5.50-5.95
5.95m.					14		
		3	5	9		SPT-4	5.95-6.40
						DS-4	7.00
Stiff, brownish grey, silty clay. Observed kankar.					15		
		6	8	7		SPT-5	7.50-7.95
8.50m.							
						UDS-3	8.50-8.95
					23		
		7	10	13		SPT-6	8.95-9.40
						DS-5	10.00
					25		
		8	9	16		SPT-7	10.50-10.95
Very stiff, yellowish brown, clayey silt / silty clay with kankar.							
					21	UDS-4	11.50-11.95
		6	8	13		SPT-8	11.95-12.40
						DS-6	13.00
					23		
		8	10	13		SPT-9	13.50-13.95
						*UDS-5	14.50-14.95
15.00m.					22		
		6	9	13		SPT-10	15.00-15.45
						DS-7	16.00
Very stiff, light yellowish brown, clayey silt with traces of kankar.					21		
		8	11	10		SPT-11	16.50-16.95
17.80m.						UDS-6	17.50-17.95

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Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 15/12/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.36

Co-ordinates E=3910 S=1930

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 02/12/2020
Completion Date : 05/12/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.497 m.
Water Struck At :
Standing Water Level : 1.4 m.

DESCRIPTION	SYMBOL	N-VALUE EACH DIVN. = 15cm				SAMPLES Ref. No	SAMPLES Depth (m)
						SPT-12	17.95-18.40
		7	12	12	24	DS-8	19.00
		8	12	14	26	SPT-13	19.50-19.95
						UDS-7	20.50-20.95
		7	10	15	25	SPT-14	20.95-21.40
						DS-9	22.00
		7	12	16	28	SPT-15	22.50-22.95
						*UDS-8	23.50-23.95
		9	9	14	23	SPT-16	24.00-24.45
						DS-10	25.00
		10	15	18	33	SPT-17	25.50-25.95
						*UDS-9	26.50-26.62
		9	14	18	32	SPT-18	27.05-27.50
						DS-11	28.00
		10	15	20	35	SPT-19	28.50-28.95
						DS-12	29.50
		12	18	28	46	SPT-20	30.00-30.45
						DS-13	31.00
		15	22	33	55	SPT-21	31.50-31.95
						DS-14	32.50
		17	27	38	65	SPT-22	33.00-33.45
						DS-15	34.20
		14	25	35	60	SPT-23	35.05-35.50

17.80m. Very stiff, light yellowish brown, clayey silt with traces of kankar.

23.50m. Very stiff, yellowish brown, clayey silt with grey patches.

25.50m. Hard, yellowish brown, clayey silt with grey patches.

31.00m. Hard, brownish grey, silty clay / clayey silt with traces of kankar. Observed concretion of silt.

N.B. – '*' means sample could not be recovered.

35.50m.

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 15/12/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.37

Co-ordinates E=3906 S=2060

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 27/11/2020
Completion Date : 29/11/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 35.710 M.
Water Struck At :
Standing Water Level : 2.4 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)	SAMPLES Ref. No	SAMPLES Depth (m)
0.00m.				
			DS-1	0.50
		1 1 1 (2)	SPT-1	1.00-1.45
Filled up coal dust with fly ash & scrap materials.			DS-2	2.00
			*UDS-1	2.50-2.95
3.00m.		1 2 2 (4)	SPT-2	3.00-3.45
			DS-3	4.00
		1 2 2 (4)	SPT-3	4.50-4.95
Soft to medium, brownish grey, clayey silt with traces of kankar. Observed sand mixture.			*UDS-2	5.50-5.95
		1 2 1 (3)	SPT-4	6.00-6.45
			DS-4	7.00
		1 2 2 (4)	SPT-5	7.50-7.95
8.50m.				
			UDS-3	8.50-8.95
		3 4 7 (11)	SPT-6	8.95-9.40
			DS-5	10.00
		4 6 9 (15)	SPT-7	10.50-10.95
Stiff to very stiff, yellowish grey, silty clay with kankar.			UDS-4	11.50-11.95
		5 6 11 (17)	SPT-8	11.95-12.40
			DS-6	13.00
		6 7 10 (17)	SPT-9	13.50-13.95
			*UDS-5	14.50-14.95
15.00m.		7 8 12 (20)	SPT-10	15.00-15.45
			DS-7	16.00
Very stiff, yellowish brown, clayey silt with traces of sand mixture.		8 9 14 (23)	SPT-11	16.50-16.95
17.80m.			UDS-6	17.50-17.95

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 15/12/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.37

Co-ordinates E=3906 S=2060

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 27/11/2020
Completion Date : 29/11/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 35.710 M.
Water Struck At :
Standing Water Level : 2.4 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				Ref. No	Depth (m)
17.80m.							
		8	10	12	22	SPT-12	17.95-18.40
						DS-8	19.00
		8	11	13	24	SPT-13	19.50-19.95
						UDS-7	20.50-20.95
		9	12	14	26	SPT-14	20.95-21.40
Very stiff, yellowish brown, clayey silt with traces of sand mixture.						DS-9	22.00
		8	11	15	26	SPT-15	22.50-22.95
						*UDS-8	23.50-23.95
		9	12	15	27	SPT-16	24.05-24.50
						DS-10	25.00
		10	13	15	28	SPT-17	25.50-25.95
26.50m.						*UDS-9	26.50-26.64
		12	16	18	34	SPT-18	27.00-27.45
						DS-11	28.00
		11	17	23	40	SPT-19	28.50-28.95
						DS-12	29.50
Hard, brownish grey, clayey silt with fine sand mixture. Observed concretion of silt.		16	25	30	55	SPT-20	30.00-30.45
						DS-13	31.00
		19	24	32	56	SPT-21	31.50-31.95
						DS-14	32.50
		20	25	32	57	SPT-22	33.00-33.45
33.50m.						DS-15	34.00
Hard, yellowish grey, silty clay / clayey silt with traces of kankar & sand mixture. N.B. - '*' means sample could not be recovered.		13	21	28	49	SPT-23	35.05-35.50
35.50m.							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 25/01/2021 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.38

Co-ordinates E=3659 S=1684

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 17/01/2021
Completion Date : 19/01/2021
Bore Hole Diameter : 150 mm.
Level Of Ground : 35.652 M.
Water Struck At :
Standing Water Level : 1.15 m.

DESCRIPTION	SYMBOL	N-VALUE EACH DIVN. = 15cm				SAMPLES Ref. No	Depth (m)
0.00m. Filled up soil consists of clayey silt with brick bats & boulders. 0.70m.						DS-1	0.50
		1	2	2	4	SPT-1	1.00-1.45
						DS-2	2.00
Medium, grey, clayey silt with brownish patches.						UDS-1	2.50-2.95
		2	3	2	5	SPT-2	2.95-3.40
						DS-3	4.00
4.50m.		2	3	3	6	SPT-3	4.50-4.95
Medium, brownish grey, silty clay / clayey silt. Observed kankar.						UDS-2	5.50-5.95
		3	4	4	8	SPT-4	5.95-6.40
						DS-4	7.00
7.50m.		3	4	5	9	SPT-5	7.50-7.95
Stiff to very stiff, brownish grey, silty clay / clayey silt. Observed kankar.						*UDS-3	8.50-8.95
		6	8	10	18	SPT-6	9.00-9.45
						DS-5	10.00
10.50m.		16	7	9	16	SPT-7	10.50-10.95
Very stiff, light grey, clayey silt with sand mixture & kankar.						UDS-4	11.50-11.95
		6	8	10	18	SPT-8	11.95-12.40
12.40m.						DS-6	13.00
		6	6	7	13	SPT-9	13.50-13.95
Stiff to very stiff, brownish grey, clayey silt with traces of kankar.						UDS-5	14.50-14.95
		6	7	8	15	SPT-10	14.95-15.40
						DS-7	16.00
		5	8	10	18	SPT-11	16.50-16.95
17.50m.						*UDS-6	17.50-17.95
17.80m.							

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Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 25/01/2021	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.38

Co-ordinates E=3659 S=1684

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 17/01/2021
Completion Date : 19/01/2021
Bore Hole Diameter : 150 mm.
Level Of Ground : 35.652 M.
Water Struck At :
Standing Water Level : 1.15 m.

DESCRIPTION	SYMBOL	N-VALUE EACH DIVN. = 15cm				SAMPLES Ref. No	SAMPLES Depth (m)
17.80m							
Very stiff, brownish grey to light yellowish brown, clayey silt with sand mixture.		6	8	11	19	SPT-12	18.00-18.45
						DS-8	19.00
		6	9	10	19	SPT-13	19.50-19.95
						UDS-7	20.50-20.95
		7	8	13	21	SPT-14	20.95-21.40
						DS-9	22.00
		6	9	13	22	SPT-15	22.50-22.95
23.00m							
Very stiff, light yellowish brown, clayey silt with traces of sand mixture.						*UDS-8	23.50-23.95
		7	9	15	24	SPT-16	24.00-24.45
						DS-10	25.00
		8	10	16	26	SPT-17	25.50-25.95
26.50m							
Very stiff, yellowish grey, clayey silt with sand mixture. Observed concretion of silt.						*UDS-9	26.50-26.95
		9	12	16	28	SPT-18	27.00-27.45
						DS-11	28.00
		10	12	15	27	SPT-19	28.50-28.95
						DS-12	29.50
30.00m							
Hard, yellowish grey, clayey silt with sand mixture. Observed concretion of silt.		12	14	18	32	SPT-20	30.00-30.45
						DS-13	31.00
		13	16	19	35	SPT-21	31.50-31.95
						DS-14	32.50
		10	16	23	39	SPT-22	33.00-33.45
						DS-15	34.20
N.B. - '*' means sample could not be recovered.		11	19	25	44	SPT-23	35.05-35.50
35.50m							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 25/01/2021 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.39

Co-ordinates E=3646 S=1710

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 17/01/2021
Completion Date : 19/01/2021
Bore Hole Diameter : 150 mm.
Level Of Ground : 35.349 M.
Water Struck At :
Standing Water Level : 1.2 m.

DESCRIPTION	SYMBOL	N-VALUE EACH DIVN. = 15cm				SAMPLES Ref. No	Depth (m)
0.00m. Filled up soil consists of clayey silt with brick bats. 0.60m.						DS-1	0.50
		1	2	1	3	SPT-1	1.00-1.45
						DS-2	2.00
Soft to medium, grey, clayey silt with traces of kankar.						*UDS-1	2.50-2.95
		2	2	4	6	SPT-2	3.00-3.45
						DS-3	4.00
4.20m. Medium, brownish grey, silty clay / clayey silt with traces of kankar.		2	2	3	5	SPT-3	4.50-4.95
5.50m.						UDS-2	5.50-5.95
		3	4	5	9	SPT-4	5.95-6.40
						DS-4	7.00
Stiff, brownish grey, silty clay / clayey silt with traces of kankar.		4	5	5	10	SPT-5	7.50-7.95
						UDS-3	8.50-8.95
		3	6	8	14	SPT-6	8.95-9.40
						DS-5	10.00
10.40m. Very stiff, light grey, clayey silt with sand mixture & kankar.		15	8	8	16	SPT-7	10.50-10.95
						*UDS-4	11.50-11.95
12.00m.		6	9	10	19	SPT-8	12.00-12.45
						DS-6	13.00
		4	5	5	10	SPT-9	13.50-13.95
Stiff, brownish grey, clayey silt with traces of sand mixture. Observed kankar.						UDS-5	14.50-14.95
		5	6	7	13	SPT-10	14.95-15.40
						DS-7	16.00
		4	7	7	14	SPT-11	16.50-16.95
17.50m. 17.80m.						UDS-6	17.50-17.95

BH-39/Sheet-1

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 25/01/2021	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.39

Co-ordinates E=3646 S=1710

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
		Disturbed (DS)	15
Vane (V)		Water Sample (WS)	0

Commencement Date : 17/01/2021
Completion Date : 19/01/2021
Bore Hole Diameter : 150 mm.
Level Of Ground : 35.349 M.
Water Struck At :
Standing Water Level : 1.2 m.

DESCRIPTION	SYMBOL	N-VALUE EACH DIVN. = 15cm				SAMPLES Ref. No	SAMPLES Depth (m)
17.80m.		5	6	8	14	SPT-12	17.95-18.40
						DS-8	19.00
Stiff to very stiff, brownish grey, clayey silt / silty clay with sand mixture & kankar.		5	7	9	16	SPT-13	19.50-19.95
						UDS-7	20.50-20.95
		6	6	11	17	SPT-14	20.95-21.40
						DS-9	22.00
22.50m.		6	8	10	18	SPT-15	22.50-22.95
						*UDS-8	23.50-23.95
Very stiff, yellowish brown, clayey silt. Observed traces of sand mixture.		6	8	11	19	SPT-16	24.00-24.45
						DS-10	25.00
		8	9	12	21	SPT-17	25.50-25.95
26.20m.							
						*UDS-9	26.50-26.95
Very stiff, yellowish grey, clayey silt with sand mixture. Observed brown patches.		9	10	18	28	SPT-18	27.00-27.45
						DS-11	28.00
28.50m.		9	14	18	32	SPT-19	28.50-28.95
						DS-12	29.50
		12	18	24	42	SPT-20	30.00-30.45
						DS-13	31.00
Hard, yellowish grey, clayey silt with sand mixture. Observed brown patches.		12	18	26	44	SPT-21	31.50-31.95
						DS-14	32.50
		15	20	25	45	SPT-22	33.00-33.45
						DS-15	34.30
N.B. - '*' means sample could not be recovered.		22	25	27	52	SPT-23	35.05-35.50
35.50m.							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 25/01/2021	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.40

Co-ordinates E=3553 S=1737

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 15/01/2021
Completion Date : 17/01/2021
Bore Hole Diameter : 150 mm.
Level Of Ground : 35.445 M.
Water Struck At :
Standing Water Level : 1.1 m.

DESCRIPTION	SYMBOL	N-VALUE EACH DIVN. = 15cm				SAMPLES Ref. No	Depth (m)
0.00m. Filled up soil consists of clayey silt with boulder pcs.						DS-1	0.50
0.70m.					4		
		2	2	2		SPT-1	1.00-1.45
						DS-2	2.00
Medium, brownish grey, silty clay with traces of kankar.						UDS-1	2.50-2.95
					5		
		2	3	2		SPT-2	2.95-3.40
						DS-3	4.00
4.30m.					8		
		3	3	5		SPT-3	4.50-4.95
						*UDS-2	5.50-5.95
					10		
		3	5	5		SPT-4	6.00-6.45
						DS-4	7.00
Stiff, brownish grey, silty clay with traces of kankar.					11		
		3	4	7		SPT-5	7.50-7.95
						UDS-3	8.50-8.95
					13		
		4	6	7		SPT-6	8.95-9.40
						DS-5	10.00
10.50m.					13		
		14	5	8		SPT-7	10.50-10.95
Stiff to very stiff, grey, clayey silt with sand mixture & kankar.						*UDS-4	11.50-11.95
					18		
		6	8	10		SPT-8	12.00-12.45
12.50m.						DS-6	13.00
					17		
		5	8	9		SPT-9	13.50-13.95
Very stiff, brownish grey, silty clay / clayey silt with traces of sand mixture.						UDS-5	14.50-14.95
					18		
		6	9	9		SPT-10	14.95-15.40
						DS-7	16.00
					20		
		5	9	11		SPT-11	16.50-16.95
17.20m. Very stiff, brownish grey, clayey silt with kankar. Observed sand mixture.							
17.80m.						UDS-6	17.50-17.95

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

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BORE LOG DATA SHEET

BORE HOLE NO.40

Co-ordinates E=3553 S=1737

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 15/01/2021
Completion Date : 17/01/2021
Bore Hole Diameter : 150 mm.
Level Of Ground : 35.445 M.
Water Struck At :
Standing Water Level : 1.1 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES Ref. No	SAMPLES Depth (m)
						SPT-12	17.95-18.40
						DS-8	19.00
						SPT-13	19.50-19.95
						UDS-7	20.50-20.95
						SPT-14	20.95-21.40
						DS-9	22.00
						SPT-15	22.50-22.95
						*UDS-8	23.50-23.95
						SPT-16	24.00-24.45
						DS-10	25.00
						SPT-17	25.50-25.95
						*UDS-9	26.50-26.59
						SPT-18	26.80-27.25
						DS-11	28.00
						SPT-19	28.50-28.95
						DS-12	29.50
						SPT-20	30.00-30.45
						DS-13	31.00
						SPT-21	31.50-31.95
						DS-14	32.50
						SPT-22	33.00-33.45
						DS-15	34.30
						SPT-23	35.05-35.50

17.80m.

Very stiff, brownish grey, clayey silt with kankar. Observed sand mixture.

22.40m.

Very stiff, yellowish brown, clayey silt with traces of sand mixture.

26.40m.

Very stiff, light yellowish grey, sandy clayey silt with kankar. Observed concretion of silt.

30.00m.

Hard, light yellowish grey, sandy clayey silt with kankar. Observed concretion of silt.

N.B. – '*' means sample could not be recovered.

35.50m.

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

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BORE LOG DATA SHEET

BORE HOLE NO.41

Co-ordinates E=3553 S=1737

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 15/01/2021
Completion Date : 16/01/2021
Bore Hole Diameter : 150 mm.
Level Of Ground : 35.228 M.
Water Struck At :
Standing Water Level : 1.95 m.

DESCRIPTION	SYMBOL	N-VALUE EACH DIVN. = 15cm				SAMPLES Ref. No	Depth (m)
0.00m. Filled up soil consists of clayey silt with boulder pcs.						DS-1	0.50
0.80m.		2	1	2	3	SPT-1	1.00-1.45
						DS-2	2.00
Soft to medium, grey, silty clay. Observed kankar.						*UDS-1	2.50-2.95
		2	2	3	5	SPT-2	3.00-3.45
						DS-3	4.00
		3	4	4	8	SPT-3	4.50-4.95
5.20m.						UDS-2	5.50-5.95
		4	5	7	12	SPT-4	5.95-6.40
						DS-4	7.00
		4	6	6	12	SPT-5	7.50-7.95
Stiff to very stiff, brownish grey, silty clay / clayey silt with kankar.						*UDS-3	8.50-8.95
		4	7	8	15	SPT-6	9.05-9.50
						DS-5	10.00
		3	7	9	16	SPT-7	10.50-10.95
11.50m.						UDS-4	11.50-11.95
		6	8	8	16	SPT-8	11.95-12.40
						DS-6	13.00
		5	7	8	15	SPT-9	13.50-13.95
Very stiff, yellowish brown, clayey silt. Observed traces of kankar.						UDS-5	14.50-14.95
		4	6	9	15	SPT-10	14.95-15.40
						DS-7	16.00
		5	9	12	21	SPT-11	16.50-16.95
17.80m.						*UDS-6	17.50-17.95

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
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BORE LOG DATA SHEET

BORE HOLE NO.41

Co-ordinates E=3553 S=1737

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 15/01/2021
Completion Date : 16/01/2021
Bore Hole Diameter : 150 mm.
Level Of Ground : 35.228 M.
Water Struck At :
Standing Water Level : 1.95 m.

DESCRIPTION	SYMBOL	N-VALUE EACH DIVN. = 15cm				SAMPLES Ref. No	SAMPLES Depth (m)
17.80m							
Very stiff, yellowish brown, clayey silt. Observed traces of kankar.		6	10	12	22	SPT-12	18.00-18.45
						DS-8	19.00
		8	13	15	28	SPT-13	19.50-19.95
20.40m							
						UDS-7	20.50-20.95
		10	13	16	29	SPT-14	20.95-21.40
Very stiff, light yellowish brown, clayey silt. Observed sand mixture.						DS-9	22.00
		12	13	17	30	SPT-15	22.50-22.95
						*UDS-8	23.50-23.63
24.00m							
Hard, light yellowish brown, clayey silt. Observed sand mixture.		12	15	19	34	SPT-16	24.00-24.45
25.00m						DS-10	25.00
		14	18	20	38	SPT-17	25.50-25.95
						*UDS-9	26.50-26.59
		10	12	25	37	SPT-18	26.80-27.25
Hard, yellowish grey, clayey silt with sand mixture, traces of kankar.						DS-11	28.00
		12	14	26	40	SPT-19	28.50-28.95
						DS-12	29.50
		12	15	25	40	SPT-20	30.00-30.45
31.00m						DS-13	31.00
		12	19	26	45	SPT-21	31.50-31.95
						DS-14	32.50
Hard, brownish grey, clayey silt with sand mixture. Observed kankar.		14	20	28	48	SPT-22	33.00-33.45
						DS-15	34.20
N.B. - '*' means sample could not be recovered.		12	17	28	45	SPT-23	35.05-35.50
35.50m							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 25/01/2021 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.42

Co-ordinates E=3471 S=1655

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 13/01/2021
Completion Date : 15/01/2021
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.998 M.
Water Struck At :
Standing Water Level : 2.25 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)			SAMPLES Ref. No	SAMPLES Depth (m)
0.00m. Filled up soil consists of clayey silt with boulders.					DS-1	0.50
1.00m.		1	2	2 (4)	SPT-1	1.00-1.45
Medium, brownish grey, silty clay.					DS-2	2.00
					*UDS-1	2.50-2.95
3.45m.		2	3	2 (5)	SPT-2	3.00-3.45
Stiff, brownish grey, silty clay.					DS-3	4.00
5.20m.		3	3	6 (9)	SPT-3	4.50-4.95
Stiff, light brownish grey, clayey silt.					UDS-2	5.50-5.95
		2	3	5 (8)	SPT-4	5.95-6.40
					DS-4	7.00
8.50m.		3	4	5 (9)	SPT-5	7.50-7.95
					UDS-3	8.50-8.95
		3	4	6 (10)	SPT-6	8.95-9.40
					DS-5	10.00
		3	5	7 (12)	SPT-7	10.50-10.95
					*UDS-4	11.50-11.95
Stiff to very stiff, yellowish grey, clayey silt / silty clay. Observed kankar.		4	6	6 (12)	SPT-8	12.05-12.50
					DS-6	13.00
		5	7	8 (15)	SPT-9	13.50-13.95
					UDS-5	14.50-14.95
		8	7	10 (17)	SPT-10	14.95-15.40
					DS-7	16.00
		6	9	12 (21)	SPT-11	16.50-16.95
17.20m. Very stiff, light yellowish grey, clayey silt with traces of kankar. 17.80m.					UDS-6	17.50-17.95

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 25/01/2021 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.42

Co-ordinates E=3471 S=1655

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 13/01/2021
Completion Date : 15/01/2021
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.998 M.
Water Struck At :
Standing Water Level : 2.25 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES Ref. No	SAMPLES Depth (m)
17.80m.							
		8	9	13	22	SPT-12	17.95-18.40
						DS-8	19.00
		9	12	15	27	SPT-13	19.50-19.95
						UDS-7	20.50-20.95
		10	12	12	24	SPT-14	20.95-21.40
Very stiff, light yellowish grey, clayey silt with traces of kankar.						DS-9	22.00
		7	10	12	22	SPT-15	22.50-22.95
						*UDS-8	23.50-23.95
		7	9	12	21	SPT-16	24.00-24.45
						DS-10	25.00
25.50m.		8	10	14	24	SPT-17	25.50-25.95
						*UDS-9	26.50-26.95
Very stiff, yellowish grey, clayey clayey silt. Observed kankar.		9	11	15	26	SPT-18	27.05-27.50
						DS-11	28.00
28.30m.		10	12	19	31	SPT-19	28.50-28.95
						DS-12	29.50
Hard, light brownish grey, clayey silt with sand mixture.		9	16	24	40	SPT-20	30.00-30.45
						DS-13	31.00
		14	19	27	46	SPT-21	31.50-31.95
						DS-14	32.50
32.70m.		15	19	26	45	SPT-22	33.00-33.45
Hard, yellowish grey, clayey silt with traces of kankar.						DS-15	34.10
N.B. - '*' means sample could not be recovered.		17	20	28	48	SPT-23	35.05-35.50
35.50m.							

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Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 25/01/2021 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.43

Co-ordinates E=3241 N=1919

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	8
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	16
		Water Sample (WS)	0

Commencement Date : 09/01/2021
Completion Date : 10/01/2021
Bore Hole Diameter : 150 mm.
Level Of Ground : 34.732 M.
Water Struck At :
Standing Water Level : 0.75 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES Ref. No	SAMPLES Depth (m)
0.00m.							
Filled up by ash with boulders.						DS-1	0.50
0.60m.					3		
		1	2	1		SPT-1	1.00-1.45
Soft, grey, clayey silt. Observed kankar.						DS-2	2.00
						UDS-1	2.50-2.95
					4		
		2	2	2		SPT-2	2.95-3.40
4.00m.						DS-3	4.00
					4		
		2	2	2		SPT-3	4.50-4.95
Medium, brownish grey, clayey silt.						UDS-2	5.50-5.95
					5		
		2	2	3		SPT-4	5.95-6.40
6.50m.						DS-4	7.00
					7		
Medium, grey, clayey silt with traces of calcareous nodule.		3	3	4		SPT-5	7.50-7.95
						*UDS-3	8.50-8.95
9.00m.					9		
		2	4	5		SPT-6	9.00-9.45
						DS-5	10.00
					10		
		3	5	5		SPT-7	10.50-10.95
Stiff, grey, clayey silt with traces of calcareous nodules.						*UDS-4	11.50-11.95
					11		
		4	6	5		SPT-8	12.00-12.45
						DS-6	13.00
					14		
		6	6	8		SPT-9	13.50-13.95
14.00m.						UDS-5	14.50-14.95
					21		
		8	9	12		SPT-10	14.95-15.40
Very stiff, light grey, clayey silt with traces of sand mixture. Observed kankar.						DS-7	16.00
					27		
		9	12	15		SPT-11	16.50-16.95
17.80m.						UDS-6	17.50-17.95

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 25/01/2021	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.43

Co-ordinates E=3241 N=1919

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	8
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	16
		Water Sample (WS)	0

Commencement Date : 09/01/2021
Completion Date : 10/01/2021
Bore Hole Diameter : 150 mm.
Level Of Ground : 34.732 M.
Water Struck At :
Standing Water Level : 0.75 m.

DESCRIPTION	N-VALUE (EACH DIVN. = 15cm)				SAMPLES	
					Ref. No	Depth (m)
17.80m / 17.95m. Very stiff, light grey, clayey silt with traces of sand mixture. Observed kankar.	12	14	18	32	SPT-12	17.95-18.40
					DS-8	19.00
	10	13	18	31	SPT-13	19.50-19.95
Hard, light grey, clayey silt with traces of sand mixture. Observed kankar.					UDS-7	20.50-20.95
	12	15	19	34	SPT-14	20.95-21.40
					DS-9	22.00
22.50m.	11	16	19	35	SPT-15	22.50-22.95
					*UDS-8	23.50-23.61
	12	18	22	40	SPT-16	24.00-24.45
					DS-10	25.00
Hard, yellowish grey, clayey silt with concretion of silt. Observed sand mixture.	13	17	23	40	SPT-17	25.50-25.95
					DS-11	26.50
	12	19	25	44	SPT-18	27.00-27.45
					DS-12	28.00
28.50m.	13	21	27	48	SPT-19	28.50-28.95
					DS-13	29.50
	16	26	37	63	SPT-20	30.00-30.45
					DS-14	31.00
Hard, yellowish grey, clayey silt. Observed sand mixture.	17	30	41	71	SPT-21	31.50-31.95
					DS-15	32.50
	15	32	40	72	SPT-22	33.00-33.45
					DS-16	34.20
N.B. - '*' means sample could not be recovered.	19	35	42	77	SPT-23	35.05-35.50
35.50m.						

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 25/01/2021 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.44

Co-ordinates E=2941 S=1900

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 07/01/2021
Completion Date : 08/01/2021
Bore Hole Diameter : 150 mm.
Level Of Ground : 35.498 M.
Water Struck At :
Standing Water Level : 1.55 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)			SAMPLES Ref. No	SAMPLES Depth (m)
0.00m.						
Filled up soil consists of clayey silt with brick bats & boulders.				4	DS-1	0.50
		3	2	2	SPT-1	1.00-1.45
1.80m.					DS-2	2.00
Medium, grey, silty clay.				5	UDS-1	2.50-2.95
		2	3	2	SPT-2	2.95-3.40
3.90m.					DS-3	4.00
				10		
		3	5	5	SPT-3	4.50-4.95
					UDS-2	5.50-5.95
				10		
		3	4	6	SPT-4	5.95-6.40
					DS-4	7.00
				12		
Stiff to very stiff, light yellowish brown, clayey silt / silty clay with traces of kankar.		4	5	7	SPT-5	7.50-7.95
					*UDS-3	8.50-8.95
				13		
		5	6	7	SPT-6	9.00-9.45
					DS-5	10.00
				13		
		4	4	9	SPT-7	10.50-10.95
					UDS-4	11.50-11.95
				17		
12.30m.		5	8	9	SPT-8	11.95-12.40
					DS-6	13.00
				24		
		8	10	14	SPT-9	13.50-13.95
Stiff to very stiff, yellowish brown, clayey silt with grey patches. Observed kankar.					UDS-5	14.50-14.95
				30		
		10	14	16	SPT-10	14.95-15.40
					DS-7	16.00
				28		
		9	13	15	SPT-11	16.50-16.95
17.80m.					UDS-6	17.50-17.95

BH-44/Sheet-1

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 25/01/2021 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.44

Co-ordinates E=2941 S=1900

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 07/01/2021
Completion Date : 08/01/2021
Bore Hole Diameter : 150 mm.
Level Of Ground : 35.498 M.
Water Struck At :
Standing Water Level : 1.55 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES Ref. No	SAMPLES Depth (m)
						SPT-12	17.95-18.40
		10	12	17	29	DS-8	19.00
		8	13	14	27	SPT-13	19.50-19.95
						*UDS-7	20.50-20.95
		8	13	17	30	SPT-14	21.00-21.45
						DS-9	22.00
		10	12	16	28	SPT-15	22.50-22.95
						*UDS-8	23.50-23.95
		9	12	19	31	SPT-16	24.00-24.45
						DS-10	25.00
		12	15	22	37	SPT-17	25.50-25.95
						*UDS-9	26.50-26.63
		11	15	25	40	SPT-18	27.00-27.45
						DS-11	28.00
		10	16	27	43	SPT-19	28.50-28.95
						DS-12	29.50
		12	15	26	41	SPT-20	30.00-30.45
						DS-13	31.00
		15	25	30	55	SPT-21	31.50-31.95
						DS-14	32.50
		19	27	34	61	SPT-22	33.00-33.45
						DS-15	34.10
		20	31	37	68	SPT-23	35.05-35.50

17.80m. Stiff to very stiff, yellowish brown, clayey silt with grey patches. Observed kankar.

22.95m. Hard, brownish grey, silty clay / clayey silt with yellowish patches.

27.90m. Hard, light yellowish brown, clayey silt. Observed grey patches. Also observed a sand pocket in SPT-19.

32.00m. Hard, yellowish grey, clayey silt. Observed concretion of silt.

N.B. – '*' means sample could not be recovered.

35.50m.

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 25/01/2021 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.45

Co-ordinates E=2948 S=1930

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	8
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	16
		Water Sample (WS)	0

Commencement Date : 04/01/2021
Completion Date : 06/01/2021
Bore Hole Diameter : 150 mm.
Level Of Ground : 35.796 M.
Water Struck At :
Standing Water Level : 1.4 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES Ref. No	SAMPLES Depth (m)
0.00m.							
Filled up by concrete materials with brick bats.						DS-1	0.50
1.00m.		2	2	2	4	SPT-1	1.00-1.45
						DS-2	2.00
						UDS-1	2.50-2.95
Medium, brownish grey, clayey silt.		2	2	3	5	SPT-2	2.95-3.40
						DS-3	4.00
		2	3	4	7	SPT-3	4.50-4.95
5.50m.						*UDS-2	5.50-5.95
		3	4	4	8	SPT-4	6.00-6.45
						DS-4	7.00
		4	5	5	10	SPT-5	7.50-7.95
						UDS-3	8.50-8.95
Stiff to very stiff, light yellowish brown, clayey silt with traces of sand mixture.		4	5	9	14	SPT-6	8.95-9.40
						DS-5	10.00
		5	6	7	13	SPT-7	10.50-10.95
						UDS-4	11.50-11.95
		6	8	8	16	SPT-8	11.95-12.40
						DS-6	13.00
13.50m.		7	8	10	18	SPT-9	13.50-13.95
						UDS-5	14.50-14.95
Very stiff, light yellowish brown, clayey silt with traces of kankar. Observed sand mixture.		8	9	9	18	SPT-10	14.95-15.40
						DS-7	16.00
		9	8	14	22	SPT-11	16.50-16.95
17.80m.						*UDS-6	17.50-17.95

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 25/01/2021 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.45

Co-ordinates E=2948 S=1930

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	8
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	16
		Water Sample (WS)	0

Commencement Date : 04/01/2021
Completion Date : 06/01/2021
Bore Hole Diameter : 150 mm.
Level Of Ground : 35.796 M.
Water Struck At :
Standing Water Level : 1.4 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES Ref. No	SAMPLES Depth (m)
17.80m. Very stiff, light yellowish brown, clayey silt with traces of kankar. Observed sand mixture. 18.85m.		8	10	20	30	SPT-12	18.40-18.85
						DS-8	19.00
		9	12	23	35	SPT-13	19.50-19.95
						*UDS-7	20.50-20.63
		9	13	23	36	SPT-14	21.00-21.45
						DS-9	22.00
		10	16	32	48	SPT-15	22.50-22.95
Hard, brownish grey, clayey silt with sand mixture.						*UDS-8	23.50-23.60
		13	16	25	41	SPT-16	24.00-24.45
						DS-10	25.00
		12	15	27	42	SPT-17	25.50-25.95
						DS-11	26.50
		15	23	29	52	SPT-18	27.00-27.45
						DS-12	28.00
28.30m.		18	22	31	53	SPT-19	28.50-28.95
						DS-13	29.50
		14	25	30	55	SPT-20	30.00-30.45
						DS-14	31.00
Hard, light yellowish brown, clayey silt with sand mixture. Observed kankar.		17	27	35	62	SPT-21	31.50-31.95
						DS-15	32.50
		15	35	37	72	SPT-22	33.00-33.45
						DS-16	34.20
N.B. - '*' means sample could not be recovered.		17	34	35	69	SPT-23	35.05-35.50
35.50m.							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 25/01/2021 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.46

Co-ordinates E=2938 S=1947

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	8
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	16
		Water Sample (WS)	0

Commencement Date : 31/12/2020
Completion Date : 02/01/2021
Bore Hole Diameter : 150 mm.
Level Of Ground : 34.912 M.
Water Struck At :
Standing Water Level : 0.8 m.

DESCRIPTION	SYMBOL	N-VALUE EACH DIVN. = 15cm				SAMPLES Ref. No	Depth (m)
0.00m. Filled up soil consists of silty clay with brick bats & boulder pcs. 0.70m.						DS-1	0.50
		2	2	2	4	SPT-1	1.00-1.45
Medium, deep grey, clayey silt.						DS-2	2.00
						UDS-1	2.50-2.95
		2	3	2	5	SPT-2	2.95-3.40
3.60m.						DS-3	4.00
Medium, yellowish brown, clayey silt with traces of kankar.		3	3	4	7	SPT-3	4.50-4.95
6.00m.						*UDS-2	5.50-5.95
		3	4	5	9	SPT-4	6.00-6.45
Stiff, yellowish brown, clayey silt with traces of kankar.						DS-4	7.00
7.50m.		4	7	7	14	SPT-5	7.50-7.95
						UDS-3	8.50-8.95
		5	8	11	19	SPT-6	8.95-9.40
Stiff to very stiff, brownish grey, silty clay / clayey silt with kankar.						DS-5	10.00
		5	9	13	22	SPT-7	10.50-10.95
						*UDS-4	11.50-11.95
		6	8	13	21	SPT-8	12.00-12.45
13.00m.						DS-6	13.00
		7	9	12	21	SPT-9	13.50-13.95
						UDS-5	14.50-14.95
Very sitff, light yellowish brown, clayey silt with traces of sand mixture. Observed kankar.		9	10	15	25	SPT-10	14.95-15.40
						DS-7	16.00
		9	12	16	28	SPT-11	16.50-16.95
17.50m.						UDS-6	17.50-17.95
17.80m.							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 25/01/2021 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.46

Co-ordinates E=2938 S=1947

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	8
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	16
		Water Sample (WS)	0

Commencement Date : 31/12/2020
Completion Date : 02/01/2021
Bore Hole Diameter : 150 mm.
Level Of Ground : 34.912 M.
Water Struck At :
Standing Water Level : 0.8 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)	SAMPLES Ref. No	SAMPLES Depth (m)
17.80m.				
		13 18 23 — 41	SPT-12	17.95-18.40
			DS-8	19.00
		12 21 20 — 41	SPT-13	19.50-19.95
			*UDS-7	20.50-20.62
		9 19 24 — 43	SPT-14	21.00-21.45
			DS-9	22.00
Hard, brownish grey, clayey silt with traces of kankar.		11 20 25 — 45	SPT-15	22.50-22.95
			*UDS-8	23.50-23.60
		12 22 27 — 49	SPT-16	24.00-24.45
			DS-10	25.00
		13 20 31 — 51	SPT-17	25.50-25.95
			DS-11	26.50
		14 24 30 — 54	SPT-18	27.00-27.45
28.00m.			DS-12	28.00
		13 22 33 — 55	SPT-19	28.50-28.95
			DS-13	29.50
		15 25 37 — 62	SPT-20	30.00-30.45
			DS-14	31.00
Hard, yellowish brown, clayey silt. Observed sand mixture.		17 24 42 — 66	SPT-21	31.50-31.95
			DS-15	32.50
		20 27 43 — 70	SPT-22	33.00-33.45
			DS-16	34.30
N.B. - '*' means sample could not be recovered.		29 52 35 — >100 (5.0 cm Pentn.)	SPT-23	35.05-35.40
35.40m.				

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 25/01/2021 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.47

Co-ordinates E=3847 S=2077

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 31/12/2020
Completion Date : 02/01/2021
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.354 M.
Water Struck At :
Standing Water Level : 1.95 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)	SAMPLES Ref. No	SAMPLES Depth (m)
0.00m.				
Filled up by coal dust with ash, brick bats etc.		6 4 8 (12)	DS-1	0.50
			SPT-1	1.00-1.45
			DS-2	2.00
2.50m.			*UDS-1	2.50-2.95
Medium, brownish grey, silty clay / clayey silt. Observed kankar.		1 2 2 (4)	SPT-2	3.00-3.45
			DS-3	4.00
		2 2 3 (5)	SPT-3	4.50-4.95
5.50m.			UDS-2	5.50-5.95
		3 5 5 (10)	SPT-4	5.95-6.40
			DS-4	7.00
Stiff to very stiff, light brownish grey, clayey silt with traces of kankar.		4 6 7 (13)	SPT-5	7.50-7.95
			UDS-3	8.50-8.95
		5 7 8 (15)	SPT-6	8.95-9.40
			DS-5	10.00
		4 7 10 (17)	SPT-7	10.50-10.95
11.20m.			*UDS-4	11.50-11.95
		6 6 9 (15)	SPT-8	12.05-12.50
			DS-6	13.00
		7 8 11 (19)	SPT-9	13.50-13.95
Very stiff, yellowish brown, clayey silt with traces of sand mixture. Observed kankar.			UDS-5	14.50-14.95
		8 10 13 (23)	SPT-10	14.95-15.40
			DS-7	16.00
		7 10 11 (21)	SPT-11	16.50-16.95
17.80m.			UDS-6	17.50-17.95

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 25/01/2021 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.47

Co-ordinates E=3847 S=2077

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
		Disturbed (DS)	15
Vane (V)		Water Sample (WS)	0

Commencement Date : 31/12/2020
Completion Date : 02/01/2021
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.354 M.
Water Struck At :
Standing Water Level : 1.95 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES Ref. No	SAMPLES Depth (m)
17.80m							
		6	9	13	22	SPT-12	17.95-18.40
						DS-8	19.00
		8	11	13	24	SPT-13	19.50-19.95
Very stiff, yellowish brown, clayey silt with traces of sand mixture. Observed kankar.						UDS-7	20.50-20.95
		10	12	15	27	SPT-14	20.95-21.40
						DS-9	22.00
22.50m							
		11	14	18	32	SPT-15	22.50-22.95
Hard, yellowish brown, clayey silt with traces of sand mixture. Observed kankar.						*UDS-8	23.50-23.61
24.00m							
		12	16	19	35	SPT-16	24.00-24.45
						DS-10	25.00
		10	17	21	38	SPT-17	25.50-25.95
						*UDS-9	26.50-26.62
		13	20	24	44	SPT-18	27.00-27.45
Hard, yellowish brown, clayey silt. Observed kankar.						DS-11	28.00
		12	22	27	49	SPT-19	28.50-28.95
						DS-12	29.50
		14	20	32	52	SPT-20	30.00-30.45
31.00m						DS-13	31.00
		13	24	30	54	SPT-21	31.50-31.95
						DS-14	32.50
Hard, brownish grey, silty clay / clayey silt with kankar.		13	22	31	53	SPT-22	33.00-33.45
						DS-15	34.20
N.B. - '*' means sample could not be recovered.		14	23	33	56	SPT-23	35.05-35.50
35.50m							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 25/01/2021 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.48

Co-ordinates E=3274 S=1919

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	8
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	16
		Water Sample (WS)	0

Commencement Date : 11/01/2021
Completion Date : 13/01/2021
Bore Hole Diameter : 150 mm.
Level Of Ground : 35.045 M.
Water Struck At :
Standing Water Level : 0.8 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES Ref. No	SAMPLES Depth (m)
0.00m.							
Filled up soil consists of clayey silt with ash & boulders.						DS-1	0.50
0.60m.					4		
		2	2	2		SPT-1	1.00-1.45
						DS-2	2.00
Medium, grey, clayey silt. Observed kankar.						*UDS-1	2.50-2.95
					5		
		2	3	2		SPT-2	3.00-3.45
						DS-3	4.00
4.20m.					6		
		3	2	4		SPT-3	4.50-4.95
Medium, light brownish grey, clayey silt.						UDS-2	5.50-5.95
					6		
		2	3	3		SPT-4	5.95-6.40
6.50m.							
						DS-4	7.00
					9		
		3	4	5		SPT-5	7.50-7.95
						*UDS-3	8.50-8.95
					10		
		3	5	5		SPT-6	9.05-9.50
						DS-5	10.00
Stiff, grey, clayey silt. Observed sand mixture.					12		
		4	5	7		SPT-7	10.50-10.95
						UDS-4	11.50-11.95
					14		
		5	6	8		SPT-8	11.95-12.40
						DS-6	13.00
					13		
		4	5	8		SPT-9	13.50-13.95
14.50m.							
					17	UDS-5	14.50-14.95
		6	8	9		SPT-10	14.95-15.40
Very stiff, brownish grey, clayey silt / silty clay. Observed calcareous nodules.						DS-7	16.00
					22		
		8	9	13		SPT-11	16.50-16.95
17.80m.						UDS-6	17.50-17.95

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 25/01/2021 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.48

Co-ordinates E=3274 S=1919

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	8
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	16
		Water Sample (WS)	0

Commencement Date : 11/01/2021
Completion Date : 13/01/2021
Bore Hole Diameter : 150 mm.
Level Of Ground : 35.045 M.
Water Struck At :
Standing Water Level : 0.8 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)	SAMPLES Ref. No	SAMPLES Depth (m)
17.80m.				
Very stiff, brownish grey, clayey silt / silty clay. Observed calcareous nodules.		10 10 15 — 25	SPT-12	17.95-18.40
			DS-8	19.00
		9 12 18 — 30	SPT-13	19.50-19.95
			UDS-7	20.50-20.95
20.95m.				
Hard, brownish grey, clayey silt / silty clay. Observed calcareous nodules.		10 15 20 — 35	SPT-14	20.95-21.40
			DS-9	22.00
22.30m.				
		9 16 20 — 36	SPT-15	22.50-22.95
			*UDS-8	23.50-23.60
		10 17 23 — 40	SPT-16	24.00-24.45
Hard, yellowish grey, clayey silt with sand mixture. Observed kankar.			DS-10	25.00
		12 16 26 — 42	SPT-17	25.50-25.95
			DS-11	26.50
		11 19 27 — 46	SPT-18	27.00-27.45
28.00m.			DS-12	28.00
		13 22 30 — 52	SPT-19	28.50-28.95
			DS-13	29.50
		12 21 35 — 56	SPT-20	30.00-30.45
			DS-14	31.00
Hard, light yellowish brown, clayey silt with kankar.		14 28 41 — 69	SPT-21	31.50-31.95
			DS-15	32.50
		13 25 49 — 74	SPT-22	33.00-33.45
			DS-16	34.20
N.B. - '*' means sample could not be recovered.		19 39 50 — >100 (7.0 cm Pentn.)	SPT-23	35.05-35.42
35.42m.				

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 25/01/2021 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.49

Co-ordinates E=3857 S=2056

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	8
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	16
		Water Sample (WS)	0

Commencement Date : 02/01/2021
Completion Date : 04/01/2021
Bore Hole Diameter : 150 mm.
Level Of Ground : 37.089 M.
Water Struck At :
Standing Water Level : 1.95 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES Ref. No	SAMPLES Depth (m)
0.00m.							
						DS-1	0.50
Filled up by coal dust with fly ash.		2	7	3	10	SPT-1	1.00-1.45
						DS-2	2.00
2.40m.							
						UDS-1	2.50-2.95
		2	1	3	4	SPT-2	2.95-3.40
Medium, brownish grey, silty clay / clayey silt.						DS-3	4.00
		2	3	5	8	SPT-3	4.50-4.95
						*UDS-2	5.50-5.95
6.00m.					10		
Stiff, brownish grey, silty clay / clayey silt.		3	5	5		SPT-4	6.00-6.45
7.00m.						DS-4	7.00
		4	5	6	11	SPT-5	7.50-7.95
						UDS-3	8.50-8.95
Stiff to very stiff, yellowish grey, clayey silt with traces of kankar.		4	5	9	14	SPT-6	8.95-9.40
						DS-5	10.00
		5	8	10	18	SPT-7	10.50-10.95
						*UDS-4	11.50-11.95
12.00m.					17		
		4	7	10		SPT-8	12.00-12.45
						DS-6	13.00
		5	8	7	15	SPT-9	13.50-13.95
Very stiff, light yellowish brown, silty clay / clayey silt with traces of kankar.						UDS-5	14.50-14.95
		6	9	11	20	SPT-10	14.95-15.40
						DS-7	16.00
		5	8	13	21	SPT-11	16.50-16.95
17.80m.						*UDS-6	17.50-17.95

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 25/01/2021	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.49

Co-ordinates E=3857 S=2056

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	8
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	16
		Water Sample (WS)	0

Commencement Date : 02/01/2021
Completion Date : 04/01/2021
Bore Hole Diameter : 150 mm.
Level Of Ground : 37.089 M.
Water Struck At :
Standing Water Level : 1.95 m.

DESCRIPTION	SYMBOL	N-VALUE EACH DIVN. = 15cm				SAMPLES	
						Ref. No	Depth (m)
17.80m.		7	9	15	24	SPT-12	18.00-18.45
						DS-8	19.00
		8	10	17	27	SPT-13	19.50-19.95
Very stiff, light yellowish brown, silty clay / clayey silt with traces of kankar.						UDS-7	20.50-20.95
		8	9	13	22	SPT-14	20.95-21.40
						DS-9	22.00
		10	12	15	27	SPT-15	22.50-22.95
						*UDS-8	23.50-23.62
24.45m.		11	13	17	30	SPT-16	24.00-24.45
						DS-10	25.00
		10	12	24	36	SPT-17	25.50-25.95
Hard, yellowish grey, clayey silt with traces of sand mixture. Observed kankar.						DS-11	26.50
		12	15	25	40	SPT-18	27.00-27.45
						DS-12	28.00
		11	14	23	37	SPT-19	28.50-28.95
						DS-13	29.50
30.00m.		12	19	25	44	SPT-20	30.00-30.45
						DS-14	31.00
		15	20	29	49	SPT-21	31.50-31.95
						DS-15	32.50
Hard, brownish, clayey silt with kankar.		16	20	35	55	SPT-22	33.00-33.45
						DS-16	34.40
N.B. - '*' means sample could not be recovered.		18	25	39	64	SPT-23	35.05-35.50
35.50m.							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 25/01/2021	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.50

Co-ordinates E=3985 S=2069

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	8
Cone (Pc)		Penetrometer (SPT)	23
		Disturbed (DS)	16
Vane (V)		Water Sample (WS)	0

Commencement Date : 11/01/2021
Completion Date : 13/01/2021
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.244 M.
Water Struck At :
Standing Water Level : 1.3 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)	SAMPLES Ref. No	SAMPLES Depth (m)
0.00m.				
Filled up by coal dust with ash, brick bats, boulders etc.		29 20 52 (7.0 cm Pentn.) >100	DS-1	0.50
			SPT-1	1.00-1.37
			DS-2	2.00
2.30m.			*UDS-1	2.50-2.95
Medium, light brownish grey, silty clay / clayey silt. Observed traces of kankar.		2 3 3 — 6	SPT-2	3.00-3.45
			DS-3	4.00
		3 3 5 — 8	SPT-3	4.50-4.95
5.00m.				
			UDS-2	5.50-5.95
		4 6 6 — 12	SPT-4	5.95-6.40
			DS-4	7.00
		5 5 9 — 14	SPT-5	7.50-7.95
Stiff to very stiff, yellowish brown, clayey silt with traces of kankar.			*UDS-3	8.50-8.95
		4 6 9 — 15	SPT-6	9.00-9.45
			DS-5	10.00
		6 8 10 — 18	SPT-7	10.50-10.95
11.50m.				
			UDS-4	11.50-11.95
		7 9 12 — 21	SPT-8	11.95-12.40
			DS-6	13.00
		7 10 10 — 20	SPT-9	13.50-13.95
Very stiff, brownish grey, silty clay / clayey silt. Observed sand mixture.			*UDS-5	14.50-14.95
		9 11 13 — 24	SPT-10	15.05-15.50
			DS-7	16.00
		10 10 15 — 25	SPT-11	16.50-16.95
17.80m.			UDS-6	17.50-17.95

BH-50/Sheet-1

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 25/01/2021	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.50

Co-ordinates E=3985 S=2069

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	8
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	16
		Water Sample (WS)	0

Commencement Date : 11/01/2021
Completion Date : 13/01/2021
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.244 M.
Water Struck At :
Standing Water Level : 1.3 m.

DESCRIPTION	N-VALUE (EACH DIVN. = 15cm)	SAMPLES Ref. No	SAMPLES Depth (m)
17.80m / 17.95m. Very stiff, brownish grey, silty clay / clayey silt. Observed sand mixture.	9 12 19 — 31	SPT-12	17.95-18.40
		DS-8	19.00
Hard, brownish grey, silty clay / clayey silt. Observed sand mixture.	12 13 20 — 33	SPT-13	19.50-19.95
		UDS-7	20.50-20.95
	11 14 24 — 38	SPT-14	20.95-21.40
21.50m.		DS-9	22.00
	10 14 25 — 39	SPT-15	22.50-22.95
		*UDS-8	23.50-23.59
Hard, yellowish brown, clayey silt with kankar. Observed grey patches.	12 17 27 — 44	SPT-16	23.80-24.25
		DS-10	25.00
	11 16 30 — 46	SPT-17	25.50-25.95
26.60m.		DS-11	26.50
	13 19 30 — 49	SPT-18	27.00-27.45
		DS-12	28.00
	12 22 32 — 54	SPT-19	28.50-28.95
		DS-13	29.50
	13 21 35 — 56	SPT-20	30.00-30.45
Hard, light yellowish brown, clayey silt. Observed sand mixture.		DS-14	31.00
	15 22 37 — 59	SPT-21	31.50-31.95
		DS-15	32.50
	14 20 38 — 58	SPT-22	33.00-33.45
		DS-16	34.10
N.B. - '*' means sample could not be recovered.			
35.50m.	16 24 39 — 63	SPT-23	35.05-35.50

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 27/01/2021 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.51

Co-ordinates E=3948 S=2132

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	8
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	16
		Water Sample (WS)	0

Commencement Date : 09/01/2021
Completion Date : 10/01/2021
Bore Hole Diameter : 150 mm.
Level Of Ground : 38.105 M.
Water Struck At :
Standing Water Level : 2.3 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)	SAMPLES Ref. No	SAMPLES Depth (m)
0.00m.				
			DS-1	0.50
		23 37 50 (>100) 4.0 cm Pentn.	SPT-1	1.00-1.34
Filled up by coal dust with ash & boulders.			DS-2	2.00
			*UDS-1	2.50-2.59
		39 65 (>100) 5.0 cm Pentn.	SPT-2	3.00-3.20
3.30m.				
			DS-3	4.00
Medium, yellowish brown, clayey silt. Observed traecs of sand mixture.		2 3 4 (7)	SPT-3	4.50-4.95
			*UDS-2	5.50-5.95
6.00m.		3 3 6 (9)	SPT-4	6.00-6.45
			DS-4	7.00
		4 5 5 (10)	SPT-5	7.50-7.95
Stiff, yellowish brown, clayey silt. Observed traces of sand mixture.			UDS-3	8.50-8.95
		3 5 7 (12)	SPT-6	8.95-9.40
			DS-5	10.00
		4 5 6 (11)	SPT-7	10.50-10.95
11.50m.				
			UDS-4	11.50-11.95
		5 7 9 (16)	SPT-8	11.95-12.40
			DS-6	13.00
		5 8 9 (17)	SPT-9	13.50-13.95
Very stiff, yellowish grey, clayey silt with traces of kankar. Observed sand mixture.			*UDS-5	14.50-14.95
		7 9 12 (21)	SPT-10	15.00-15.45
			DS-7	16.00
		8 10 15 (25)	SPT-11	16.50-16.95
17.80m.			UDS-6	17.50-17.95

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 27/01/2021 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.51

Co-ordinates E=3948 S=2132

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	8
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	16
		Water Sample (WS)	0

Commencement Date : 09/01/2021
Completion Date : 10/01/2021
Bore Hole Diameter : 150 mm.
Level Of Ground : 38.105 M.
Water Struck At :
Standing Water Level : 2.3 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES Ref. No	SAMPLES Depth (m)
17.80m.							
		9	11	18	29	SPT-12	17.95-18.40
						DS-8	19.00
Very stiff, yellowish grey, clayey silt with traces of kankar. Observed sand mixture.		8	10	20	30	SPT-13	19.50-19.95
						UDS-7	20.50-20.95
20.95m.					34		
		9	13	21		SPT-14	20.95-21.40
						DS-9	22.00
					38		
		11	16	22		SPT-15	22.50-22.95
Hard, yellowish grey, clayey silt with traces of sand mixture.						*UDS-8	23.50-23.64
					37		
		1	17	20		SPT-16	24.00-24.45
						DS-10	25.00
					40		
		12	18	22		SPT-17	25.50-25.95
26.00m.							
						DS-11	26.50
					44		
		13	19	25		SPT-18	27.00-27.45
						DS-12	28.00
					47		
		12	20	27		SPT-19	28.50-28.95
						DS-13	29.50
					50		
		16	22	28		SPT-20	30.00-30.45
Hard, yellowish brown, clayey silt with sand mixture. Observed concreton of silt.						DS-14	31.00
					58		
		17	25	33		SPT-21	31.50-31.95
						DS-15	32.50
					59		
		16	24	35		SPT-22	33.00-33.45
						DS-16	34.30
					61		
N.B. - '*' means sample could not be recovered.		15	27	34		SPT-23	35.05-35.50
35.50m.							

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Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 27/01/2021 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.52

Co-ordinates E=3892 S=2127

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	8
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	16
		Water Sample (WS)	0

Commencement Date : 07/01/2021
Completion Date : 08/01/2021
Bore Hole Diameter : 150 mm.
Level Of Ground : 38.661 M.
Water Struck At :
Standing Water Level : 3.8 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)	SAMPLES Ref. No	SAMPLES Depth (m)
0.00m.				
			DS-1	0.50
		26		
		12 9 17	SPT-1	1.00-1.45
			DS-2	2.00
		>100		
Filled up by coal dust with ash, plastic materials & boulders.		43 62 3.0 cm Pentn.	SPT-2	2.50-2.68
			DS-3	3.50
		>100		
		37 65 8.0 cm Pentn.	SPT-3	4.00-4.23
			DS-4	5.00
			*UDS-1	5.50-5.59
5.80m.		6		
		2 3 3	SPT-4	6.00-6.45
			DS-5	7.00
Medium, light yellowish brown, clayey silt with traces of sand mixture.		8		
		3 4 4	SPT-5	7.50-7.95
			UDS-2	8.50-8.95
8.95m.		9		
		3 4 5	SPT-6	8.95-9.40
			DS-6	10.00
		12		
Stiff, light yellowish brown, clayey silt with traces of sand mixture.		3 6 6	SPT-7	10.50-10.95
		11	UDS-3	11.50-11.95
		5 5 6	SPT-8	11.95-12.40
13.00m.			DS-7	13.00
		16		
		6 8 8	SPT-9	13.50-13.95
			UDS-4	14.50-14.95
		32		
Very stiff, brownish grey, clayey silt / silty clay. Observed traces of sand mixture.		7 10 22	SPT-10	14.95-15.40
			DS-8	16.00
		24		
		7 10 14	SPT-11	16.50-16.95
17.80m.			UDS-5	17.50-17.95

BH-52/Sheet-1

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 27/01/2021 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.52

Co-ordinates E=3892 S=2127

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	8
Cone (Pc)		Penetrometer (SPT)	23
		Disturbed (DS)	16
Vane (V)		Water Sample (WS)	0

Commencement Date : 07/01/2021
Completion Date : 08/01/2021
Bore Hole Diameter : 150 mm.
Level Of Ground : 38.661 M.
Water Struck At :
Standing Water Level : 3.8 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES	
						Ref. No	Depth (m)
17.80m.		10	12	15	27	SPT-12	17.95-18.40
						DS-9	19.00
Very stiff, brownish grey, clayey silt / silty clay. Observed traces of sand mixture.		12	13	17	30	SPT-13	19.50-19.95
						UDS-6	20.50-20.95
		1	12	14	26	SPT-14	20.95-21.40
						DS-10	22.00
22.40m.		10	10	13	23	SPT-15	22.50-22.95
Very stiff, yellowish grey, clayey silt.						*UDS-7	23.50-23.95
		1	13	12	25	SPT-16	24.00-24.45
						DS-11	25.00
25.50m.		12	14	18	32	SPT-17	25.50-25.95
Hard, yellowish grey, clayey silt.						*UDS-8	26.50-26.63
		13	15	21	36	SPT-18	27.00-27.45
27.80m.						DS-12	28.00
		15	19	24	43	SPT-19	28.50-28.95
						DS-13	29.50
		16	20	26	46	SPT-20	30.00-30.45
						DS-14	31.00
Hard, yellowish grey, clayey silt. Observed concretion of silt.		14	23	32	55	SPT-21	31.50-31.95
						DS-15	32.50
		15	21	35	56	SPT-22	33.00-33.45
						DS-16	34.20
N.B. - '*' means sample could not be recovered.		14	25	38	63	SPT-23	35.05-35.50
35.50m.							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 15/12/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO. IBH1 | Co-ordinates E=3984 S=2075

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	1

Commencement Date : 03/12/2020
Completion Date : 04/12/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 35.986 M.
Water Struck At :
Standing Water Level : 1.15 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES Ref. No	SAMPLES Depth (m)
0.00m.							
Filled up by coal dust with scrap materials.		1	7	5	12	DS-1	0.50
						WS-1	1.15
						SPT-1	1.00-1.45
2.00m.						DS-2	2.00
						*UDS-1	2.50-2.95
		2	2	2	4	SPT-2	3.00-3.45
Medium, light brownish grey, silty clay / clayey silt with traces of kankar.						DS-3	4.00
		2	2	4	6	SPT-3	4.50-4.95
5.50m.						UDS-2	5.50-5.95
		3	3	6	9	SPT-4	5.95-6.40
						DS-4	7.00
		2	4	8	12	SPT-5	7.50-7.95
Stiff to very stiff, yellowish brown, clayey silt with kankar.						*UDS-3	8.50-8.95
		5	8	8	16	SPT-6	9.00-9.45
						DS-5	10.00
		7	8	10	18	SPT-7	10.50-10.95
11.00m.						UDS-4	11.50-11.95
		6	9	12	21	SPT-8	11.95-12.40
						DS-6	13.00
		8	8	12	20	SPT-9	13.50-13.95
Very sitff, brownish grey, clayey silt / silty clay. Observed kankar.						UDS-5	14.50-14.95
		7	10	14	24	SPT-10	14.95-15.40
						DS-7	16.00
		9	12	15	27	SPT-11	16.50-16.95
17.80m.						*UDS-6	17.50-17.95

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 15/12/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO. IBH1 | Co-ordinates E=3984 S=2075

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
		Disturbed (DS)	15
Vane (V)		Water Sample (WS)	1

Commencement Date : 03/12/2020
Completion Date : 04/12/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 35.986 M.
Water Struck At :
Standing Water Level : 1.15 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES	
						Ref. No	Depth (m)
17.80m.		9	12	18	30	SPT-12	18.00-18.45
						DS-8	19.00
Very sitff, brownish grey, clayey silt / silty clay. Observed kankar.		9	9	17	26	SPT-13	19.50-19.95
						UDS-7	20.50-20.95
		8	10	15	25	SPT-14	20.95-21.40
21.50m.							
						DS-9	22.00
Very stiff, light yellowish brown, clayey silt with steel grey patches. Observed kankar.		9	12	19	31	SPT-15	22.50-22.95
						*UDS-8	23.50-23.61
		8	10	17	27	SPT-16	24.00-24.45
						DS-10	25.00
25.50m.		11	12	19	31	SPT-17	25.50-25.95
Hard, light yellowish brown, clayey silt with steel grey patches. Observed kankar.						*UDS-9	26.50-26.59
		10	14	23	37	SPT-18	27.00-27.45
27.80m.						DS-11	28.00
		11	13	27	40	SPT-19	28.50-28.95
						DS-12	29.50
Hard, light yellowish grey, clayey silt with sand mixture.		12	22	30	52	SPT-20	30.00-30.45
						DS-13	31.00
		19	28	37	65	SPT-21	31.50-31.95
32.00m.						DS-14	32.50
		17	29	35	64	SPT-22	33.00-33.45
Hard, yellowish grey, clayey silt with kankar.						DS-15	34.00
N.B. - '*' means sample could not be recovered.		21	32	40	72	SPT-23	35.10-35.55
35.55m.							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 15/12/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO. IBH2 | Co-ordinates E=3986 S=2033

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 05/12/2020
Completion Date : 06/12/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.289 m.
Water Struck At :
Standing Water Level : 0.7 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)	SAMPLES Ref. No	SAMPLES Depth (m)
0.00m.				
Filled up with coal dust with scrap materials.		1 1 1 (2)	DS-1	0.50
			SPT-1	1.00-1.45
			DS-2	2.00
			*UDS-1	2.50-2.95
3.00m.				
Soft, brownish grey, clayey silt / silty clay with traces of kankar.		1 1 2 (3)	SPT-2	3.00-3.45
			DS-3	4.00
		1 2 1 (3)	SPT-3	4.50-4.95
5.00m.				
Medium, light yellowish brown, clayey silt. Observed kankar.			*UDS-2	5.50-5.95
		1 2 3 (5)	SPT-4	6.00-6.45
			DS-4	7.00
		2 3 5 (8)	SPT-5	7.50-7.95
			UDS-3	8.50-8.95
8.95m.				
Stiff, light yellowish brown, clayey silt. Observed kankar.		4 4 7 (11)	SPT-6	8.95-9.40
10.00m.				
			DS-5	10.00
		4 6 8 (14)	SPT-7	10.50-10.95
			UDS-4	11.50-11.95
		5 7 10 (17)	SPT-8	11.95-12.40
			DS-6	13.00
Stiff to very stiff, brownish grey, clayey silt / silty clay. Observed traces of kankar.		6 8 13 (21)	SPT-9	13.50-13.95
			UDS-5	14.50-14.95
		5 8 15 (23)	SPT-10	14.95-15.40
			DS-7	16.00
		8 10 16 (26)	SPT-11	16.50-16.95
17.80m.			*UDS-6	17.50-17.95

BH-2/Sheet-1

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 15/12/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO. IBH2 | Co-ordinates E=3986 S=2033

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 05/12/2020
Completion Date : 06/12/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.289 m.
Water Struck At :
Standing Water Level : 0.7 m.

DESCRIPTION	SYMBOL	N-VALUE EACH DIVN. = 15cm				SAMPLES Ref. No	SAMPLES Depth (m)
17.80m.							
Stiff to very stiff, brownish grey, clayey silt / silty clay. Observed traces of kankar.		6	9	17	26	SPT-12	18.00-18.45
						DS-8	19.00
		8	11	19	30	SPT-13	19.50-19.95
20.00m.							
						UDS-7	20.50-20.95
		8	10	21	31	SPT-14	20.95-21.40
						DS-9	22.00
Hard, yellowish brown, clayey silt with steel grey patches.		9	11	20	31	SPT-15	22.50-22.95
						*UDS-8	23.50-23.95
		10	13	21	34	SPT-16	24.05-24.50
						DS-10	25.00
25.50m.							
		11	15	20	35	SPT-17	25.50-25.95
						*UDS-9	26.50-26.60
		10	13	25	38	SPT-18	27.00-27.45
						DS-11	28.00
Hard, yellowish grey, clayey silt with fine sand mixture.		11	15	28	43	SPT-19	28.50-28.95
						DS-12	29.50
		10	18	32	50	SPT-20	30.00-30.45
						DS-13	31.00
31.10m.							
		15	22	37	59	SPT-21	31.50-31.95
						DS-14	32.50
Hard, light yellowish brown, clayey silt with kankar.		18	26	40	66	SPT-22	33.00-33.45
						DS-15	34.20
N.B. - '*' means sample could not be recovered.		16	29	39	68	SPT-23	35.05-35.50
35.50m.							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 15/12/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO. IBH3

Co-ordinates E=3986 S=2005

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 07/12/2020
Completion Date : 08/12/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 35.926 M.
Water Struck At :
Standing Water Level : 0.5 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES Ref. No	SAMPLES Depth (m)
0.00m.							
						DS-1	0.50
Filled up by coal dust with concrete materials.		5	2	4	6	SPT-1	1.00-1.45
2.00m.						DS-2	2.00
						*UDS-1	2.50-2.95
		2	2	2	4	SPT-2	3.00-3.45
						DS-3	4.00
Medium, yellowish grey, silty clay.		1	2	2	4	SPT-3	4.50-4.95
						UDS-2	5.50-5.95
		2	2	3	5	SPT-4	5.95-6.40
7.20m.						DS-4	7.00
		5	6	6	12	SPT-5	7.50-7.95
						UDS-3	8.50-8.95
Stiff, light brownish grey, clayey silt with grey patches. Observed kankar.		6	6	8	14	SPT-6	8.95-9.40
						DS-5	10.00
		5	6	9	15	SPT-7	10.50-10.95
11.40m.							
						UDS-4	11.50-11.95
		6	8	12	20	SPT-8	11.95-12.40
						DS-6	13.00
		8	8	11	19	SPT-9	13.50-13.95
Very stiff, brownish grey, clayey silt. Observed kankar.						*UDS-5	14.50-14.95
		7	9	14	23	SPT-10	15.00-15.45
						DS-7	16.00
		8	11	12	23	SPT-11	16.50-16.95
17.80m.						UDS-6	17.50-17.95

BH-3/Sheet-1

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 15/12/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO. IBH3 — Co-ordinates E=3986 S=2005

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
		Disturbed (DS)	15
Vane (V)		Water Sample (WS)	0

Commencement Date : 07/12/2020
Completion Date : 08/12/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 35.926 M.
Water Struck At :
Standing Water Level : 0.5 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES	
						Ref. No	Depth (m)
17.80m.							
		7	9	15	24	SPT-12	17.95-18.40
						DS-8	19.00
		9	12	17	29	SPT-13	19.50-19.95
Very stiff, brownish grey, clayey silt. Observed kankar.						UDS-7	20.50-20.95
		8	11	19	30	SPT-14	20.95-21.40
						DS-9	22.00
		10	12	18	30	SPT-15	22.50-22.95
22.95m.							
						*UDS-8	23.50-23.95
		12	13	19	32	SPT-16	24.00-24.45
						DS-10	25.00
		14	14	20	34	SPT-17	25.50-25.95
						*UDS-9	26.50-26.61
		12	16	23	39	SPT-18	27.00-27.45
Hard, yellowish grey, silty clay with fine sand mixture & kankar.						DS-11	28.00
		14	18	26	44	SPT-19	28.50-28.95
						DS-12	29.50
		15	21	33	54	SPT-20	30.00-30.45
						DS-13	31.00
31.50m.							
		24	30	39	69	SPT-21	31.50-31.95
						DS-14	32.50
Hard, yellowish grey, clayey silt with kankar. Observed concretion of silt.		29	39	50 5.0 cm	>100 Pentn.	SPT-22	33.00-33.35
						DS-15	34.20
N.B. - '*' means sample could not be recovered.		25	44	50 3.0 cm	>100 Pentn.	SPT-23	35.05-35.38
35.38m.							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 08/10/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO. IBH4

Co-ordinates E=3985 S=1944

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	8
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	18
		Water Sample (WS)	0

Commencement Date : 09/09/2020
Completion Date : 11/09/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.589 M.
Water Struck At :
Standing Water Level : 0.6 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)	SAMPLES Ref. No	SAMPLES Depth (m)
0.00m.				
Filled up soil consists of blackish grey, clayey silt with coal pcs., brick bats, sand & boulder pcs.			DS-1	0.50
		3 5 8 = 13	SPT-1	1.00-1.45
			DS-2	2.00
			UDS-1	2.50-2.95
		6 9 10 = 19	SPT-2	3.05-3.50
3.50m.			DS-3	4.00
Medium, yellowish grey, clayey silt / silty clay. Observed kankar.		1 2 2 = 4	SPT-3	4.50-4.95
			UDS-2	5.50-5.95
		2 2 3 = 5	SPT-4	5.95-6.40
			DS-4	7.00
		3 3 4 = 7	SPT-5	7.50-7.95
8.95m.			UDS-3	8.50-8.95
		4 6 7 = 13	SPT-6	8.95-9.40
			DS-5	10.00
Stiff to very stiff, yellowish grey, clayey silt / silty clay. Observed kankar.		3 5 6 = 11	SPT-7	10.50-10.95
			UDS-4	11.50-11.95
		7 12 15 = 27	SPT-8	11.95-12.40
			DS-6	13.00
13.50m.				
		8 15 18 = 33	SPT-9	13.50-13.95
			DS-7	14.30
Hard, yellowish grey, clayey silt / silty clay. Observed kankar.			UDS-5	14.60-15.05
		9 16 19 = 35	SPT-10	15.05-15.50
16.00m.			DS-8	16.00
Hard, yellowish brown, clayey silt with sand mixture. Observed calcareous nodules, steel grey patches & rusty spots.		10 13 17 = 30	SPT-11	16.50-16.95
17.80m.			UDS-6	17.50-17.95

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 08/10/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO. IBH4 | Co-ordinates E=3985 S=1944

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	8
Cone (Pc)		Penetrometer (SPT)	23
		Disturbed (DS)	18
Vane (V)		Water Sample (WS)	0

Commencement Date : 09/09/2020
Completion Date : 11/09/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.589 M.
Water Struck At :
Standing Water Level : 0.6 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)			SAMPLES Ref. No	SAMPLES Depth (m)
17.80m.						
		8	11	16 (27)	SPT-12	17.95-18.40
					DS-9	19.00
		11	13	17 (30)	SPT-13	19.50-19.95
Hard, yellowish brown, clayey silt with sand mixture. Observed calcareous nodules, steel grey patches & rusty spots.					UDS-7	20.50-20.95
		19	22	33 (55)	SPT-14	20.95-21.40
					DS-10	22.00
		15	20	30 (50)	SPT-15	22.50-22.95
					*UDS-8	23.50-23.85
24.00m.		20	27	32 (59)	SPT-16	24.00-24.45
					DS-11	25.00
Hard, greyish brown, clayey silt with sand mixture.		19	25	27 (52)	SPT-17	25.50-25.95
26.50m.					DS-12	26.50
		11	17	19 (36)	SPT-18	27.00-27.45
					DS-13	28.00
		10	15	18 (33)	SPT-19	28.50-28.95
					DS-14	29.50
		9	16	21 (37)	SPT-20	30.00-30.45
Hard, yellowish brown, clayey silt with sand mixture. Observed concretion of silt.					DS-15	31.00
		10	18	21 (39)	SPT-21	31.50-31.95
					DS-16	32.50
		12	18	23 (41)	SPT-22	33.00-33.45
					DS-17	34.00
					DS-18	34.50
N.B. - '*' means sample could not be recovered.		13	19	26 (45)	SPT-23	35.05-35.50
35.50m.						

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 08/10/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO. IBH5

Co-ordinates E=3984 S=1911

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	21
		Water Sample (WS)	0

Commencement Date : 01/09/2020
Completion Date : 06/09/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 38.118 M.
Water Struck At :
Standing Water Level : 0.8 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES Ref. No	SAMPLES Depth (m)
0.00m.							
						DS-1	0.50
					9		
		3	5	4		SPT-1	1.00-1.45
Filled up soil consists of blackish grey, clayey silt with ash, coal pcs., boulder pcs. & old cutting iron pcs.						DS-2	2.00
						*UDS-1	2.50-2.95
					10		
		4	4	6		SPT-2	3.10-3.55
						DS-3	4.00
4.20m.							
					5		
		2	2	3		SPT-3	4.50-4.95
						DS-4	5.30
						*UDS-2	5.50-5.95
Soft to medium, light brown, clayey sandy silt. Observed mica & black spots.					4		
		1	2	2		SPT-4	6.10-6.55
						DS-5	7.00
7.50m.							
					7	UDS-3	7.50-7.95
Medium, brownish grey, clayey silt with sand mixture. Observed kankar & siltstone.		3	3	4		SPT-5	7.95-8.40
						DS-6	9.00
					10		
9.50m.							
		4	5	5		SPT-6	9.50-9.95
						DS-7	10.20
						UDS-4	10.50-10.95
					13		
		4	6	7		SPT-7	10.95-11.40
						DS-8	12.00
					14		
		5	6	8		SPT-8	12.50-12.95
						DS-9	13.30
Stiff to very stiff, brownish grey, clayey silt with sand mixture. Observed kankar & siltstone.						UDS-5	13.50-13.95
					17		
		5	8	9		SPT-9	13.95-14.40
						DS-10	15.00
					21		
		6	9	12		SPT-10	15.50-15.95
						DS-11	16.20
						UDS-6	16.50-16.95
					18		
		4	7	11		SPT-11	16.95-17.40
17.80m.							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

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BORE LOG DATA SHEET

BORE HOLE NO. IBH5

Co-ordinates E=3984 S=1911

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
		Disturbed (DS)	21
Vane (V)		Water Sample (WS)	0

Commencement Date : 01/09/2020
Completion Date : 06/09/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 38.118 M.
Water Struck At :
Standing Water Level : 0.8 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)	SAMPLES Ref. No	SAMPLES Depth (m)
			DS-12	18.00
		5 9 12 (21)	SPT-12	18.50-18.95
			DS-13	19.20
			*UDS-7	19.50-19.95
Stiff to very stiff, brownish grey, clayey silt with sand mixture. Observed kankar & siltstone.		6 8 11 (19)	SPT-13	20.10-20.55
			DS-14	21.00
		7 10 12 (22)	SPT-14	21.50-21.95
17.80m.				
			UDS-8	22.50-22.95
		10 14 17 (31)	SPT-15	22.95-23.40
			DS-15	24.00
Hard, brownish grey, silty clay / clayey silt with sand mixture.		13 15 20 (35)	SPT-16	24.50-24.95
			UDS-9	25.50-25.95
		11 17 24 (41)	SPT-17	25.95-26.40
22.50m.				
			DS-16	27.00
Hard, brownish grey, clayey silt with sand mixture & rusty spots.		17 24 32 (56)	SPT-18	27.50-27.95
			DS-17	28.50
27.00m.		13 18 20 (38)	SPT-19	29.00-29.45
			DS-18	30.00
		11 16 24 (40)	SPT-20	30.50-30.95
			DS-19	31.50
Hard, brownish grey, silty clay / clayey silt with sand mixture & steel grey patches. Observed calcareous nodules.		12 20 23 (43)	SPT-21	32.00-32.45
			DS-20	33.00
		15 22 26 (48)	SPT-22	33.50-33.95
			DS-21	34.50
N.B. - '*' means sample could not be recovered.		17 21 30 (51)	SPT-23	35.05-35.50
29.00m.				
35.50m.				

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 08/10/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO. IBH6 | Co-ordinates E=3954 S=1911

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	8
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	19
		Water Sample (WS)	0

Commencement Date : 07/09/2020
Completion Date : 10/09/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 37.358 M.
Water Struck At :
Standing Water Level : 1.7 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES	
						Ref. No	Depth (m)
0.00m.							
						DS-1	0.50
					11		
		4	4	7		SPT-1	1.00-1.45
						DS-2	2.00
Filled up soil consists of blackish grey, clayey silt with ash, coal pcs., sand, boulder pcs. & lod cutting iron pcs.						*UDS-1	2.50-2.95
					24		
		11	12	12		SPT-2	3.05-3.50
						DS-3	4.00
					31		
		10	14	17		SPT-3	4.50-4.95
5.30m.						DS-4	5.20
						UDS-2	5.50-5.95
					7		
		2	3	4		SPT-4	5.95-6.40
						DS-5	7.00
Medium, light brown, clayey silt. Observed mica & black spots.					10		
		3	4	6		SPT-5	7.50-7.95
						DS-6	8.20
						UDS-3	8.50-8.95
					8		
		2	3	5		SPT-6	8.95-9.40
10.00m.						DS-7	10.00
					12		
		4	5	7		SPT-7	10.50-10.95
						*UDS-4	11.50-11.95
Stiff to very stiff, brownish grey, clayey silt / silty clay with sand mixture. Observed kankar.					19		
		5	8	11		SPT-8	12.05-12.50
						DS-8	13.00
					16		
		4	7	9		SPT-9	13.50-13.95
14.50m.							
						UDS-5	14.50-14.95
					21		
		6	8	13		SPT-10	14.95-15.40
						DS-9	16.00
Very stiff, brownish grey to greyish brown, clayey silt with sand mixture. Observed kankar, concretion of silt & rusty spots.					19		
		5	9	10		SPT-11	16.50-16.95
17.80m.						*UDS-6	17.50-17.95

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 08/10/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO. IBH6

Co-ordinates E=3954 S=1911

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	8
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	19
		Water Sample (WS)	0

Commencement Date : 07/09/2020
Completion Date : 10/09/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 37.358 M.
Water Struck At :
Standing Water Level : 1.7 m.

DESCRIPTION	SYMBOL	N-VALUE EACH DIVN. = 15cm				Ref. No	Depth (m)
17.80m.							
		4	7	9	16	SPT-12	18.10-18.55
						DS-10	19.00
		6	9	9	18	SPT-13	19.50-19.95
Very stiff, brownish grey to greyish brown, clayey silt with sand mixture. Observed kankar, concretion of silt & rusty spots.						*UDS-7	20.50-20.95
		7	9	11	20	SPT-14	21.05-21.50
						DS-11	22.00
		9	11	14	25	SPT-15	22.50-22.95
23.50m.							
						*UDS-8	23.50-23.95
Very stiff, greyish brown, clayey sandy silt. Observed mica.		10	13	15	28	SPT-16	24.10-24.55
						DS-12	25.00
25.50m.							
		12	15	18	33	SPT-17	25.50-25.95
						DS-13	26.50
		15	21	25	46	SPT-18	27.00-27.45
						DS-14	28.00
		17	24	27	51	SPT-19	28.50-28.95
						DS-15	29.50
Hard, greyish brown, clayey silt with sand mixture.		11	17	17	34	SPT-20	30.00-30.45
						DS-16	31.00
		20	24	29	53	SPT-21	31.50-31.95
						DS-17	32.50
		21	26	31	57	SPT-22	33.00-33.45
						DS-18	34.00
						DS-19	34.50
N.B. - '*' means sample could not be recovered.		21	27	30	57	SPT-23	35.10-35.55
35.55m.							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 08/10/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO. IBH7 | Co-ordinates E=3929 S=1911

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	8
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	17
		Water Sample (WS)	0

Commencement Date : 11/09/2020
Completion Date : 15/09/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.977 M.
Water Struck At :
Standing Water Level : 1.3 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES	
						Ref. No	Depth (m)
0.00m.							
Filled up soil consists of blackish grey, clayey silt with coal pcs., sand, concrete pcs. & boulder pcs.		4	5	7	12	DS-1	0.50
						SPT-1	1.00-1.45
						DS-2	2.00
2.20m.							
Medium, brownish grey, silty clay / clayey silt with sand mixture. Observed kankar.		2	3	3	6	UDS-1	2.50-2.95
						SPT-2	2.95-3.40
						DS-3	4.00
		2	2	3	5	SPT-3	4.50-4.95
5.50m.							
Medium, brownish grey, clayey silt with sand mixture & traces of steel grey patch. Observed rusty spots.		2	3	4	7	UDS-2	5.50-5.95
						SPT-4	5.95-6.40
						DS-4	7.00
		3	4	4	8	SPT-5	7.50-7.95
8.50m.							
Stiff to very stiff, greyish brown, clayey silt / silty clay with sand mixture & traces of calcareous nodule.						*UDS-3	8.50-8.95
		4	5	7	12	SPT-6	9.05-9.50
						DS-5	10.00
		5	6	8	14	SPT-7	10.50-10.95
						UDS-4	11.50-11.95
		5	7	10	17	SPT-8	11.95-12.40
						DS-6	13.00
		7	8	12	20	SPT-9	13.50-13.95
14.00m.							
Very stiff, yellowish brown, clayey silt with sand mixture & traces of steel grey patch. Observed rusty spots.						*UDS-5	14.50-14.95
		5	8	9	17	SPT-10	15.10-15.55
						DS-7	16.00
		8	10	11	21	SPT-11	16.50-16.95
17.80m.						UDS-6	17.50-17.95

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 08/10/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO. IBH7

Co-ordinates E=3929 S=1911

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	8
Cone (Pc)		Penetrometer (SPT)	23
		Disturbed (DS)	17
Vane (V)		Water Sample (WS)	0

Commencement Date : 11/09/2020
Completion Date : 15/09/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.977 M.
Water Struck At :
Standing Water Level : 1.3 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)	SAMPLES Ref. No	SAMPLES Depth (m)
17.80m. Very stiff, yellowish brown, clayey silt with sand mixture & traces of steel grey patch. Observed rusty spots.		6 8 11 — 19	SPT-12	17.95-18.40
			DS-8	19.00
		9 10 12 — 22	SPT-13	19.50-19.95
20.00m. Hard, yellowish brown, clayey silt with traces of sand mixture. Observed concretion of silt & steel grey patches.			*UDS-7	20.50-20.95
		8 17 21 — 38	SPT-14	21.05-21.50
			DS-9	22.00
		7 13 19 — 32	SPT-15	22.50-22.95
			UDS-8	23.50-23.95
		9 18 23 — 41	SPT-16	23.95-24.40
			DS-10	25.00
		8 15 21 — 36	SPT-17	25.50-25.95
26.50m. Dense, greyish brown, silty sand.			DS-11	26.50
		10 14 25 — 39	SPT-18	27.00-27.45
			DS-12	28.00
		7 16 20 — 36	SPT-19	28.50-28.95
29.00m. Hard, yellowish brown, clayey silt with sand mixture & traces of steel grey patch. Observed rusty spots.			DS-13	29.50
		9 13 19 — 32	SPT-20	30.00-30.45
			DS-14	31.00
		11 15 22 — 37	SPT-21	31.50-31.95
32.50m. Hard, yellowish brown, silty clay / clayey silt with sand mixture, traces of steel grey patch & kankar. Observed rusty spots.			DS-15	32.50
		13 19 25 — 44	SPT-22	33.00-33.45
			DS-16	34.00
			DS-17	34.50
N.B. – '*' means sample could not be recovered.		16 21 26 — 47	SPT-23	35.05-35.50
35.50m.				

BH-7/Sheet-2

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 15/12/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO. IBH8

Co-ordinates E=3936 S=2063

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 29/11/2020
Completion Date : 30/11/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.500 M.
Water Struck At :
Standing Water Level : 1.5 m.

DESCRIPTION	SYMBOL	N-VALUE EACH DIVN. = 15cm				SAMPLES Ref. No	Depth (m)
0.00m.							
						DS-1	0.50
Filled up by coal dust with fly ash & scrap materials.		1	1	2	3	SPT-1	1.00-1.45
						DS-2	2.00
2.20m.							
						*UDS-1	2.50-2.95
		2	2	2	4	SPT-2	3.00-3.45
						DS-3	4.00
Soft to medium, brownish grey, silty clay with traces of kankar.		1	2	2	4	SPT-3	4.50-4.95
						UDS-2	5.50-5.95
		2	2	3	5	SPT-4	5.95-6.40
						DS-4	7.00
7.50m.							
		3	3	4	7	SPT-5	7.50-7.95
Medium, yellowish brown, clayey silt with traces of kankar.							
						UDS-3	8.50-8.95
8.95m.							
		3	5	7	12	SPT-6	8.95-9.40
						DS-5	10.00
Stiff, yellowish brown, clayey silt with traces of kankar.		3	5	6	11	SPT-7	10.50-10.95
						*UDS-4	11.50-11.95
12.00m.							
		4	6	8	14	SPT-8	12.00-12.45
						DS-6	13.00
		6	5	10	15	SPT-9	13.50-13.95
						UDS-5	14.50-14.95
Stiff to very stiff, brownish grey, clayey silt / silty clay. Observed kankar.		5	7	10	17	SPT-10	14.95-15.40
						DS-7	16.00
		6	7	13	20	SPT-11	16.50-16.95
17.80m.						UDS-6	17.50-17.95

BH-8/Sheet-1

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 15/12/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO. IBH8 | Co-ordinates E=3936 S=2063

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
		Disturbed (DS)	15
Vane (V)		Water Sample (WS)	0

Commencement Date : 29/11/2020
Completion Date : 30/11/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.500 M.
Water Struck At :
Standing Water Level : 1.5 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES	
						Ref. No	Depth (m)
17.80m.		7	11	16	27	SPT-12	17.95-18.40
						DS-8	19.00
		8	13	16	29	SPT-13	19.50-19.95
Stiff to very stiff, brownish grey, clayey silt / silty clay. Observed kankar.						UDS-7	20.50-20.95
		7	12	16	28	SPT-14	20.95-21.40
						DS-9	22.00
		8	13	15	28	SPT-15	22.50-22.95
						*UDS-8	23.50-23.63
		10	14	16	30	SPT-16	24.00-24.45
24.50m.						DS-10	25.00
		12	15	19	34	SPT-17	25.50-25.95
Hard, yellowish brown, clayey silt with kankar. Observed concretion of silt.						*UDS-9	26.50-26.60
		13	17	26	43	SPT-18	27.00-27.45
						DS-11	28.00
		14	21	32	53	SPT-19	28.50-28.95
29.20m.						DS-12	29.50
		16	25	30	55	SPT-20	30.00-30.45
						DS-13	31.00
		17	27	33	60	SPT-21	31.50-31.95
Hard, yellowish grey, clayey silt with sand mixture & concretion of silt.						DS-14	32.50
		17	32	39	71	SPT-22	33.00-33.45
						DS-15	34.20
N.B. - '*' means sample could not be recovered.		27	47	26	>100	SPT-23	35.05-35.42
35.42m.				7.0	cm Pentn.		

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 15/12/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO. IBH9

Co-ordinates E=3988 S=2087

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 01/12/2020
Completion Date : 02/12/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.53 m.
Water Struck At :
Standing Water Level : 1.1 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES Ref. No	SAMPLES Depth (m)
0.00m.							
Filled up by coal dust with scrap materials.						DS-1	0.50
		3	5	3	8	SPT-1	1.00-1.45
2.00m.						DS-2	2.00
						UDS-1	2.50-2.95
		1	2	1	3	SPT-2	2.95-3.40
						DS-3	4.00
Soft to medium, yellowish grey, silty clay / clayey silt with traces of kankar.		1	2	2	4	SPT-3	4.50-4.95
						*UDS-2	5.50-5.95
		2	2	4	6	SPT-4	6.00-6.45
						DS-4	7.00
7.20m.							
		3	6	8	14	SPT-5	7.50-7.95
						UDS-3	8.50-8.95
Stiff to very stiff, light yellowish brown, clayey silt with traces of kankar.		4	7	8	15	SPT-6	8.95-9.40
						DS-5	10.00
		5	8	12	20	SPT-7	10.50-10.95
11.50m.							
						*UDS-4	11.50-11.95
		6	9	13	22	SPT-8	12.05-12.50
						DS-6	13.00
		5	9	12	21	SPT-9	13.50-13.95
Very stiff, brownish grey, clayey silt / silty clay. Observed kankar.						UDS-5	14.50-14.95
		6	10	15	25	SPT-10	14.95-15.40
						DS-7	16.00
		8	12	17	29	SPT-11	16.50-16.95
17.80m.						UDS-6	17.50-17.95

BH-9/Sheet-1

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 15/12/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO. IBH9 | Co-ordinates E=3988 S=2087

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 01/12/2020
Completion Date : 02/12/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.53 m.
Water Struck At :
Standing Water Level : 1.1 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES	
						Ref. No	Depth (m)
17.80m 17.95m Very stiff, brownish grey, clayey silt / silty clay. Observed kankar.		11	14	19	33	SPT-12	17.95-18.40
						DS-8	19.00
		10	13	19	32	SPT-13	19.50-19.95
						UDS-7	20.50-20.95
Hard, brownish grey, clayey silt / silty clay. Observed kankar.		8	12	18	30	SPT-14	20.95-21.40
						DS-9	22.00
		9	13	18	31	SPT-15	22.50-22.95
23.50m						*UDS-8	23.50-23.95
		8	10	12	22	SPT-16	24.00-24.45
Very stiff, yellowish grey, clayey silt.						DS-10	25.00
		10	13	15	28	SPT-17	25.50-25.95
						*UDS-9	26.50-26.64
27.00m							
		9	13	18	31	SPT-18	27.00-27.45
Hard, yellowish grey, clayey silt.						DS-11	28.00
28.50m							
		10	16	24	40	SPT-19	28.50-28.95
						DS-12	29.50
Hard, yellowish grey, clayey silt with sand mixture & concretion of silt.		14	24	29	53	SPT-20	30.00-30.45
						DS-13	31.00
		19	23	30	53	SPT-21	31.50-31.95
32.50m						DS-14	32.50
		24	28	34	62	SPT-22	33.00-33.45
Hard, yellowish brown, silty clay / clayey silt with kankar. Observed steel grey patches.						DS-15	34.00
N.B. - '*' means sample could not be recovered.							
35.50m		20	27	38	65	SPT-23	35.05-35.50

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 15/12/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO. IBH10 | Co-ordinates E=3985 S=1980

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
Vane (V)		Disturbed (DS)	15
		Water Sample (WS)	0

Commencement Date : 09/12/2020
Completion Date : 11/12/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.134 M.
Water Struck At :
Standing Water Level : 0.4 m.

DESCRIPTION	SYMBOL	N-VALUE EACH DIVN. = 15cm				SAMPLES Ref. No	Depth (m)
0.00m.							
						DS-1	0.50
Filled up by coal dust with clay & fly ash.		1	5	2	7	SPT-1	1.00-1.45
2.00m.						DS-2	2.00
						UDS-1	2.50-2.95
Medium, yellowish grey, silty clay.		2	2	3	5	SPT-2	2.95-3.40
						DS-3	4.00
4.50m.		3	5	7	12	SPT-3	4.50-4.95
						*UDS-2	5.50-5.95
Stiff, yellowish grey, silty clay.		4	6	6	12	SPT-4	6.00-6.45
						DS-4	7.00
7.50m.		7	8	9	17	SPT-5	7.50-7.95
						UDS-3	8.50-8.95
		7	9	11	20	SPT-6	8.95-9.40
Very stiff, brownish grey, clayey silt. Observed kankar.						DS-5	10.00
		6	8	13	21	SPT-7	10.50-10.95
						*UDS-4	11.50-11.95
12.00m.		7	10	13	23	SPT-8	12.00-12.45
						DS-6	13.00
		9	10	15	25	SPT-9	13.50-13.95
						UDS-5	14.50-14.95
Very stiff, brownish grey, clayey silt with traces of kankar. Observed steel grey patches.		8	9	15	24	SPT-10	14.95-15.40
						DS-7	16.00
		9	10	14	24	SPT-11	16.50-16.95
17.80m.						UDS-6	17.50-17.95

BH-10/Sheet-1

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 15/12/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO. IBH10 | Co-ordinates E=3985 S=1980

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	23	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	23
		Disturbed (DS)	15
Vane (V)		Water Sample (WS)	0

Commencement Date : 09/12/2020
Completion Date : 11/12/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.134 M.
Water Struck At :
Standing Water Level : 0.4 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)	SAMPLES Ref. No	SAMPLES Depth (m)
17.80m.				
		7 11 12 (23)	SPT-12	17.95-18.40
			DS-8	19.00
Very stiff, brownish grey, clayey silt with traces of kankar. Observed steel grey patches.		7 11 12 (23)	SPT-13	19.50-19.95
			UDS-7	20.50-20.95
		9 10 13 (23)	SPT-14	20.95-21.40
			DS-9	22.00
22.20m.				
Very stiff, yellowish grey, silty clay. Observed sand mixture.		10 11 15 (26)	SPT-15	22.50-22.95
			*UDS-8	23.50-23.95
24.00m.		12 14 17 (31)	SPT-16	24.00-24.45
			DS-10	25.00
		11 15 20 (35)	SPT-17	25.50-25.95
			*UDS-9	26.50-26.64
Hard, yellowish grey, silty clay. Observed sand mixture.		13 17 22 (39)	SPT-18	27.00-27.45
			DS-11	28.00
		12 18 25 (43)	SPT-19	28.50-28.95
			DS-12	29.50
30.00m.				
		14 24 30 (54)	SPT-20	30.00-30.45
			DS-13	31.00
		16 23 32 (55)	SPT-21	31.50-31.95
Hard, light brownish grey, clayey silt with fine sand mixture. Observed concretion of silt.			DS-14	32.50
		20 32 40 (72)	SPT-22	33.00-33.45
			DS-15	34.20
N.B. - '*' means sample could not be recovered.		21 38 50 (>100) 5.0 cm Pentn.	SPT-23	35.05-35.40
35.40m.				

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 13/10/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO. CHST1 | Co-ordinates E=3057.000 S=1920.000

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	24	Undisturbed (UDS)	10
Cone (Pc)		Penetrometer (SPT)	24
Vane (V)		Disturbed (DS)	16
		Water Sample (WS)	0

Commencement Date : 06/10/2020
Completion Date : 08/10/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 34.831 M.
Water Struck At :
Standing Water Level :

DESCRIPTION	SYMBOL	N-VALUE EACH DIVN. = 15cm				SAMPLES Ref. No	SAMPLES Depth (m)
0.00m.							
Filled up by boulders with fly ash.						DS-1	0.50
0.80m.					5		
		2	2	3		SPT-1	1.00-1.45
						DS-2	2.00
Medium, deep grey, clayey silt with traces of kankar.					6	UDS-1	2.50-2.95
		3	3	3		SPT-2	2.95-3.40
						DS-3	4.00
4.30m.					7		
		3	4	3		SPT-3	4.50-4.95
Medium, yellowish brown, silty clay / clayey silt with traces of kankar.					8	*UDS-2	5.50-5.95
		3	4	4		SPT-4	6.00-6.45
						DS-4	7.00
7.50m.					9		
		4	4	5		SPT-5	7.50-7.95
					10	UDS-3	8.50-8.95
Stiff, yellowish brown, silty clay / clayey silt with traces of kankar.		4	5	5		SPT-6	8.95-9.40
						DS-5	10.00
					11		
		4	5	6		SPT-7	10.50-10.95
11.50m.							
					13	UDS-4	11.50-11.95
		4	6	7		SPT-8	11.95-12.40
						DS-6	13.00
					15		
		5	7	8		SPT-9	13.50-13.95
Stiff to very stiff, deep brown, clayey silt with traces of kankar & sand mixture.					16	UDS-5	14.50-14.95
		6	7	9		SPT-10	14.95-15.40
						DS-7	16.00
					18		
		7	8	10		SPT-11	16.50-16.95
17.50m.							
					21	*UDS-6	17.50-17.95
Very stiff, brownish grey, clayey silt / silty clay with sand mixture. Observed concretion of silt.		6	9	12		SPT-12	18.05-18.50
18.60m.							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 13/10/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO. CHST1 | Co-ordinates E=3057.000 S=1920.000

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	24	Undisturbed (UDS)	10
Cone (Pc)		Penetrometer (SPT)	24
Vane (V)		Disturbed (DS)	16
		Water Sample (WS)	0

Commencement Date : 06/10/2020
Completion Date : 08/10/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 34.831 M.
Water Struck At :
Standing Water Level :

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES	
						Ref. No	Depth (m)
18.60m.							
		8	10	10	20	DS-8	19.00
						SPT-13	19.50-19.95
Very stiff, brownish grey, clayey silt / silty clay with sand mixture. Observed concretion of silt.						*UDS-7	20.50-20.95
		6	10	17	27	SPT-14	21.10-21.55
						DS-9	22.00
		7	9	13	22	SPT-15	22.50-22.95
23.50m.							
						*UDS-8	23.50-23.95
		7	10	14	24	SPT-16	24.05-24.50
Very stiff, light yellowish brown, clayey silt with grey patches.						DS-10	25.00
		9	11	16	27	SPT-17	25.50-25.95
						*UDS-9	26.50-26.95
27.05m.					32		
		13	16	16		SPT-18	27.05-27.50
						DS-11	28.00
Hard, light yellowish brown, clayey silt with grey patches.		10	15	18	33	SPT-19	28.50-28.95
						*UDS-10	29.50-29.64
30.00m.					30		
		9	12	18		SPT-20	30.00-30.45
						DS-12	31.00
Hard, deep brown, silty clay with traces of kankar.		9	12	19	31	SPT-21	31.50-31.95
						DS-13	32.50
		10	13	19	32	SPT-22	33.00-33.45
33.50m.							
						DS-14	34.00
		12	15	21	36	SPT-23	34.50-34.95
Hard, brownish grey, silty clay with kankar & grey patches. Observed traces of sand mixture.						DS-15	35.50
						DS-16	36.20
N.B. - '*' means sample could not be recovered.		13	16	25	41	SPT-24	36.50-36.95
36.95m.							

BH-1/Sheet-2

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 13/10/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO. CHST1(R1) | Co-ordinates E=3054.000 S=1920.000

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	25	Undisturbed (UDS)	0
Cone (Pc)		Penetrometer (SPT)	25
Vane (V)		Disturbed (DS)	25
		Water Sample (WS)	0

Commencement Date : 09/10/2020
Completion Date : 10/10/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 34.831 M.
Water Struck At :
Standing Water Level :

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES	
						Ref. No	Depth (m)
0.00m.							
Filled up with fly ash & boulders.						DS-1	0.50
0.80m.		1	2	2	4	SPT-1	1.00-1.45
						DS-2	2.00
Medium, deep grey, silty clay with kankar.		2	2	3	5	SPT-2	2.50-2.95
						DS-3	3.50
		2	3	3	6	SPT-3	4.00-4.45
4.50m.						DS-4	5.00
		3	4	4	8	SPT-4	5.50-5.95
						DS-5	6.50
Stiff, yellowish brown, silty clay / clayey silt. Observed kankar.		3	4	5	9	SPT-5	7.00-7.45
						DS-6	8.00
		3	5	6	11	SPT-6	8.50-8.95
						DS-7	9.50
		5	7	8	15	SPT-7	10.00-10.45
						DS-8	11.00
11.50m.		6	6	7	13	SPT-8	11.50-11.95
						DS-9	12.50
		8	7	8	15	SPT-9	13.00-13.45
						DS-10	14.00
Stiff to very stiff, deep brown, clayey silt with traces of kankar. Observed sand mixture.		7	7	7	14	SPT-10	14.50-14.95
						DS-11	15.50
		8	7	9	16	SPT-11	16.00-16.45
						DS-12	17.00
		8	9	9	18	SPT-12	17.50-17.95
18.00m.							
Very stiff, brownish grey, silty clay with traces of sand mixture.						DS-13	18.50
18.60m.							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 13/10/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO. CHST1(R1) | Co-ordinates E=3054.000 S=1920.000

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	25	Undisturbed (UDS)	0
Cone (Pc)		Penetrometer (SPT)	25
Vane (V)		Disturbed (DS)	25
		Water Sample (WS)	0

Commencement Date : 09/10/2020
Completion Date : 10/10/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 34.831 M.
Water Struck At :
Standing Water Level :

DESCRIPTION	SYMBOL	N-VALUE EACH DIVN. = 15cm				SAMPLES Ref. No	SAMPLES Depth (m)
18.60m.					20		
		6	8	12		SPT-13	19.00-19.45
						DS-14	20.00
					23		
		8	10	13		SPT-14	20.50-20.95
Very stiff, brownish grey, silty clay with traces of sand mixture.						DS-15	21.50
					23		
		10	12	11		SPT-15	22.00-22.45
						DS-16	23.00
					24		
		8	10	14		SPT-16	23.50-23.95
24.00m.						DS-17	24.50
					24		
		10	12	12		SPT-17	25.00-25.45
						DS-18	26.00
					23		
		9	11	12		SPT-18	26.50-26.95
Very stiff, light yellowish brown, clayey silt with grey patches. Observed sand mixture.						DS-19	27.50
					28		
		10	13	15		SPT-19	28.00-28.45
						DS-20	29.00
					30		
		11	12	18		SPT-20	29.50-29.95
						DS-21	30.50
31.00m.					33		
		12	14	19		SPT-21	31.00-31.45
Hard, light yellowish brown, clayey silt with grey patches. Observed sand mixture.						DS-22	32.00
32.50m.					32		
		11	12	20		SPT-22	32.50-32.95
						DS-23	33.50
					35		
		12	13	22		SPT-23	34.00-34.45
Hard, brownish grey, silty clay with sand mixture & kankar.						DS-24	35.00
					37		
		10	14	23		SPT-24	35.50-35.95
						DS-25	36.20
					40		
		11	17	23		SPT-25	36.50-36.95
36.95m.							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 22/10/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO. CHST1(R2) | Co-ordinates E=3051.000 S=1920.000

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	25	Undisturbed (UDS)	0
Cone (Pc)		Penetrometer (SPT)	25
Vane (V)		Disturbed (DS)	25
		Water Sample (WS)	0

Commencement Date : 11/10/2020
Completion Date : 12/10/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 34.831 M.
Water Struck At :
Standing Water Level :

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES Ref. No	SAMPLES Depth (m)
0.00m. Filled up by boulders with fly ash & sand.						DS-1	0.50
0.80m.		1	1	2	3	SPT-1	1.00-1.45
Soft, deep grey, silty clay with traces of kankar.						DS-2	2.00
		2	2	2	4	SPT-2	2.50-2.95
						DS-3	3.50
4.00m.		2	3	2	5	SPT-3	4.00-4.45
						DS-4	5.00
		2	3	3	6	SPT-4	5.50-5.95
Medium, light yellowish brown, silty clay / clayey silt with traces of kankar.						DS-5	6.50
		3	2	3	5	SPT-5	7.00-7.45
						DS-6	8.00
		3	4	4	8	SPT-6	8.50-8.95
						DS-7	9.50
10.00m.		4	5	6	11	SPT-7	10.00-10.45
Stiff, light yellowish brown, silty clay / clayey silt with traces of kankar.						DS-8	11.00
11.40m.		5	7	8	15	SPT-8	11.50-11.95
						DS-9	12.50
		8	8	8	16	SPT-9	13.00-13.45
						DS-10	14.00
Very stiff, yellowish brown, clayey silt with traces of sand mixture. Observed kankar.		7	10	10	20	SPT-10	14.50-14.95
						DS-11	15.50
		6	8	9	17	SPT-11	16.00-16.45
						DS-12	17.00
		8	9	9	18	SPT-12	17.50-17.95
18.60m.						DS-13	18.50

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 22/10/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO. CHST1(R2) | Co-ordinates E=3051.000 S=1920.000

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	25	Undisturbed (UDS)	0
Cone (Pc)		Penetrometer (SPT)	25
Vane (V)		Disturbed (DS)	25
		Water Sample (WS)	0

Commencement Date : 11/10/2020
Completion Date : 12/10/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 34.831 M.
Water Struck At :
Standing Water Level :

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)			SAMPLES	
					Ref. No	Depth (m)
18.60m / 18.70m. Very stiff, yellowish brown, clayey silt with traces of sand mixture. Observed kankar.		9	10	12	SPT-13	19.00-19.45
					DS-14	20.00
		10	12	12	SPT-14	20.50-20.95
Very stiff, brownish grey, silty clay with traces of sand mixture. Observed kankar.					DS-15	21.50
		9	12	13	SPT-15	22.00-22.45
					DS-16	23.00
23.30m.		10	11	15	SPT-16	23.50-23.95
					DS-17	24.50
		10	12	15	SPT-17	25.00-25.45
					DS-18	26.00
Very stiff, yellowish brown, clayey silt with grey patches & sand mixture.		11	13	15	SPT-18	26.50-26.95
					DS-19	27.50
		10	12	15	SPT-19	28.00-28.45
					DS-20	29.00
		11	13	17	SPT-20	29.50-29.95
					DS-21	30.50
31.00m.		12	15	18	SPT-21	31.00-31.45
Hard, yellowish brown, clayey silt with grey patches & sand mixture.					DS-22	32.00
32.50m.		11	16	20	SPT-22	32.50-32.95
					DS-23	33.50
		12	17	21	SPT-23	34.00-34.45
Hard, brownish grey, silty clay with traces of kankar & sand mixture.					DS-24	35.00
		13	17	20	SPT-24	35.50-35.95
					DS-25	36.30
36.95m.		12	19	20	SPT-25	36.50-36.95

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 13/10/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO. CHST2 | Co-ordinates E=3398.000 S=1700.000

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	24	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	24
Vane (V)		Disturbed (DS)	16
		Water Sample (WS)	0

Commencement Date : 08/10/2020
Completion Date : 10/10/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.588 M.
Water Struck At :
Standing Water Level :

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES Ref. No	SAMPLES Depth (m)
0.00m. Filled up soil consists of silty clay with boulders.						DS-1	0.50
0.80m.		1	1	2	3	SPT-1	1.00-1.45
						DS-2	2.00
Soft, deep grey, clayey silt with sand mixture.		2	2	2	4	UDS-1 SPT-2	2.50-2.95 2.95-3.40
						DS-3	4.00
		2	2	2	4	SPT-3	4.50-4.95
5.20m.						UDS-2	5.50-5.95
Medium, brownish grey, silty clay / clayey silt with traces of kankar.		2	3	2	5	SPT-4	5.95-6.40
						DS-4	7.00
7.50m.		3	4	4	8	SPT-5	7.50-7.95
Stiff, deep grey, clayey silt with traces of sand mixture.						UDS-3	8.50-8.95
8.95m.		4	5	6	11	SPT-6	8.95-9.40
Stiff to very stiff, light grey, sandy silt with mica. Observed siltstone.						DS-5	10.00
		8	8	7	15	SPT-7	10.50-10.95
11.00m.						UDS-4	11.50-11.95
		6	8	10	18	SPT-8	11.95-12.40
						DS-6	13.00
		7	10	12	22	SPT-9	13.50-13.95
Very stiff, brownish grey, silty clay / clayey silt with sand mixture & rusty spots.						*UDS-5	14.50-14.95
		8	12	13	25	SPT-10	15.10-15.55
						DS-7	16.00
		10	14	15	29	SPT-11	16.50-16.95
17.95m.						UDS-6	17.50-17.95
		11	15	17	32	SPT-12	17.95-18.40
18.60m.							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 13/10/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO. CHST2 | Co-ordinates E=3398.000 S=1700.000

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	24	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	24
Vane (V)		Disturbed (DS)	16
		Water Sample (WS)	0

Commencement Date : 08/10/2020
Completion Date : 10/10/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.588 M.
Water Struck At :
Standing Water Level :

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)	SAMPLES Ref. No	SAMPLES Depth (m)
18.60m				
Hard, brownish grey, silty clay / clayey silt with sand mixture & rusty spots.		12 15 21 — 36	DS-8	19.00
			SPT-13	19.50-19.95
			*UDS-7	20.50-20.62
		13 17 23 — 40	SPT-14	21.00-21.45
22.00m			DS-9	22.00
		13 17 20 — 37	SPT-15	22.50-22.95
			*UDS-8	23.50-23.60
		15 18 22 — 40	SPT-16	24.00-24.45
			DS-10	25.00
		16 19 23 — 42	SPT-17	25.50-25.95
			*UDS-9	26.50-26.63
Hard, greyish brown, clayey sandy silt / silty clay. Observed rusty spots.		17 21 24 — 45	SPT-18	27.00-27.45
			DS-11	28.00
		18 23 25 — 48	SPT-19	28.50-28.95
			DS-12	29.50
		16 22 23 — 45	SPT-20	30.00-30.45
			DS-13	31.00
		17 23 25 — 48	SPT-21	31.50-31.95
			DS-14	32.50
33.00m		18 24 26 — 50	SPT-22	33.00-33.45
			DS-15	34.00
Hard, yellowish grey, clayey silt with rusty spots & traces of mica.		16 22 24 — 46	SPT-23	34.50-34.95
			DS-16	35.50
N.B. - '*' means sample could not be recovered.		15 24 30 — 54	SPT-24	36.50-36.95
36.95m				

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 22/10/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO. CHST2(R1) | Co-ordinates E=3398.000 S=1703.000

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	24	Undisturbed (UDS)	0
Cone (Pc)		Penetrometer (SPT)	24
Vane (V)		Disturbed (DS)	25
		Water Sample (WS)	0

Commencement Date : 11/10/2020
Completion Date : 12/10/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.588 M.
Water Struck At :
Standing Water Level :

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES	
						Ref. No	Depth (m)
0.00m. Filled up soil consists of blackish grey, clayey silt with brick bats & boulders. 0.70m.						DS-1	0.50
		1	1	2	3	SPT-1	1.00-1.45
						DS-2	2.00
		2	2	2	4	SPT-2	2.50-2.95
Soft to medium, brownish grey, silty clay with rusty spots.						DS-3	3.50
		2	2	3	5	SPT-3	4.00-4.45
						DS-4	5.00
		2	2	2	4	SPT-4	5.50-5.95
6.50m.						DS-5	6.50
Medium, brownish grey, silty clay / clayey silt with traces of kankar.		2	3	3	6	SPT-5	7.00-7.45
						DS-6	8.00
8.50m.		4	5	5	10	SPT-6	8.50-8.95
						DS-7	9.50
		4	5	6	11	SPT-7	10.00-10.45
Stiff, brownish grey, silty clay / clayey silt with traces of kankar.						DS-8	11.00
		6	6	7	13	SPT-8	11.50-11.95
						DS-9	12.50
13.00m.		7	10	10	20	SPT-9	13.00-13.45
						DS-10	14.00
		8	12	13	25	SPT-10	14.50-14.95
Very stiff, greyish brown, silty clay / clayey silt with sand mixture & rusty spots.						DS-11	15.50
		10	13	14	27	SPT-11	16.00-16.45
						DS-12	17.00
		11	14	16	30	SPT-12	17.50-17.95
18.60m.						DS-13	18.50

BH-21/Sheet-1

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 22/10/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO. CHST2(R1) | Co-ordinates E=3398.000 S=1703.000

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	24	Undisturbed (UDS)	0
Cone (Pc)		Penetrometer (SPT)	24
Vane (V)		Disturbed (DS)	25
		Water Sample (WS)	0

Commencement Date : 11/10/2020
Completion Date : 12/10/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.588 M.
Water Struck At :
Standing Water Level :

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES	
						Ref. No	Depth (m)
18.60m. Very stiff, greyish brown, silty clay / clayey silt with sand mixture & rusty spots. 19.00m.		12	15	17	32	SPT-13	19.00-19.45
						DS-14	20.00
		13	16	18	34	SPT-14	20.50-20.95
Hard, greyish brown, silty clay / clayey silt with sand mixture & rusty spots.						DS-15	21.50
		11	14	16	30	SPT-15	22.00-22.45
						DS-16	23.00
23.50m.		13	17	18	35	SPT-16	23.50-23.95
						DS-17	24.50
		14	18	20	38	SPT-17	25.00-25.45
						DS-18	26.00
Hard, greyish brown, clayey sandy silt / silty clay.		15	19	23	42	SPT-18	26.50-26.95
						DS-19	27.50
		16	21	25	46	SPT-19	28.00-28.45
						DS-20	29.00
		17	22	27	49	SPT-20	29.50-29.95
						DS-21	30.50
31.00m.		18	23	28	51	SPT-21	31.00-31.45
						DS-22	32.00
		16	21	26	47	SPT-22	32.50-32.95
						DS-23	33.50
Hard, yellowish grey, clayey silt with kankar & rusty spots. Observed traces of kankar.		15	20	25	45	SPT-23	34.00-34.45
						DS-24	35.00
						DS-25	36.00
		10	22	28	50	SPT-24	36.50-36.95
36.95m.							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 22/10/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO.CHST2(R2) | Co-ordinates E=3398.000 S=1706.000

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	24	Undisturbed (UDS)	0
Cone (Pc)		Penetrometer (SPT)	24
Vane (V)		Disturbed (DS)	25
		Water Sample (WS)	0

Commencement Date : 13/10/2020
Completion Date : 14/10/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.588 M.
Water Struck At :
Standing Water Level :

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES	
						Ref. No	Depth (m)
0.00m. Filled up soil consists of blackish grey, silty clay with brick bats & boulder pcs. 0.75m.						DS-1	0.50
		1	1	2	3	SPT-1	1.00-1.45
						DS-2	2.00
		2	2	2	4	SPT-2	2.50-2.95
						DS-3	3.50
Soft to medium, brownish grey, silty clay with rusty spots.		2	2	3	5	SPT-3	4.00-4.45
						DS-4	5.00
		2	2	2	4	SPT-4	5.50-5.95
						DS-5	6.50
7.00m.		2	2	3	5	SPT-5	7.00-7.45
Medium, brownish grey, silty clay with kankar.						DS-6	8.00
8.50m.		4	4	5	9	SPT-6	8.50-8.95
						DS-7	9.50
		4	5	5	10	SPT-7	10.00-10.45
						DS-8	11.00
Stiff, brownish grey, silty clay with kankar.		5	6	6	12	SPT-8	11.50-11.95
						DS-9	12.50
		6	7	8	15	SPT-9	13.00-13.45
14.00m.						DS-10	14.00
		8	9	12	21	SPT-10	14.50-14.95
						DS-11	15.50
Very stiff, greyish brown, silty clay / clayey silt with sand mixture & rusty spots.		9	11	13	24	SPT-11	16.00-16.45
						DS-12	17.00
		10	14	17	31	SPT-12	17.50-17.95
18.60m.						DS-13	18.50

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 22/10/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO. CHST2(R2) | Co-ordinates E=3398.000 S=1706.000

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	24	Undisturbed (UDS)	0
Cone (Pc)		Penetrometer (SPT)	24
Vane (V)		Disturbed (DS)	25
		Water Sample (WS)	0

Commencement Date : 13/10/2020
Completion Date : 14/10/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.588 M.
Water Struck At :
Standing Water Level :

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES	
						Ref. No	Depth (m)
18.60m.							
Very stiff, greyish brown, silty clay / clayey silt with sand mixture & rusty spots.		10	12	15	27	SPT-13	19.00-19.45
						DS-14	20.00
20.50m.		12	14	17	31	SPT-14	20.50-20.95
						DS-15	21.50
		14	16	19	35	SPT-15	22.00-22.45
						DS-16	23.00
		13	15	18	33	SPT-16	23.50-23.95
						DS-17	24.50
Hard, greyish brown, silty clay / clayey silt with sand mixture & rusty spots.		14	16	19	35	SPT-17	25.00-25.45
						DS-18	26.00
		15	18	21	39	SPT-18	26.50-26.95
						DS-19	27.50
		17	20	22	42	SPT-19	28.00-28.45
						DS-20	29.00
30.00m.		19	22	23	45	SPT-20	29.50-29.95
						DS-21	30.50
		20	23	24	47	SPT-21	31.00-31.45
						DS-22	32.00
		22	25	26	51	SPT-22	32.50-32.95
Hard, yellowish grey, sandy silt with traces of rusty spot. Observed traces of mica.						DS-23	33.50
		20	24	25	49	SPT-23	34.00-34.45
						DS-24	35.00
						DS-25	36.00
		20	25	27	52	SPT-24	36.50-36.95
36.95m.							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 21/12/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO. CHST3 | Co-ordinates E=3829 S=1958

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	24	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	24
Vane (V)		Disturbed (DS)	16
		Water Sample (WS)	0

Commencement Date : 10/12/2020
Completion Date : 11/12/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.712 M.
Water Struck At :
Standing Water Level : 0.85 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES Ref. No	SAMPLES Depth (m)
0.00m.							
Filled up soil consists of clayey silt with boulder pcs.		6	2	5	7	DS-1	0.50
						SPT-1	1.00-1.45
1.80m.						DS-2	2.00
Medium, grey, clayey silt with sand mixture.		2	2	3	5	UDS-1	2.50-2.95
						SPT-2	3.00-3.45
						DS-3	4.00
4.30m.					9		
		2	5	4		SPT-3	4.50-4.95
					10	UDS-2	5.50-5.95
		3	5	5		SPT-4	5.95-6.40
Stiff, brownish grey, clayey silt with traces of kankar. Observed sand mixture.						DS-4	7.00
					13		
		4	6	7		SPT-5	7.50-7.95
					13	UDS-3	8.50-8.95
		5	5	8		SPT-6	8.95-9.40
9.50m.							
						DS-5	10.00
					18		
Very stiff, light yellowish brown, clayey silt / silty clay with sand mixture.		6	8	10		SPT-7	10.50-10.95
						*UDS-4	11.50-11.95
					20		
		5	8	12		SPT-8	12.05-12.50
12.70m.							
						DS-6	13.00
					20		
		6	9	11		SPT-9	13.50-13.95
					23	UDS-5	14.50-14.95
		7	10	13		SPT-10	14.95-15.40
Very stiff, yellowish brown, clayey silt with traces of sand mixture.						DS-7	16.00
					22		
		7	9	13		SPT-11	16.50-16.95
					24	UDS-6	17.50-17.95
		8	10	14		SPT-12	17.95-18.40
18.60m.							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 21/12/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO. CHST3 | Co-ordinates E=3829 S=1958

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	24	Undisturbed (UDS)	9
Cone (Pc)		Penetrometer (SPT)	24
		Disturbed (DS)	16
Vane (V)		Water Sample (WS)	0

Commencement Date : 10/12/2020
Completion Date : 11/12/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.712 M.
Water Struck At :
Standing Water Level : 0.85 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES Ref. No	SAMPLES Depth (m)
						DS-8	19.00
		7	10	17	27	SPT-13	19.50-19.95
Very stiff, yellowish brown, clayey silt with traces of sand mixture.						*UDS-7	20.50-20.95
		8	12	14	26	SPT-14	21.00-21.45
						DS-9	22.00
18.60m.							
		9	13	18	31	SPT-15	22.50-22.95
						*UDS-8	23.50-23.63
		10	15	22	37	SPT-16	24.00-24.45
						DS-10	25.00
Dense, light yellowish brown, silty sand with clay binder. Observed kankar.		11	14	24	38	SPT-17	25.50-25.95
						*UDS-9	26.50-26.59
		10	14	27	41	SPT-18	27.00-27.45
						DS-11	28.00
		12	16	27	43	SPT-19	28.50-28.95
						DS-12	29.50
29.80m.							
		13	18	29	47	SPT-20	30.00-30.45
						DS-13	31.00
		13	21	32	53	SPT-21	31.50-31.95
						DS-14	32.50
Hard, brownish grey, clayey silt with sand mixture. Observed concretion of silt.		15	23	35	58	SPT-22	33.00-33.45
						DS-15	34.00
		16	24	36	60	SPT-23	34.50-34.95
						DS-16	35.80
N.B. - '*' means sample could not be recovered.		20	26	38	64	SPT-24	36.50-36.95
36.95m.							

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4388	Created by : SKD	Created on : 21/12/2020	Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO. CHST3(R1) | Co-ordinates E=3826 S=1958

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	25	Undisturbed (UDS)	0
Cone (Pc)		Penetrometer (SPT)	25
Vane (V)		Disturbed (DS)	25
		Water Sample (WS)	0

Commencement Date : 12/12/2020
Completion Date : 13/12/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.712 M.
Water Struck At :
Standing Water Level : 0.8 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES	
						Ref. No	Depth (m)
0.00m.							
Filled up soil consists of clayey silt with boulder pcs.		5	3	8	11	DS-1	0.50
						SPT-1	1.00-1.45
1.70m.						DS-2	2.00
Medium, grey, clayey silt with traces of sand mixture.		2	2	2	4	SPT-2	2.50-2.95
						DS-3	3.50
		2	3	2	5	SPT-3	4.00-4.45
4.50m.						DS-4	5.00
		4	4	4	8	SPT-4	5.50-5.95
Stiff, light brownish grey, clayey silt with traces of sand mixture. Observed kankar.						DS-5	6.50
		3	4	6	10	SPT-5	7.00-7.45
						DS-6	8.00
		4	6	8	14	SPT-6	8.50-8.95
9.60m.						DS-7	9.50
		6	8	8	16	SPT-7	10.00-10.45
Very stiff, yellowish brown, silty clay / clayey silt. Observed sand mixture.						DS-8	11.00
		5	7	9	16	SPT-8	11.50-11.95
12.50m.						DS-9	12.50
		6	9	10	19	SPT-9	13.00-13.45
						DS-10	14.00
		7	8	12	20	SPT-10	14.50-14.95
Very stiff, light yellowish brown, clayey silt with traces of sand mixture.						DS-11	15.50
		6	9	14	23	SPT-11	16.00-16.45
						DS-12	17.00
		7	12	17	29	SPT-12	17.50-17.95
18.60m.						DS-13	18.50

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 21/12/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO. CHST3(R1) | Co-ordinates E=3826 S=1958

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	25	Undisturbed (UDS)	0
Cone (Pc)		Penetrometer (SPT)	25
Vane (V)		Disturbed (DS)	25
		Water Sample (WS)	0

Commencement Date : 12/12/2020
Completion Date : 13/12/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.712 M.
Water Struck At :
Standing Water Level : 0.8 m.

DESCRIPTION	SYMBOL	N-VALUE EACH DIVN. = 15cm				SAMPLES Ref. No	SAMPLES Depth (m)
18.60m.					30		
Very stiff, light yellowish brown, clayey silt with traces of sand mixture.		7	12	18		SPT-13	19.00-19.45
						DS-14	20.00
					29		
		6	11	18		SPT-14	20.50-20.95
						DS-15	21.50
22.00m.					34		
Hard, light yellowish brown, clayey silt with traces of sand mixture.		7	13	21		SPT-15	22.00-22.45
23.00m.						DS-16	23.00
					35		
		9	15	20		SPT-16	23.50-23.95
						DS-17	24.50
					37		
		10	14	23		SPT-17	25.00-25.45
Dense, yellowish brown, silty sand with clay binder. Observed kankar.						DS-18	26.00
					40		
		11	15	25		SPT-18	26.50-26.95
						DS-19	27.50
					39		
		12	15	24		SPT-19	28.00-28.45
						DS-20	29.00
29.50m.					42		
		13	17	25		SPT-20	29.50-29.95
						DS-21	30.50
					46		
		12	19	27		SPT-21	31.00-31.45
						DS-22	32.00
					51		
		13	21	30		SPT-22	32.50-32.95
Hard, brownish grey, clayey silt with sand mixture. Observed concretion of silt.						DS-23	33.50
					58		
		14	24	34		SPT-23	34.00-34.45
						DS-24	35.00
					60		
		15	23	37		SPT-24	35.50-35.95
						DS-25	36.20
					68		
36.95m.		19	28	40		SPT-25	36.50-36.95

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 21/12/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO. CHST3(R2) | Co-ordinates E=3823 S=1958

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	25	Undisturbed (UDS)	0
Cone (Pc)		Penetrometer (SPT)	25
Vane (V)		Disturbed (DS)	25
		Water Sample (WS)	0

Commencement Date : 13/12/2020
Completion Date : 15/12/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.712 M.
Water Struck At :
Standing Water Level : 0.85 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)				SAMPLES Ref. No	SAMPLES Depth (m)
0.00m.							
Filled up soil consists of clayey silt with scrap materials.		2	1	4	5	DS-1	0.50
						SPT-1	1.00-1.45
2.00m.						DS-2	2.00
Medium, light brownish grey, clayey silt with sand mixture.		1	2	2	4	SPT-2	2.50-2.95
						DS-3	3.50
		2	3	4	7	SPT-3	4.00-4.45
4.50m.						DS-4	5.00
Medium, brownish grey, clayey silt / silty clay with traces of sand mixture.		2	3	3	6	SPT-4	5.50-5.95
						DS-5	6.50
		3	4	3	7	SPT-5	7.00-7.45
						DS-6	8.00
8.50m.		3	4	6	10	SPT-6	8.50-8.95
						DS-7	9.50
Stiff, yellowish brown, silty clay / clayey silt. Observed sand mixture.		3	5	7	12	SPT-7	10.00-10.45
						DS-8	11.00
		4	6	7	13	SPT-8	11.50-11.95
12.50m.						DS-9	12.50
		6	8	8	16	SPT-9	13.00-13.45
						DS-10	14.00
		8	10	12	22	SPT-10	14.50-14.95
Very stiff, yellowish brown, clayey silt with traces of sand mixture.						DS-11	15.50
		7	10	11	21	SPT-11	16.00-16.45
						DS-12	17.00
		8	12	14	26	SPT-12	17.50-17.95
18.60m.						DS-13	18.50

BH-32/Sheet-1

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar — CETEST

Job No : 4388 | Created by : SKD | Created on : 21/12/2020 | Sheet No:

BORE LOG DATA SHEET

BORE HOLE NO. CHST3(R2) | Co-ordinates E=3823 S=1958

Field Test	Nos	Samples	Nos
Penetrometer (SPT)	25	Undisturbed (UDS)	0
Cone (Pc)		Penetrometer (SPT)	25
		Disturbed (DS)	25
Vane (V)		Water Sample (WS)	0

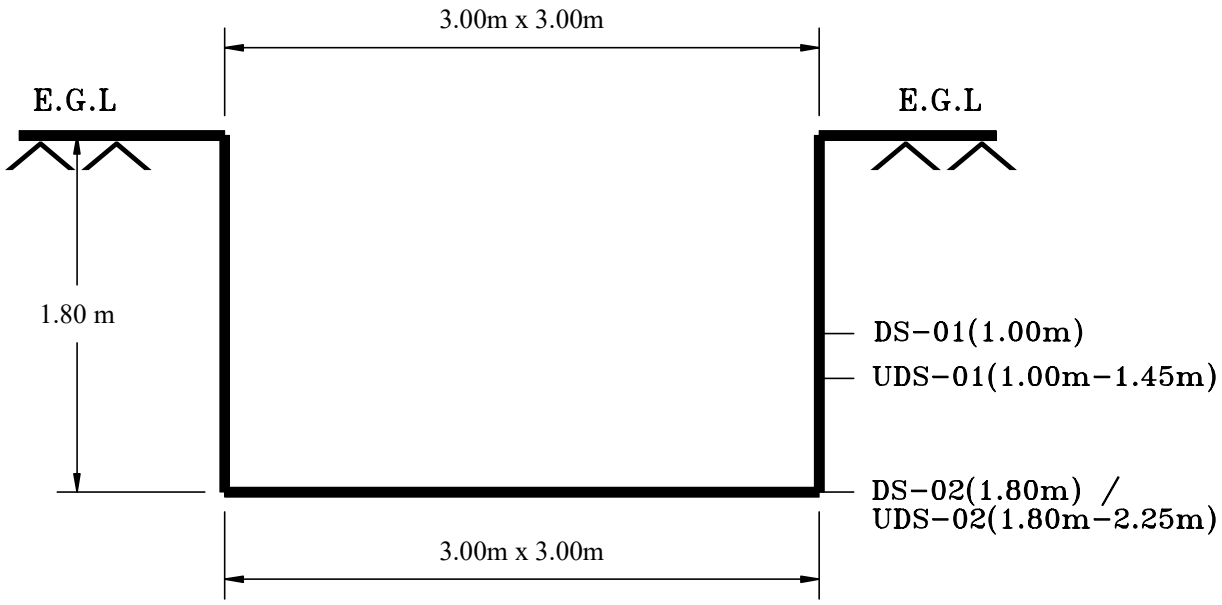
Commencement Date : 13/12/2020
Completion Date : 15/12/2020
Bore Hole Diameter : 150 mm.
Level Of Ground : 36.712 M.
Water Struck At :
Standing Water Level : 0.85 m.

DESCRIPTION	SYMBOL	N-VALUE (EACH DIVN. = 15cm)	SAMPLES Ref. No	SAMPLES Depth (m)
18.60m.				
Very stiff, yellowish brown, clayey silt with traces of sand mixture.		8 13 16 — 29	SPT-13	19.00-19.45
			DS-14	20.00
		8 12 16 — 28	SPT-14	20.50-20.95
			DS-15	21.50
22.00m.		9 14 17 — 31	SPT-15	22.00-22.45
Hard, yellowish brown, clayey silt with traces of sand mixture.			DS-16	23.00
23.20m.		9 16 19 — 35	SPT-16	23.50-23.95
			DS-17	24.50
		11 18 24 — 42	SPT-17	25.00-25.45
Dense, yellowish brown, silty sand with clay binder. Observed kankar.			DS-18	26.00
		13 17 25 — 42	SPT-18	26.50-26.95
			DS-19	27.50
		14 19 27 — 46	SPT-19	28.00-28.45
			DS-20	29.00
29.30m.		12 20 31 — 51	SPT-20	29.50-29.95
			DS-21	30.50
		13 28 30 — 58	SPT-21	31.00-31.45
			DS-22	32.00
		14 24 35 — 59	SPT-22	32.50-32.95
Hard, brownish grey, clayey silt with high % of sand mixture & kankar.			DS-23	33.50
		14 25 33 — 58	SPT-23	34.00-34.45
			DS-24	35.00
		15 26 31 — 57	SPT-24	35.50-35.95
			DS-25	36.00
		17 28 32 — 60	SPT-25	36.50-36.95
36.95m.				

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4 3 8 8	Created by : S K D	Created on : 22/10/2020	Sheet No:

Co-ordinates:
E = 3340.000
S = 1683.000
RL = 37.318 M

SWL = 1.80m.



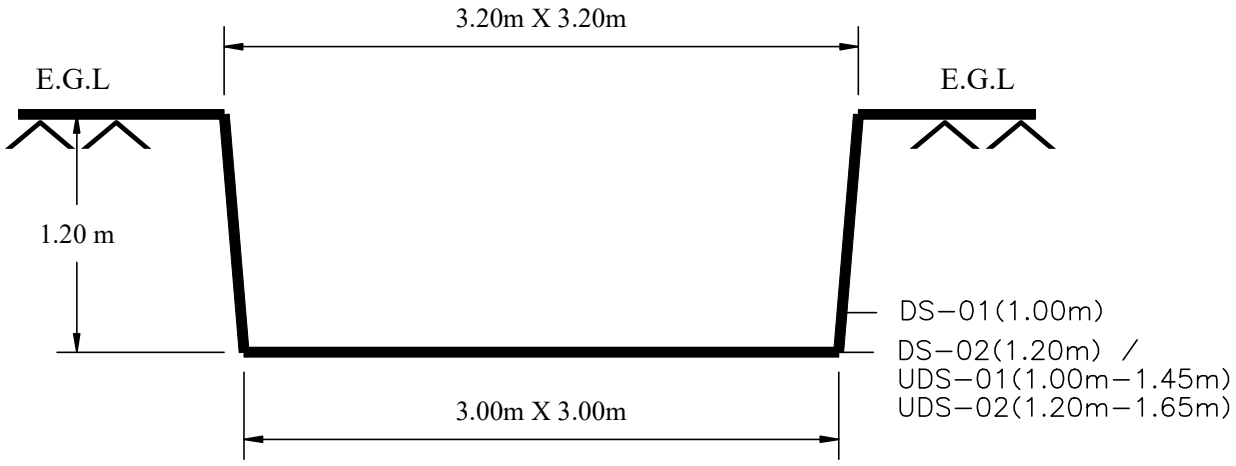
EGL-1.80m:- Blackish grey, clayey silt with coal pcs., sand & boulder pcs.

PIT LOG OF PLT-01 AT TP-07

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4 3 8 8	Created by : S K D	Created on : 04/01/2021	Sheet No:

Co-ordinates:
E = 3925.000
S = 2087.000
RL = 36.470M

SWL = 1.20m.

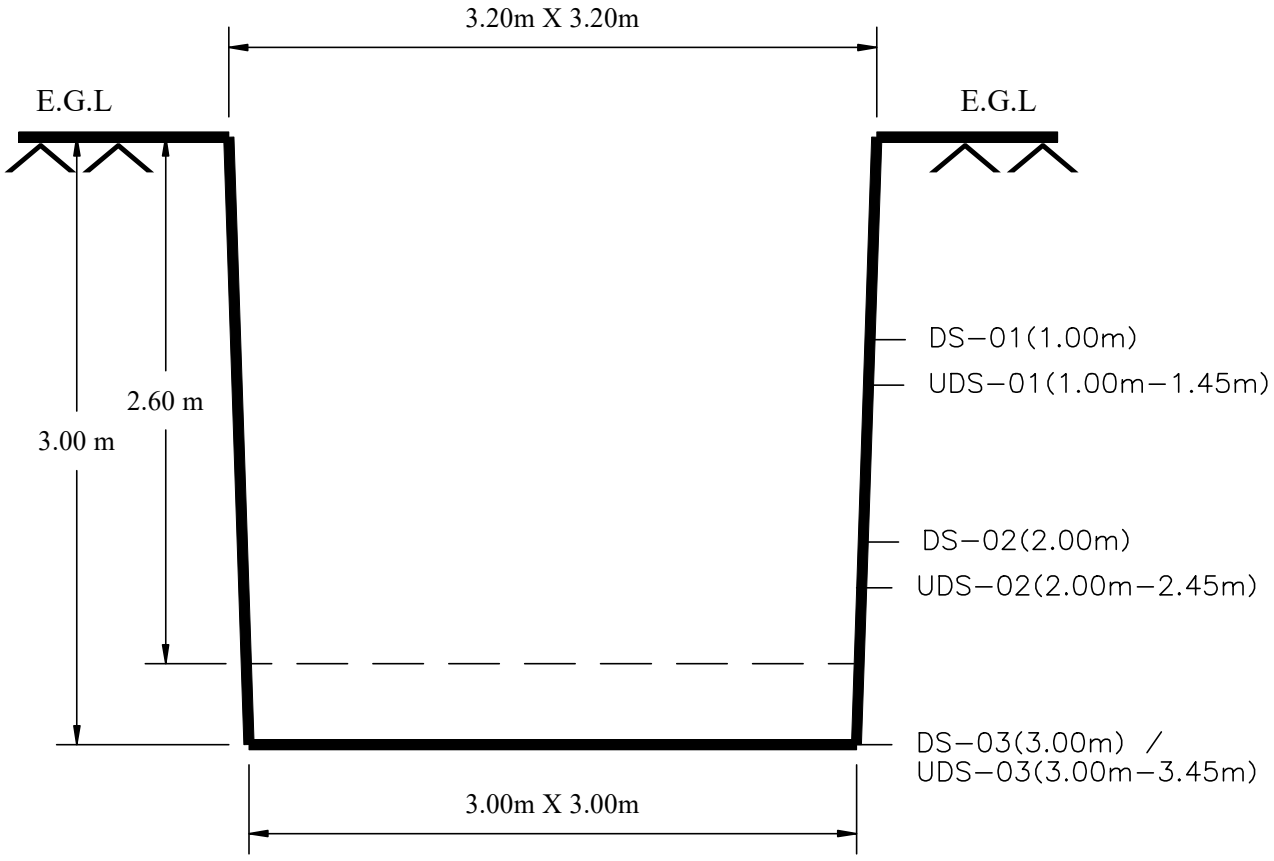


EGL-1.20m:- Blackish grey, clayey silt with sand mixture, ash & kankar.

PIT LOG OF PLT-02 AT ITP-01

Co-ordinates:
E = 3871.000
S = 1882.000
RL = 36.257M

SWL = 3.00m.



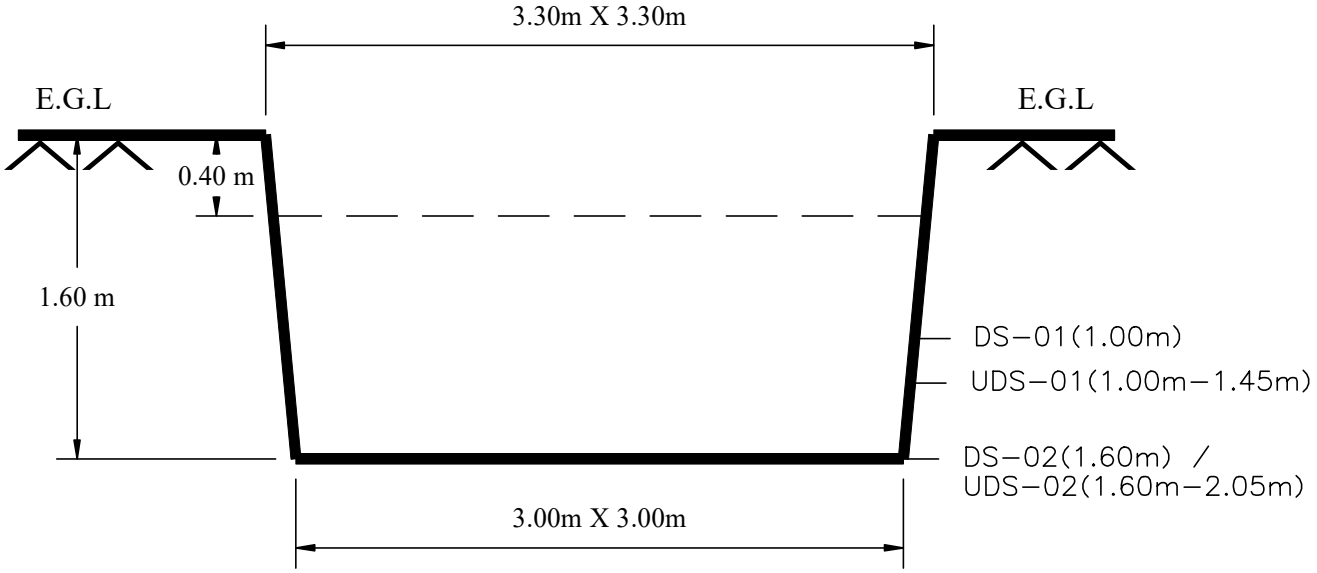
EGL-2.60m:-	Blackish grey, clayey silt with brick bats, coal pcs. & stone pcs.
2.60m-3.00m:-	Brownish grey, clayey silt with traces of sand mixture.

PIT LOG OF CPLT-01 AT TP-02

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4 3 8 8	Created by : S K D	Created on : 04/01/2021	Sheet No:

Co-ordinates:
E = 3186.980
S = 1919.554
RL = 34.908M

SWL = 1.50m.



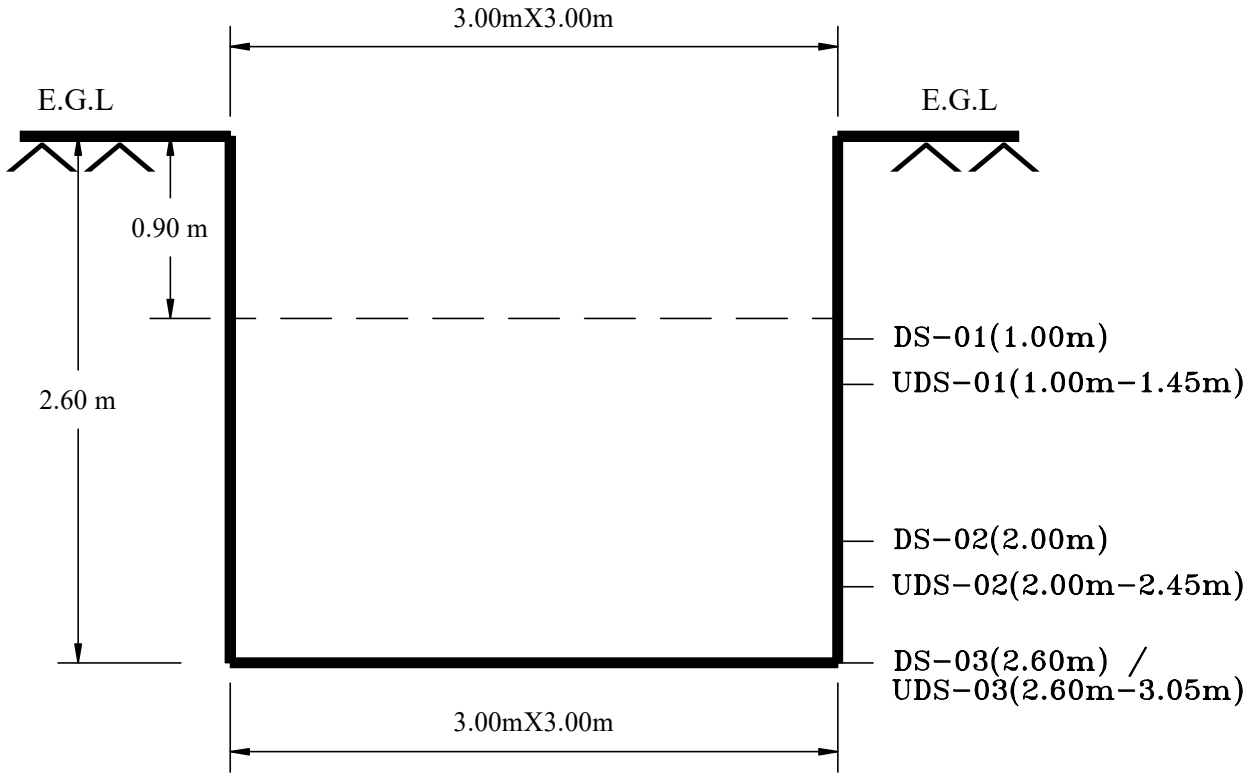
EGL-0.40m:-	Brownish grey, clayey silt with ash, boulders etc.
0.40m-1.60m:-	Brownish grey, clayey silt with traces of sand mixture.

PIT LOG OF CPLT-02 AT TP-04

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4 3 8 8	Created by : S K D	Created on : 22/10/2020	Sheet No:

Co-ordinates:
E = 3433.000
N = (-)1660.000
RL = 37.004 M

SWL = 2.60m.



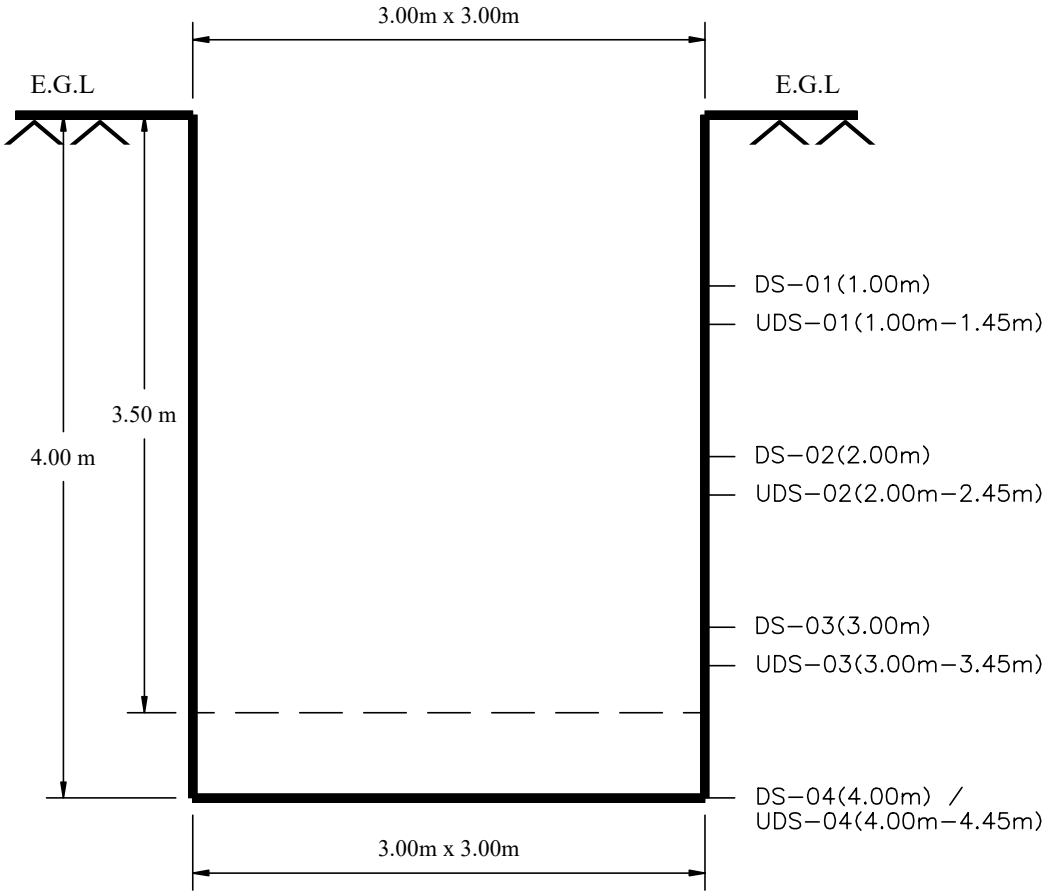
EGL-0.90m:-	Filled up soil consists of blackish grey, clayey silt with brick bats, coal pcs. & concrete pcs.
0.90m-2.60m:-	Brownish grey, clayey silt with sand mixture.

PIT LOG OF CPLT-03 AT TP-06

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			
Job No : 4 3 8 8	Created by : S K D	Created on : 22/10/2020	Sheet No:

Co-ordinates:
E = 3945.000
S = 1928.000
RL = 37.486M

SWL = 2.00m.



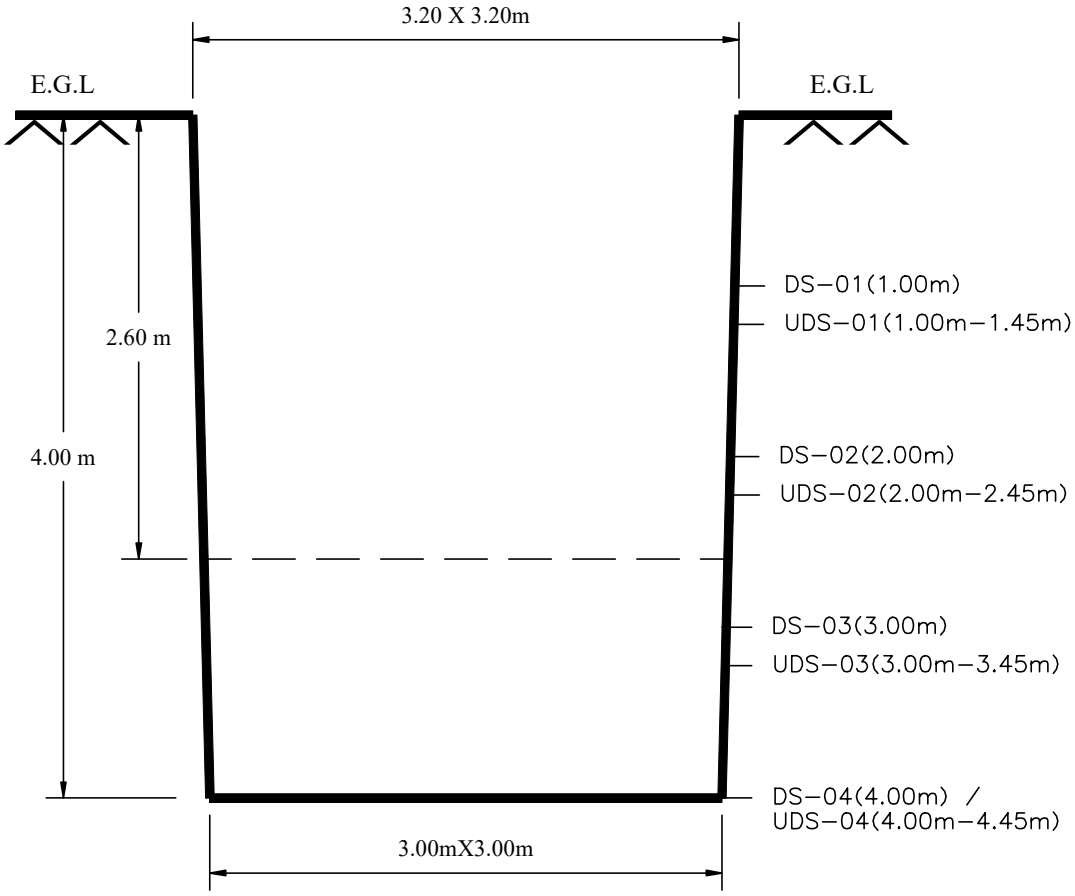
EGL-3.50m:-	Filled up soil consists of blackish grey, clayey silt with coal pcs., sand, iron pcs. & boulder pcs.
3.50m-4.00m:-	Yellowish brown, clayey silt with sand mixture.

PIT LOG OF TP-1

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4 3 8 8	Created by : S K D	Created on : 04/01/2021	Sheet No:

Co-ordinates:
E = 3871.000
S = 1882.000
RL = 36.257M

SWL = 3.00m.



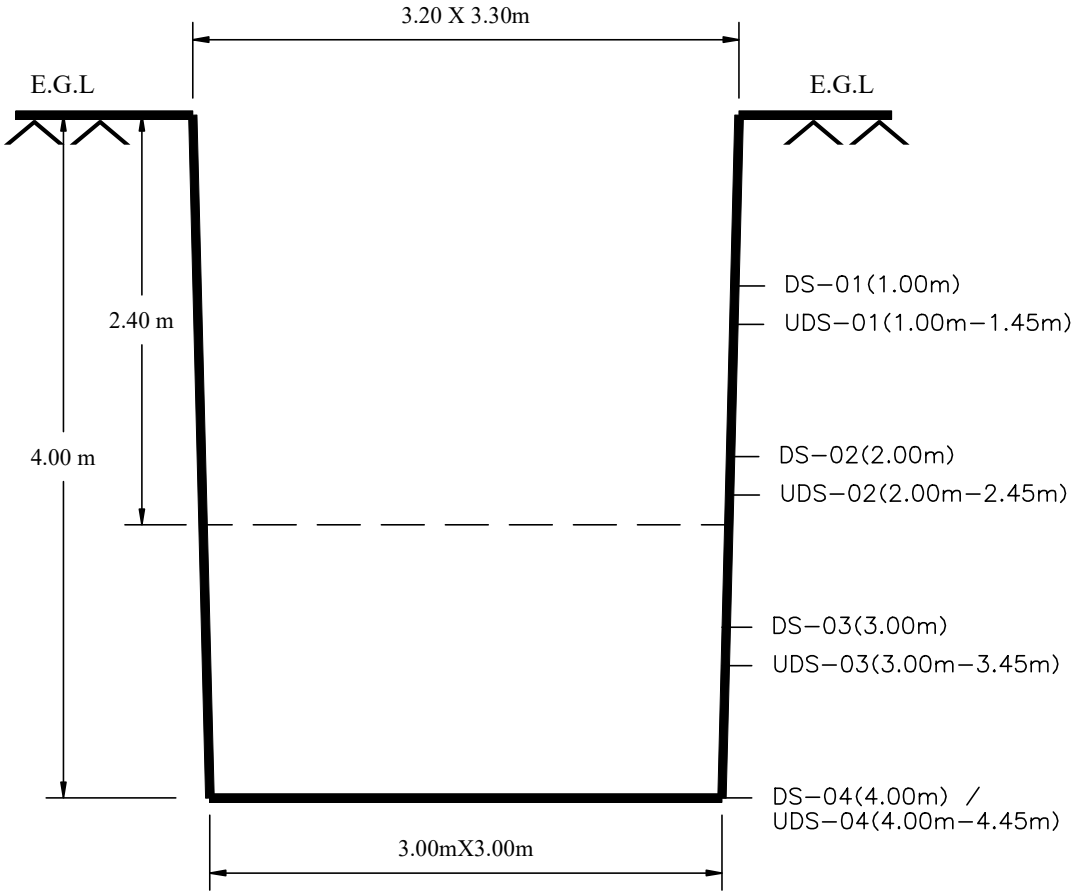
EGL-2.60m:-	Blackish grey, clayey silt with brick bats, coal pcs. & stone pcs.
2.60m-4.00m:-	Brownish grey, clayey silt with traces of sand mixture.

PIT LOG OF TP-2

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4 3 8 8	Created by : S K D	Created on : 04/01/2021	Sheet No:

Co-ordinates:
E = 3247.950
S = 1942.489
RL = 34.612M

SWL = 0.60m.



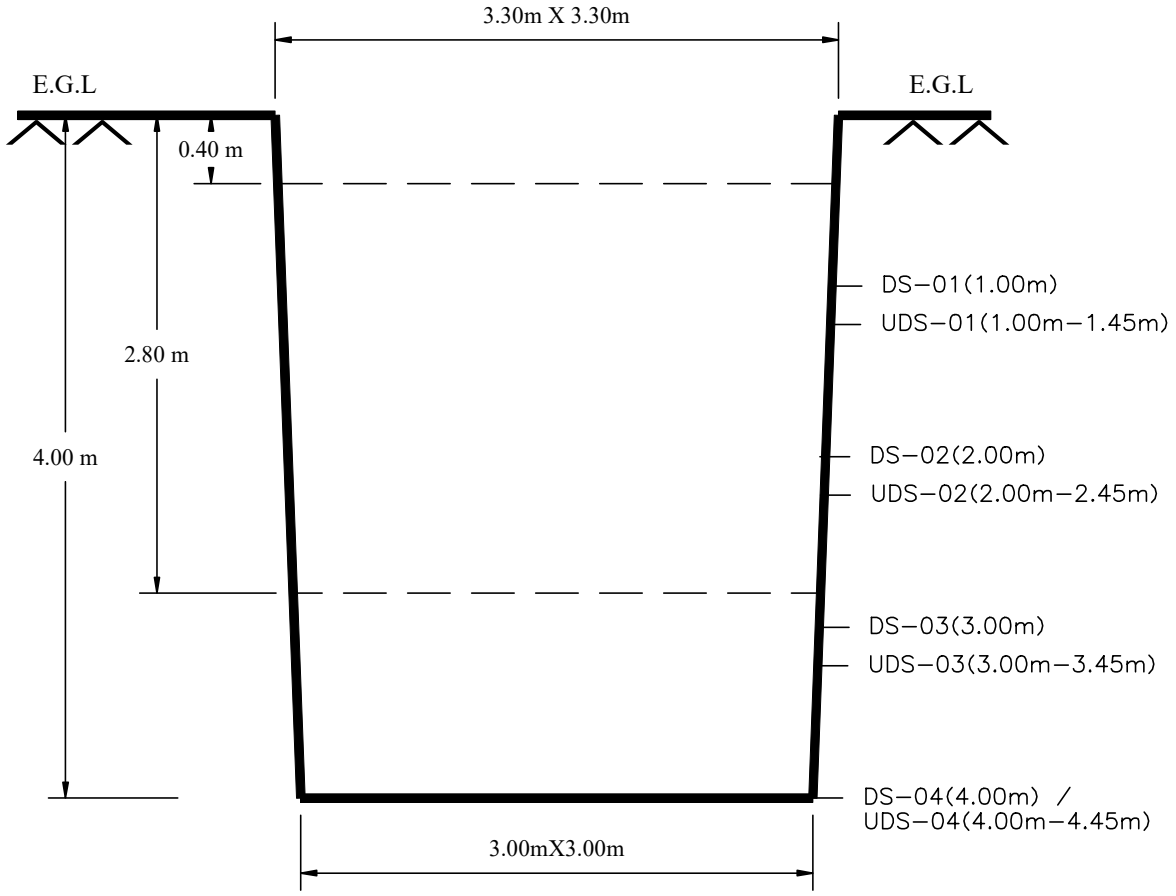
EGL-2.40m:-	Brownish grey, clayey silt with traces of kankar & sand mixture.
2.40m-4.00m:-	Yellowish grey, clayey silt. Observed sand mixture.

PIT LOG OF TP-3

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4 3 8 8	Created by : S K D	Created on : 04/01/2021	Sheet No:

Co-ordinates:
E = 3186.980
S = 1919.554
RL = 34.908M

SWL = 1.50m.



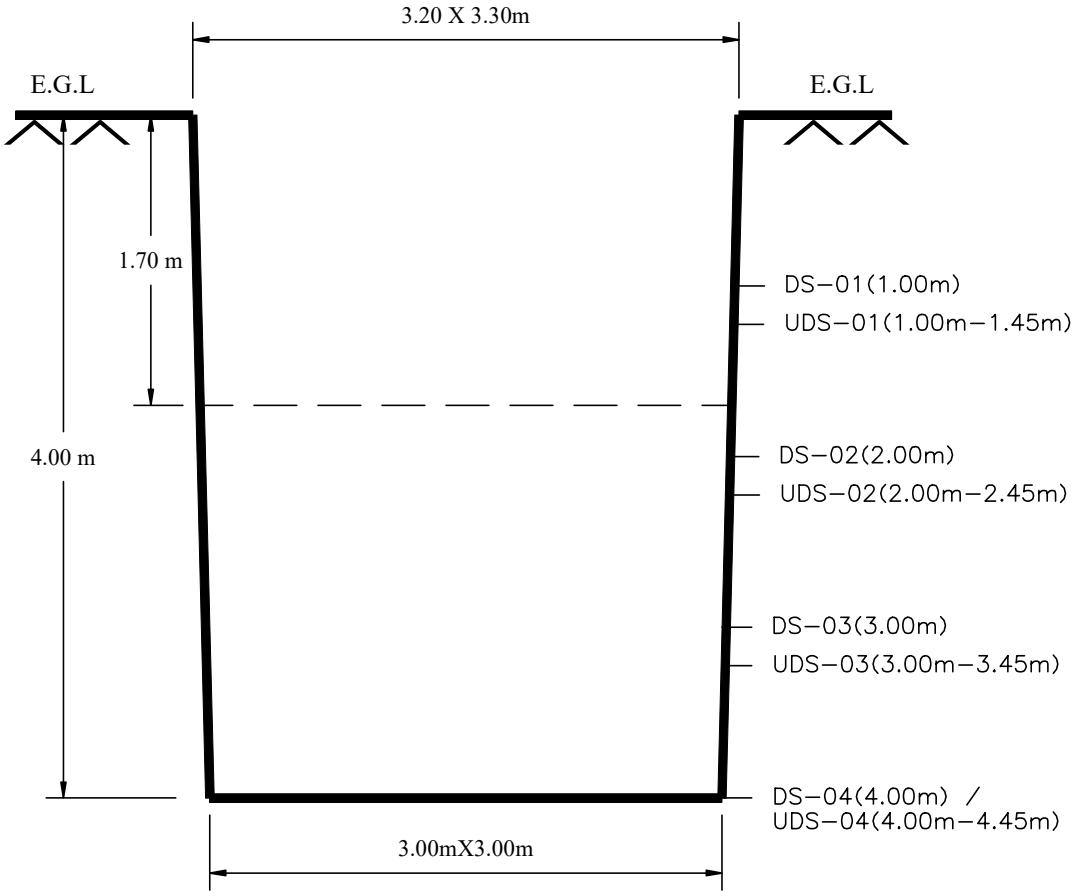
EGL-0.40m:-	Brownish grey, clayey silt with ash, boulders etc.
0.40m-2.80m:-	Brownish grey, clayey silt with traces of sand mixture.
2.80m-4.00m:-	Yellowish grey, clayey silt. Observed sand mixture.

PIT LOG OF TP-4

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4 3 8 8	Created by : S K D	Created on : 04/01/2021	Sheet No:

Co-ordinates:
E = 3014.000
S = 1975.000
RL = 35.028M

SWL = 0.80m.



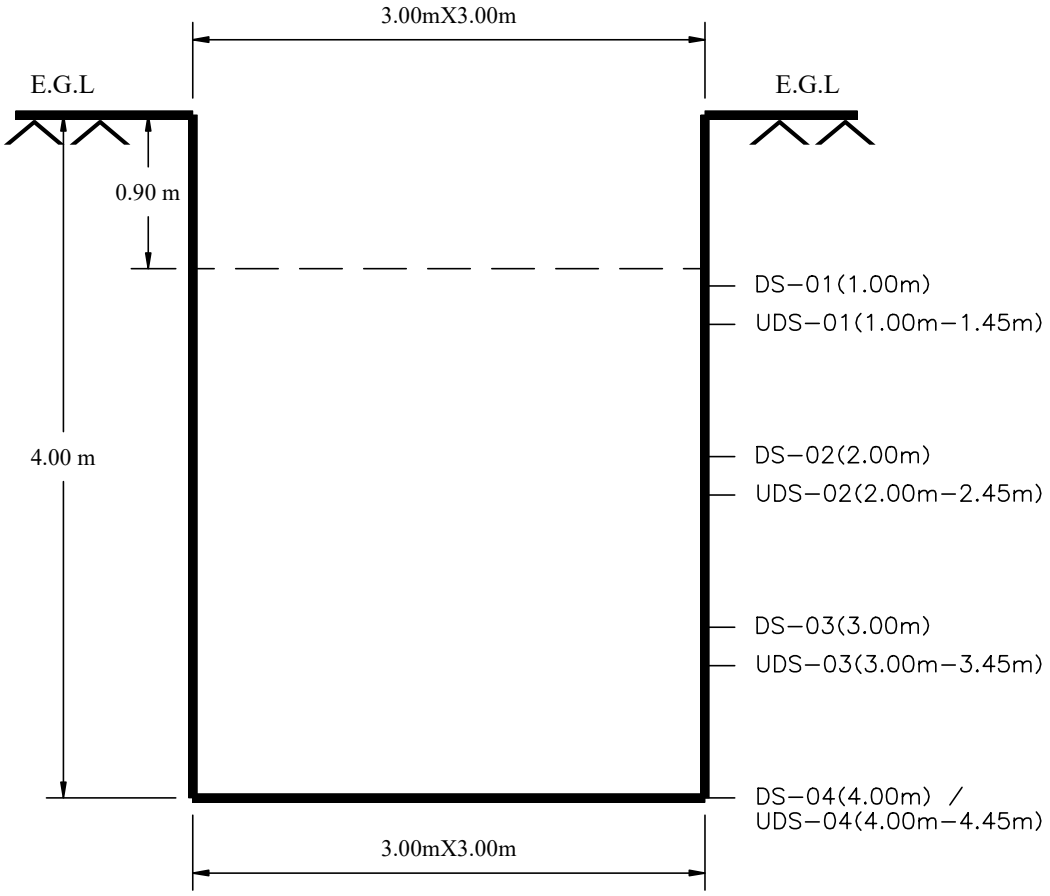
EGL-1.70m:-	Brownish grey, clayey silt with traces of sand mixture. Observed kankar & boulders.
1.70m-4.00m:-	Yellowish grey, clayey silt. Observed sand mixture.

PIT LOG OF TP-5

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4 3 8 8	Created by : S K D	Created on : 22/12/2020	Sheet No:

Co-ordinates:
E = 3433.000
S = 1660.000
RL = 37.004M

SWL = 2.60m.



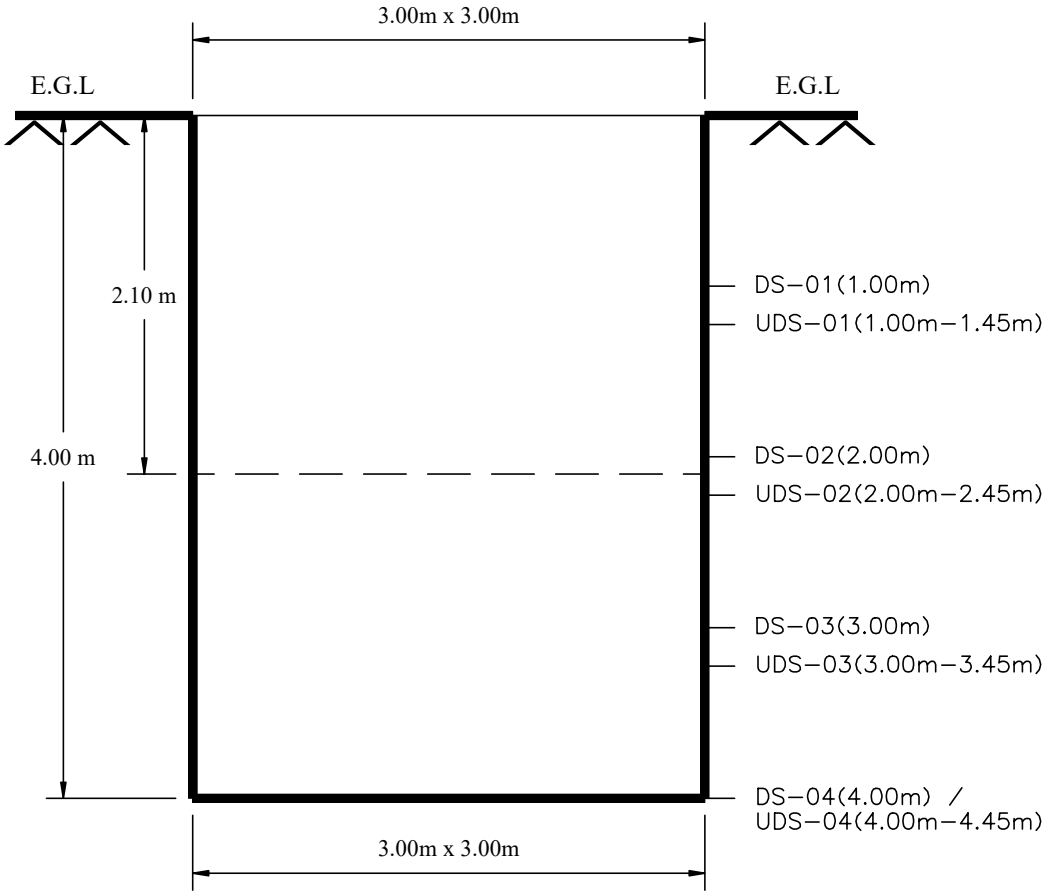
EGL-0.90m:-	Filled up soil consists of blackish grey, clayey silt with brick bats, coal pcs. & stone pcs.
0.90m-4.00m:-	Brownish grey, clayey silt with sand mixture.

PIT LOG OF TP-6

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4 3 8 8	Created by : S K D	Created on : 04/01/2021	Sheet No:

Co-ordinates:
E = 3340.000
S = 1683.000
RL = 37.318M

SWL = 1.20m.



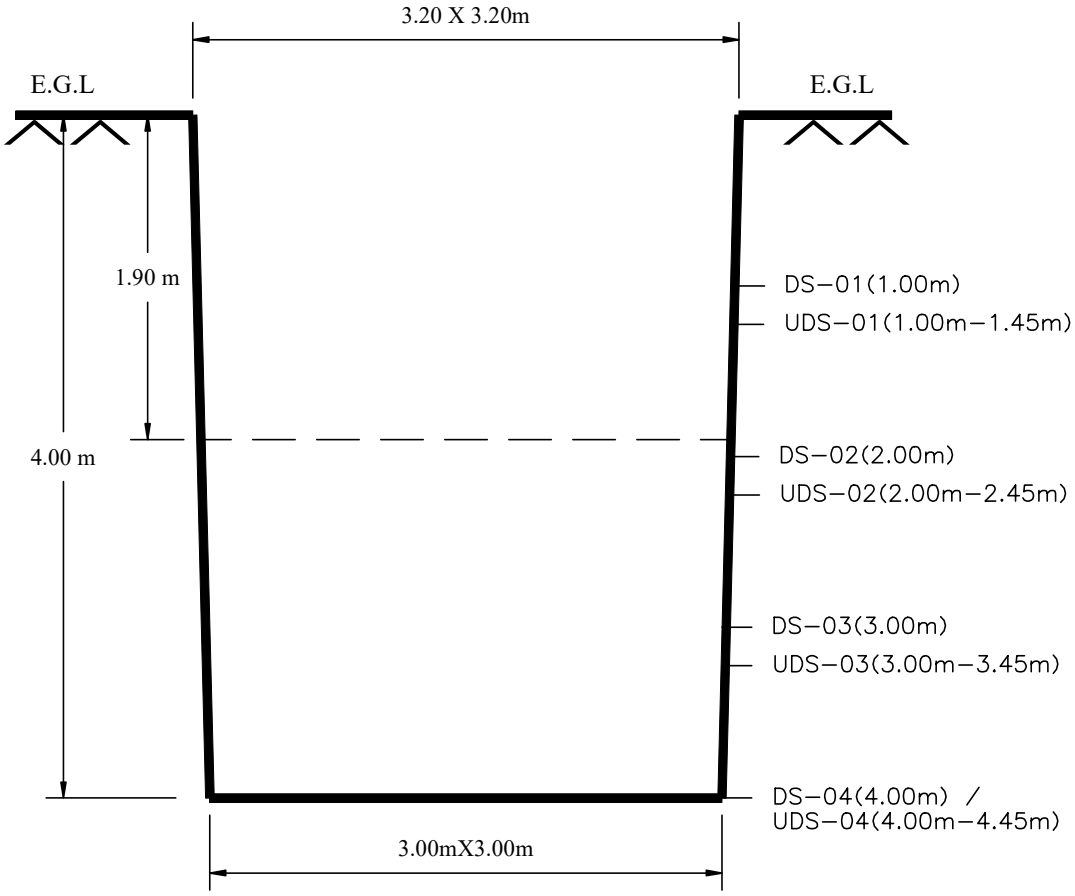
EGL-2.10m:-	Blackish grey, clayey silt with sand mixture, coal pieces & boulder.
2.10m-4.00m:-	Yellowish grey, clayey silt with sand mixture.

PIT LOG OF TP-7

Project : Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar			CETEST
Job No : 4 3 8 8	Created by : S K D	Created on : 04/01/2021	Sheet No:

Co-ordinates:
E = 3925.000
S = 2087.000
RL = 36.470M

SWL = 1.20m.



EGL–1.90m:–	Blackish grey, clayey silt with sand mixture, ash & kankar.
1.90m–4.00m:–	Yellowish grey, clayey silt with traces of sand mixture.

PIT LOG OF ITP–1

CORRECTION FOR STANDARD PENETRATION TEST VALUES

Bore Hole No:	Starting Depth (M)	Ending Depth (M)	Average Depth (M)	Field 'N' Values	Cor. 'N' for Ovp. & Dilatancy (if reqd)	Reduced Level (M)	Stratum
BH01	1.00	1.45	1.23	9	09	33.43	II
BH01	2.95	3.40	3.18	7	07	31.48	II
BH01	4.50	4.95	4.73	8	08	29.93	II
BH01	5.95	6.40	6.18	8	08	28.48	II
BH01	7.50	7.95	7.73	11	11	26.93	II
BH01	8.95	9.40	9.18	15	15	25.48	II
BH01	10.50	10.95	10.73	16	16	23.93	II
BH01	11.95	12.40	12.18	17	17	22.48	II
BH01	13.50	13.95	13.73	16	16	20.93	II
BH01	15.10	15.55	15.33	19	19	19.33	II
BH01	16.50	16.95	16.73	24	24	17.93	II
BH01	17.95	18.40	18.18	25	25	16.48	II
BH01	19.50	19.95	19.73	28	28	14.93	II
BH01	21.10	21.55	21.33	31	31	13.33	III
BH01	22.50	22.95	22.73	34	34	11.93	III
BH01	23.95	24.40	24.18	37	37	10.48	III
BH01	25.50	25.95	25.73	45	45	8.93	III
BH01	27.10	27.55	27.33	49	49	7.33	III
BH01	28.50	28.95	28.73	51	51	5.93	III
BH01	30.10	30.55	30.33	46	46	4.33	III
BH01	31.50	31.95	31.73	48	48	2.93	III
BH01	33.00	33.45	33.23	46	46	1.43	III
BH01	35.10	35.55	35.33	43	43	-0.67	III
BH02	1.00	1.45	1.23	2	02	33.30	I
BH02	2.95	3.40	3.18	3	03	31.35	I
BH02	4.50	4.95	4.73	5	05	29.80	I
BH02	5.95	6.40	6.18	7	07	28.35	I
BH02	7.50	7.95	7.73	9	09	26.80	II
BH02	8.95	9.40	9.18	12	12	25.35	II
BH02	10.50	10.95	10.73	13	13	23.80	II
BH02	11.95	12.40	12.18	15	15	22.35	II
BH02	13.50	13.95	13.73	18	18	20.80	II
BH02	15.10	15.55	15.33	21	21	19.20	II
BH02	16.50	16.95	16.73	24	24	17.80	II
BH02	17.95	18.40	18.18	28	28	16.35	II
BH02	19.50	19.95	19.73	32	32	14.80	III
BH02	20.95	21.40	21.18	35	35	13.35	III
BH02	22.50	22.95	22.73	37	37	11.80	III
BH02	24.00	24.45	24.23	41	41	10.30	III
BH02	25.50	25.95	25.73	42	42	8.80	III
BH02	27.00	27.45	27.23	43	43	7.30	III
BH02	28.50	28.95	28.73	52	52	5.80	III
BH02	30.00	30.45	30.23	50	50	4.30	III

CORRECTION FOR STANDARD PENETRATION TEST VALUES

Bore Hole No:	Starting Depth (M)	Ending Depth (M)	Average Depth (M)	Field 'N' Values	Cor. 'N' for Ovp. & Dilatancy (if reqd)	Reduced Level (M)	Stratum
BH02	31.50	31.95	31.73	45	45	2.80	III
BH02	33.00	33.45	33.23	47	47	1.30	III
BH02	35.05	35.50	35.28	44	44	-0.75	III
BH03	1.00	1.45	1.23	4	04	34.30	I
BH03	2.95	3.40	3.18	5	05	32.35	I
BH03	4.50	4.95	4.73	7	07	30.80	I
BH03	5.95	6.40	6.18	9	09	29.35	II
BH03	7.50	7.95	7.73	10	10	27.80	II
BH03	8.95	9.40	9.18	13	13	26.35	II
BH03	10.50	10.95	10.73	15	15	24.80	II
BH03	11.95	12.40	12.18	17	17	23.35	II
BH03	13.50	13.95	13.73	22	22	21.80	II
BH03	14.95	15.40	15.18	26	26	20.35	II
BH03	16.50	16.95	16.73	30	30	18.80	II
BH03	18.10	18.55	18.33	26	26	17.20	II
BH03	19.50	19.95	19.73	30	30	15.80	II
BH03	20.95	21.40	21.18	30	30	14.35	II
BH03	22.50	22.95	22.73	32	32	12.80	III
BH03	24.10	24.55	24.33	64	64	11.20	III
BH03	25.50	25.95	25.73	43	43	9.80	III
BH03	27.10	27.55	27.33	46	46	8.20	III
BH03	28.50	28.95	28.73	50	50	6.80	III
BH03	30.00	30.45	30.23	43	43	5.30	III
BH03	31.50	31.95	31.73	45	45	3.80	III
BH03	33.00	33.45	33.23	48	48	2.30	III
BH03	35.05	35.50	35.28	49	49	0.25	III
BH04	1.00	1.45	1.23	30	30	35.08	Fill
BH04	2.95	3.40	3.18	8	08	33.13	II
BH04	4.50	4.95	4.73	11	11	31.58	II
BH04	5.95	6.40	6.18	11	11	30.13	II
BH04	7.50	7.95	7.73	15	15	28.58	II
BH04	9.00	9.45	9.23	17	17	27.08	II
BH04	10.50	10.95	10.73	15	15	25.58	II
BH04	11.95	12.40	12.18	16	16	24.13	II
BH04	13.50	13.95	13.73	15	15	22.58	II
BH04	15.05	15.50	15.28	16	16	21.03	II
BH04	16.50	16.95	16.73	23	23	19.58	II
BH04	17.95	18.40	18.18	33	33	18.13	III
BH04	19.50	19.95	19.73	35	35	16.58	III
BH04	20.95	21.40	21.18	39	39	15.13	III
BH04	22.50	22.95	22.73	42	42	13.58	III
BH04	23.95	24.40	24.18	45	45	12.13	III
BH04	25.50	25.95	25.73	41	41	10.58	III

CORRECTION FOR STANDARD PENETRATION TEST VALUES

Bore Hole No:	Starting Depth (M)	Ending Depth (M)	Average Depth (M)	Field 'N' Values	Cor. 'N' for Ovp. & Dilatancy (if reqd)	Reduced Level (M)	Stratum
BH04	27.00	27.45	27.23	51	51	9.08	III
BH04	28.50	28.95	28.73	55	55	7.58	III
BH04	30.00	30.45	30.23	47	47	6.08	III
BH04	31.50	31.95	31.73	47	47	4.58	III
BH04	33.00	33.45	33.23	55	55	3.08	III
BH04	35.10	35.55	35.33	52	52	0.98	III
BH05	1.00	1.45	1.23	5	05	33.43	I
BH05	2.95	3.40	3.18	7	07	31.48	I
BH05	4.50	4.95	4.73	9	09	29.93	II
BH05	6.05	6.50	6.28	8	08	28.38	II
BH05	7.50	7.95	7.73	11	11	26.93	II
BH05	9.00	9.45	9.23	12	12	25.43	II
BH05	10.50	10.95	10.73	18	18	23.93	II
BH05	11.95	12.40	12.18	17	17	22.48	II
BH05	13.50	13.95	13.73	18	18	20.93	II
BH05	15.05	15.50	15.28	19	19	19.38	II
BH05	16.50	16.95	16.73	20	20	17.93	II
BH05	17.95	18.40	18.18	23	23	16.48	II
BH05	19.50	19.95	19.73	21	21	14.93	II
BH05	21.00	21.45	21.23	25	25	13.43	II
BH05	22.50	22.95	22.73	23	23	11.93	II
BH05	23.95	24.40	24.18	23	23	10.48	II
BH05	25.50	25.95	25.73	33	33	8.93	III
BH05	27.00	27.45	27.23	34	34	7.43	III
BH05	28.50	28.95	28.73	35	35	5.93	III
BH05	30.00	30.45	30.23	37	37	4.43	III
BH05	31.50	31.95	31.73	37	37	2.93	III
BH05	33.00	33.45	33.23	39	39	1.43	III
BH05	35.05	35.50	35.28	40	40	-0.62	III
BH06	1.00	1.45	1.23	8	08	33.68	I
BH06	2.95	3.40	3.18	5	05	31.73	I
BH06	4.50	4.95	4.73	6	06	30.18	I
BH06	5.95	6.40	6.18	7	07	28.73	I
BH06	7.50	7.95	7.73	5	05	27.18	I
BH06	8.95	9.40	9.18	7	07	25.73	I
BH06	10.50	10.95	10.73	18	18	24.18	II
BH06	12.10	12.55	12.33	22	22	22.58	II
BH06	13.50	13.95	13.73	28	28	21.18	II
BH06	14.95	15.40	15.18	33	33	19.73	III
BH06	16.50	16.95	16.73	31	31	18.18	III
BH06	17.95	18.40	18.18	24	24	16.73	II
BH06	19.50	19.95	19.73	27	27	15.18	II
BH06	21.10	21.55	21.33	32	32	13.58	III

CORRECTION FOR STANDARD PENETRATION TEST VALUES

Bore Hole No:	Starting Depth (M)	Ending Depth (M)	Average Depth (M)	Field 'N' Values	Cor. 'N' for Ovp. & Dilatancy (if reqd)	Reduced Level (M)	Stratum
BH06	22.50	22.95	22.73	36	36	12.18	III
BH06	24.00	24.45	24.23	33	33	10.68	III
BH06	25.50	25.95	25.73	37	37	9.18	III
BH06	27.00	27.45	27.23	40	40	7.68	III
BH06	28.50	28.95	28.73	78	78	6.18	III
BH06	30.00	30.45	30.23	60	60	4.68	III
BH06	31.50	31.95	31.73	42	42	3.18	III
BH06	33.00	33.45	33.23	48	48	1.68	III
BH06	35.05	35.50	35.28	52	52	-0.37	III
BH07	1.00	1.45	1.23	5	05	33.62	I
BH07	2.95	3.40	3.18	6	06	31.67	I
BH07	4.50	4.95	4.73	4	04	30.12	I
BH07	5.95	6.40	6.18	6	06	28.67	I
BH07	7.50	7.95	7.73	7	07	27.12	I
BH07	9.10	9.55	9.33	9	09	25.52	II
BH07	10.50	10.95	10.73	11	11	24.12	II
BH07	11.95	12.40	12.18	16	16	22.67	II
BH07	13.50	13.95	13.73	19	19	21.12	II
BH07	14.95	15.40	15.18	21	21	19.67	II
BH07	16.50	16.95	16.73	24	24	18.12	II
BH07	18.10	18.55	18.33	30	30	16.52	II
BH07	19.50	19.95	19.73	33	33	15.12	III
BH07	21.10	21.55	21.33	39	39	13.52	III
BH07	22.50	22.95	22.73	37	37	12.12	III
BH07	24.00	24.45	24.23	30	30	10.62	III
BH07	25.50	25.95	25.73	35	35	9.12	III
BH07	27.00	27.45	27.23	33	33	7.62	III
BH07	28.50	28.95	28.73	37	37	6.12	III
BH07	30.00	30.45	30.23	40	40	4.62	III
BH07	31.50	31.95	31.73	42	42	3.12	III
BH07	33.00	33.45	33.23	43	43	1.62	III
BH07	35.05	35.50	35.28	45	45	-0.43	III
BH08	1.00	1.45	1.23	2	02	33.50	I
BH08	3.00	3.45	3.23	3	03	31.50	I
BH08	4.50	4.95	4.73	4	04	30.00	I
BH08	5.95	6.40	6.18	5	05	28.55	I
BH08	7.50	7.95	7.73	2	02	27.00	I
BH08	8.95	9.40	9.18	3	03	25.55	I
BH08	10.50	10.95	10.73	4	04	24.00	I
BH08	12.05	12.50	12.28	7	07	22.45	I
BH08	13.50	13.95	13.73	20	20	21.00	II
BH08	15.05	15.50	15.28	20	20	19.45	II
BH08	16.50	16.95	16.73	21	21	18.00	II

CORRECTION FOR STANDARD PENETRATION TEST VALUES

Bore Hole No:	Starting Depth (M)	Ending Depth (M)	Average Depth (M)	Field 'N' Values	Cor. 'N' for Ovp. & Dilatancy (if reqd)	Reduced Level (M)	Stratum
BH08	17.95	18.40	18.18	24	24	16.55	II
BH08	19.50	19.95	19.73	25	25	15.00	II
BH08	21.00	21.45	21.23	25	25	13.50	II
BH08	22.50	22.95	22.73	27	27	12.00	II
BH08	24.05	24.50	24.28	28	28	10.45	II
BH08	25.50	25.95	25.73	34	34	9.00	III
BH08	27.00	27.45	27.23	36	36	7.50	III
BH08	28.50	28.95	28.73	38	38	6.00	III
BH08	30.00	30.45	30.23	38	38	4.50	III
BH08	31.50	31.95	31.73	40	40	3.00	III
BH08	33.00	33.45	33.23	42	42	1.50	III
BH08	35.05	35.50	35.28	45	45	-0.55	III
BH09	1.00	1.45	1.23	4	04	34.10	I
BH09	2.95	3.40	3.18	6	06	32.15	I
BH09	4.50	4.95	4.73	5	05	30.60	I
BH09	5.95	6.40	6.18	6	06	29.15	I
BH09	7.50	7.95	7.73	9	09	27.60	II
BH09	8.95	9.40	9.18	12	12	26.15	II
BH09	10.50	10.95	10.73	23	23	24.60	II
BH09	11.95	12.40	12.18	27	27	23.15	II
BH09	13.50	13.95	13.73	24	24	21.60	II
BH09	15.10	15.55	15.33	26	26	20.00	II
BH09	16.50	16.95	16.73	27	27	18.60	II
BH09	17.95	18.40	18.18	24	24	17.15	II
BH09	19.50	19.95	19.73	21	21	15.60	II
BH09	21.10	21.55	21.33	23	23	14.00	II
BH09	22.50	22.95	22.73	20	20	12.60	II
BH09	23.95	24.40	24.18	27	27	11.15	II
BH09	25.50	25.95	25.73	35	35	9.60	III
BH09	27.00	27.45	27.23	30	30	8.10	II
BH09	28.50	28.95	28.73	37	37	6.60	III
BH09	30.00	30.45	30.23	43	43	5.10	III
BH09	31.50	31.95	31.73	50	50	3.60	III
BH09	33.00	33.45	33.23	45	45	2.10	III
BH09	35.05	35.50	35.28	58	58	0.05	III
BH10	1.00	1.45	1.23	5	05	33.51	Fill
BH10	2.95	3.40	3.18	9	09	31.56	II
BH10	4.50	4.95	4.73	10	10	30.01	II
BH10	5.95	6.40	6.18	11	11	28.56	II
BH10	7.50	7.95	7.73	13	13	27.01	II
BH10	8.95	9.40	9.18	14	14	25.56	II
BH10	10.50	10.95	10.73	18	18	24.01	II
BH10	11.95	12.40	12.18	22	22	22.56	II

CORRECTION FOR STANDARD PENETRATION TEST VALUES

Bore Hole No:	Starting Depth (M)	Ending Depth (M)	Average Depth (M)	Field 'N' Values	Cor. 'N' for Ovp. & Dilatancy (if reqd)	Reduced Level (M)	Stratum
BH10	13.50	13.95	13.73	25	25	21.01	II
BH10	14.95	15.40	15.18	29	29	19.56	II
BH10	16.50	16.95	16.73	30	30	18.01	II
BH10	17.95	18.40	18.18	28	28	16.56	II
BH10	19.50	19.95	19.73	44	44	15.01	III
BH10	21.10	21.55	21.33	41	41	13.41	III
BH10	22.50	22.95	22.73	39	39	12.01	III
BH10	24.10	24.55	24.33	45	45	10.41	III
BH10	25.50	25.95	25.73	48	48	9.01	III
BH10	27.10	27.55	27.33	53	53	7.41	III
BH10	28.50	28.95	28.73	59	59	6.01	III
BH10	30.05	30.50	30.28	64	64	4.46	III
BH10	31.50	31.95	31.73	45	45	3.01	III
BH10	33.00	33.45	33.23	48	48	1.51	III
BH10	35.00	35.45	35.23	51	51	-0.49	III
BH11	1.00	1.45	1.23	20	20	34.08	Fill
BH11	2.95	3.40	3.18	5	05	32.13	I
BH11	4.50	4.95	4.73	7	07	30.58	I
BH11	6.00	6.45	6.23	10	10	29.08	II
BH11	7.50	7.95	7.73	9	09	27.58	II
BH11	8.95	9.40	9.18	11	11	26.13	II
BH11	10.50	10.95	10.73	13	13	24.58	II
BH11	11.95	12.40	12.18	16	16	23.13	II
BH11	13.50	13.95	13.73	15	15	21.58	II
BH11	15.00	15.45	15.23	19	19	20.08	II
BH11	16.50	16.95	16.73	18	18	18.58	II
BH11	17.95	18.40	18.18	20	20	17.13	II
BH11	19.50	19.95	19.73	21	21	15.58	II
BH11	21.05	21.50	21.28	21	21	14.03	II
BH11	22.50	22.95	22.73	22	22	12.58	II
BH11	24.10	24.55	24.33	16	16	10.98	II
BH11	25.50	25.95	25.73	20	20	9.58	II
BH11	27.05	27.50	27.28	19	19	8.03	II
BH11	28.50	28.95	28.73	32	32	6.58	III
BH11	29.80	30.25	30.03	32	32	5.28	III
BH11	31.50	31.95	31.73	34	34	3.58	III
BH11	33.00	33.45	33.23	36	36	2.08	III
BH11	35.05	35.50	35.28	37	37	0.03	III
BH12	1.00	1.45	1.23	8	08	36.76	Fill
BH12	2.95	3.40	3.18	10	10	34.81	II
BH12	4.50	4.95	4.73	13	13	33.26	II
BH12	5.95	6.40	6.18	12	12	31.81	II
BH12	7.50	7.95	7.73	14	14	30.26	II

CORRECTION FOR STANDARD PENETRATION TEST VALUES

Bore Hole No:	Starting Depth (M)	Ending Depth (M)	Average Depth (M)	Field 'N' Values	Cor. 'N' for Ovp. & Dilatancy (if reqd)	Reduced Level (M)	Stratum
BH12	8.95	9.40	9.18	13	13	28.81	II
BH12	10.50	10.95	10.73	14	14	27.26	II
BH12	11.95	12.40	12.18	17	17	25.81	II
BH12	13.50	13.95	13.73	18	18	24.26	II
BH12	15.10	15.55	15.33	20	20	22.66	II
BH12	16.50	16.95	16.73	21	21	21.26	II
BH12	18.00	18.45	18.23	25	25	19.76	II
BH12	19.50	19.95	19.73	24	24	18.26	II
BH12	20.95	21.40	21.18	29	29	16.81	II
BH12	22.50	22.95	22.73	31	31	15.26	III
BH12	24.10	24.55	24.33	28	28	13.66	II
BH12	25.50	25.95	25.73	28	28	12.26	II
BH12	27.10	27.55	27.33	32	32	10.66	III
BH12	28.50	28.95	28.73	39	39	9.26	III
BH12	30.10	30.55	30.33	44	44	7.66	III
BH12	31.50	31.95	31.73	47	47	6.26	III
BH12	33.05	33.50	33.28	51	51	4.71	III
BH12	35.15	35.60	35.38	58	58	2.61	III
BH13	1.00	1.45	1.23	5	05	36.04	Fill
BH13	2.95	3.40	3.18	7	07	34.09	I
BH13	4.50	4.95	4.73	8	08	32.54	I
BH13	5.95	6.40	6.18	9	09	31.09	II
BH13	7.50	7.95	7.73	11	11	29.54	II
BH13	8.95	9.40	9.18	12	12	28.09	II
BH13	10.50	10.95	10.73	13	13	26.54	II
BH13	11.95	12.40	12.18	14	14	25.09	II
BH13	13.50	13.95	13.73	18	18	23.54	II
BH13	14.95	15.40	15.18	20	20	22.09	II
BH13	16.50	16.95	16.73	22	22	20.54	II
BH13	18.10	18.55	18.33	21	21	18.94	II
BH13	19.50	19.95	19.73	26	26	17.54	II
BH13	20.95	21.40	21.18	29	29	16.09	II
BH13	22.50	22.95	22.73	28	28	14.54	II
BH13	24.05	24.50	24.28	30	30	12.99	II
BH13	25.50	25.95	25.73	33	33	11.54	III
BH13	26.95	27.40	27.18	45	45	10.09	III
BH13	28.50	28.95	28.73	45	45	8.54	III
BH13	30.05	30.50	30.28	50	50	6.99	III
BH13	31.50	31.95	31.73	53	53	5.54	III
BH13	33.00	33.45	33.23	57	57	4.04	III
BH13	35.15	35.60	35.38	60	60	1.89	III
BH14	1.00	1.45	1.23	10	10	35.67	I
BH14	2.95	3.40	3.18	6	06	33.72	I

CORRECTION FOR STANDARD PENETRATION TEST VALUES

Bore Hole No:	Starting Depth (M)	Ending Depth (M)	Average Depth (M)	Field 'N' Values	Cor. 'N' for Ovp. & Dilatancy (if reqd)	Reduced Level (M)	Stratum
BH14	4.50	4.95	4.73	10	10	32.17	II
BH14	5.95	6.40	6.18	9	09	30.72	II
BH14	7.50	7.95	7.73	11	11	29.17	II
BH14	8.95	9.40	9.18	11	11	27.72	II
BH14	10.50	10.95	10.73	14	14	26.17	II
BH14	11.95	12.40	12.18	13	13	24.72	II
BH14	13.50	13.95	13.73	12	12	23.17	II
BH14	14.95	15.40	15.18	13	13	21.72	II
BH14	16.50	16.95	16.73	15	15	20.17	II
BH14	18.10	18.55	18.33	16	16	18.57	II
BH14	20.20	20.65	20.43	27	27	16.47	II
BH14	21.50	21.95	21.73	31	31	15.17	III
BH14	22.95	23.40	23.18	31	31	13.72	III
BH14	24.50	24.95	24.73	30	30	12.17	II
BH14	25.95	26.40	26.18	32	32	10.72	III
BH14	27.50	27.95	27.73	32	32	9.17	III
BH14	29.00	29.45	29.23	29	29	7.67	II
BH14	32.00	32.45	32.23	37	37	4.67	III
BH14	33.50	33.95	33.73	39	39	3.17	III
BH14	35.05	35.50	35.28	46	46	1.62	III
BH15	1.00	1.45	1.23	11	11	36.43	II
BH15	2.95	3.40	3.18	4	04	34.48	I
BH15	4.50	4.95	4.73	5	05	32.93	I
BH15	5.95	6.40	6.18	9	09	31.48	II
BH15	7.50	7.95	7.73	10	10	29.93	II
BH15	8.95	9.40	9.18	15	15	28.48	II
BH15	11.95	12.40	12.18	17	17	25.48	II
BH15	13.50	13.95	13.73	20	20	23.93	II
BH15	14.95	15.40	15.18	25	25	22.48	II
BH15	16.50	16.95	16.73	19	19	20.93	II
BH15	18.10	18.55	18.33	23	23	19.33	II
BH15	19.50	19.95	19.73	25	25	17.93	II
BH15	21.10	21.55	21.33	26	26	16.33	II
BH15	22.50	22.95	22.73	34	34	14.93	III
BH15	24.00	24.45	24.23	38	38	13.43	III
BH15	25.50	25.95	25.73	41	41	11.93	III
BH15	27.00	27.45	27.23	45	45	10.43	III
BH15	28.50	28.95	28.73	41	41	8.93	III
BH15	30.00	30.45	30.23	38	38	7.43	III
BH15	31.50	31.95	31.73	39	39	5.93	III
BH15	33.00	33.45	33.23	40	40	4.43	III
BH15	35.05	35.50	35.28	42	42	2.38	III

CORRECTION FOR STANDARD PENETRATION TEST VALUES

Bore Hole No:	Starting Depth (M)	Ending Depth (M)	Average Depth (M)	Field 'N' Values	Cor. 'N' for Ovp. & Dilatancy (if reqd)	Reduced Level (M)	Stratum
BH16	1.00	1.45	1.23	13	13	35.95	Fill
BH16	2.95	3.40	3.18	3	03	34.00	I
BH16	4.50	4.95	4.73	4	04	32.45	I
BH16	5.95	6.40	6.18	5	05	31.00	I
BH16	7.50	7.95	7.73	8	08	29.45	I
BH16	8.95	9.40	9.18	11	11	28.00	II
BH16	10.50	10.95	10.73	15	15	26.45	II
BH16	12.10	12.55	12.33	19	19	24.85	II
BH16	13.50	13.95	13.73	25	25	23.45	II
BH16	15.10	15.55	15.33	25	25	21.85	II
BH16	16.50	16.95	16.73	22	22	20.45	II
BH16	18.05	18.50	18.28	25	25	18.90	II
BH16	19.50	19.95	19.73	30	19	17.45	Samd Pocket
BH16	21.15	21.60	21.38	34	34	15.80	III
BH16	22.50	22.95	22.73	38	38	14.45	III
BH16	24.10	24.55	24.33	43	43	12.85	III
BH16	25.50	25.95	25.73	45	45	11.45	III
BH16	27.00	27.45	27.23	49	49	9.95	III
BH16	28.50	28.95	28.73	42	42	8.45	III
BH16	30.00	30.45	30.23	40	40	6.95	III
BH16	31.50	31.95	31.73	43	43	5.45	III
BH16	33.00	33.45	33.23	41	41	3.95	III
BH16	35.05	35.50	35.28	41	41	1.90	III
BH17	1.00	1.45	1.23	4	04	36.22	I
BH17	2.95	3.40	3.18	9	09	34.27	II
BH17	4.50	4.95	4.73	9	09	32.72	II
BH17	5.95	6.40	6.18	8	08	31.27	II
BH17	7.50	7.95	7.73	9	09	29.72	II
BH17	8.95	9.40	9.18	17	17	28.27	II
BH17	10.50	10.95	10.73	20	20	26.72	II
BH17	11.95	12.40	12.18	24	24	25.27	II
BH17	13.50	13.95	13.73	21	21	23.72	II
BH17	14.95	15.40	15.18	23	23	22.27	II
BH17	16.50	16.95	16.73	26	26	20.72	II
BH17	18.10	18.55	18.33	23	23	19.12	II
BH17	19.50	19.95	19.73	27	27	17.72	II
BH17	20.95	21.40	21.18	35	35	16.27	III
BH17	22.50	22.95	22.73	34	34	14.72	III
BH17	23.95	24.40	24.18	38	38	13.27	III
BH17	25.50	25.95	25.73	48	48	11.72	III
BH17	27.10	27.55	27.33	55	55	10.12	III
BH17	28.50	28.95	28.73	51	51	8.72	III
BH17	30.00	30.45	30.23	52	52	7.22	III
BH17	31.50	31.95	31.73	37	37	5.72	III

CORRECTION FOR STANDARD PENETRATION TEST VALUES

Bore Hole No:	Starting Depth (M)	Ending Depth (M)	Average Depth (M)	Field 'N' Values	Cor. 'N' for Ovp. & Dilatancy (if reqd)	Reduced Level (M)	Stratum
BH17	33.00	33.45	33.23	41	41	4.22	III
BH17	35.10	35.55	35.33	49	49	2.11	III
BH18	1.00	1.45	1.23	3	03	35.64	I
BH18	2.95	3.40	3.18	6	06	33.69	I
BH18	4.50	4.95	4.73	7	07	32.14	I
BH18	5.95	6.40	6.18	9	09	30.69	II
BH18	7.50	7.95	7.73	11	11	29.14	II
BH18	8.95	9.40	9.18	14	14	27.69	II
BH18	10.50	10.95	10.73	17	17	26.14	II
BH18	11.95	12.40	12.18	21	21	24.69	II
BH18	13.50	13.95	13.73	25	25	23.14	II
BH18	15.15	15.60	15.38	28	28	21.49	II
BH18	16.50	16.95	16.73	31	31	20.14	III
BH18	18.15	18.60	18.38	30	30	18.49	III
BH18	19.50	19.95	19.73	34	34	17.14	III
BH18	21.00	21.45	21.23	38	38	15.64	III
BH18	22.50	22.95	22.73	30	30	14.14	III
BH18	24.00	24.45	24.23	27	27	12.64	II
BH18	25.50	25.95	25.73	30	30	11.14	III
BH18	27.00	27.45	27.23	34	34	9.64	III
BH18	28.50	28.95	28.73	35	35	8.14	III
BH18	30.00	30.45	30.23	38	38	6.64	III
BH18	31.50	31.95	31.73	37	37	5.14	III
BH18	33.00	33.45	33.23	40	40	3.64	III
BH18	35.05	35.50	35.28	51	51	1.59	III
BH19	1.00	1.45	1.23	2	02	36.61	I
BH19	2.95	3.40	3.18	3	03	34.66	I
BH19	4.50	4.95	4.73	4	04	33.11	I
BH19	5.95	6.40	6.18	5	05	31.66	I
BH19	7.50	7.95	7.73	11	11	30.11	II
BH19	8.95	9.40	9.18	13	13	28.66	II
BH19	10.50	10.95	10.73	18	18	27.11	II
BH19	11.95	12.40	12.18	20	20	25.66	II
BH19	13.50	13.95	13.73	28	28	24.11	II
BH19	15.10	15.55	15.33	26	26	22.51	II
BH19	16.50	16.95	16.73	27	27	21.11	II
BH19	17.95	18.40	18.18	30	30	19.66	III
BH19	19.50	19.95	19.73	32	32	18.11	III
BH19	20.95	21.40	21.18	29	29	16.66	II
BH19	23.10	23.55	23.33	38	38	14.51	III
BH19	24.50	24.95	24.73	45	45	13.11	III
BH19	26.10	26.55	26.33	51	51	11.51	III
BH19	27.50	27.95	27.73	55	55	10.11	III

CORRECTION FOR STANDARD PENETRATION TEST VALUES

Bore Hole No:	Starting Depth (M)	Ending Depth (M)	Average Depth (M)	Field 'N' Values	Cor. 'N' for Ovp. & Dilatancy (if reqd)	Reduced Level (M)	Stratum
BH19	28.95	29.40	29.18	46	46	8.66	III
BH19	30.50	30.95	30.73	43	43	7.11	III
BH19	32.00	32.45	32.23	42	42	5.61	III
BH19	33.50	33.95	33.73	43	43	4.11	III
BH19	35.05	35.50	35.28	45	45	2.56	III
BH20	1.00	1.45	1.23	5	05	34.82	I
BH20	2.95	3.40	3.18	5	05	32.87	I
BH20	4.50	4.95	4.73	9	09	31.32	II
BH20	5.95	6.40	6.18	10	10	29.87	II
BH20	7.50	7.95	7.73	12	12	28.32	II
BH20	9.00	9.45	9.23	13	13	26.82	II
BH20	10.50	10.95	10.73	16	16	25.32	II
BH20	11.95	12.40	12.18	17	17	23.87	II
BH20	13.50	13.95	13.73	19	19	22.32	II
BH20	14.95	15.40	15.18	25	25	20.87	II
BH20	16.50	16.95	16.73	17	17	19.32	II
BH20	18.10	18.55	18.33	21	21	17.72	II
BH20	19.50	19.95	19.73	25	25	16.32	II
BH20	21.00	21.45	21.23	25	25	14.82	II
BH20	22.50	22.95	22.73	61	61	13.32	III
BH20	23.80	24.25	24.03	59	59	12.02	III
BH20	25.50	25.95	25.73	25	25	10.32	II
BH20	27.10	27.55	27.33	31	31	8.72	III
BH20	28.50	28.95	28.73	44	44	7.32	III
BH20	30.00	30.45	30.23	63	63	5.82	III
BH20	31.50	31.95	31.73	41	41	4.32	III
BH20	33.00	33.45	33.23	42	42	2.82	III
BH20	35.05	35.50	35.28	30	30	0.77	III
BH21	1.00	1.45	1.23	12	12	35.46	Fill
BH21	2.95	3.40	3.18	6	06	33.51	I
BH21	4.50	4.95	4.73	8	08	31.96	I
BH21	6.15	6.60	6.38	9	09	30.31	II
BH21	7.50	7.95	7.73	12	12	28.96	II
BH21	8.95	9.40	9.18	15	15	27.51	II
BH21	10.50	10.95	10.73	18	18	25.96	II
BH21	11.95	12.40	12.18	21	21	24.51	II
BH21	13.50	13.95	13.73	20	20	22.96	II
BH21	15.05	15.50	15.28	23	23	21.41	II
BH21	16.50	16.95	16.73	23	23	19.96	II
BH21	17.95	18.40	18.18	24	24	18.51	II
BH21	19.50	19.95	19.73	22	22	16.96	II
BH21	20.95	21.40	21.18	24	24	15.51	II
BH21	22.50	22.95	22.73	29	29	13.96	II

CORRECTION FOR STANDARD PENETRATION TEST VALUES

Bore Hole No:	Starting Depth (M)	Ending Depth (M)	Average Depth (M)	Field 'N' Values	Cor. 'N' for Ovp. & Dilatancy (if reqd)	Reduced Level (M)	Stratum
BH21	24.05	24.50	24.28	33	33	12.41	III
BH21	25.50	25.95	25.73	32	32	10.96	III
BH21	27.05	27.50	27.28	31	31	9.41	III
BH21	28.50	28.95	28.73	42	42	7.96	III
BH21	30.00	30.45	30.23	53	53	6.46	III
BH21	31.50	31.95	31.73	53	53	4.96	III
BH21	33.00	33.45	33.23	58	58	3.46	III
BH21	35.10	35.55	35.33	61	61	1.36	III
BH22	1.00	1.45	1.23	10	10	35.65	Fill
BH22	3.00	3.45	3.23	4	04	33.65	I
BH22	4.50	4.95	4.73	5	05	32.15	I
BH22	5.95	6.40	6.18	4	04	30.70	I
BH22	7.50	7.95	7.73	5	05	29.15	I
BH22	9.00	9.45	9.23	7	07	27.65	I
BH22	10.50	10.95	10.73	12	12	26.15	II
BH22	11.95	12.40	12.18	14	14	24.70	II
BH22	13.50	13.95	13.73	13	13	23.15	II
BH22	14.95	15.40	15.18	16	16	21.70	II
BH22	16.50	16.95	16.73	20	20	20.15	II
BH22	18.00	18.45	18.23	26	26	18.65	II
BH22	19.50	19.95	19.73	27	27	17.15	II
BH22	20.95	21.40	21.18	26	26	15.70	II
BH22	22.50	22.95	22.73	31	31	14.15	III
BH22	24.05	24.50	24.28	35	20	12.60	IV
BH22	25.50	25.95	25.73	40	22	11.15	IV
BH22	27.00	27.45	27.23	42	22	9.65	IV
BH22	28.50	28.95	28.73	46	23	8.15	IV
BH22	30.00	30.45	30.23	48	23	6.65	IV
BH22	31.50	31.95	31.73	54	54	5.15	III
BH22	33.00	33.45	33.23	59	59	3.65	III
BH22	35.05	35.50	35.28	61	61	1.60	III
BH23	1.00	1.45	1.23	11	11	35.45	Fill
BH23	2.95	3.40	3.18	6	06	33.50	I
BH23	4.50	4.95	4.73	6	06	31.95	I
BH23	5.95	6.40	6.18	9	09	30.50	II
BH23	7.50	7.95	7.73	10	10	28.95	II
BH23	8.95	9.40	9.18	12	12	27.50	II
BH23	10.50	10.95	10.73	11	11	25.95	II
BH23	11.95	12.40	12.18	14	14	24.50	II
BH23	13.50	13.95	13.73	16	16	22.95	II
BH23	15.05	15.50	15.28	17	17	21.40	II
BH23	16.50	16.95	16.73	20	20	19.95	II
BH23	17.95	18.40	18.18	24	24	18.50	II

CORRECTION FOR STANDARD PENETRATION TEST VALUES

Bore Hole No:	Starting Depth (M)	Ending Depth (M)	Average Depth (M)	Field 'N' Values	Cor. 'N' for Ovp. & Dilatancy (if reqd)	Reduced Level (M)	Stratum
BH23	19.50	19.95	19.73	27	27	16.95	II
BH23	21.05	21.50	21.28	26	26	15.40	II
BH23	22.50	22.95	22.73	32	32	13.95	III
BH23	23.95	24.40	24.18	53	27	12.50	IV
BH23	25.50	25.95	25.73	48	25	10.95	IV
BH23	27.00	27.45	27.23	41	22	9.45	IV
BH23	28.50	28.95	28.73	47	23	7.95	IV
BH23	30.00	30.45	30.23	62	62	6.45	III
BH23	31.50	31.95	31.73	55	55	4.95	III
BH23	33.00	33.45	33.23	44	44	3.45	III
BH23	35.05	35.50	35.28	54	54	1.40	III
BH24	1.00	1.45	1.23	16	16	35.38	Fill
BH24	3.00	3.45	3.23	4	04	33.38	I
BH24	4.50	4.95	4.73	6	06	31.88	I
BH24	5.95	6.40	6.18	10	10	30.43	II
BH24	7.50	7.95	7.73	12	12	28.88	II
BH24	8.95	9.40	9.18	12	12	27.43	II
BH24	10.50	10.95	10.73	14	14	25.88	II
BH24	12.00	12.45	12.23	16	16	24.38	II
BH24	13.50	13.95	13.73	14	14	22.88	II
BH24	14.95	15.40	15.18	15	15	21.43	II
BH24	16.50	16.95	16.73	21	21	19.88	II
BH24	18.00	18.45	18.23	24	24	18.38	II
BH24	19.50	19.95	19.73	22	22	16.88	II
BH24	21.05	21.50	21.28	22	22	15.33	II
BH24	22.50	22.95	22.73	33	33	13.88	III
BH24	24.10	24.55	24.33	43	43	12.28	III
BH24	25.50	25.95	25.73	42	23	10.88	IV
BH24	27.00	27.45	27.23	46	24	9.38	IV
BH24	28.50	28.95	28.73	44	23	7.88	IV
BH24	30.00	30.45	30.23	40	40	6.38	III
BH24	31.50	31.95	31.73	50	50	4.88	III
BH24	33.00	33.45	33.23	58	58	3.38	III
BH24	35.05	35.50	35.28	62	62	1.33	III
BH25	1.00	1.34	1.17	>100	100	36.28	Fill
BH25	3.00	3.45	3.23	5	05	34.23	I
BH25	4.50	4.95	4.73	7	07	32.73	I
BH25	5.95	6.40	6.18	8	08	31.28	I
BH25	7.50	7.95	7.73	11	11	29.73	II
BH25	8.95	9.40	9.18	13	13	28.28	II
BH25	10.50	10.95	10.73	14	14	26.73	II
BH25	12.00	12.45	12.23	13	13	25.23	II
BH25	13.50	13.95	13.73	16	16	23.73	II

CORRECTION FOR STANDARD PENETRATION TEST VALUES

Bore Hole No:	Starting Depth (M)	Ending Depth (M)	Average Depth (M)	Field 'N' Values	Cor. 'N' for Ovp. & Dilatancy (if reqd)	Reduced Level (M)	Stratum
BH25	14.95	15.40	15.18	24	24	22.28	II
BH25	16.50	16.95	16.73	24	24	20.73	II
BH25	18.00	18.45	18.23	26	26	19.23	II
BH25	19.50	19.95	19.73	25	25	17.73	II
BH25	20.95	21.40	21.18	27	27	16.28	II
BH25	22.50	22.95	22.73	29	29	14.73	II
BH25	24.00	24.45	24.23	30	30	13.23	III
BH25	25.50	25.95	25.73	31	31	11.73	III
BH25	27.00	27.45	27.23	34	34	10.23	III
BH25	28.50	28.95	28.73	40	40	8.73	III
BH25	30.00	30.45	30.23	44	44	7.23	III
BH25	31.50	31.95	31.73	41	41	5.73	III
BH25	33.00	33.45	33.23	40	40	4.23	III
BH25	35.05	35.50	35.28	39	39	2.18	III
BH26	1.00	1.45	1.23	8	08	35.66	Fill
BH26	2.95	3.40	3.18	4	04	33.71	I
BH26	4.50	4.95	4.73	5	05	32.16	I
BH26	6.00	6.45	6.23	7	07	30.66	II
BH26	7.50	7.95	7.73	11	11	29.16	II
BH26	8.95	9.40	9.18	15	15	27.71	II
BH26	10.50	10.95	10.73	17	17	26.16	II
BH26	11.95	12.40	12.18	17	17	24.71	II
BH26	13.50	13.95	13.73	21	21	23.16	II
BH26	15.00	15.45	15.23	22	22	21.66	II
BH26	16.50	16.95	16.73	26	26	20.16	II
BH26	17.95	18.40	18.18	27	27	18.71	II
BH26	19.50	19.95	19.73	26	26	17.16	II
BH26	20.95	21.40	21.18	30	30	15.71	II
BH26	22.50	22.95	22.73	33	33	14.16	III
BH26	24.00	24.45	24.23	31	31	12.66	III
BH26	25.50	25.95	25.73	30	30	11.16	III
BH26	27.00	27.45	27.23	43	43	9.66	III
BH26	28.50	28.95	28.73	46	46	8.16	III
BH26	30.00	30.45	30.23	54	54	6.66	III
BH26	31.50	31.95	31.73	57	57	5.16	III
BH26	33.00	33.45	33.23	58	58	3.66	III
BH26	35.05	35.50	35.28	63	63	1.61	III
BH27	1.00	1.45	1.23	10	10	35.26	Fill
BH27	3.00	3.45	3.23	4	04	33.26	I
BH27	4.50	4.95	4.73	6	06	31.76	I
BH27	5.95	6.40	6.18	10	10	30.31	II
BH27	7.50	7.95	7.73	14	14	28.76	II
BH27	8.95	9.40	9.18	16	16	27.31	II

CORRECTION FOR STANDARD PENETRATION TEST VALUES

Bore Hole No:	Starting Depth (M)	Ending Depth (M)	Average Depth (M)	Field 'N' Values	Cor. 'N' for Ovp. & Dilatancy (if reqd)	Reduced Level (M)	Stratum
BH27	10.50	10.95	10.73	19	19	25.76	II
BH27	12.05	12.50	12.28	20	20	24.21	II
BH27	13.50	13.95	13.73	23	23	22.76	II
BH27	14.95	15.40	15.18	23	23	21.31	II
BH27	16.50	16.95	16.73	27	27	19.76	II
BH27	17.95	18.40	18.18	32	32	18.31	II
BH27	19.50	19.95	19.73	29	29	16.76	II
BH27	20.95	21.40	21.18	34	34	15.31	III
BH27	22.50	22.95	22.73	36	36	13.76	III
BH27	24.00	24.45	24.23	31	31	12.26	III
BH27	25.50	25.95	25.73	33	33	10.76	III
BH27	27.00	27.45	27.23	37	37	9.26	III
BH27	28.50	28.95	28.73	39	39	7.76	III
BH27	30.00	30.45	30.23	42	42	6.26	III
BH27	31.50	31.95	31.73	48	48	4.76	III
BH27	33.00	33.45	33.23	60	60	3.26	III
BH27	35.05	35.50	35.28	58	58	1.21	III
BH28	1.00	1.45	1.23	9	09	35.67	Fill
BH28	3.00	3.45	3.23	4	04	33.67	I
BH28	4.50	4.95	4.73	5	05	32.17	I
BH28	5.95	6.40	6.18	16	16	30.72	II
BH28	7.50	7.95	7.73	18	18	29.17	II
BH28	8.95	9.40	9.18	21	21	27.72	II
BH28	10.50	10.95	10.73	26	26	26.17	II
BH28	11.95	12.40	12.18	25	25	24.72	II
BH28	13.50	13.95	13.73	15	15	23.17	II
BH28	15.00	15.45	15.23	17	17	21.67	II
BH28	16.50	16.95	16.73	18	18	20.17	II
BH28	17.95	18.40	18.18	19	19	18.72	II
BH28	19.50	19.95	19.73	20	20	17.17	II
BH28	20.95	21.40	21.18	21	21	15.72	II
BH28	22.50	22.95	22.73	19	19	14.17	II
BH28	24.00	24.45	24.23	20	20	12.67	II
BH28	25.50	25.95	25.73	21	21	11.17	II
BH28	27.00	27.45	27.23	24	24	9.67	II
BH28	28.50	28.95	28.73	35	35	8.17	III
BH28	30.00	30.45	30.23	54	54	6.67	III
BH28	31.50	31.95	31.73	60	60	5.17	III
BH28	33.00	33.45	33.23	72	72	3.67	III
BH28	35.05	35.38	35.22	>100	100	1.68	III
BH29	1.00	1.45	1.23	4	04	35.78	Fill
BH29	3.00	3.45	3.23	3	03	33.78	I
BH29	4.50	4.95	4.73	4	04	32.28	I

CORRECTION FOR STANDARD PENETRATION TEST VALUES

Bore Hole No:	Starting Depth (M)	Ending Depth (M)	Average Depth (M)	Field 'N' Values	Cor. 'N' for Ovp. & Dilatancy (if reqd)	Reduced Level (M)	Stratum
BH29	5.95	6.40	6.18	8	08	30.83	I
BH29	7.50	7.95	7.73	10	10	29.28	II
BH29	8.95	9.40	9.18	14	14	27.83	II
BH29	10.50	10.95	10.73	15	15	26.28	II
BH29	12.00	12.45	12.23	19	19	24.78	II
BH29	13.50	13.95	13.73	21	21	23.28	II
BH29	14.95	15.40	15.18	23	23	21.83	II
BH29	16.50	16.95	16.73	25	25	20.28	II
BH29	17.95	18.40	18.18	26	26	18.83	II
BH29	19.50	19.95	19.73	26	26	17.28	II
BH29	20.95	21.40	21.18	30	30	15.83	II
BH29	22.50	22.95	22.73	29	29	14.28	II
BH29	24.00	24.45	24.23	35	35	12.78	III
BH29	25.50	25.95	25.73	36	36	11.28	III
BH29	27.00	27.45	27.23	44	44	9.78	III
BH29	28.50	28.95	28.73	49	49	8.28	III
BH29	30.00	30.45	30.23	57	57	6.78	III
BH29	31.50	31.95	31.73	62	62	5.28	III
BH29	33.00	33.45	33.23	65	65	3.78	III
BH29	35.05	35.50	35.28	72	72	1.73	III
BH30	1.00	1.45	1.23	10	10	38.28	Fill
BH30	2.95	3.40	3.18	13	13	36.33	Fill
BH30	4.50	4.95	4.73	23	23	34.78	Fill
BH30	6.00	6.45	6.23	47	47	33.28	Fill
BH30	7.50	7.95	7.73	13	13	31.78	II
BH30	8.95	9.40	9.18	14	14	30.33	II
BH30	10.50	10.95	10.73	15	15	28.78	II
BH30	11.95	12.40	12.18	14	14	27.33	II
BH30	13.50	13.95	13.73	13	13	25.78	II
BH30	14.95	15.40	15.18	31	31	24.33	III
BH30	16.50	16.95	16.73	29	29	22.78	II
BH30	17.95	18.40	18.18	24	24	21.33	II
BH30	19.50	19.95	19.73	27	27	19.78	II
BH30	20.95	21.40	21.18	28	28	18.33	II
BH30	22.50	22.95	22.73	31	31	16.78	III
BH30	24.10	24.55	24.33	27	27	15.18	II
BH30	25.50	25.95	25.73	30	30	13.78	III
BH30	27.05	27.50	27.28	35	35	12.23	III
BH30	28.50	28.95	28.73	40	40	10.78	III
BH30	30.05	30.50	30.28	42	42	9.23	III
BH30	31.50	31.95	31.73	45	45	7.78	III
BH30	33.00	33.45	33.23	50	50	6.28	III
BH30	35.10	35.55	35.33	52	52	4.18	III

CORRECTION FOR STANDARD PENETRATION TEST VALUES

Bore Hole No:	Starting Depth (M)	Ending Depth (M)	Average Depth (M)	Field 'N' Values	Cor. 'N' for Ovp. & Dilatancy (if reqd)	Reduced Level (M)	Stratum
BH31	1.00	1.45	1.23	2	02	33.51	Fill
BH31	2.95	3.40	3.18	8	08	31.56	II
BH31	4.50	4.95	4.73	9	09	30.01	II
BH31	5.95	6.40	6.18	11	11	28.56	II
BH31	7.50	7.95	7.73	12	12	27.01	II
BH31	9.10	9.55	9.33	14	14	25.41	II
BH31	10.50	10.95	10.73	15	15	24.01	II
BH31	11.95	12.40	12.18	17	17	22.56	II
BH31	13.50	13.95	13.73	24	24	21.01	II
BH31	14.95	15.40	15.18	30	30	19.56	II
BH31	16.50	16.95	16.73	26	26	18.01	II
BH31	17.95	18.40	18.18	26	26	16.56	II
BH31	19.50	19.95	19.73	30	30	15.01	II
BH31	20.95	21.40	21.18	34	34	13.56	III
BH31	22.50	22.95	22.73	37	37	12.01	III
BH31	24.10	24.55	24.33	40	40	10.41	III
BH31	25.50	25.95	25.73	43	43	9.01	III
BH31	27.10	27.55	27.33	46	46	7.41	III
BH31	28.50	28.95	28.73	50	50	6.01	III
BH31	30.00	30.45	30.23	46	46	4.51	III
BH31	31.50	31.95	31.73	50	50	3.01	III
BH31	33.00	33.45	33.23	43	43	1.51	III
BH31	35.10	35.55	35.33	45	45	-0.59	III
BH32	1.00	1.45	1.23	6	06	35.12	I
BH32	2.95	3.40	3.18	6	06	33.17	I
BH32	4.50	4.95	4.73	7	07	31.62	I
BH32	5.95	6.40	6.18	11	11	30.17	II
BH32	7.50	7.95	7.73	13	13	28.62	II
BH32	8.95	9.40	9.18	15	15	27.17	II
BH32	10.50	10.95	10.73	14	14	25.62	II
BH32	11.95	12.40	12.18	17	17	24.17	II
BH32	13.50	13.95	13.73	15	15	22.62	II
BH32	15.05	15.50	15.28	15	15	21.07	II
BH32	16.50	16.95	16.73	16	16	19.62	II
BH32	18.05	18.50	18.28	18	18	18.07	II
BH32	19.50	19.95	19.73	18	18	16.62	II
BH32	20.95	21.40	21.18	23	23	15.17	II
BH32	22.50	22.95	22.73	22	22	13.62	II
BH32	24.00	24.45	24.23	29	29	12.12	II
BH32	25.50	25.95	25.73	33	33	10.62	III
BH32	27.00	27.45	27.23	30	30	9.12	II
BH32	28.50	28.95	28.73	29	29	7.62	II
BH32	30.00	30.45	30.23	27	27	6.12	II
BH32	31.50	31.95	31.73	29	29	4.62	II

CORRECTION FOR STANDARD PENETRATION TEST VALUES

Bore Hole No:	Starting Depth (M)	Ending Depth (M)	Average Depth (M)	Field 'N' Values	Cor. 'N' for Ovp. & Dilatancy (if reqd)	Reduced Level (M)	Stratum
BH32	33.00	33.45	33.23	30	30	3.12	II
BH32	35.05	35.50	35.28	45	45	1.07	III
BH33	1.00	1.45	1.23	13	13	35.06	Fill
BH33	2.95	3.40	3.18	5	05	33.11	I
BH33	4.50	4.95	4.73	7	07	31.56	I
BH33	5.95	6.40	6.18	12	12	30.11	II
BH33	7.50	7.95	7.73	15	15	28.56	II
BH33	9.00	9.45	9.23	13	13	27.06	II
BH33	10.50	10.95	10.73	13	13	25.56	II
BH33	11.95	12.40	12.18	15	15	24.11	II
BH33	13.50	13.95	13.73	12	12	22.56	II
BH33	14.95	15.40	15.18	14	14	21.11	II
BH33	16.50	16.95	16.73	15	15	19.56	II
BH33	18.00	18.45	18.23	17	17	18.06	II
BH33	19.50	19.95	19.73	18	18	16.56	II
BH33	20.95	21.40	21.18	24	24	15.11	II
BH33	22.50	22.95	22.73	24	24	13.56	II
BH33	24.10	24.55	24.33	29	29	11.96	II
BH33	25.50	25.95	25.73	28	28	10.56	II
BH33	27.05	27.50	27.28	31	31	9.01	III
BH33	28.50	28.95	28.73	33	33	7.56	III
BH33	30.00	30.45	30.23	33	33	6.06	III
BH33	31.50	31.95	31.73	38	38	4.56	III
BH33	33.00	33.45	33.23	37	37	3.06	III
BH33	35.05	35.50	35.28	41	41	1.01	III
BH34	1.00	1.45	1.23	13	13	38.38	Fill
BH34	2.90	3.35	3.13	16	16	36.48	Fill
BH34	4.50	4.95	4.73	12	12	34.88	II
BH34	5.95	6.40	6.18	13	13	33.43	II
BH34	7.50	7.95	7.73	15	15	31.88	II
BH34	8.95	9.40	9.18	16	16	30.43	II
BH34	10.50	10.95	10.73	18	18	28.88	II
BH34	11.95	12.40	12.18	16	16	27.43	II
BH34	13.50	13.95	13.73	18	18	25.88	II
BH34	15.05	15.50	15.28	23	23	24.33	II
BH34	16.50	16.95	16.73	24	24	22.88	II
BH34	17.95	18.40	18.18	28	28	21.43	II
BH34	19.50	19.95	19.73	29	29	19.88	II
BH34	20.95	21.40	21.18	32	32	18.43	III
BH34	22.50	22.95	22.73	33	33	16.88	III
BH34	23.95	24.40	24.18	36	36	15.43	III
BH34	25.50	25.95	25.73	37	37	13.88	III
BH34	27.00	27.45	27.23	39	39	12.38	III

CORRECTION FOR STANDARD PENETRATION TEST VALUES

Bore Hole No:	Starting Depth (M)	Ending Depth (M)	Average Depth (M)	Field 'N' Values	Cor. 'N' for Ovp. & Dilatancy (if reqd)	Reduced Level (M)	Stratum
BH34	28.50	28.95	28.73	45	45	10.88	III
BH34	30.00	30.45	30.23	47	47	9.38	III
BH34	31.50	31.95	31.73	45	45	7.88	III
BH34	33.00	33.45	33.23	52	52	6.38	III
BH34	35.05	35.50	35.28	56	56	4.33	III
BH35	1.00	1.45	1.23	4	04	33.58	I
BH35	2.95	3.40	3.18	4	04	31.63	I
BH35	4.50	4.95	4.73	5	05	30.08	I
BH35	6.00	6.45	6.23	5	05	28.58	I
BH35	7.50	7.95	7.73	6	06	27.08	I
BH35	8.95	9.40	9.18	5	05	25.63	I
BH35	10.50	10.95	10.73	4	04	24.08	I
BH35	11.95	12.40	12.18	5	05	22.63	I
BH35	13.50	13.95	13.73	11	11	21.08	II
BH35	15.00	15.45	15.23	39	39	19.58	III
BH35	16.50	16.95	16.73	44	44	18.08	III
BH35	18.00	18.45	18.23	43	43	16.58	III
BH35	19.00	19.45	19.23	40	40	15.58	III
BH35	20.50	20.95	20.73	41	41	14.08	III
BH35	22.00	22.45	22.23	34	34	12.58	III
BH35	23.95	24.40	24.18	35	35	10.63	III
BH35	25.50	25.95	25.73	41	41	9.08	III
BH35	27.00	27.45	27.23	48	48	7.58	III
BH35	28.50	28.95	28.73	52	52	6.08	III
BH35	30.00	30.45	30.23	55	55	4.58	III
BH35	31.50	31.95	31.73	63	63	3.08	III
BH35	33.00	33.45	33.23	69	69	1.58	III
BH35	35.00	35.45	35.23	82	82	-0.42	III
BH36	1.00	1.45	1.23	10	10	35.27	Fill
BH36	3.00	3.45	3.23	3	03	33.27	I
BH36	4.50	4.95	4.73	4	04	31.77	I
BH36	5.95	6.40	6.18	14	14	30.32	II
BH36	7.50	7.95	7.73	15	15	28.77	II
BH36	8.95	9.40	9.18	23	23	27.32	II
BH36	10.50	10.95	10.73	25	25	25.77	II
BH36	11.95	12.40	12.18	21	21	24.32	II
BH36	13.50	13.95	13.73	23	23	22.77	II
BH36	15.00	15.45	15.23	22	22	21.27	II
BH36	16.50	16.95	16.73	21	21	19.77	II
BH36	17.95	18.40	18.18	24	24	18.32	II
BH36	19.50	19.95	19.73	26	26	16.77	II
BH36	20.95	21.40	21.18	25	25	15.32	II
BH36	22.50	22.95	22.73	28	28	13.77	II

CORRECTION FOR STANDARD PENETRATION TEST VALUES

Bore Hole No:	Starting Depth (M)	Ending Depth (M)	Average Depth (M)	Field 'N' Values	Cor. 'N' for Ovp. & Dilatancy (if reqd)	Reduced Level (M)	Stratum
BH36	24.00	24.45	24.23	23	23	12.27	II
BH36	25.50	25.95	25.73	33	33	10.77	III
BH36	27.05	27.50	27.28	32	32	9.22	III
BH36	28.50	28.95	28.73	35	35	7.77	III
BH36	30.00	30.45	30.23	46	46	6.27	III
BH36	31.50	31.95	31.73	55	55	4.77	III
BH36	33.00	33.45	33.23	65	65	3.27	III
BH36	35.05	35.50	35.28	60	60	1.22	III
BH37	1.00	1.45	1.23	2	02	34.49	Fill
BH37	3.00	3.45	3.23	4	04	32.49	I
BH37	4.50	4.95	4.73	4	04	30.99	I
BH37	6.00	6.45	6.23	3	03	29.49	I
BH37	7.50	7.95	7.73	4	04	27.99	I
BH37	8.95	9.40	9.18	11	11	26.54	II
BH37	10.50	10.95	10.73	15	15	24.99	II
BH37	11.95	12.40	12.18	17	17	23.54	II
BH37	13.50	13.95	13.73	17	17	21.99	II
BH37	15.00	15.45	15.23	20	20	20.49	II
BH37	16.50	16.95	16.73	23	23	18.99	II
BH37	17.95	18.40	18.18	22	22	17.54	II
BH37	19.50	19.95	19.73	24	24	15.99	II
BH37	20.95	21.40	21.18	26	26	14.54	II
BH37	22.50	22.95	22.73	26	26	12.99	II
BH37	24.05	24.50	24.28	27	27	11.44	II
BH37	25.50	25.95	25.73	28	28	9.99	II
BH37	27.00	27.45	27.23	34	34	8.49	III
BH37	28.50	28.95	28.73	40	40	6.99	III
BH37	30.00	30.45	30.23	55	55	5.49	III
BH37	31.50	31.95	31.73	56	56	3.99	III
BH37	33.00	33.45	33.23	57	57	2.49	III
BH37	34.05	34.50	34.28	49	49	1.44	III
BH38	1.00	1.45	1.23	4	04	34.43	I
BH38	2.95	3.40	3.18	5	05	32.48	I
BH38	4.50	4.95	4.73	6	06	30.93	I
BH38	5.95	6.40	6.18	8	08	29.48	I
BH38	7.50	7.95	7.73	9	09	27.93	II
BH38	9.00	9.45	9.23	18	18	26.43	II
BH38	10.50	10.95	10.73	16	16	24.93	II
BH38	11.95	12.40	12.18	18	18	23.48	II
BH38	13.50	13.95	13.73	13	13	21.93	II
BH38	14.95	15.40	15.18	15	15	20.48	II
BH38	16.50	16.95	16.73	18	18	18.93	II
BH38	18.00	18.45	18.23	19	19	17.43	II

CORRECTION FOR STANDARD PENETRATION TEST VALUES

Bore Hole No:	Starting Depth (M)	Ending Depth (M)	Average Depth (M)	Field 'N' Values	Cor. 'N' for Ovp. & Dilatancy (if reqd)	Reduced Level (M)	Stratum
BH38	19.50	19.95	19.73	19	19	15.93	II
BH38	20.95	21.40	21.18	21	21	14.48	II
BH38	22.50	22.95	22.73	22	22	12.93	II
BH38	24.00	24.45	24.23	24	24	11.43	II
BH38	25.50	25.95	25.73	26	26	9.93	II
BH38	27.00	27.45	27.23	28	28	8.43	II
BH38	28.50	28.95	28.73	27	27	6.93	II
BH38	30.00	30.45	30.23	32	32	5.43	III
BH38	31.50	31.95	31.73	35	35	3.93	III
BH38	33.00	33.45	33.23	39	39	2.43	III
BH38	35.05	35.50	35.28	44	44	0.38	III
BH39	1.00	1.45	1.23	3	03	34.12	I
BH39	3.00	3.45	3.23	6	06	32.12	I
BH39	4.50	4.95	4.73	5	05	30.62	I
BH39	5.95	6.40	6.18	9	09	29.17	II
BH39	7.50	7.95	7.73	10	10	27.62	II
BH39	8.95	9.40	9.18	14	14	26.17	II
BH39	10.50	10.95	10.73	16	16	24.62	II
BH39	12.00	12.45	12.23	19	19	23.12	II
BH39	13.50	13.95	13.73	10	10	21.62	II
BH39	14.95	15.40	15.18	13	13	20.17	II
BH39	16.50	16.95	16.73	14	14	18.62	II
BH39	17.95	18.40	18.18	14	14	17.17	II
BH39	19.50	19.95	19.73	16	16	15.62	II
BH39	20.95	21.40	21.18	17	17	14.17	II
BH39	22.50	22.95	22.73	18	18	12.62	II
BH39	24.00	24.45	24.23	19	19	11.12	II
BH39	25.50	25.95	25.73	21	21	9.62	II
BH39	27.00	27.45	27.23	28	28	8.12	II
BH39	28.50	28.95	28.73	32	32	6.62	III
BH39	30.00	30.45	30.23	42	42	5.12	III
BH39	31.50	31.95	31.73	44	44	3.62	III
BH39	33.00	33.45	33.23	45	45	2.12	III
BH39	35.05	35.50	35.28	52	52	0.07	III
BH40	1.00	1.45	1.23	4	04	34.22	I
BH40	2.95	3.40	3.18	5	05	32.27	I
BH40	4.50	4.95	4.73	8	08	30.72	II
BH40	6.00	6.45	6.23	10	10	29.22	II
BH40	7.50	7.95	7.73	11	11	27.72	II
BH40	8.95	9.40	9.18	13	13	26.27	II
BH40	10.50	10.95	10.73	13	13	24.72	II
BH40	12.00	12.45	12.23	18	18	23.22	II
BH40	13.50	13.95	13.73	17	17	21.72	II

CORRECTION FOR STANDARD PENETRATION TEST VALUES

Bore Hole No:	Starting Depth (M)	Ending Depth (M)	Average Depth (M)	Field 'N' Values	Cor. 'N' for Ovp. & Dilatancy (if reqd)	Reduced Level (M)	Stratum
BH40	14.95	15.40	15.18	18	18	20.27	II
BH40	16.50	16.95	16.73	20	20	18.72	II
BH40	17.95	18.40	18.18	20	20	17.27	II
BH40	19.50	19.95	19.73	19	19	15.72	II
BH40	20.95	21.40	21.18	22	22	14.27	II
BH40	22.50	22.95	22.73	21	21	12.72	II
BH40	24.00	24.45	24.23	23	23	11.22	II
BH40	25.50	25.95	25.73	24	24	9.72	II
BH40	26.80	27.25	27.03	23	23	8.42	II
BH40	28.50	28.95	28.73	28	28	6.72	II
BH40	30.00	30.45	30.23	34	34	5.22	III
BH40	31.50	31.95	31.73	36	36	3.72	III
BH40	33.00	33.45	33.23	44	44	2.22	III
BH40	35.05	35.50	35.28	48	48	0.17	III
BH41	1.00	1.45	1.23	3	03	34.00	I
BH41	3.00	3.45	3.23	5	05	32.00	I
BH41	4.50	4.95	4.73	8	08	30.50	I
BH41	5.95	6.40	6.18	12	12	29.05	II
BH41	7.50	7.95	7.73	12	12	27.50	II
BH41	9.05	9.50	9.28	15	15	25.95	II
BH41	10.50	10.95	10.73	16	16	24.50	II
BH41	11.95	12.40	12.18	16	16	23.05	II
BH41	13.50	13.95	13.73	15	15	21.50	II
BH41	14.95	15.40	15.18	15	15	20.05	II
BH41	16.50	16.95	16.73	21	21	18.50	II
BH41	18.00	18.45	18.23	22	22	17.00	II
BH41	19.50	19.95	19.73	28	28	15.50	II
BH41	20.95	21.40	21.18	29	29	14.05	II
BH41	22.50	22.95	22.73	30	30	12.50	II
BH41	24.00	24.45	24.23	34	34	11.00	III
BH41	25.50	25.95	25.73	38	38	9.50	III
BH41	26.80	27.25	27.03	37	37	8.20	III
BH41	28.50	28.95	28.73	40	40	6.50	III
BH41	30.00	30.45	30.23	40	40	5.00	III
BH41	31.50	31.95	31.73	45	45	3.50	III
BH41	33.00	33.45	33.23	48	48	2.00	III
BH41	35.05	35.50	35.28	45	45	-0.05	III
BH42	1.00	1.45	1.23	4	04	35.77	I
BH42	3.00	3.45	3.23	5	05	33.77	I
BH42	4.50	4.95	4.73	9	09	32.27	II
BH42	5.95	6.40	6.18	8	08	30.82	II
BH42	7.50	7.95	7.73	9	09	29.27	II
BH42	8.95	9.40	9.18	10	10	27.82	II

CORRECTION FOR STANDARD PENETRATION TEST VALUES

Bore Hole No:	Starting Depth (M)	Ending Depth (M)	Average Depth (M)	Field 'N' Values	Cor. 'N' for Ovp. & Dilatancy (if reqd)	Reduced Level (M)	Stratum
BH42	10.50	10.95	10.73	12	12	26.27	II
BH42	12.05	12.50	12.28	12	12	24.72	II
BH42	13.50	13.95	13.73	15	15	23.27	II
BH42	14.95	15.40	15.18	17	17	21.82	II
BH42	16.50	16.95	16.73	21	21	20.27	II
BH42	17.95	18.40	18.18	22	22	18.82	II
BH42	19.50	19.95	19.73	27	27	17.27	II
BH42	20.95	21.40	21.18	24	24	15.82	II
BH42	22.50	22.95	22.73	22	22	14.27	II
BH42	24.00	24.45	24.23	21	21	12.77	II
BH42	25.50	25.95	25.73	24	24	11.27	II
BH42	27.05	27.50	27.28	26	26	9.72	II
BH42	28.50	28.95	28.73	31	31	8.27	III
BH42	30.00	30.45	30.23	40	40	6.77	III
BH42	31.50	31.95	31.73	46	46	5.27	III
BH42	33.00	33.45	33.23	45	45	3.77	III
BH42	35.05	35.50	35.28	48	48	1.72	III
BH43	1.00	1.45	1.23	3	03	33.51	I
BH43	2.95	3.40	3.18	4	04	31.56	I
BH43	4.50	4.95	4.73	4	04	30.01	I
BH43	5.95	6.40	6.18	5	05	28.56	I
BH43	7.50	7.95	7.73	7	07	27.01	I
BH43	9.00	9.45	9.23	9	09	25.51	II
BH43	10.50	10.95	10.73	10	10	24.01	II
BH43	12.00	12.45	12.23	11	11	22.51	II
BH43	13.50	13.95	13.73	14	14	21.01	II
BH43	14.95	15.40	15.18	21	21	19.56	II
BH43	16.50	16.95	16.73	27	27	18.01	II
BH43	17.95	18.40	18.18	32	32	16.56	III
BH43	19.50	19.95	19.73	31	31	15.01	III
BH43	20.95	21.40	21.18	34	34	13.56	III
BH43	22.50	22.95	22.73	35	35	12.01	III
BH43	24.00	24.45	24.23	40	40	10.51	III
BH43	25.50	25.95	25.73	40	40	9.01	III
BH43	27.00	27.45	27.23	44	44	7.51	III
BH43	28.50	28.95	28.73	48	48	6.01	III
BH43	30.00	30.45	30.23	63	63	4.51	III
BH43	31.50	31.95	31.73	71	71	3.01	III
BH43	33.00	33.45	33.23	72	72	1.51	III
BH43	35.05	35.50	35.28	77	77	-0.54	III
BH44	1.00	1.45	1.23	4	04	34.27	Fill
BH44	2.95	3.40	3.18	5	05	32.32	I
BH44	4.50	4.95	4.73	10	10	30.77	II

CORRECTION FOR STANDARD PENETRATION TEST VALUES

Bore Hole No:	Starting Depth (M)	Ending Depth (M)	Average Depth (M)	Field 'N' Values	Cor. 'N' for Ovp. & Dilatancy (if reqd)	Reduced Level (M)	Stratum
BH44	5.95	6.40	6.18	10	10	29.32	II
BH44	7.50	7.95	7.73	12	12	27.77	II
BH44	9.00	9.45	9.23	13	13	26.27	II
BH44	10.50	10.95	10.73	13	13	24.77	II
BH44	11.95	12.40	12.18	17	17	23.32	II
BH44	13.50	13.95	13.73	24	24	21.77	II
BH44	14.95	15.40	15.18	30	30	20.32	II
BH44	16.50	16.95	16.73	28	28	18.77	II
BH44	17.95	18.40	18.18	29	29	17.32	II
BH44	19.50	19.95	19.73	27	27	15.77	II
BH44	21.00	21.45	21.23	30	30	14.27	II
BH44	22.50	22.95	22.73	28	28	12.77	II
BH44	24.00	24.45	24.23	31	31	11.27	III
BH44	25.50	25.95	25.73	37	37	9.77	III
BH44	27.00	27.45	27.23	40	40	8.27	III
BH44	28.50	28.95	28.73	43	43	6.77	III
BH44	30.00	30.45	30.23	41	41	5.27	III
BH44	31.50	31.95	31.73	55	55	3.77	III
BH44	33.00	33.45	33.23	61	61	2.27	III
BH44	35.05	35.50	35.28	68	68	0.22	III
BH45	1.00	1.45	1.23	4	04	34.57	I
BH45	2.95	3.40	3.18	5	05	32.62	I
BH45	4.50	4.95	4.73	7	07	31.07	I
BH45	6.00	6.45	6.23	8	08	29.57	II
BH45	7.50	7.95	7.73	10	10	28.07	II
BH45	8.95	9.40	9.18	14	14	26.62	II
BH45	10.50	10.95	10.73	13	13	25.07	II
BH45	11.95	12.40	12.18	16	16	23.62	II
BH45	13.50	13.95	13.73	18	18	22.07	II
BH45	14.95	15.40	15.18	18	18	20.62	II
BH45	16.50	16.95	16.73	22	22	19.07	II
BH45	18.40	18.85	18.63	30	30	17.17	II
BH45	19.50	19.95	19.73	35	35	16.07	III
BH45	21.00	21.45	21.23	36	36	14.57	III
BH45	22.50	22.95	22.73	48	48	13.07	III
BH45	24.00	24.45	24.23	41	41	11.57	III
BH45	25.50	25.95	25.73	42	42	10.07	III
BH45	27.00	27.45	27.23	52	52	8.57	III
BH45	28.50	28.95	28.73	53	53	7.07	III
BH45	30.00	30.45	30.23	55	55	5.57	III
BH45	31.50	31.95	31.73	62	62	4.07	III
BH45	33.00	33.45	33.23	72	72	2.57	III
BH45	35.05	35.50	35.28	69	69	0.52	III

CORRECTION FOR STANDARD PENETRATION TEST VALUES

Bore Hole No:	Starting Depth (M)	Ending Depth (M)	Average Depth (M)	Field 'N' Values	Cor. 'N' for Ovp. & Dilatancy (if reqd)	Reduced Level (M)	Stratum
BH46	1.00	1.45	1.23	4	04	33.69	I
BH46	2.95	3.40	3.18	5	05	31.74	I
BH46	4.50	4.95	4.73	7	07	30.19	I
BH46	6.00	6.45	6.23	9	09	28.69	II
BH46	7.50	7.95	7.73	14	14	27.19	II
BH46	8.95	9.40	9.18	19	19	25.74	II
BH46	10.50	10.95	10.73	22	22	24.19	II
BH46	12.00	12.45	12.23	21	21	22.69	II
BH46	13.50	13.95	13.73	21	21	21.19	II
BH46	14.95	15.40	15.18	25	25	19.74	II
BH46	16.50	16.95	16.73	28	28	18.19	II
BH46	17.95	18.40	18.18	41	41	16.74	III
BH46	19.50	19.95	19.73	41	41	15.19	III
BH46	21.00	21.45	21.23	43	43	13.69	III
BH46	22.50	22.95	22.73	45	45	12.19	III
BH46	24.00	24.45	24.23	49	49	10.69	III
BH46	25.50	25.95	25.73	51	51	9.19	III
BH46	27.00	27.45	27.23	54	54	7.69	III
BH46	28.50	28.95	28.73	55	55	6.19	III
BH46	30.00	30.45	30.23	62	62	4.69	III
BH46	31.50	31.95	31.73	66	66	3.19	III
BH46	33.00	33.45	33.23	70	70	1.69	III
BH46	35.05	35.40	35.23	>100	100	-0.31	III
BH47	1.00	1.45	1.23	12	12	35.13	Fill
BH47	3.00	3.45	3.23	4	04	33.13	I
BH47	4.50	4.95	4.73	5	05	31.63	I
BH47	5.95	6.40	6.18	10	10	30.18	II
BH47	7.50	7.95	7.73	13	13	28.63	II
BH47	8.95	9.40	9.18	15	15	27.18	II
BH47	10.50	10.95	10.73	17	17	25.63	II
BH47	12.05	12.50	12.28	15	15	24.08	II
BH47	13.50	13.95	13.73	19	19	22.63	II
BH47	14.95	15.40	15.18	23	23	21.18	II
BH47	16.50	16.95	16.73	21	21	19.63	II
BH47	17.95	18.40	18.18	22	22	18.18	II
BH47	19.50	19.95	19.73	24	24	16.63	II
BH47	20.95	21.40	21.18	27	27	15.18	II
BH47	22.50	22.95	22.73	32	32	13.63	III
BH47	24.00	24.45	24.23	35	35	12.13	III
BH47	25.50	25.95	25.73	38	38	10.63	III
BH47	27.00	27.45	27.23	44	44	9.13	III
BH47	28.50	28.95	28.73	49	49	7.63	III
BH47	30.00	30.45	30.23	52	52	6.13	III
BH47	31.50	31.95	31.73	54	54	4.63	III

CORRECTION FOR STANDARD PENETRATION TEST VALUES

Bore Hole No:	Starting Depth (M)	Ending Depth (M)	Average Depth (M)	Field 'N' Values	Cor. 'N' for Ovp. & Dilatancy (if reqd)	Reduced Level (M)	Stratum
BH47	33.00	33.45	33.23	53	53	3.13	III
BH47	35.05	35.50	35.28	56	56	1.08	III
BH48	1.00	1.45	1.23	4	04	33.82	I
BH48	3.00	3.45	3.23	5	05	31.82	I
BH48	4.50	4.95	4.73	6	06	30.32	I
BH48	5.95	6.40	6.18	6	06	28.87	I
BH48	7.50	7.95	7.73	9	09	27.32	II
BH48	9.05	9.50	9.28	10	10	25.77	II
BH48	10.50	10.95	10.73	12	12	24.32	II
BH48	11.95	12.40	12.18	14	14	22.87	II
BH48	13.50	13.95	13.73	13	13	21.32	II
BH48	14.95	15.40	15.18	17	17	19.87	II
BH48	16.50	16.95	16.73	22	22	18.32	II
BH48	17.95	18.40	18.18	25	25	16.87	II
BH48	19.50	19.95	19.73	30	30	15.32	II
BH48	20.95	21.40	21.18	35	35	13.87	III
BH48	22.50	22.95	22.73	36	36	12.32	III
BH48	24.00	24.45	24.23	40	40	10.82	III
BH48	25.50	25.95	25.73	42	42	9.32	III
BH48	27.00	27.45	27.23	46	46	7.82	III
BH48	28.50	28.95	28.73	52	52	6.32	III
BH48	30.00	30.45	30.23	56	56	4.82	III
BH48	31.50	31.95	31.73	69	69	3.32	III
BH48	33.00	33.45	33.23	74	74	1.82	III
BH48	35.05	35.42	35.24	>100	100	-0.19	III
BH49	1.00	1.45	1.23	10	10	35.86	Fill
BH49	2.95	3.40	3.18	4	04	33.91	I
BH49	4.50	4.95	4.73	8	08	32.36	I
BH49	6.00	6.45	6.23	10	10	30.86	II
BH49	7.50	7.95	7.73	11	11	29.36	II
BH49	8.95	9.40	9.18	14	14	27.91	II
BH49	10.50	10.95	10.73	18	18	26.36	II
BH49	12.00	12.45	12.23	17	17	24.86	II
BH49	13.50	13.95	13.73	15	15	23.36	II
BH49	14.95	15.40	15.18	20	20	21.91	II
BH49	16.50	16.95	16.73	21	21	20.36	II
BH49	18.00	18.45	18.23	24	24	18.86	II
BH49	19.50	19.95	19.73	27	27	17.36	II
BH49	20.95	21.40	21.18	22	22	15.91	II
BH49	22.50	22.95	22.73	27	27	14.36	II
BH49	24.00	24.45	24.23	30	30	12.86	III
BH49	25.50	25.95	25.73	36	36	11.36	III
BH49	27.00	27.45	27.23	40	40	9.86	III

CORRECTION FOR STANDARD PENETRATION TEST VALUES

Bore Hole No:	Starting Depth (M)	Ending Depth (M)	Average Depth (M)	Field 'N' Values	Cor. 'N' for Ovp. & Dilatancy (if reqd)	Reduced Level (M)	Stratum
BH49	28.50	28.95	28.73	37	37	8.36	III
BH49	30.00	30.45	30.23	44	44	6.86	III
BH49	31.50	31.95	31.73	49	49	5.36	III
BH49	33.00	33.45	33.23	55	55	3.86	III
BH49	35.05	35.50	35.28	64	64	1.81	III
BH50	1.00	1.37	1.19	>100	100	35.06	Fill
BH50	3.00	3.45	3.23	6	06	33.02	I
BH50	4.50	4.95	4.73	8	08	31.52	I
BH50	5.95	6.40	6.18	12	12	30.07	II
BH50	7.50	7.95	7.73	14	14	28.52	II
BH50	9.00	9.45	9.23	15	15	27.02	II
BH50	10.50	10.95	10.73	18	18	25.52	II
BH50	11.95	12.40	12.18	21	21	24.07	II
BH50	13.50	13.95	13.73	20	20	22.52	II
BH50	15.05	15.50	15.28	24	24	20.97	II
BH50	16.50	16.95	16.73	25	25	19.52	II
BH50	17.95	18.40	18.18	31	31	18.07	III
BH50	19.50	19.95	19.73	33	33	16.52	III
BH50	20.95	21.40	21.18	38	38	15.07	III
BH50	22.50	22.95	22.73	39	39	13.52	III
BH50	23.80	24.25	24.03	44	44	12.22	III
BH50	25.50	25.95	25.73	46	46	10.52	III
BH50	27.00	27.45	27.23	49	49	9.02	III
BH50	28.50	28.95	28.73	54	54	7.52	III
BH50	30.00	30.45	30.23	56	56	6.02	III
BH50	31.50	31.95	31.73	59	59	4.52	III
BH50	33.00	33.45	33.23	58	58	3.02	III
BH50	35.05	35.50	35.28	63	63	0.97	III
BH51	1.00	1.34	1.17	>100	100	36.94	Fill
BH51	3.00	3.20	3.10	>100	100	35.01	Fill
BH51	4.50	4.95	4.73	7	07	33.38	I
BH51	6.00	6.45	6.23	9	09	31.88	II
BH51	7.50	7.95	7.73	10	10	30.38	II
BH51	8.95	9.40	9.18	12	12	28.93	II
BH51	10.50	10.95	10.73	11	11	27.38	II
BH51	11.95	12.40	12.18	16	16	25.93	II
BH51	13.50	13.95	13.73	17	17	24.38	II
BH51	15.00	15.45	15.23	21	21	22.88	II
BH51	16.50	16.95	16.73	25	25	21.38	II
BH51	17.95	18.40	18.18	29	29	19.93	II
BH51	19.50	19.95	19.73	30	30	18.38	II
BH51	20.95	21.40	21.18	34	34	16.93	III
BH51	22.50	22.95	22.73	38	38	15.38	III

CORRECTION FOR STANDARD PENETRATION TEST VALUES

Bore Hole No:	Starting Depth (M)	Ending Depth (M)	Average Depth (M)	Field 'N' Values	Cor. 'N' for Ovp. & Dilatancy (if reqd)	Reduced Level (M)	Stratum
BH51	24.00	24.45	24.23	37	37	13.88	III
BH51	25.50	25.95	25.73	40	40	12.38	III
BH51	27.00	27.45	27.23	44	44	10.88	III
BH51	28.50	28.95	28.73	47	47	9.38	III
BH51	30.00	30.45	30.23	50	50	7.88	III
BH51	31.50	31.95	31.73	58	58	6.38	III
BH51	33.00	33.45	33.23	59	59	4.88	III
BH51	35.05	35.50	35.28	61	61	2.83	III
BH52	1.00	1.45	1.23	26	26	37.44	Fill
BH52	2.50	2.68	2.59	>100	100	36.07	Fill
BH52	4.00	4.23	4.12	>100	100	34.55	Fill
BH52	6.00	6.45	6.23	6	06	32.44	I
BH52	7.50	7.95	7.73	8	08	30.94	I
BH52	8.95	9.40	9.18	9	09	29.49	II
BH52	10.50	10.95	10.73	12	12	27.94	II
BH52	11.95	12.40	12.18	11	11	26.49	II
BH52	13.50	13.95	13.73	16	16	24.94	II
BH52	14.95	15.40	15.18	32	32	23.49	II
BH52	16.50	16.95	16.73	24	24	21.94	II
BH52	17.95	18.40	18.18	27	27	20.49	II
BH52	19.50	19.95	19.73	30	30	18.94	II
BH52	20.95	21.40	21.18	26	26	17.49	II
BH52	22.50	22.95	22.73	23	23	15.94	II
BH52	24.00	24.45	24.23	25	25	14.44	II
BH52	25.50	25.95	25.73	32	32	12.94	III
BH52	27.00	27.45	27.23	36	36	11.44	III
BH52	28.50	28.95	28.73	43	43	9.94	III
BH52	30.00	30.45	30.23	46	46	8.44	III
BH52	31.50	31.95	31.73	55	55	6.94	III
BH52	33.00	33.45	33.23	56	56	5.44	III
BH52	35.05	35.50	35.28	63	63	3.39	III

CORRECTION FOR STANDARD PENETRATION TEST VALUES

Bore Hole No:	Starting Depth (M)	Ending Depth (M)	Average Depth (M)	Field 'N' Values	Cor. 'N' for Ovp. & Dilatancy (if reqd)	Reduced Level (M)	Stratum
IBH01	1.00	1.45	1.23	12	12	34.76	Fill
IBH01	3.00	3.45	3.23	4	04	32.76	I
IBH01	4.50	4.95	4.73	6	06	31.26	I
IBH01	5.95	6.40	6.18	9	09	29.81	II
IBH01	7.50	7.95	7.73	12	12	28.26	II
IBH01	9.00	9.45	9.23	16	16	26.76	II
IBH01	10.50	10.95	10.73	18	18	25.26	II
IBH01	11.95	12.40	12.18	21	21	23.81	II
IBH01	13.50	13.95	13.73	20	20	22.26	II
IBH01	14.95	15.40	15.18	24	24	20.81	II
IBH01	16.50	16.95	16.73	27	27	19.26	II
IBH01	18.00	18.45	18.23	30	30	17.76	II
IBH01	19.50	19.95	19.73	26	26	16.26	II
IBH01	20.95	21.40	21.18	25	25	14.81	II
IBH01	22.50	22.95	22.73	31	31	13.26	III
IBH01	24.00	24.45	24.23	27	27	11.76	III
IBH01	25.50	25.95	25.73	31	31	10.26	III
IBH01	27.00	27.45	27.23	37	37	8.76	III
IBH01	28.50	28.95	28.73	40	40	7.26	III
IBH01	30.00	30.45	30.23	52	52	5.76	III
IBH01	31.50	31.95	31.73	65	65	4.26	III
IBH01	33.00	33.45	33.23	64	64	2.76	III
IBH01	35.10	35.55	35.33	72	72	0.66	III
IBH02	1.00	1.45	1.23	2	02	35.06	Fill
IBH02	3.00	3.45	3.23	3	03	33.06	I
IBH02	4.50	4.95	4.73	3	03	31.56	I
IBH02	6.00	6.45	6.23	5	05	30.06	I
IBH02	7.50	7.95	7.73	8	08	28.56	I
IBH02	8.95	9.40	9.18	11	11	27.11	II
IBH02	10.50	10.95	10.73	14	14	25.56	II
IBH02	11.95	12.40	12.18	17	17	24.11	II
IBH02	13.50	13.95	13.73	21	21	22.56	II
IBH02	14.95	15.40	15.18	23	23	21.11	II
IBH02	16.50	16.95	16.73	26	26	19.56	II
IBH02	18.00	18.45	18.23	26	26	18.06	II
IBH02	19.50	19.95	19.73	30	30	16.56	II
IBH02	20.95	21.40	21.18	31	31	15.11	III
IBH02	22.50	22.95	22.73	31	31	13.56	III
IBH02	24.05	24.50	24.28	34	34	12.01	III
IBH02	25.50	25.95	25.73	35	35	10.56	III
IBH02	27.00	27.45	27.23	38	38	9.06	III
IBH02	28.50	28.95	28.73	43	43	7.56	III
IBH02	30.00	30.45	30.23	50	50	6.06	III
IBH02	31.50	31.95	31.73	59	59	4.56	III

CORRECTION FOR STANDARD PENETRATION TEST VALUES

Bore Hole No:	Starting Depth (M)	Ending Depth (M)	Average Depth (M)	Field 'N' Values	Cor. 'N' for Ovp. & Dilatancy (if reqd)	Reduced Level (M)	Stratum
IBH02	33.00	33.45	33.23	66	66	3.06	III
IBH02	35.05	35.50	35.28	68	68	1.01	III
IBH03	1.00	1.45	1.23	6	06	34.70	Fill
IBH03	3.00	3.45	3.23	4	04	32.70	I
IBH03	4.50	4.95	4.73	4	04	31.20	I
IBH03	5.95	6.40	6.18	5	05	29.75	I
IBH03	7.50	7.95	7.73	12	12	28.20	II
IBH03	8.95	9.40	9.18	14	14	26.75	II
IBH03	10.50	10.95	10.73	15	15	25.20	II
IBH03	11.95	12.40	12.18	20	20	23.75	II
IBH03	13.50	13.95	13.73	19	19	22.20	II
IBH03	15.00	15.45	15.23	23	23	20.70	II
IBH03	16.50	16.95	16.73	23	23	19.20	II
IBH03	17.95	18.40	18.18	24	24	17.75	II
IBH03	19.50	19.95	19.73	29	29	16.20	II
IBH03	20.95	21.40	21.18	30	30	14.75	II
IBH03	22.50	22.95	22.73	30	30	13.20	II
IBH03	24.00	24.45	24.23	32	32	11.70	III
IBH03	25.50	25.95	25.73	34	34	10.20	III
IBH03	27.00	27.45	27.23	39	39	8.70	III
IBH03	28.50	28.95	28.73	44	44	7.20	III
IBH03	30.00	30.45	30.23	54	54	5.70	III
IBH03	31.50	31.95	31.73	69	69	4.20	III
IBH03	33.00	33.35	33.18	>100	100	2.75	III
IBH03	35.05	35.38	35.22	>100	100	0.71	III
IBH04	1.00	1.45	1.23	13	13	35.36	Fill
IBH04	3.05	3.50	3.28	19	19	33.31	Fill
IBH04	4.50	4.95	4.73	4	04	31.86	I
IBH04	5.95	6.40	6.18	5	05	30.41	I
IBH04	7.50	7.95	7.73	7	07	28.86	I
IBH04	8.95	9.40	9.18	13	13	27.41	II
IBH04	10.50	10.95	10.73	11	11	25.86	II
IBH04	11.95	12.40	12.18	27	27	24.41	II
IBH04	13.50	13.95	13.73	33	33	22.86	III
IBH04	15.05	15.50	15.28	35	35	21.31	III
IBH04	16.50	16.95	16.73	30	30	19.86	III
IBH04	17.95	18.40	18.18	27	27	18.41	III
IBH04	19.50	19.95	19.73	30	30	16.86	III
IBH04	20.95	21.40	21.18	55	55	15.41	III
IBH04	22.50	22.95	22.73	50	50	13.86	III
IBH04	24.00	24.45	24.23	59	59	12.36	III
IBH04	25.50	25.95	25.73	52	52	10.86	III
IBH04	27.00	27.45	27.23	36	36	9.36	III

CORRECTION FOR STANDARD PENETRATION TEST VALUES

Bore Hole No:	Starting Depth (M)	Ending Depth (M)	Average Depth (M)	Field 'N' Values	Cor. 'N' for Ovp. & Dilatancy (if reqd)	Reduced Level (M)	Stratum
IBH04	28.50	28.95	28.73	33	33	7.86	III
IBH04	30.00	30.45	30.23	37	37	6.36	III
IBH04	31.50	31.95	31.73	39	39	4.86	III
IBH04	33.00	33.45	33.23	41	41	3.36	III
IBH04	35.05	35.50	35.28	45	45	1.31	III
IBH05	1.00	1.45	1.23	9	09	36.89	Fill
IBH05	3.10	3.55	3.33	10	10	34.79	Fill
IBH05	4.50	4.95	4.73	5	05	33.39	I
IBH05	6.10	6.55	6.33	4	04	31.79	I
IBH05	7.95	8.40	8.18	7	07	29.94	I
IBH05	9.50	9.95	9.73	10	10	28.39	II
IBH05	10.95	11.40	11.18	13	13	26.94	II
IBH05	12.50	12.95	12.73	14	14	25.39	II
IBH05	13.95	14.40	14.18	17	17	23.94	II
IBH05	15.50	15.95	15.73	21	21	22.39	II
IBH05	16.95	17.40	17.18	18	18	20.94	II
IBH05	18.50	18.95	18.73	21	21	19.39	II
IBH05	20.10	20.55	20.33	19	19	17.79	II
IBH05	21.50	21.95	21.73	22	22	16.39	II
IBH05	22.95	23.40	23.18	31	31	14.94	III
IBH05	24.50	24.95	24.73	35	35	13.39	III
IBH05	25.95	26.40	26.18	41	41	11.94	III
IBH05	27.50	27.95	27.73	56	56	10.39	III
IBH05	29.00	29.45	29.23	38	38	8.89	III
IBH05	30.50	30.95	30.73	40	40	7.39	III
IBH05	32.00	32.45	32.23	43	43	5.89	III
IBH05	33.50	33.95	33.73	48	48	4.39	III
IBH05	35.05	35.50	35.28	51	51	2.84	III
IBH06	1.00	1.45	1.23	11	11	36.13	Fill
IBH06	3.05	3.50	3.28	24	24	34.08	Fill
IBH06	4.50	4.95	4.73	31	31	32.63	Fill
IBH06	5.95	6.40	6.18	7	07	31.18	I
IBH06	7.50	7.95	7.73	10	10	29.63	II
IBH06	8.95	9.40	9.18	8	08	28.18	I
IBH06	10.50	10.95	10.73	12	12	26.63	II
IBH06	12.05	12.50	12.28	19	19	25.08	II
IBH06	13.50	13.95	13.73	16	16	23.63	II
IBH06	14.95	15.40	15.18	21	21	22.18	II
IBH06	16.50	16.95	16.73	19	19	20.63	II
IBH06	18.10	18.55	18.33	16	16	19.03	II
IBH06	19.50	19.95	19.73	18	18	17.63	II
IBH06	21.05	21.50	21.28	20	20	16.08	II
IBH06	22.50	22.95	22.73	25	25	14.63	II

CORRECTION FOR STANDARD PENETRATION TEST VALUES

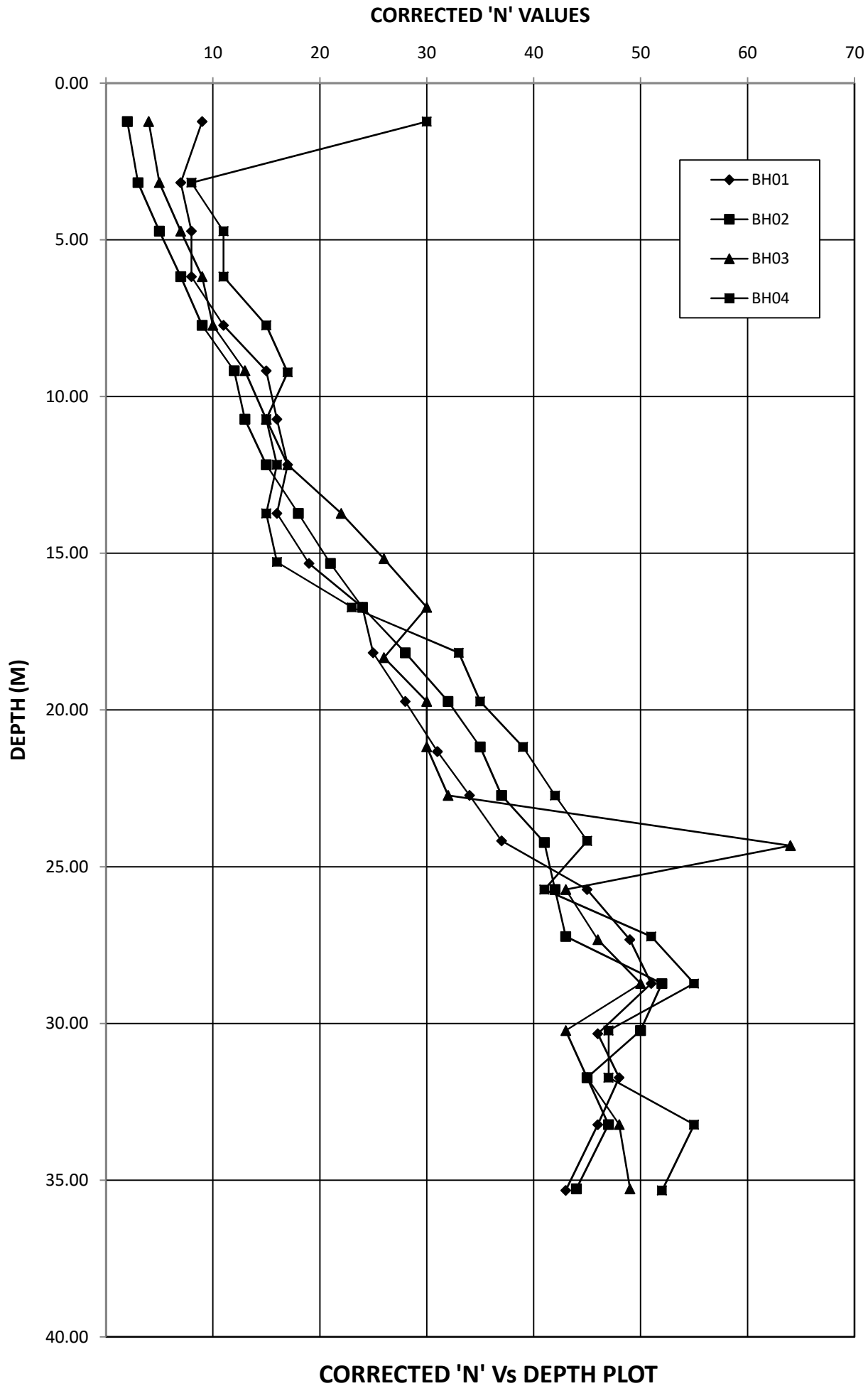
Bore Hole No:	Starting Depth (M)	Ending Depth (M)	Average Depth (M)	Field 'N' Values	Cor. 'N' for Ovp. & Dilatancy (if reqd)	Reduced Level (M)	Stratum
IBH06	24.10	24.55	24.33	28	28	13.03	II
IBH06	25.50	25.95	25.73	33	33	11.63	III
IBH06	27.00	27.45	27.23	46	46	10.13	III
IBH06	28.50	28.95	28.73	51	51	8.63	III
IBH06	30.00	30.45	30.23	34	34	7.13	III
IBH06	31.50	31.95	31.73	53	53	5.63	III
IBH06	33.00	33.45	33.23	57	57	4.13	III
IBH06	35.10	35.55	35.33	57	57	2.03	III
IBH07	1.00	1.45	1.23	12	12	35.75	Fill
IBH07	2.95	3.40	3.18	6	06	33.80	I
IBH07	4.50	4.95	4.73	5	05	32.25	I
IBH07	5.95	6.40	6.18	7	07	30.80	I
IBH07	7.50	7.95	7.73	8	08	29.25	I
IBH07	9.05	9.50	9.28	12	12	27.70	II
IBH07	10.50	10.95	10.73	14	14	26.25	II
IBH07	11.95	12.40	12.18	17	17	24.80	II
IBH07	13.50	13.95	13.73	20	20	23.25	II
IBH07	15.10	15.55	15.33	17	17	21.65	II
IBH07	16.50	16.95	16.73	21	21	20.25	II
IBH07	17.95	18.40	18.18	19	19	18.80	II
IBH07	19.50	19.95	19.73	22	22	17.25	II
IBH07	21.05	21.50	21.28	38	38	15.70	III
IBH07	22.50	22.95	22.73	32	32	14.25	III
IBH07	23.95	24.40	24.18	41	41	12.80	III
IBH07	25.50	25.95	25.73	36	36	11.25	III
IBH07	27.00	27.45	27.23	39	21	9.75	IV
IBH07	28.50	28.95	28.73	36	20	8.25	IV
IBH07	30.00	30.45	30.23	32	32	6.75	III
IBH07	31.50	31.95	31.73	37	37	5.25	III
IBH07	33.00	33.45	33.23	44	44	3.75	III
IBH07	35.05	35.50	35.28	47	47	1.70	III
IBH08	1.00	1.45	1.23	3	03	35.28	Fill
IBH08	3.00	3.45	3.23	4	04	33.28	I
IBH08	4.50	4.95	4.73	4	04	31.78	I
IBH08	5.95	6.40	6.18	5	05	30.33	I
IBH08	7.50	7.95	7.73	7	07	28.78	I
IBH08	8.95	9.40	9.18	12	12	27.33	II
IBH08	10.50	10.95	10.73	11	11	25.78	II
IBH08	12.00	12.45	12.23	14	14	24.28	II
IBH08	13.50	13.95	13.73	15	15	22.78	II
IBH08	14.95	15.40	15.18	17	17	21.33	II
IBH08	16.50	16.95	16.73	20	20	19.78	II
IBH08	17.95	18.40	18.18	27	27	18.33	II

CORRECTION FOR STANDARD PENETRATION TEST VALUES

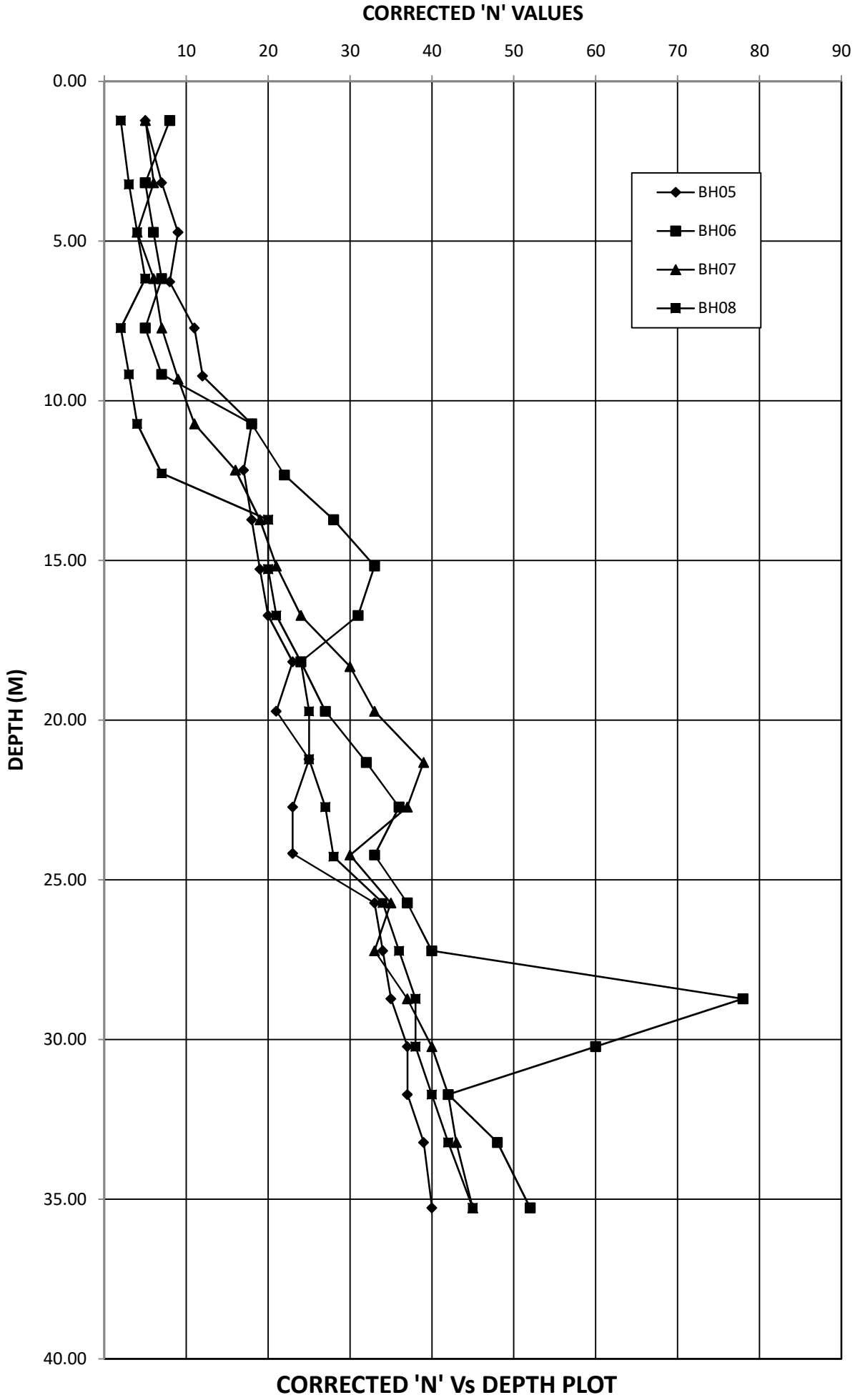
Bore Hole No:	Starting Depth (M)	Ending Depth (M)	Average Depth (M)	Field 'N' Values	Cor. 'N' for Ovp. & Dilatancy (if reqd)	Reduced Level (M)	Stratum
IBH08	19.50	19.95	19.73	29	29	16.78	II
IBH08	20.95	21.40	21.18	28	28	15.33	II
IBH08	22.50	22.95	22.73	28	28	13.78	II
IBH08	24.00	24.45	24.23	30	30	12.28	II
IBH08	25.50	25.95	25.73	34	34	10.78	III
IBH08	27.00	27.45	27.23	43	43	9.28	III
IBH08	28.50	28.95	28.73	53	53	7.78	III
IBH08	30.00	30.45	30.23	55	55	6.28	III
IBH08	31.50	31.95	31.73	60	60	4.78	III
IBH08	33.00	33.45	33.23	71	71	3.28	III
IBH08	35.05	35.42	35.24	>100	100	1.27	III
IBH09	1.00	1.45	1.23	8	08	35.31	Fill
IBH09	2.95	3.40	3.18	3	03	33.36	I
IBH09	4.50	4.95	4.73	4	04	31.81	I
IBH09	6.00	6.45	6.23	6	06	30.31	I
IBH09	7.50	7.95	7.73	14	14	28.81	II
IBH09	8.95	9.40	9.18	15	15	27.36	II
IBH09	10.50	10.95	10.73	20	20	25.81	II
IBH09	12.05	12.50	12.28	22	22	24.26	II
IBH09	13.50	13.95	13.73	21	21	22.81	II
IBH09	14.95	15.40	15.18	25	25	21.36	II
IBH09	16.50	16.95	16.73	29	29	19.81	II
IBH09	17.95	18.40	18.18	33	33	18.36	III
IBH09	19.50	19.95	19.73	32	32	16.81	III
IBH09	20.95	21.40	21.18	30	30	15.36	II
IBH09	22.50	22.95	22.73	31	31	13.81	III
IBH09	24.00	24.45	24.23	22	22	12.31	II
IBH09	25.50	25.95	25.73	28	28	10.81	II
IBH09	27.00	27.45	27.23	31	31	9.31	III
IBH09	28.50	28.95	28.73	40	40	7.81	III
IBH09	30.00	30.45	30.23	53	53	6.31	III
IBH09	31.50	31.95	31.73	53	53	4.81	III
IBH09	33.00	33.45	33.23	62	62	3.31	III
IBH09	35.05	35.50	35.28	65	65	1.26	III
IBH10	1.00	1.45	1.23	7	07	34.91	Fill
IBH10	2.95	3.40	3.18	5	05	32.96	I
IBH10	4.50	4.95	4.73	12	12	31.41	II
IBH10	6.00	6.45	6.23	12	12	29.91	II
IBH10	7.50	7.95	7.73	17	17	28.41	II
IBH10	8.95	9.40	9.18	20	20	26.96	II
IBH10	10.50	10.95	10.73	21	21	25.41	II
IBH10	12.00	12.45	12.23	23	23	23.91	II
IBH10	13.50	13.95	13.73	25	25	22.41	II

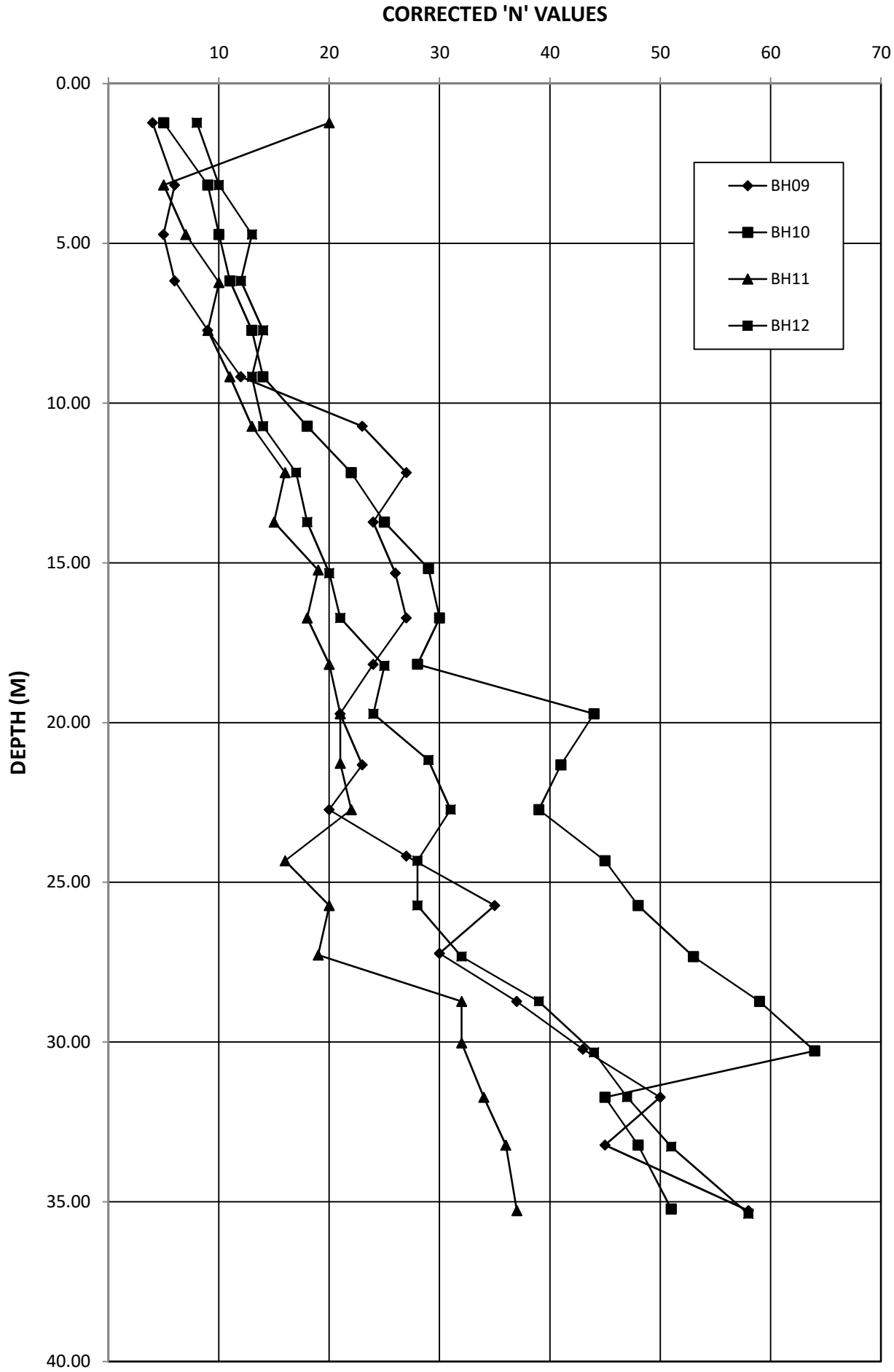
CORRECTION FOR STANDARD PENETRATION TEST VALUES

Bore Hole No:	Starting Depth (M)	Ending Depth (M)	Average Depth (M)	Field 'N' Values	Cor. 'N' for Ovp. & Dilatancy (if reqd)	Reduced Level (M)	Stratum
IBH10	14.95	15.40	15.18	24	24	20.96	II
IBH10	16.50	16.95	16.73	24	24	19.41	II
IBH10	17.95	18.40	18.18	23	23	17.96	II
IBH10	19.50	19.95	19.73	23	23	16.41	II
IBH10	20.95	21.40	21.18	23	23	14.96	II
IBH10	22.50	22.95	22.73	26	26	13.41	II
IBH10	24.00	24.45	24.23	31	31	11.91	III
IBH10	25.50	25.95	25.73	35	35	10.41	III
IBH10	27.00	27.45	27.23	39	39	8.91	III
IBH10	28.50	28.95	28.73	43	43	7.41	III
IBH10	30.00	30.45	30.23	54	54	5.91	III
IBH10	31.50	31.95	31.73	55	55	4.41	III
IBH10	33.00	33.45	33.23	72	72	2.91	III
IBH10	35.05	35.40	35.23	>100	100	0.91	III

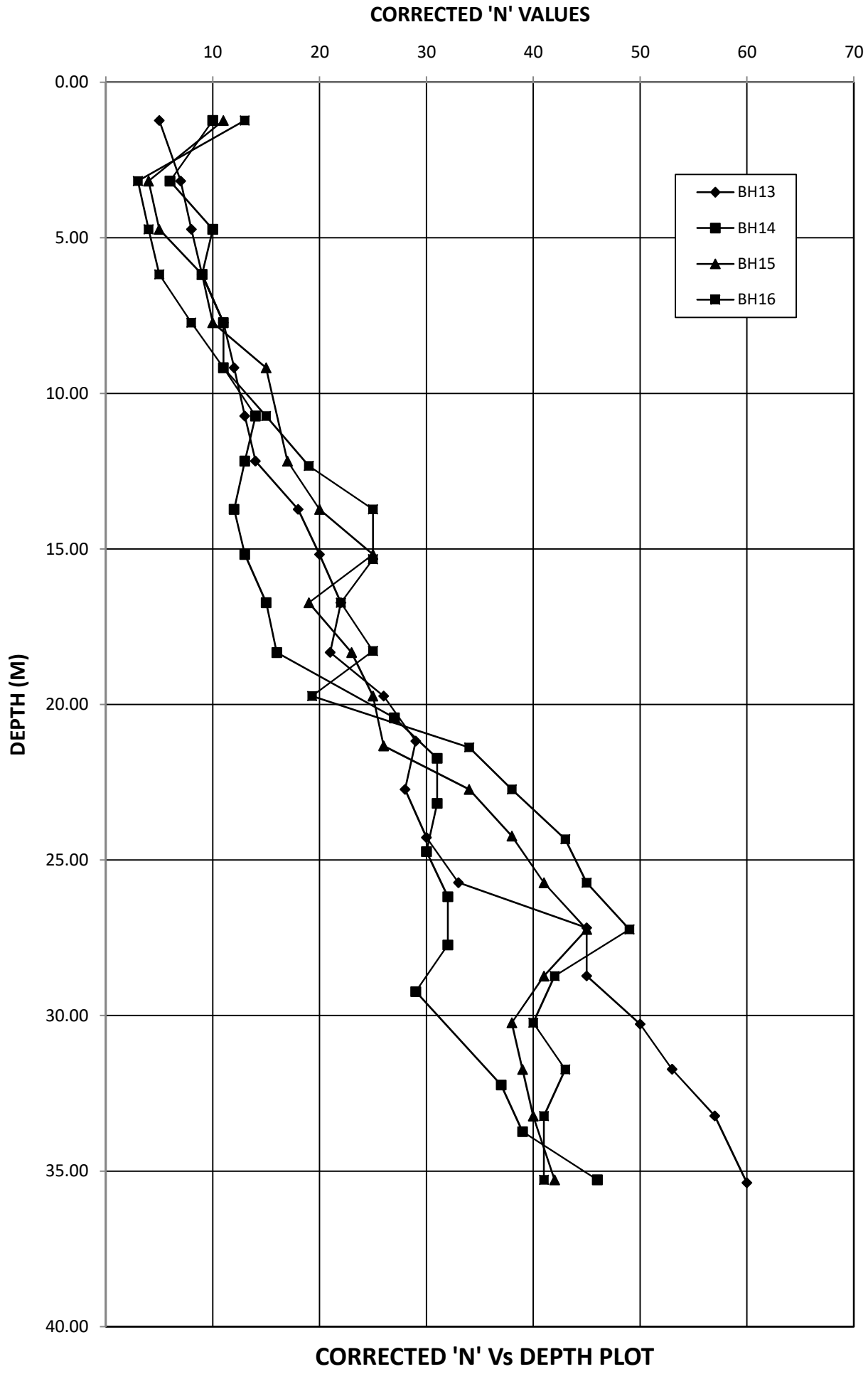


CORRECTED 'N' Vs DEPTH PLOT

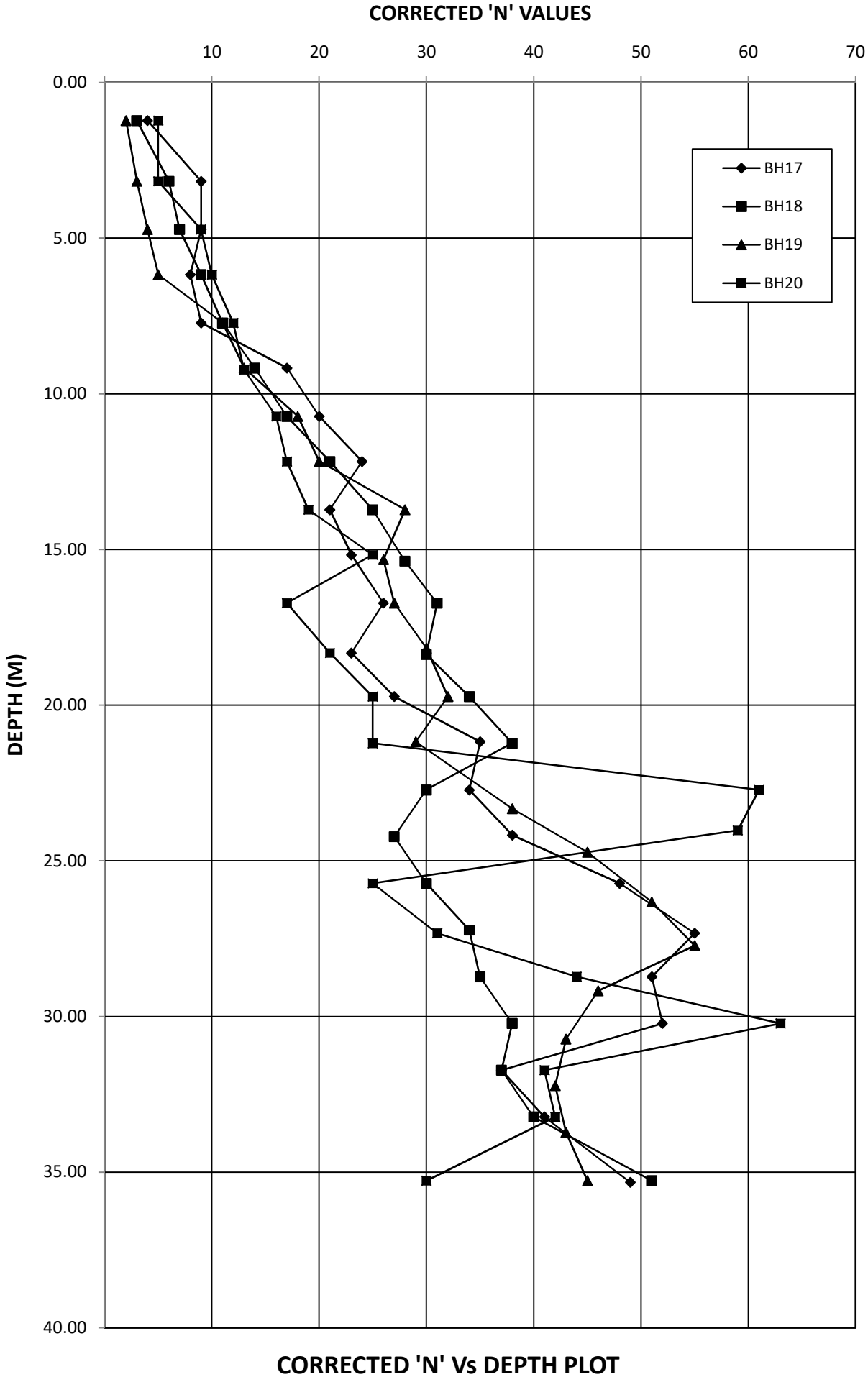

CORRECTED 'N' VALUES
10
20
30
40
50
60
70
80
90
0.00
5.00
10.00
15.00
20.00
25.00
30.00
35.00
40.00
DEPTH (M)
BH05
BH06
BH07
BH08
CORRECTED 'N' Vs DEPTH PLOT



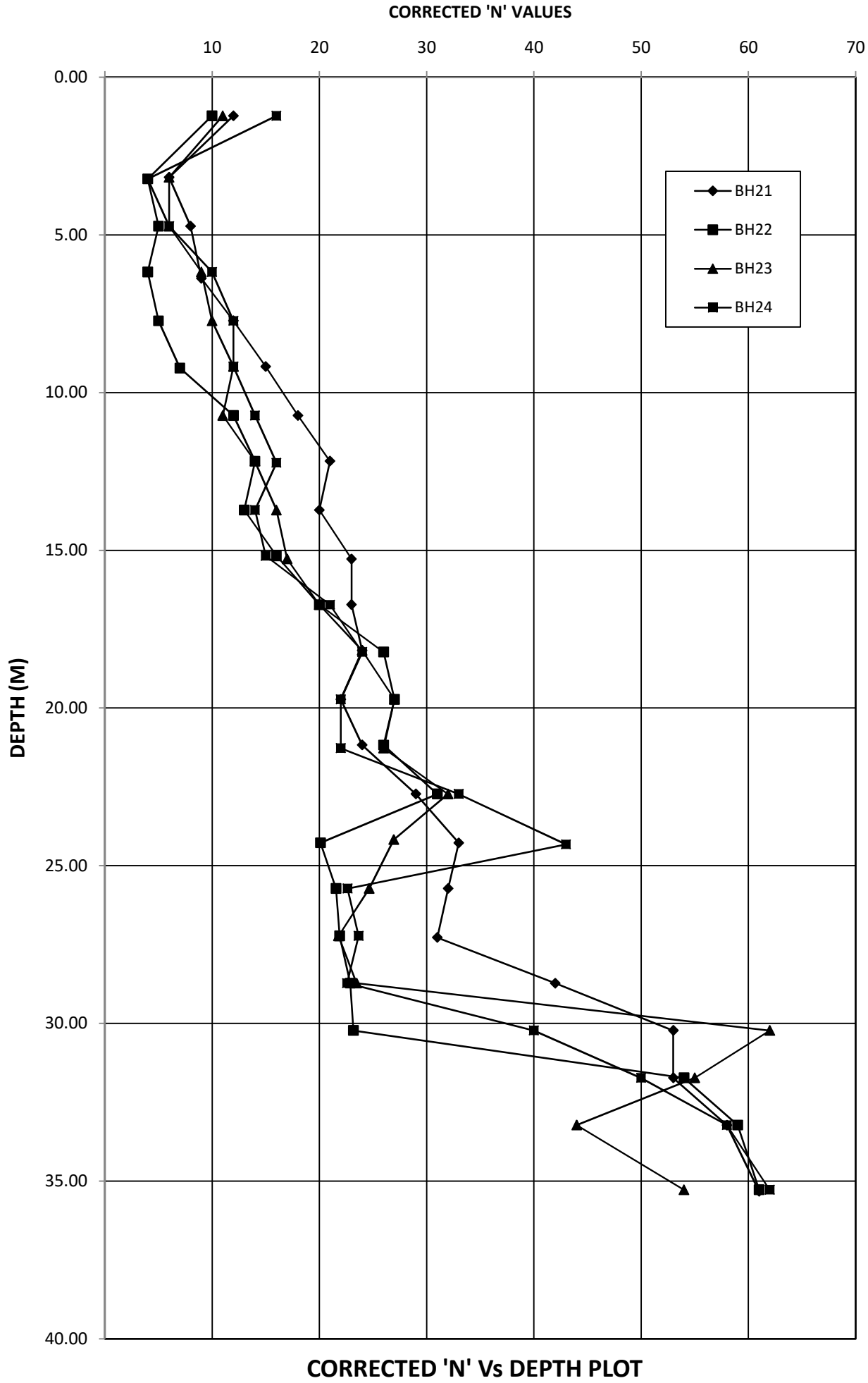
CORRECTED 'N' Vs DEPTH PLOT



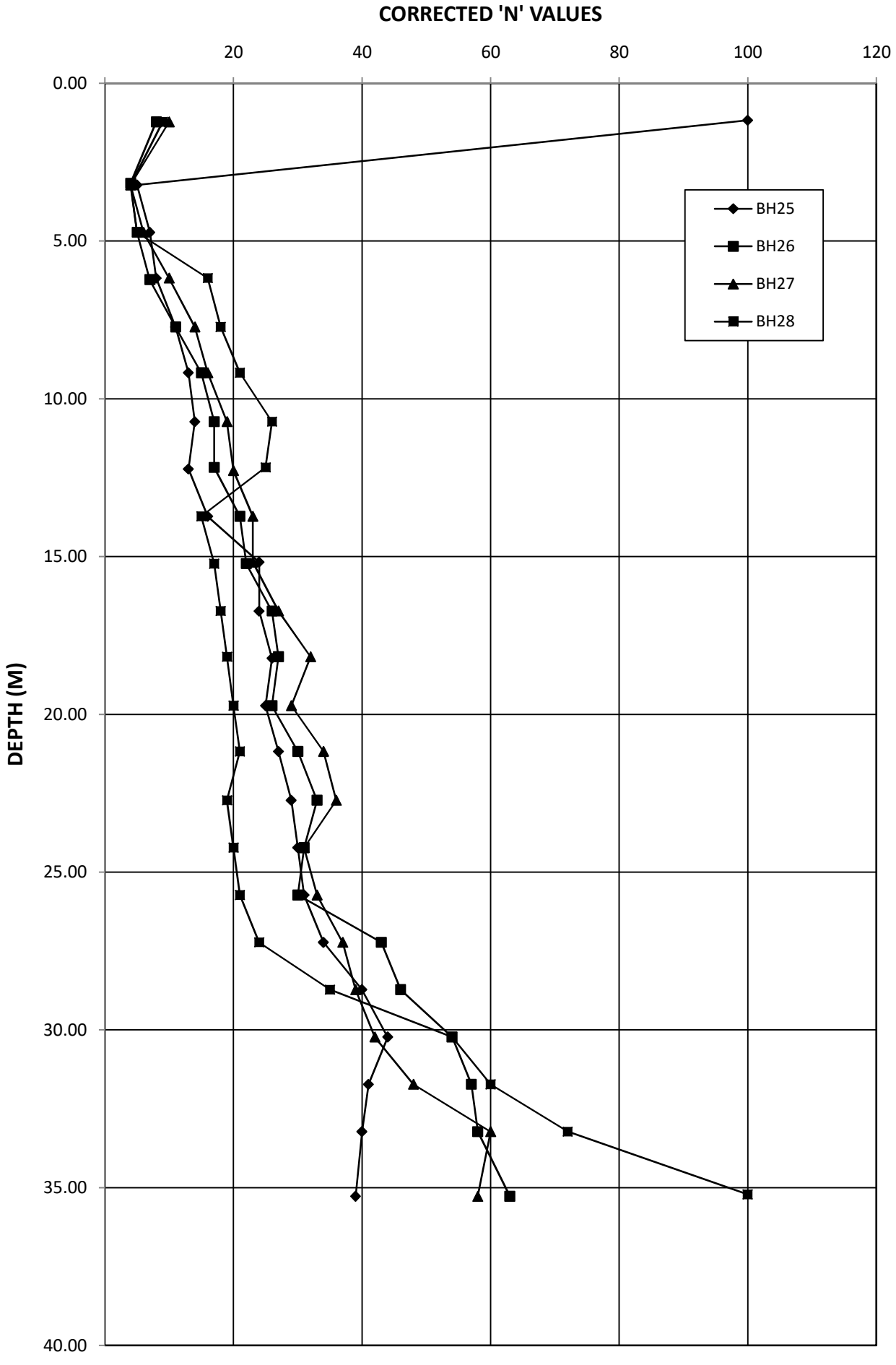
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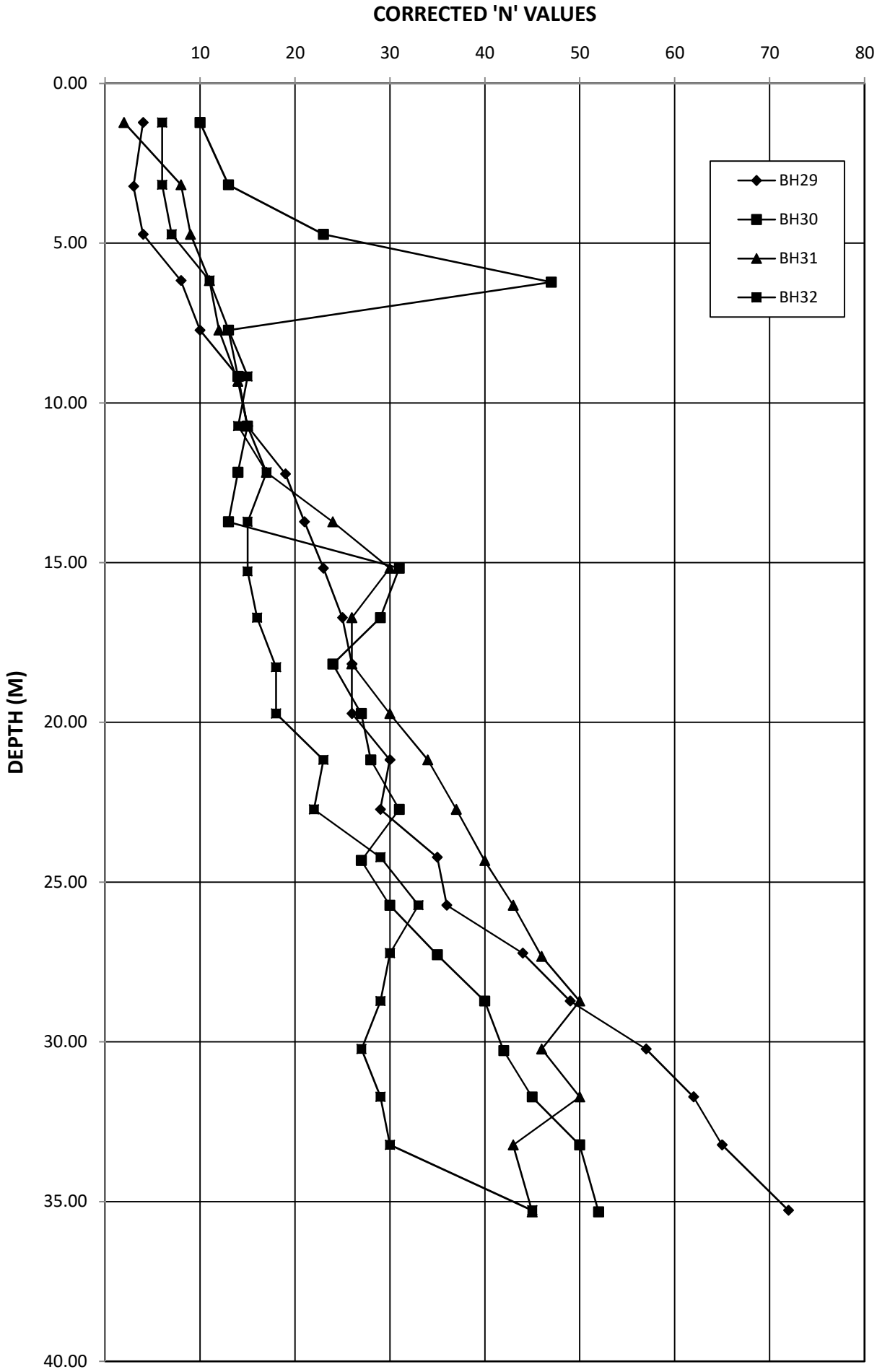
CORRECTED 'N' Vs DEPTH PLOT



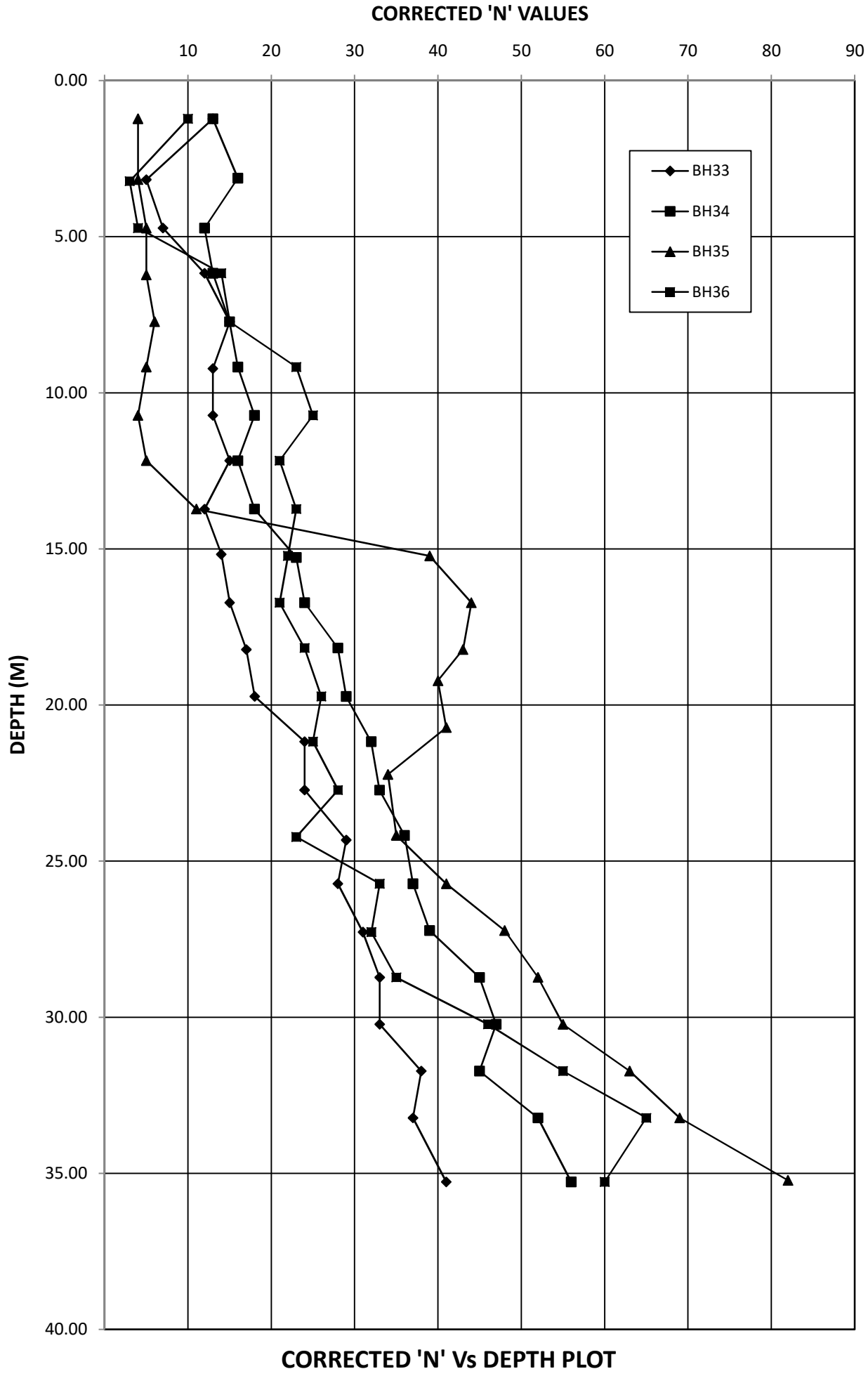
CORRECTED 'N' Vs DEPTH PLOT



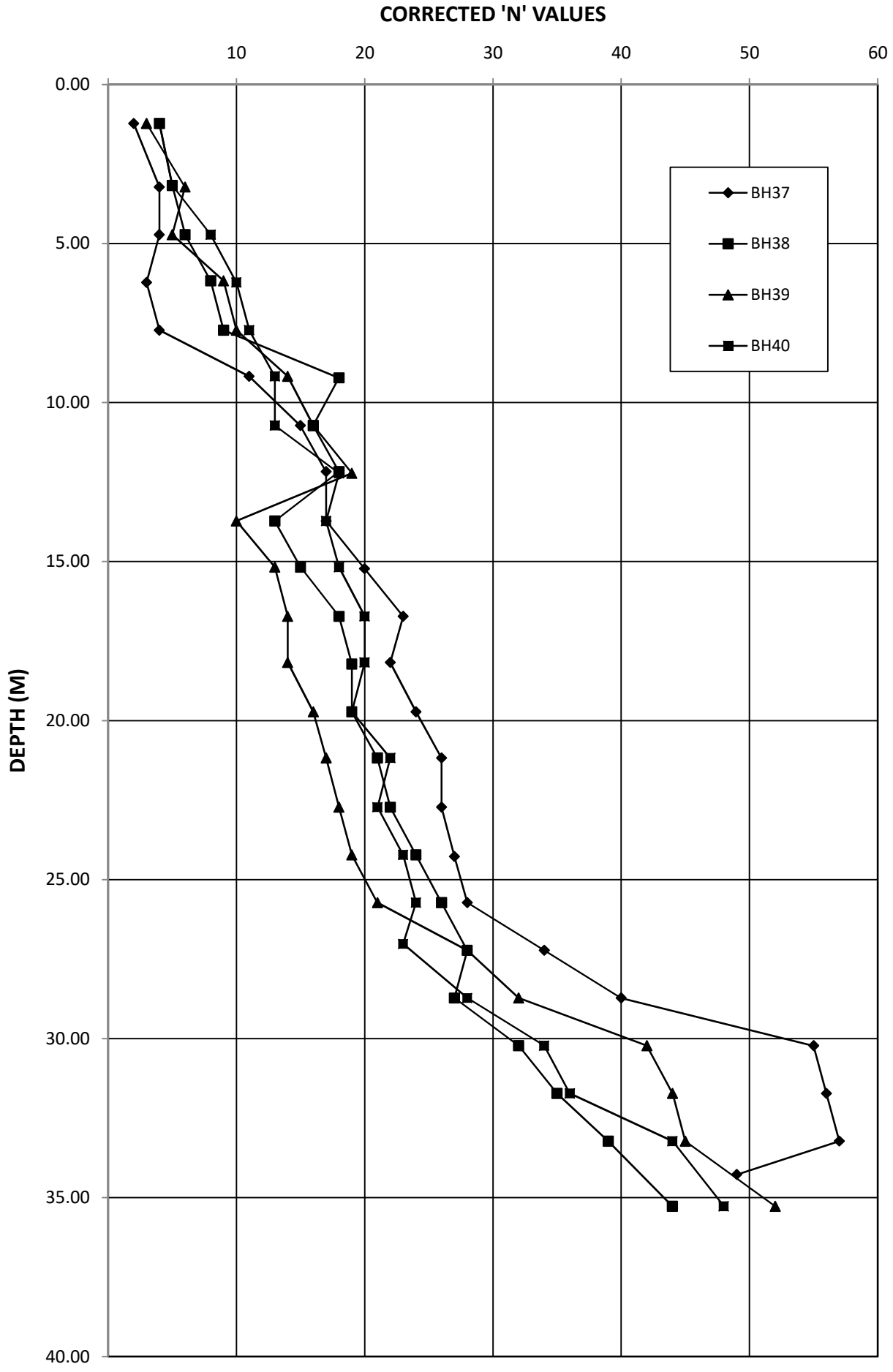
CORRECTED 'N' Vs DEPTH PLOT



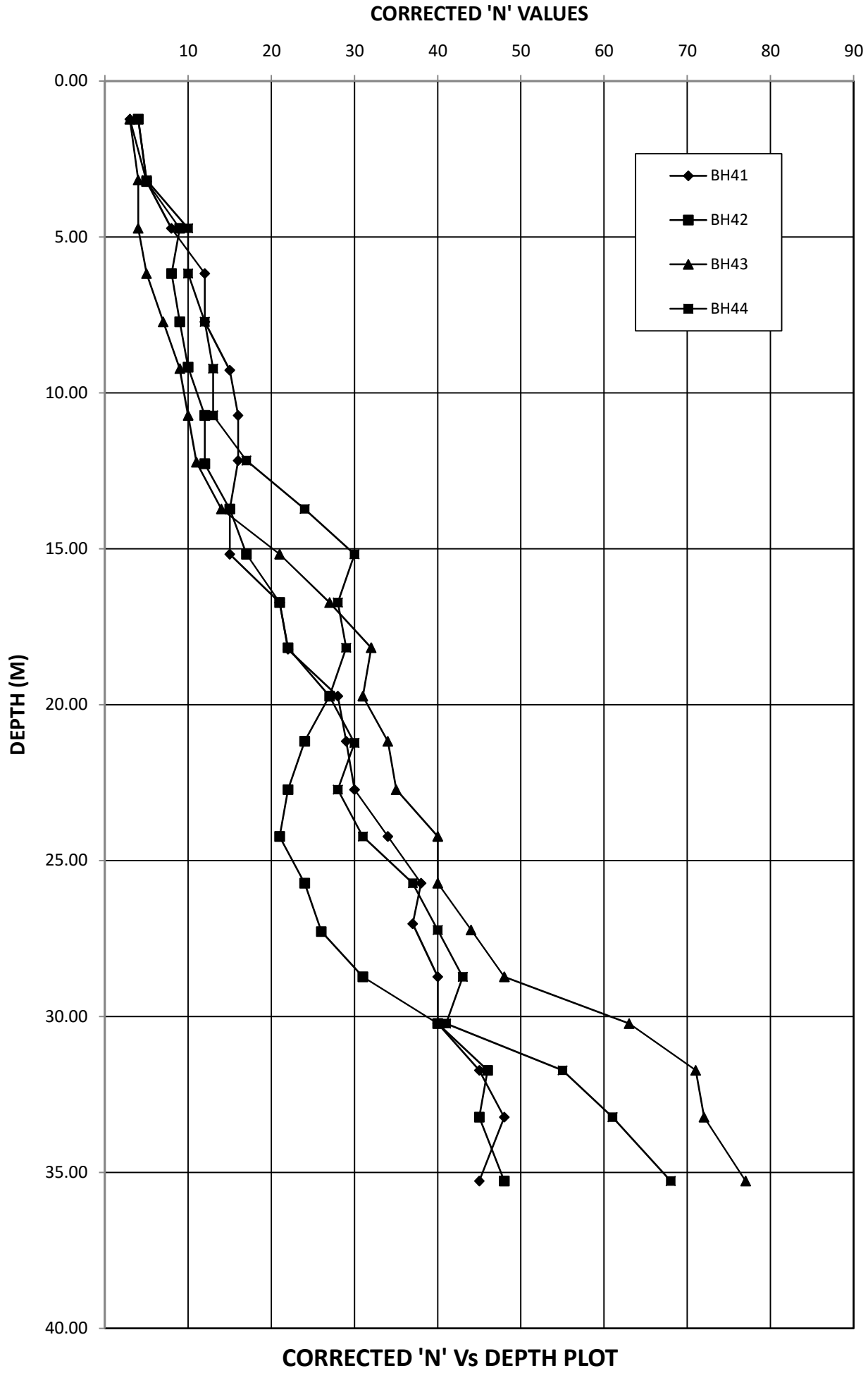
CORRECTED 'N' Vs DEPTH PLOT

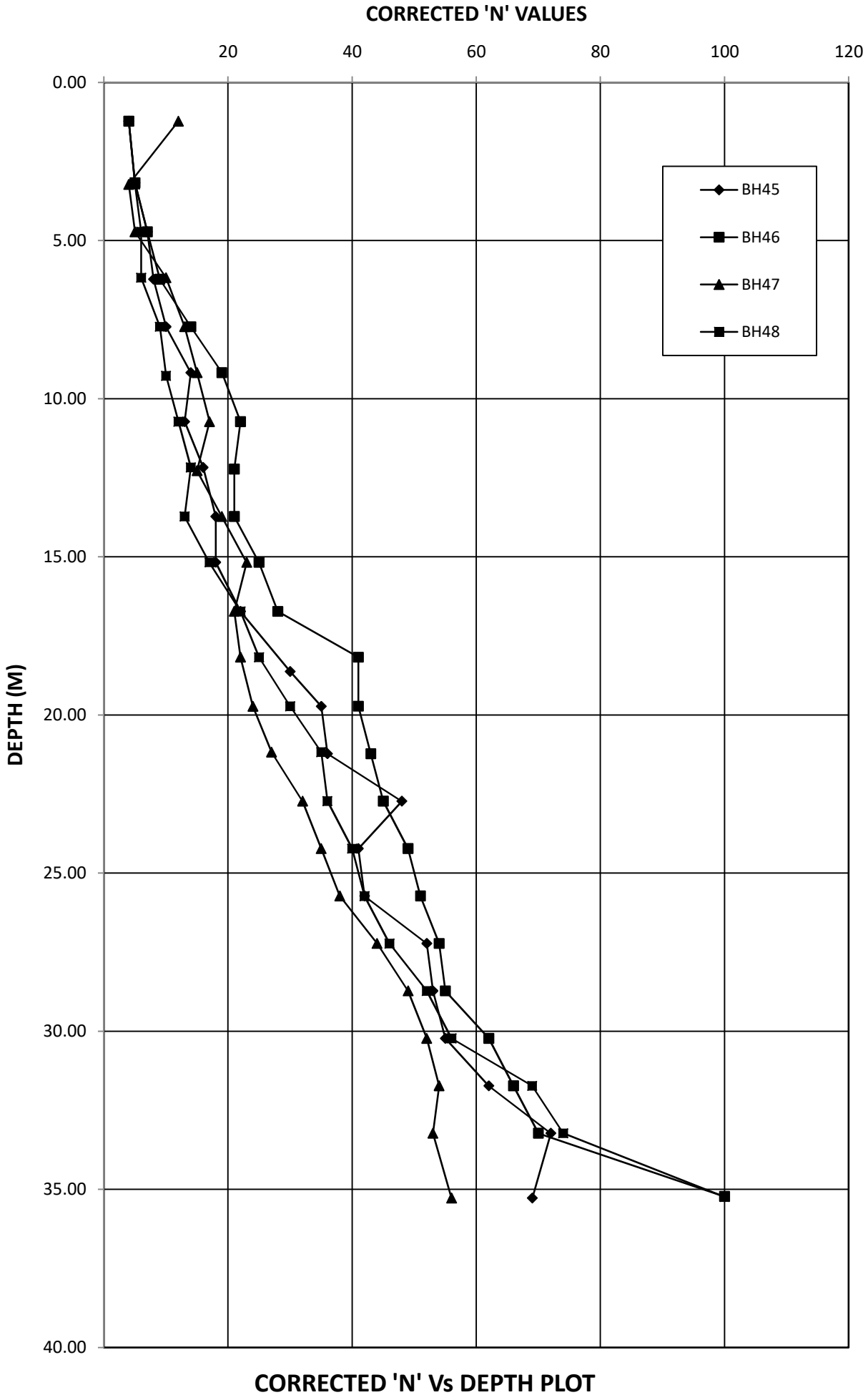


CORRECTED 'N' Vs DEPTH PLOT

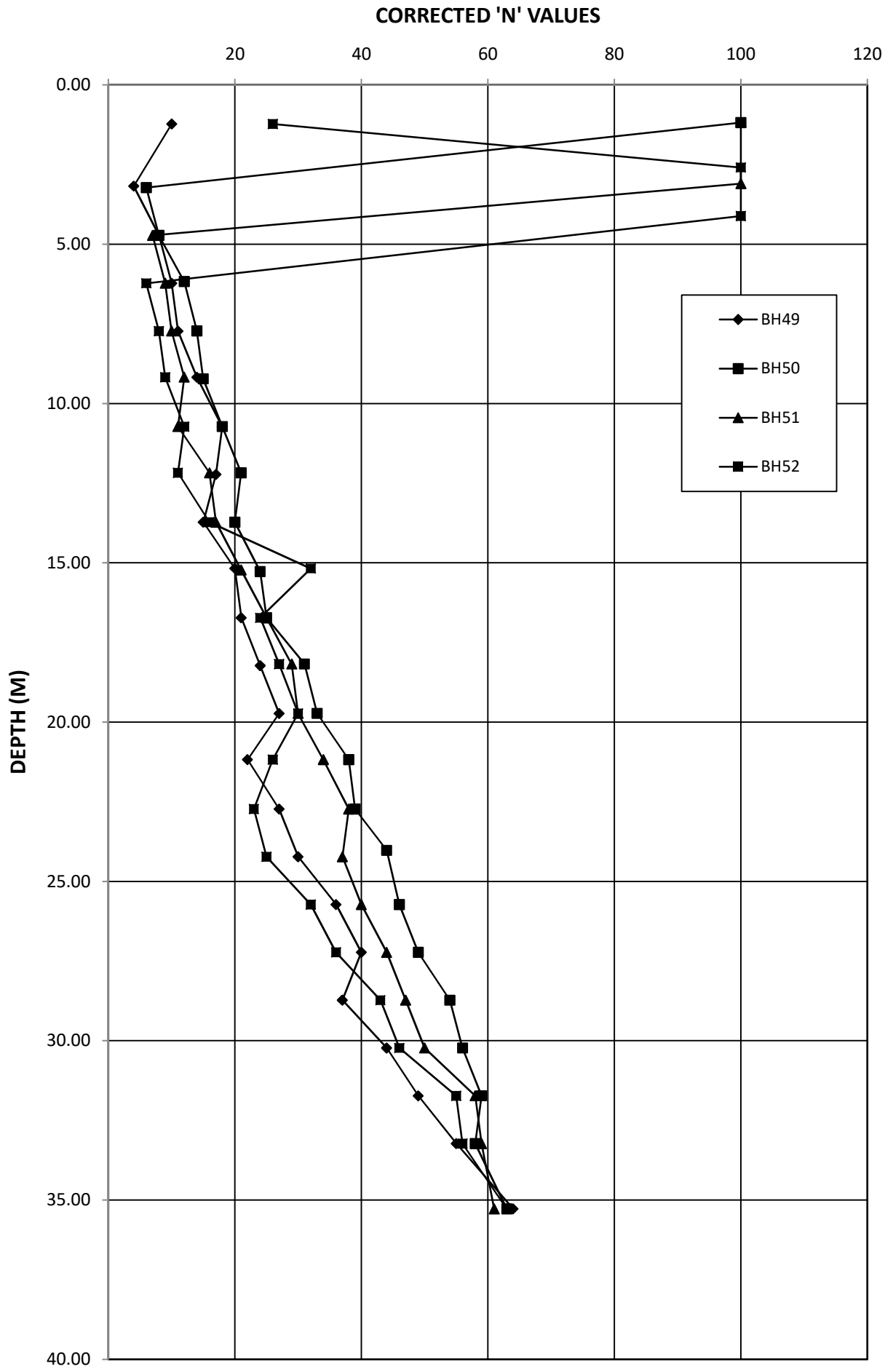


CORRECTED 'N' Vs DEPTH PLOT

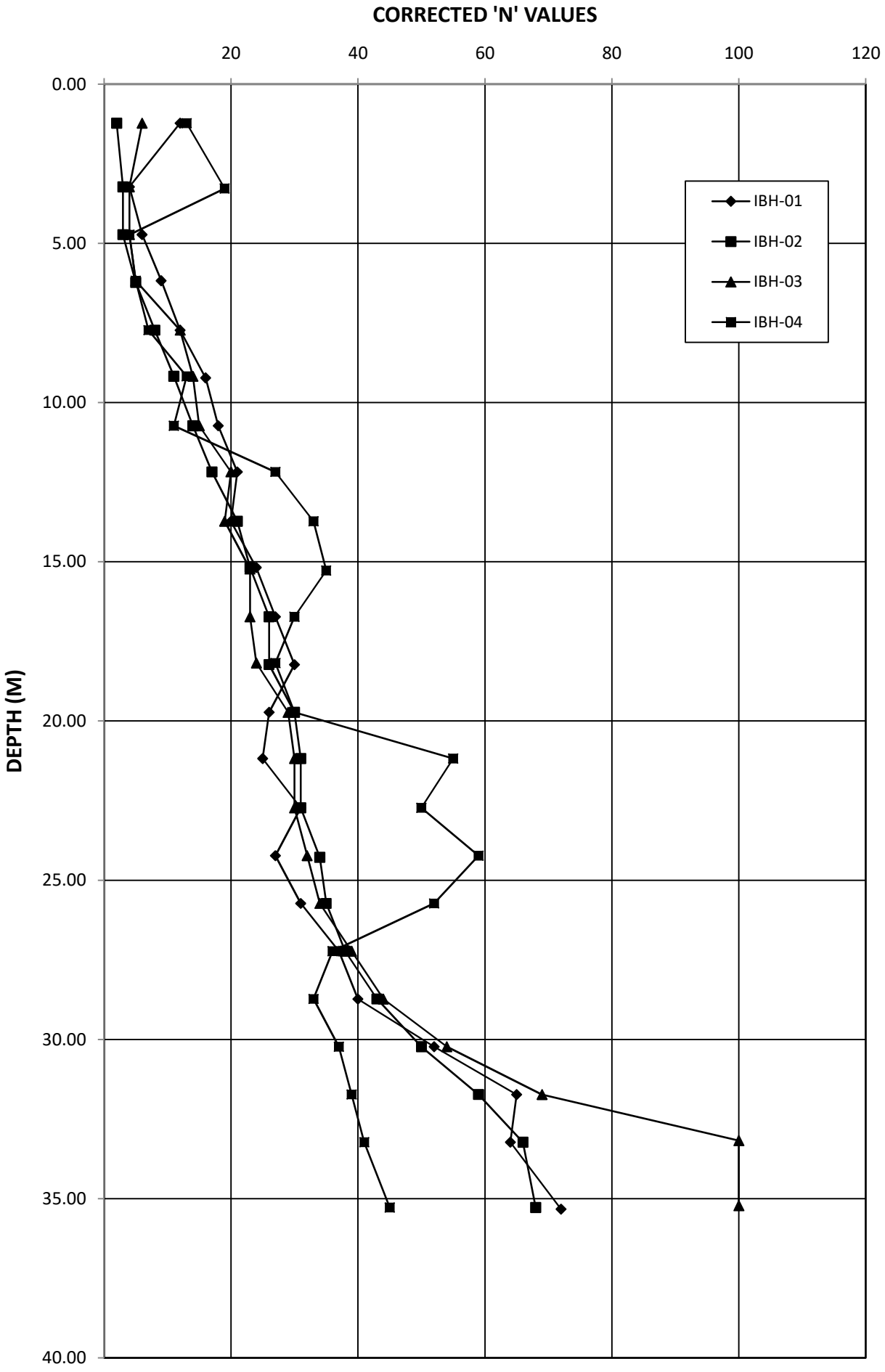

CORRECTED 'N' VALUES
10
20
30
40
50
60
70
80
90
0.00
5.00
10.00
15.00
20.00
25.00
30.00
35.00
40.00
DEPTH (M)
BH41
BH42
BH43
BH44
CORRECTED 'N' Vs DEPTH PLOT



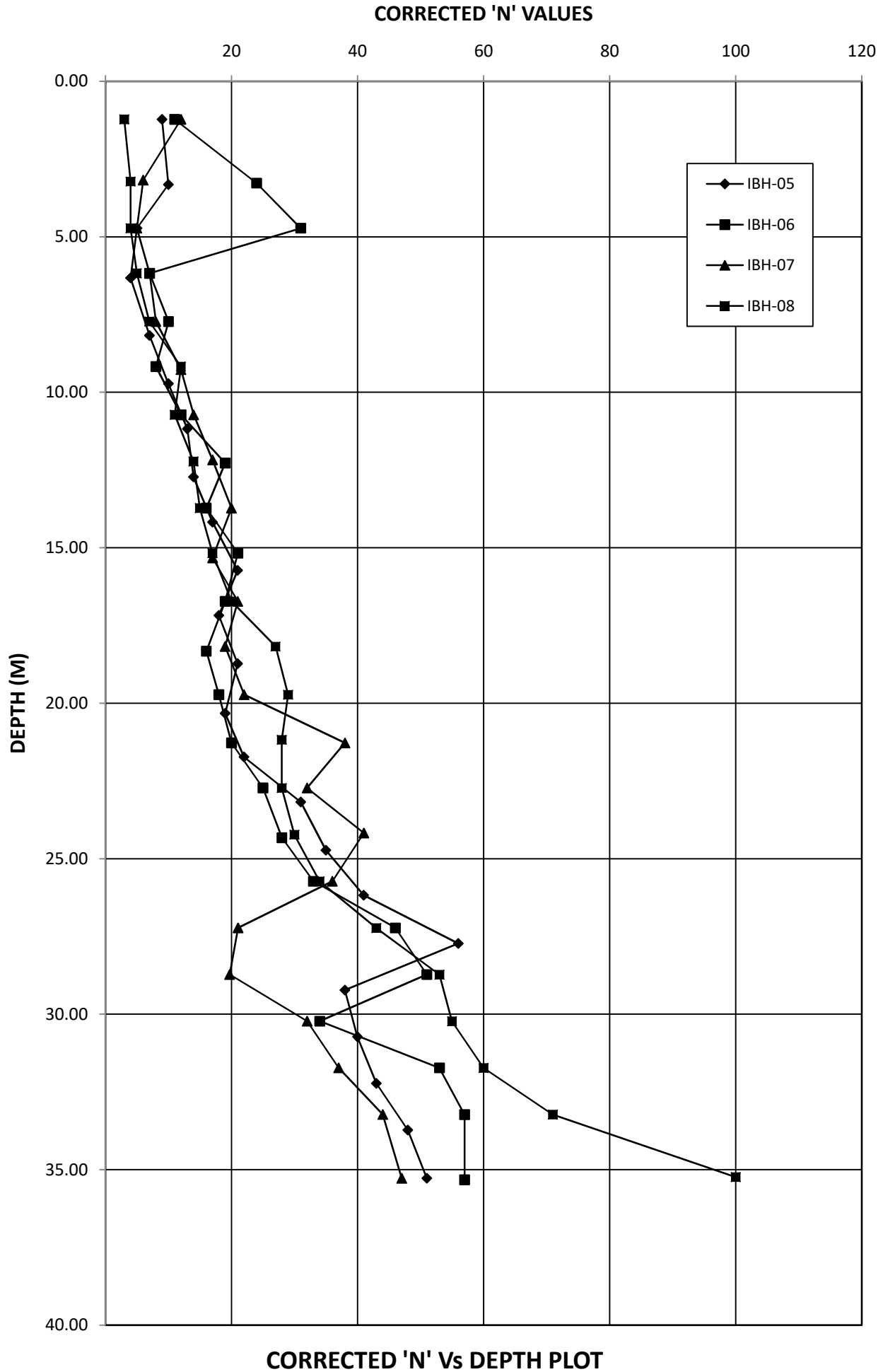
CORRECTED 'N' Vs DEPTH PLOT



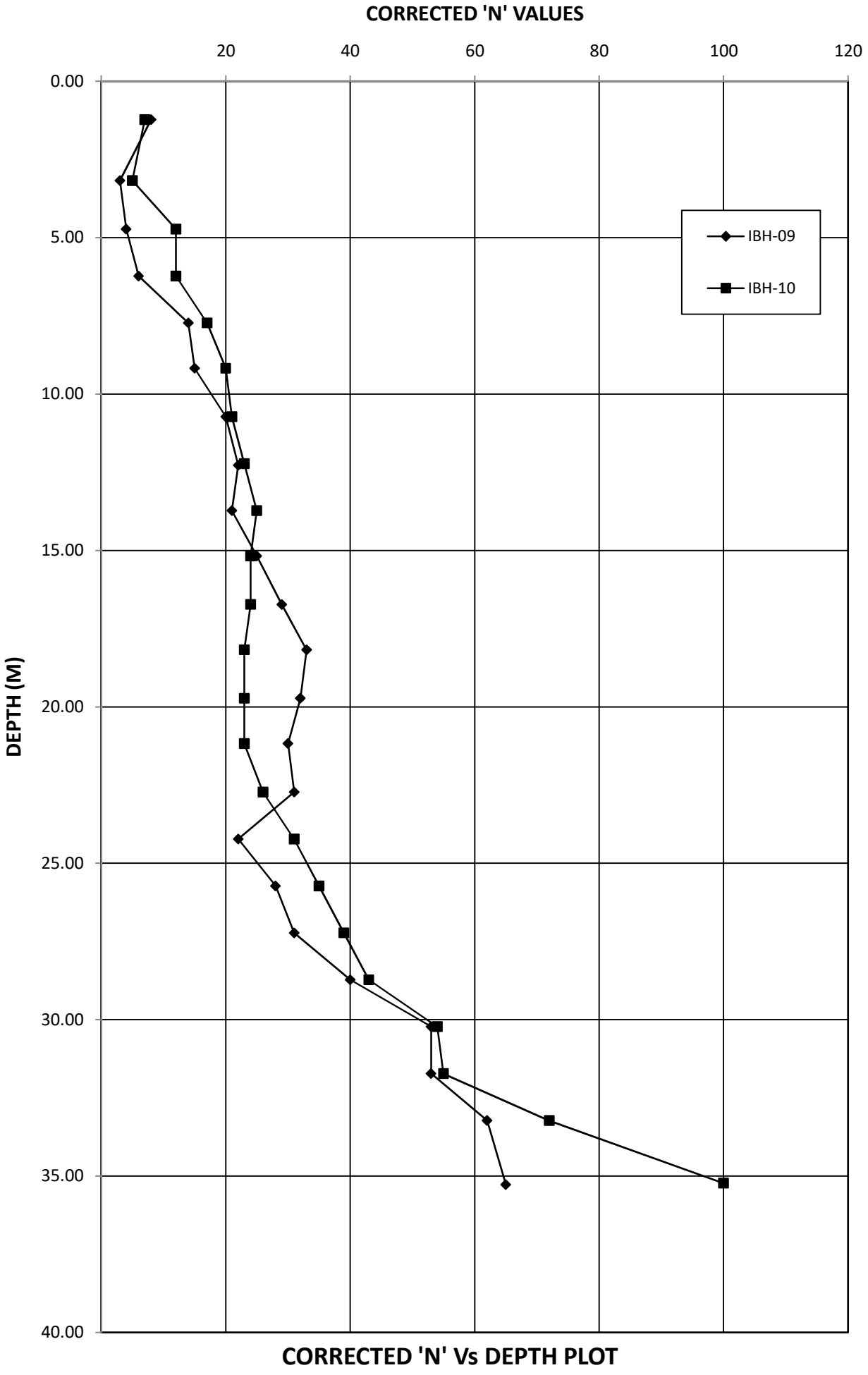
. CORRECTED 'N' Vs DEPTH PLOT



. CORRECTED 'N' Vs DEPTH PLOT



CORRECTED 'N' Vs DEPTH PLOT


CORRECTED 'N' VALUES
20
40
60
80
100
120
0.00
5.00
10.00
15.00
20.00
25.00
30.00
35.00
40.00
DEPTH (M)
IBH-09
IBH-10
CORRECTED 'N' Vs DEPTH PLOT

FIELD PERMEABILITY TEST RESULTS

Field permeability test was conducted at different depths by falling head method and the test results are presented below.

Test Locations	Type of Test	Depth of Test (M)	Permeability (cm/sec)
BH-05	Falling Head	0.80 – 1.50	1.403×10^{-6}
	Falling Head	2.85 – 3.50	7.271×10^{-7}
	Falling Head	4.90 – 5.60	6.538×10^{-7}
	Falling Head	7.70 – 8.40	9.807×10^{-7}
	Falling Head	11.85 – 12.50	9.707×10^{-7}
BH-15	Falling Head	0.80 – 1.50	1.464×10^{-5}
	Falling Head	2.80 – 3.50	1.059×10^{-5}
	Falling Head	4.70 – 5.40	1.261×10^{-5}
	Falling Head	7.80 – 8.50	1.010×10^{-5}
	Falling Head	11.70 – 12.40	7.638×10^{-6}
BH-29	Falling Head	0.70 – 1.50	1.754×10^{-5}
	Falling Head	2.80 – 3.50	1.405×10^{-6}
	Falling Head	4.60 – 5.30	9.337×10^{-7}
	Falling Head	7.70 – 8.40	4.666×10^{-7}
	Falling Head	11.80 – 12.50	4.661×10^{-7}
IBH-10	Falling Head	0.75 – 1.50	2.732×10^{-6}
	Falling Head	2.70 – 3.40	1.403×10^{-6}
	Falling Head	4.80 – 5.50	1.871×10^{-6}
	Falling Head	7.70 – 8.50	1.307×10^{-6}
	Falling Head	11.80 – 12.50	1.405×10^{-6}

PART II: LABORATORY TEST RESULTS

Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
BH01	UDS01	2.50	Yellowish grey silty clay with traces of calcareous nodules.	2.10	1.78	2.63	18 S	0.547	UNCONFD		0.95	0	37	17		CI		7	81	12
							18 T		0.0	0.899										
							22 C		0.0	0.938										
									0.0	1.003										
									REMOULD		0.71	0								
									0.0	0.647										
									0.0	0.706										
									0.0	0.770										
BH01	UDS03	8.50	Reddish grey clayey silt with traces of kankars.	2.02	1.64	2.66	23 S		TRSH-UU		0.76	0	36	20		CI		11	83	6
							23 T		3.0	0.850										
									2.0	0.762										
									1.0	0.694										
BH01	UDS04	11.50	Grey clayey silt with traces of rusty spots.	2.03	1.67	2.66	22 S		TRSH-UU		0.51	8	38	17		CI		7	87	6
							22 T		3.0	1.072										
									2.0	0.910										
									1.0	0.748										
BH01	UDS08	23.50	Brownish grey clayey silt with traces of calcareous nodules.			2.62	28 S						39	17		CI		5	85	10
BH01	SPT20	30.10	Light brown silty clay / clayey silt.										34	17		CL				
BH02	UDS01	2.50	Grey clayey silt.	2.01	1.63	2.60	24 S		UNCONFD		0.15	0	37	17		CI		6	85	9
							24 T		0.0	0.150										
									0.0	0.142										
									0.0	0.166										
									REMOULD		0.09	0								
									0.0	0.089										
									0.0	0.080										
									0.0	0.113										
BH02	UDS02	5.50	Greyish brown clayey silt with traces of kankars.	2.02	1.64	2.74	23 S		TRSH-UU		0.43	0	39	19		CI		5	90	5
							23 T		3.0	0.437										
									2.0	0.421										
									1.0	0.421										

Project: Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar.

Job No. : 4388

Sheet No.

CETEST

Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
BH02	UDS03	8.50	Greyish brown silty clay / clayey silt with traces of kankars.	2.07	1.71	2.64	20 S	0.537	TRSH-UU		0.80	0	37	18		CI		14	80	6
							21 T		3.0	0.816										
							21 C		2.0	0.792										
									1.0	0.784										
BH02	UDS06	17.50	Light grey silty clay with calcareous nodules.	2.06	1.74	2.65	17 S		TRSH-UU		1.09	8	39	19		CI		4	88	8
							19 T		3.0	1.724										
									2.0	1.490										
									1.0	1.424										
BH02	UDS07	20.50	Greish yellow silty clay / clayey silt with traces of calcareous nodules.	2.03	1.66	2.69	21 S		UNCONFD		1.12	0	36	18		CI		4	82	14
							22 T		0.0	1.154										
									0.0	1.108										
									0.0	1.122										
									REMOULD		0.72	0								
									0.0	0.744										
									0.0	0.688										
									0.0	0.700										
BH02	SPT21	31.50	Brownish grey clayey silt with traces of sand mixture.			2.69										CI*		13	82	5
BH03	UDS01	2.50	Reddish brown clayey silt with traces of kankars.	2.02	1.63	2.66	23 S		TRSH-UU		0.26	0	36	17		CI		11	82	7
							24 T		3.0	0.303										
									2.0	0.270										
									1.0	0.203										
BH03	UDS02	5.50	Reddish brown clayey silt with traces of kankars and steel grey patches.	1.98	1.59		23 S	0.563	TRSH-UU		0.50	0	38	18		CI				
							25 T		3.0	0.540										
							21 C		2.0	0.494										
									1.0	0.450										
BH03	UDS03	8.50	Brownish grey clayey silt with siltstone.	1.95	1.69	2.65	16 S		TRSH-UU		0.63	7	33	18	15	CL		6	84	10
							15 T		3.0	1.128										
									2.0	0.990										
									1.0	0.851										
BH03	UDS04	11.50	Reddish grey clayey silt with tarces of kankars.	2.02	1.63	2.66	23 S		TRSH-UU		0.75	8	38	18		CI		8	87	5
							24 T		3.0	1.348										
									2.0	1.186										
									1.0	1.024										

Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
BH03	UDS07	20.50	Brownish grey clayey silt.	2.04	1.68	2.61	21 S		UNCONFD		0.62	0	39	17		CI		7	80	13
							21 T		0.0	0.598										
									0.0	0.625										
									0.0	0.627										
									REMOULD		0.39	0								
									0.0	0.378										
									0.0	0.395										
									0.0	0.404										
BH03	SPT22	33.00	Light brown silty clay / clayey silt.										41	20		CI				
BH04	UDS01	2.50	Brownish grey clayey silt with traces of calcareous nodules & kankars.	2.10	1.77	2.70	18 S		UNCONFD		0.46	0	42	19		CI		4	82	14
							19 T		0.0	0.432										
									0.0	0.462										
									0.0	0.482										
									REMOULD		0.30	0								
									0.0	0.265										
									0.0	0.305										
									0.0	0.331										
BH04	UDS02	5.50	Brownish grey clayey silt, with traces of kankars	2.01	1.65	2.65	22 S	0.545	TRSH-UU		0.65	5	36	19		CI		5	90	5
							22 T		3.0	0.996										
							22 C		2.0	0.900										
									1.0	0.805										
BH04	UDS06	17.50	Brownish grey clayey silt with traces of calcareous nodules.	2.06	1.69	2.64	23 S		TRSH-UU		0.66	0	34	18		CL		9	86	5
							22 T		3.0	0.850										
									2.0	0.606										
									1.0	0.494										
BH04	UDS08	23.50	Brownish grey silty clay with traces of kankars.	2.08	1.74		20 S		UNCONFD		1.71	0	39	17		CI				
							20 T		0.0	1.776										
									0.0	1.687										
									0.0	1.665										
									REMOULD		1.25	0								
									0.0	1.331										
									0.0	1.228										
									0.0	1.181										

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Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
BH04	SPT23	35.10	Brownish grey clayey silt with traces of sand mixture.			2.66										CI*		9	81	10
BH05	UDS01	2.50	Brownish grey silty clay with traces of kankars.	2.01	1.64	2.63	23 S		UNCONFD		0.17	0	34	17		CL		6	83	11
							23 T		0.0	0.142										
									0.0	0.190										
									0.0	0.166										
									REMOULD		0.10	0								
									0.0	0.088										
									0.0	0.113										
									0.0	0.103										
BH05	UDS02	5.60	Greyish brown clayey silt with traces of kankars.	1.97	1.57		25 S	0.656	UNCONFD		0.57	0	36	19	19	CI				
							26 T		0.0	0.566										
							26 C		0.0	0.561										
									0.0	0.588										
									REMOULD		0.36	0								
									0.0	0.355										
									0.0	0.346										
									0.0	0.381										
BH05	UDS04	11.50	Reddish brown clayey silt.	2.03	1.65	2.62	22 S		UNCONFD		0.73	0	34	17		CL		6	85	9
							23 T		0.0	0.711										
									0.0	0.733										
									0.0	0.744										
									REMOULD		0.61	0								
									0.0	0.595										
									0.0	0.608										
									0.0	0.616										
BH05	UDS06	17.50	Brownish grey clayey silt with calcareous nodules.	2.08	1.76	2.66	18 S		UNCONFD		0.66	0	37	25	17	MI		5	85	10
							18 T		0.0	0.682										
									0.0	0.663										
									0.0	0.648										
									REMOULD		0.45	0								
									0.0	0.466										
									0.0	0.445										
									0.0	0.430										

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Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
BH05	UDS08	23.50	Greyish brown clayey silt.	2.02	1.64	2.68	23 S		UNCONFD		0.53	0	36	19	17	CI		5	90	5
							23 T		0.0	0.518										
									0.0	0.546										
									0.0	0.523										
									REMOULD		0.34	0								
									0.0	0.323										
									0.0	0.357										
									0.0	0.336										
BH05	SPT19	28.50	Light brown silty clay / clayey silt.										34	18		CL				
BH06	UDS01	2.50	Deep grey clayey silt.	2.03	1.67	2.78	22 S		TRSH-UU		0.30	6	36	19		CI		3	88	9
							22 T		3.0	0.705										
									2.0	0.571										
									1.0	0.460										
BH06	UDS02	5.50	Brownish grey silty clay with kankar.				27 C	0.673					37	17		CI				
BH06	UDS03	8.50	Brownish grey clayey silt with traces of kankars & rusty spots.	2.00	1.61	2.71	24 S		TRSH-UU		0.64	0	35	17	12	CI		4	78	18
							24 T		3.0	0.658										
									2.0	0.634										
									1.0	0.634										
BH06	UDS05	14.50	Brownish grey clayey silt/ silty clay				26 S						37	19		CI				
BH06	UDS06	17.50	Light grey clayey silt / silty clay with sand mixture.	1.99	1.59		25 S		UNCONFD		0.81	0				CL*				
							25 T		0.0	0.835										
									0.0	0.815										
									0.0	0.786										
									REMOULD		0.69	0								
									0.0	0.717										
									0.0	0.700										
									0.0	0.665										
BH06	SPT19	28.50	Brownish grey clayey silt / silty clay with sand mixture.				26 S						35	20		CI				

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Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
BH07	UDS01	2.50	Brownish grey silty clay with rusty spots.				22 C	0.556								CL*				
BH07	UDS02	5.50	Brownish grey silty clay with rusty spots.										36	20		CI				
BH07	UDS04	11.50	Light grey clayey silt / silty clay with sand mixture.	1.98	1.64		22 S		UNCONFD		0.58	0				CL*				
							21 T		0.0	0.605										
									0.0	0.591										
									0.0	0.550										
									REMOULD		0.42	0								
									0.0	0.444										
									0.0	0.433										
									0.0	0.386										
BH07	UDS05	14.50	Brownish grey clayey silt with traces of kankars.	1.95	1.56	2.58	23 S		TRSH-UU		0.78	0	32	19		CL		7	87	6
							25 T		3.0	0.792										
									2.0	0.781										
									1.0	0.769										
BH07	UDS07	20.50	Greyish brown clayey silt.				18 S						33	18		CL				
BH08	UDS02	5.50	Brownish grey clayey silt with traces of sand mixture & kankars.	2.00	1.61	2.67	22 S		UNCONFD		0.21	0	34	17		CL		5	90	5
							24 T		0.0	0.211										
									0.0	0.186										
									0.0	0.231										
									REMOULD		0.13	0								
									0.0	0.133										
									0.0	0.120										
									0.0	0.145										
BH08	UDS03	8.50	Light grey clayey silt with traces of calcareous nodules.	1.99	1.59	2.64	23 S	0.634	TRSH-UU		0.21	0	33	17		CL		5	87	8
							25 T		3.0	0.259										
							25 C		2.0	0.192										
									1.0	0.192										

Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
BH08	UDS06	17.50	Light grey clayey silt with traces of sand mixture	2.01	1.66	2.65	20 S		TRSH-UU		0.86	0	37	20	15	CI		8	82	10
							21 T		3.0	0.259										
									2.0	0.192										
									1.0	0.192										
BH08	SPT18	27.00	Brownish grey clayey silt with traces of sand mixture										36	18		CI				
BH09	UDS03	8.50	Greyish yellow clayey silt with calcareous nodules.	2.04	1.67	2.65	21 S	0.518	TRSH-UU		0.74	0	34	20		CL		8	86	6
							22 T		3.0	0.762										
							21 C		2.0	0.746										
									1.0	0.730										
BH09	UDS04	11.50	Greyish brown clayey silt with traces of kankars.	1.98	1.55	2.67	25 S		UNCONFD		0.53	0	36	19		CI		5	89	6
							27 T		0.0	0.542										
									0.0	0.519										
									0.0	0.527										
									REMOULD		0.37	0								
									0.0	0.379										
									0.0	0.364										
									0.0	0.371										
BH09	UDS06	17.50	Greyish brown clayey silt with traces of calcareous nodules.	2.10	1.81	2.63	17 S		UNCONFD		0.73	0	36	18	17	CI		5	87	8
							16 T		0.0	0.693										
									0.0	0.743										
									0.0	0.743										
									REMOULD		0.62	0								
									0.0	0.585										
									0.0	0.644										
									0.0	0.644										
BH09	UDS08	23.50	Brownish grey clayey silt	1.98	1.56	2.65	25 S		TRSH-UU		0.86	5	36	18		CI		7	88	5
							26 T		3.0	1.225										
									2.0	1.129										
									1.0	1.034										
BH09	SPT22	33.00	Light brown silty clay / clayey silt.										41	20		CI				

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Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
BH10	UDS01	2.50	Brownish grey clayey silt.	1.98	1.59	2.62	25 S	0.526	TRSH-UU		0.48	0				CL*		4	89	7
							25 T		3.0	0.507										
							22 C		2.0	0.479										
									1.0	0.447										
BH10	UDS02	5.50	Brownish grey clayey silt.										30	18		CL				
BH10	UDS03	8.50	Brownish grey clayey silt with traces of sand mixtures.	2.02	1.66	2.63	21 S		UNCONFD		0.43	0	33	19		CL		13	82	5
							22 T		0.0	0.490										
									0.0	0.391										
									0.0	0.418										
									REMOULD		0.30	0								
									0.0	0.351										
									0.0	0.264										
									0.0	0.295										
BH10	UDS04	11.50	Brownish grey, clayey silt with traces of sand mixture.			2.68	18 S									CL*		10	83	7
BH10	UDS05	14.50	Brownish grey clayey silt.										33	16		CL				
BH10	UDS06	17.50	Brownish grey, clayey silt with traces of sand mixture.			2.67	18 S									CL*		10	86	4
BH10	SPT18	27.10	Brownish grey clayey silt.										38	18		CI				
BH10	SPT22	33.00	Brownish grey clayey silt with traces of sand mixtures.			2.67										CI*		9	80	11
BH11	UDS01	2.50	Light grey silty clay with traces of calcareous nodules.	2.02	1.64	2.63	23 S	0.538	TRSH-UU		0.48	0	37	17		CI		5	86	9
							23 T		3.0	0.536										
							21 C		2.0	0.478										
									1.0	0.436										

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Bore Hole	Sample Number	Depth M	Sample Description	Bulk Dens. gms/cc	Dry Dens. gms/cc	Spec. Grav.	Nat. Mois. %	Void Ratio	Strength Test Results Pc/Pn kg/sqcm	Shear kg/sqcm	Cohesn kg/sqcm	Frictn Deg.	Atter. Limits LL %	PL %	SL %	IS Classification	Grain Size Gravl %	Sand %	Silt %	Clay %
BH11	UDS03	8.50	Brownish grey clayey silt with traces of kankars.	2.05	1.68	2.65	22 S		TRSH-UU		0.52	0	34	18		CL		7	87	6
							22 T		3.0	0.536										
									2.0	0.525										
									1.0	0.503										
BH11	UDS04	11.50	Brownish grey clayey silt with traces of kankars.	1.97	1.55	2.64	26 S		TRSH-UU		0.65	10	36	18		CI		9	86	5
							27 T		3.0	1.405										
									2.0	1.195										
									1.0	0.985										
BH11	SPT21	33.00	Brownish grey clayey silt with sand mixture.			2.66										CI*		21	71	8
BH12	UDS01	2.50	Light grey, clayey silt with traces of sand mixture.			2.67	24 S	0.626					31	23		ML		17	81	2
							26 C													
BH12	UDS02	5.50	Brownish grey silty clay with traces of kankars.	1.97	1.60		24 S		UNCONFD		0.25	0	36	17		CI				
							24 T		0.0	0.172										
									0.0	0.293										
									0.0	0.275										
									REMOULD		0.16	0								
									0.0	0.106										
									0.0	0.192										
									0.0	0.173										
BH12	UDS03	8.50	Brownish grey silty clay with traces of kankars.	2.05	1.72	2.61	19 T		TRSH-UU		0.72	0				CL*		12	84	4
									3.0	0.745										
									2.0	0.737										
									1.0	0.690										
BH12	UDS04	11.50	Light grey clayey silt.										31	19		CL				
BH12	UDS07	20.50	Brownish grey clayey silt with traces of sand mixtures.			2.63	28 S									CL*		6	91	3
BH12	SPT16	24.10	Brownish grey clayey silt with traces of sand mixtures.			2.64										CL*		10	79	11

Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
BH12	SPT19	28.50	Brownish grey clayey silt.										34	17		CL				
BH13	UDS01	2.50	Brownish grey clayey silt with traces of kankars.	1.98	1.59		25 S		UNCONFD		0.23	0	33	18		CL				
							25 T		0.0	0.221										
									0.0	0.239										
									0.0	0.221										
									REMOULD		0.17	0								
									0.0	0.163										
									0.0	0.174										
									0.0	0.158										
BH13	UDS02	5.50	Brownish grey clayey silt.	1.97	1.56	2.62	25 S	0.612	TRSH-UU		0.21	6	33	17		CL		10	77	13
							26 T		3.0	0.583										
							24 C		2.0	0.467										
									1.0	0.350										
BH13	UDS03	8.50	Brownish grey clayey silt with traces of sand mixtures.			2.64										CL*		6	90	3
BH13	UDS04	11.50	Brownish grey silty clayey silt with traces of kankars				25 S						31	17		CL				
BH13	UDS05	14.50	Brownish grey clayey silt with traces of fine sand mixtures.			2.64	23 S									CL*		9	87	4
BH13	UDS07	20.50	Brownish grey clayey silt with calcarious nodules.				23 S						35	17		CI				
BH13	SPT17	25.50	Brownish grey clayey silt with sand mixtures.			2.68										CL*		15	76	9
BH13	SPT20	30.05	Brownish grey clayey silt										34	20		CL				

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Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
BH14	UDS01	2.50	Brownish grey, clayey silt with traces of sand mixture.	2.00	1.65	2.66	21 T		TRSH-UU		0.33	5	32	19		CL		9	86	5
									3.0	0.647										
									2.0	0.551										
									1.0	0.456										
BH14	UDS02	5.50	Deep grey, clayey silt.				24 S	0.560								CL*				
							21 C													
BH14	UDS03	8.50	Brownish grey, clayey silt with traces of sand mixture.			2.63	23 S						32	19		CL		11	85	4
BH14	UDS04	11.50	Brownish grey silty clay with black spot.	1.97	1.58		24 S		UNCONFD		0.64	0				CL*				
							24 T		0.0	0.634										
									0.0	0.662										
									0.0	0.629										
									REMOULD		0.45	0								
									0.0	0.432										
									0.0	0.461										
									0.0	0.463										
BH14	UDS05	14.50	Brownish grey, clayey silt with traces of sand mixture.			2.64	24 S						35	17		CI		15	82	3
BH14	UDS08	22.50	Brownish grey clayey silt.										31	18		CL				
BH14	SPT20	32.00	Brownish grey clayey silt.										36	19		CI				
BH15	UDS01	2.50	Brownish grey, clayey silt.				19 S						30	19	16	CL				
BH15	UDS02	5.50	Brownish grey clayey silt with traces of sand mixtures.			2.62										CL*		6	88	6

Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
BH15	UDS03	8.50	Brownish grey clayey silt.	1.94	1.52		25 S	0.655	TRSH-UU		0.79	0	32	19		CL				
							27 T		3.0	0.831										
							26 C		2.0	0.791										
									1.0	0.752										
BH15	UDS05	14.50	Brownish grey clayey silt with traces of sand mixtures.	1.96	1.57	2.63	25 S		UNCONFD		0.20	0				CL*		13	83	4
							25 T		0.0	0.198										
									0.0	0.214										
									0.0	0.190										
									REMOULD		0.15	0								
									0.0	0.154										
									0.0	0.142										
									0.0	0.140										
BH15	SPT11	18.10	Brownish grey clayey silt.										30	17		CL				
BH15	SPT21	33.00	Brownish grey clayey silt.										29	16		CL				
BH16	UDS01	2.50	Brownish grey clayey silt with traces of kankars.	1.96	1.61	2.60	21 S	0.593	TRSH-UU		0.40	0				CL*		6	69	25
							22 T		3.0	0.436										
							24 C		2.0	0.414										
									1.0	0.336										
BH16	UDS02	5.50	Light grey, clayey silt.				26 S						37	16		CI				
BH16	UDS03	8.50	Brownish grey clayey silt with traces of sand mixtures.			2.63										CL*		9	88	3
BH16	SPT13	19.50	Brownish grey silty sand with traces of mica.													SM-SP		89	11 (Silt+Clay)	
BH16	SPT19	28.50	Yellowish grey clayey silt with traces of sand mixtures.			2.67										CI*		11	77	12

Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
BH16	SPT23	35.05	Brownish grey clayey silt with traces of kankars.										35	17		CI				
BH17	UDS01	2.50	Brownish grey clayey silt with traces of sand mixture.			2.68	28 S						35	16		CI		11	85	4
BH17	UDS02	5.50	Brownish grey silty clay / clayey silt.	1.99	1.61		22 S	0.621	TRSH-UU		0.55	0				CL*				
							23 T		3.0	0.568										
							24 C		2.0	0.536										
									1.0	0.536										
BH17	UDS03	8.50	Brownish grey clayey silt with traces of sand mixture.			2.63	21 S						33	23	19	CL		19	78	3
BH17	UDS04	11.50	Brownish grey clayey silt.										34	17		CL				
BH17	UDS05	14.50	Brownish grey, clayey silt with traces of sand mixture.			2.63	25 S									CL*		11	85	4
BH17	UDS07	20.50	Brownish grey clayey silt with traces of calcareous nodules.	1.96	1.58		23 S		UNCONFD		0.49	0	33	19		CL				
							24 T		0.0	0.134										
									0.0	0.738										
									0.0	0.599										
									REMOULD		0.34	0								
									0.0	0.092										
									0.0	0.504										
									0.0	0.426										
BH17	UDS08	23.50	Brownish grey silty clay with traces of kankars.				20 S									CI*				
BH18	UDS01	2.50	Brownish grey silty clay.				25 S						30	16		CL				

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Bore Hole	Sample Number	Depth M	Sample Description	Bulk Dens. gms/cc	Dry Dens. gms/cc	Spec. Grav.	Nat. Mois. %	Void Ratio	Strength Test Results Pc/Pn kg/sqcm	Shear kg/sqcm	Cohesn kg/sqcm	Frictn Deg.	Atter. Limits LL %	PL %	SL %	IS Classification	Grain Size Gravl %	Sand %	Silt %	Clay %
BH18	UDS02	5.50	Brownish grey, clayey silt with traces of sand mixture.			2.67										CL*		7	86	7
BH18	UDS03	8.50	Brownish grey clayey silt with traces of kankars.				24 S 19 C	0.487					31	17		CL				
BH18	UDS04	11.50	Brownish grey clayey silt with traces of sand mixtures.			2.67	24 S									CL*		18	78	4
BH18	SPT11	16.50	Brownish grey clayey silt with traces of calcareous nodlues										35	18		CI				
BH18	SPT20	30.00	Brownish grey clayey silt with traces of sand mixtures.			2.68										CI*		13	76	11
BH18	SPT22	33.00	Yellowish grey clayey silt with traces of sand mixtures.													CI*		4	96 (Silt+Clay)	
BH19	UDS01	2.50	Light grey, clayey silt.				22 S									CL*				
BH19	UDS02	5.50	Brownish grey, clayey silt with traces of sand mixture.			2.68	18 S						35	17	17	CI		10	83	7
BH19	UDS03	8.50	Brownish grey, clayey silt with sand mixture.	1.99	1.70		17 S 17 T		TRSH-UU 3.0 2.0 1.0	 0.707 0.651 0.623	0.66	0				CL*				
BH19	UDS04	11.50	Brownish grey, clayey silt with traces of sand mixture.			2.66							31	19		CL		19	77	4

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Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
BH19	UDS06	17.50	Brownish grey, clayey silt with traces of sand mixture.			2.66	19 S						34	16		CL		10	85	5
BH19	UDS07	20.50	Brownish grey clayey silt with tracers of kankars.				24 S									CI*				
BH19	UDS10	28.50	Brownish grey clayey silt with traces of sand mixtures.	2.02	1.67	2.65	20 S		UNCONFD		1.58	0	34	13		CL		12	82	6
							21 T		0.0	1.706										
									0.0	1.598										
									0.0	1.420										
									REMOULD		1.14	0								
									0.0	1.244										
									0.0	1.150										
									0.0	1.048										
BH19	SPT20	30.50	Yellowish grey clayey silt with traces of sand mixtures.													CI*		3	97 (Silt+Clay)	
BH20	UDS01	2.50	Brownish grey silty clay / clayey silt	2.14	1.85	2.63	15 S	0.412	TRSH-UU		0.31	0	33	18		CL		11	83	6
							15 T		3.0	0.382										
							15 C		2.0	0.287										
									1.0	0.255										
BH20	UDS02	5.50	Brownish grey silty clayey silt with traces of kankars				24 S									CL*				
BH20	UDS04	11.50	Brownish grey, clayey silt with rusty spots & traces of calcareous nodules.				19 S						37	17		CI				
BH20	UDS05	14.50	Brownish grey, clayey silt with traces of sand mixture.			2.67										CL*		11	83	6
BH20	SPT15	22.50	Brownish grey clayey silt.										34	17		CL				

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Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
BH20	SPT20	30.00	Brownish grey clayey silt with traces of sand mixtures.			2.68										CI*		11	80	9
BH21	UDS01	2.50	Brownish grey, clayey silt with rusty spots & traces of rock pieces.				23 S	0.586					37	17	16	CI				
							23 C													
BH21	UDS03	8.50	Brownish grey clayey silt with traces of sand mixtures.			2.63							34	16		CL		5	89	6
BH21	UDS04	11.50	Brownish grey silty clayey silt				21 S						36	14		CI				
BH21	UDS06	17.50	Deep brown silty clay / clayey silt with traces of calcareous nodules.			2.62	22 S									CL*		12	77	11
BH21	UDS07	20.50	Brownish grey clayey silt .				22 S									CL*				
BH21	SPT16	24.05	Brownish grey clayey silt with traces of sand mixtures.													CI*		3	97 (Silt+Clay)	
BH21	SPT18	27.05	Brownish grey clayey silt with traces of sand mixtures.													CI*		3	97 (Silt+Clay)	
BH21	SPT20	30.00	Brownish grey clayey silt.										31	17		CL				
BH22	UDS02	5.50	Brownish grey clayey silt.	2.01	1.62	2.71	23 S	0.593	TRSH-UU		0.19	0	35	17		CI		10	74	16
							24 T		3.0	0.207										
							22 C		2.0	0.184										
									1.0	0.176										

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Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
BH22	UDS04	11.50	Brownish grey clayey silt with traces of kankars.	2.03	1.65	2.71	23 S		TRSH-UU		0.58	0	32	18		CL		6	87	7
							23 T		3.0	0.603										
									2.0	0.581										
									1.0	0.562										
BH22	UDS05	14.50	Brownish grey clayey silt.	1.98	1.58	2.68	24 S		TRSH-UU		0.66	0	34	18		CL		6	86	8
							25 T		3.0	0.678										
									2.0	0.647										
									1.0	0.643										
BH22	UDS07	20.50	Light grey clayey silt / silty clay with sand mixture.	1.95	1.54		26 S		UNCONFD		0.78	0				CL*				
							27 T		0.0	0.807										
									0.0	0.788										
									0.0	0.757										
									REMOULD		0.61	0								
									0.0	0.636										
									0.0	0.621										
									0.0	0.582										
BH22	SPT16	24.05	Yellowish brown silty sand with clay binder.													SM		76	24 (Silt+Clay)	
BH22	SPT20	30.00	Yellowish brown silty sand with clay binder.													SM		80	20 (Silt+Clay)	
BH22	SPT21	31.50	Brownish grey clayey silt with sand mixture.										37	19		CI				
BH23	UDS01	2.50	Brownish grey clayey silt with traces of sand mixture.			2.66	25 S	0.625								CL*		12	82	6
							24 C													
BH23	UDS02	5.50	Brownish grey, clayey silt with rusty spots & sand mixture.	2.00	1.63		23 S		TRSH-UU		0.43	0	37	18		CI				
							22 T		3.0	0.444										
									2.0	0.444										
									1.0	0.405										
BH23	UDS04	11.50	Brownish grey clayey silt with traces of kankars and rusty spots				22 S									CL*				

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Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
BH23	UDS06	17.50	Brownish grey, clayey silt with traces of kankars.	1.98	1.63		22 T		UNCONFD		0.76	0	34	18		CL				
									0.0	0.971										
									0.0	0.642										
									0.0	0.672										
									REMOULD		0.63	0								
									0.0	0.707										
									0.0	0.559										
									0.0	0.614										
BH23	UDS08	23.50	Brownish grey, clayey silt with traces of sand mixture.				23 S									CI*		17	83 (Silt+Clay)	
BH23	SPT16	23.95	Yellowish brown silty sand with clay binder.													SM		65	35 (Silt+Clay)	
BH23	SPT20	30.00	Yellowish grey clayey silt with traces of sand mixtures.			2.63										CI*		9	82	9
BH23	SPT22	33.00	Brownish grey clayey silt.										34	19		CL				
BH24	UDS02	5.50	Brownish grey clayey silt with traces of kankars.	2.06	1.70	2.65	21 S	0.584	TRSH-UU		0.46	6	33	17		CL		9	85	6
							21 T		3.0	0.861										
							23 C		2.0	0.744										
									1.0	0.628										
BH24	UDS03	8.50	Yellowish brown clayey silt.	2.04	1.67	2.66	23 S		TRSH-UU		0.61	0	37	18		CI		11	82	7
							22 T		3.0	0.623										
									2.0	0.615										
									1.0	0.599										
BH24	UDS05	14.50	Brownish grey clayey silt with traces of kankars.	1.98	1.58	2.63	25 S		UNCONFD		0.54	0	35	17		CI		6	85	9
							26 T		0.0	0.498										
									0.0	0.534										
									0.0	0.567										

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Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
									REMOULD		0.33	0								
									0.0	0.306										
									0.0	0.339										
									0.0	0.375										
BH24	SPT16	24.10	Yellowish grey clayey silt with sand mixture.													CI*		12	88 (Silt+Clay)	
BH24	SPT19	28.50	Brownish grey silty sand with traces of mica.													SM-SP		95	5 (Silt+Clay)	
BH25	UDS02	5.50	Brownish grey clayey silt	2.03	1.68	2.67	22 S	0.568	UNCONFD		0.44	0	33	15		CL		5	79	16
							21 T		0.0	0.460										
							20 C		0.0	0.449										
									0.0	0.417										
									REMOULD		0.36	0								
									0.0	0.380										
									0.0	0.371										
									0.0	0.335										
BH25	UDS03	8.50	Brownish grey silty clay with traces of kankar.				24 S						34	16		CL				
BH25	UDS05	14.50	Brownish grey, clayey silt	2.01	1.63	2.75	24 S		TRSH-UU		0.69	10	33	18		CL		3	88	9
							23 T		3.0	1.453										
									2.0	1.243										
									1.0	1.032										
BH25	UDS07	20.50	Brownish grey clayey silt.	1.98	1.58	2.70	23 S		TRSH-UU		0.72	5	34	17	12	CL		6	90	4
							25 T		3.0	1.072										
									2.0	0.977										
									1.0	0.881										
BH25	SPT21	31.50	Brownish grey silty clay / clayey silt with sand mixture.										36	17		CI				

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Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
BH26	UDS01	2.50	Brownish grey clayey silt.	2.02	1.63		22 S	0.589	UNCONFD		0.28	0				CL*				
							24 T		0.0	0.307										
							26 C		0.0	0.300										
									0.0	0.245										
									REMOULD		0.19	0								
									0.0	0.216										
									0.0	0.211										
									0.0	0.152										
BH26	UDS03	8.50	Brownish grey clayey silt with traces of rusty spots.	2.01	1.62	2.67	23 S		TRSH-UU		0.58	6	33	19	15	CL		5	87	8
							24 T		3.0	0.994										
									2.0	0.878										
									1.0	0.761										
BH26	UDS04	11.50	Brownish grey clayey silt with traces of kankars.	2.00	1.64	2.70	21 S		TRSH-UU		0.62	7	34	19		CL		5	88	7
							22 T		3.0	1.117										
									2.0	0.978										
									1.0	0.840										
BH26	UDS06	17.50	Brownish grey clayey silt with traces of kankars.	1.98	1.59	2.69	25 S		TRSH-UU		0.78	5	34	16		CL		4	90	6
							24 T		3.0	1.138										
									2.0	1.042										
									1.0	0.947										
BH26	UDS07	20.50	Brownish grey clayey silt with traces of kankars.	1.98	1.58	2.68	25 S		TRSH-UU		0.82	0	35	19		CI		3	89	8
							25 T		3.0	0.844										
									2.0	0.824										
									1.0	0.795										
BH26	SPT20	30.00	Yellowish brown clayey silt with sand mixture.										34	18		CL				
BH27	UDS02	5.50	Brownish grey clayey silt with traces of kankars.	2.00	1.61	2.68	24 S	0.599	TRSH-UU		0.27	0	33	17		CL		5	86	9
							25 T		3.0	0.314										
							25 C		2.0	0.247										
									1.0	0.236										
BH27	UDS03	8.50	Brownish grey clayey silt with traces of kankars.	1.98	1.59	2.68	24 S		TRSH-UU		0.63	6	33	19		CL		4	89	7
							25 T		3.0	1.050										
									2.0	0.933										
									1.0	0.816										

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Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
BH27	UDS05	14.50	Brownish grey clayey silt with traces of kankars.	2.04	1.66	2.67	22 S		TRSH-UU		0.70	0	34	18		CL		5	86	9
							22 T		3.0	0.724										
									2.0	0.694										
									1.0	0.684										
BH27	UDS06	17.50	Brownish grey clayey silt with traces of kankars.	2.05	1.69	2.70	21 S		TRSH-UU		0.67	8	35	17		CI		4	88	8
							21 T		3.0	1.256										
									2.0	1.094										
									1.0	0.932										
BH27	UDS07	20.50	Brownish grey clayey silt.	2.05	1.70	2.70	21 S		TRSH-UU		0.74	5	36	19		CI		4	86	10
							21 T		3.0	1.094										
									2.0	0.999										
									1.0	0.903										
BH27	SPT22	33.00	Brownish grey clayey silt with sand mixture.										36	20		CI				
BH28	UDS02	5.50	Brownish grey silty clay.				21 C	0.532								CL*				
BH28	UDS03	8.50	Yellowish brown silty clay / clayey silt.	1.98	1.62	2.76	23 S		UNCONFD		0.68	0	34	20		CL		4	87	9
							22 T		0.0	0.706										
									0.0	0.689										
									0.0	0.654										
									REMOULD		0.59	0								
									0.0	0.615										
									0.0	0.600										
									0.0	0.561										
BH28	UDS04	11.50	Yellowish brown silty clay / clayey silt with traces of kankars.	2.01	1.72	2.60	20 S		TRSH-UU		0.74	5	33	14	10	CL		9	76	15
							17 T		3.0	1.094										
									2.0	0.999										
									1.0	0.903										
BH28	UDS06	17.50	Brownish grey clayey silt with traces of kankars.	2.06	1.71	2.74	19 S		TRSH-UU		0.69	6	32	18		CL		3	92	5
							20 T		3.0	1.117										
									2.0	1.000										
									1.0	0.883										

Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
BH28	UDS07	20.50	Brownish grey clayey silt with traces of kankars.	2.03	1.66	2.68	22 S		TRSH-UU		0.88	7	34	18		CL		4	87	9
							22 T		3.0	1.411										
									2.0	1.272										
									1.0	1.133										
BH28	SPT19	28.50	Brownish grey clayey silt with sand mixture.										31	17		CL				
BH29	UDS02	5.50	Brownish grey, clayey silt with traces of kankars	1.99	1.59	2.65	23 S		TRSH-UU		0.45	0	32	16		CL		5	86	9
							25 T		3.0	0.470										
									2.0	0.447										
									1.0	0.447										
BH29	UDS03	8.50	Greenish brown, clayey silt with traces of calcareous nodules.	2.04	1.69	2.74	21 S	0.607	TRSH-UU		0.65	0	35	18		CI		2	90	8
							21 T		3.0	0.660										
							22 C		2.0	0.652										
									1.0	0.637										
BH29	UDS05	14.50	Yellowish brown clayey silt with traces of kankar.				23 S						33	20		CL				
BH29	UDS06	17.50	Brownish grey clayey silt.	2.00	1.61	2.70	25 S		TRSH-UU		0.83	0	32	21		CL		6	87	7
							24 T		3.0	0.844										
									2.0	0.828										
									1.0	0.822										
BH29	SPT18	27.00	Brownish grey silty clay / clayey silt with sand mixture.										37	14		CI				
BH30	UDS01	2.50	Dark grey, fly ash with brick brats.				17 S													
BH30	UDS03	8.50	Brownish grey, clayey silt with traces of sand mixture.			2.66	22 S									CL*		9	90	1

Project: Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar.

Job No. : 4388

Sheet No.

CETEST

Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
BH30	UDS04	11.50	Brownish grey clayey silt with traces of sand mixtures.	2.04	1.70	2.63	20 S	0.520	TRSH-UU		0.67	0	35	18	16	CI		10	81	9
							20 T		3.0	0.680										
							20 C		2.0	0.669										
									1.0	0.647										
BH30	UDS05	14.50	Brownish grey clayey silt with traces of kankars..				17 S						35	14		CI				
BH30	UDS06	17.50	Brownish grey, clayey silt with sand mixture.			2.67	19 S									CL*		14	83	3
BH30	UDS07	20.50	Brownish grey silty clay / clayey silt with traces of kankars.				20 S						34	14		CL				
BH30	UDS09	26.60	Brownish grey clayey silt with traces of fine sand mixtures.			2.63							34	21		CL		4	90	6
BH31	UDS01	2.50	Brownish grey clayey silt with traces of calcareous nodules.	2.00	1.60	2.65	24 S	0.620	TRSH-UU		0.36	0	34	20		CL		17	77	6
							24 T		3.0	0.381										
							25 C		2.0	0.370										
									1.0	0.336										
BH31	UDS02	5.50	Brownish grey clayey silt.	1.96	1.54	2.68	27 S		UNCONFD		0.35	0	33	18		CL		5	87	8
							28 T		0.0	0.333										
									0.0	0.357										
									0.0	0.357										
									REMOULD		0.21	0								
									0.0	0.192										
									0.0	0.216										
									0.0	0.216										
BH31	UDS05	14.50	Greyish brown clayey silt with traces of kankars.	2.02	1.64	2.69	23 S		UNCONFD		0.62	0	36	18		CI		4	88	8
							23 T		0.0	0.838										
									0.0	0.238										
									0.0	0.790										
									REMOULD		0.54	0								
									0.0	0.530										
									0.0	0.566										
									0.0	0.496										

Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
BH31	UDS06	17.50	Greyish brown silty clay with calcareous nodules.	2.06	1.72	2.66	19 S		TRSH-UU		0.83	0	40	18		CI		5	89	6
							20 T		3.0	0.840										
									2.0	0.824										
									1.0	0.816										
BH31	UDS07	20.50	Brownish grey clayey silt with traces of calcareous nodules.	2.01	1.62	2.63	23 S		UNCONFD		1.40	0	43	21		CI		7	84	9
							24 T		0.0	1.821										
									0.0	0.963										
									0.0	1.421										
									REMOULD		1.07	0								
									0.0	1.428										
									0.0	0.679										
									0.0	1.108										
BH31	SPT22	33.00	Light brown silty clay / clayey silt.										40	17		CI				
BH32	UDS01	2.50	Brownish grey silty clay with traces of kankars.	2.09	1.75		19 S	0.481	UNCONFD		0.43	0	37	17		CI				
							19 C		0.0	0.400										
							19 T		0.0	0.462										
									0.0	0.422										
									REMOULD		0.27	0								
									0.0	0.252										
									0.0	0.289										
									0.0	0.255										
BH32	UDS02	5.50	Brownish grey clayey silt with traces of sand mixture.	2.02	1.65	2.61	23 S		UNCONFD		0.63	0	40	17		CI		11	85	4
							22 T		0.0	0.648										
									0.0	0.617										
									0.0	0.617										
									REMOULD		0.39	0								
									0.0	0.410										
									0.0	0.384										
									0.0	0.384										
BH32	UDS04	11.50	Brownish grey clayey silt with traces of kankars.	2.05	1.70	2.68	20 S		UNCONFD		0.94	0	36	24	18	CI		5	87	8
							21 T		0.0	0.910										
									0.0	0.954										
									0.0	0.976										

Bore Hole	Sample Number	Depth M	Sample Description	Bulk Dens. gms/cc	Dry Dens. gms/cc	Spec. Grav.	Nat. Mois. %	Void Ratio	Strength Test Results Pc/Pn kg/sqcm	Shear kg/sqcm	Cohesn kg/sqcm	Frictn Deg.	Atter. Limits LL %	PL %	SL %	IS Classification	Grain Size Gravl %	Sand %	Silt %	Clay %
									REMOULD		0.58	0								
									0.0	0.546										
									0.0	0.596										
									0.0	0.578										
BH32	UDS07	20.50	Greyish yellow silty clay / clayey silt.	2.04	1.68	2.70	21 S		UNCONFD		0.60	0	39	17		CI		5	87	8
							21 T		0.0	0.554										
									0.0	0.586										
									0.0	25.912										
									REMOULD		0.36	0								
									0.0	0.320										
									0.0	0.354										
									0.0	0.398										
BH32	SPT23	35.05	Yellowish grey clayey silt with sand mixture.			2.67										CI*		14	77	9
BH33	UDS01	2.50	Brownish grey clayey silt with traces of calcareous nodules.	2.03	1.65	2.64	22 S		TRSH-UU		0.46	0	35	18		CI		4	87	9
							23 T		3.0	0.469										
									2.0	0.458										
									1.0	0.458										
BH33	UDS02	5.50	Brownish grey clayey silt with traces of kankars.	2.04	1.66	2.69	22 S	0.608	TRSH-UU		0.75	0	36	19		CI		6	88	6
							23 T		3.0	0.869										
							23 C		2.0	0.714										
									1.0	0.669										
BH33	UDS04	11.50	Yellowish brown clayey silt.	2.04	1.67	2.65	22 S		TRSH-UU		0.51	0	34	17		CL		6	86	8
							23 T		3.0	0.516										
									2.0	0.501										
									1.0	0.500										
BH33	UDS05	14.50	Brownish grey silty clay with traces of calcareous nodules.	2.06	1.68	2.58	22 S		UNCONFD		0.44	0	38	17		CI		12	79	9
							23 T		0.0	0.400										
									0.0	0.488										
									0.0	0.444										
									REMOULD		0.28	0								
									0.0	0.232										
									0.0	0.320										
									0.0	0.272										

Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
BH34	UDS02	5.50	Brownish grey, clayey silt.	2.01	1.64		24 S	0.527	TRSH-UU		0.65	0	34	18		CL				
							23 T		3.0	0.657										
							20 C		2.0	0.642										
									1.0	0.642										
BH34	UDS03	8.50	Brownish grey clayey silt with traces of nodules.										30	18		CL				
BH34	UDS04	11.50	Brownish grey clayey silt with rusty spots.				21 S						33	16		CL				
BH34	UDS06	17.50	Brownish grey, clayey silt with traces of sand mixture.			2.68	21 S									CL*		8	88	4
BH34	UDS07	20.50	Deep brown silty clay / clayey silt with traces of calcarious nodules.	2.01	1.66	2.64	21 S		UNCONFD		0.51	0	29	17		CL		13	83	4
							21 T		0.0	0.545										
									0.0	0.480										
									0.0	0.509										
									REMOULD		0.36	0								
									0.0	0.384										
									0.0	0.329										
									0.0	0.351										
BH34	UDS08	23.50	Brownish grey, clayey silt with traces of sand mixture.			2.65	21 S						34	17		CL		13	82	5
BH34	SPT22	33.00	Brownish grey clayey silt with sand mixtures.			2.68										CI*		19	70	11
BH35	UDS01	2.50	Deep grey clayey silt.				25 S						34	18		CL				
BH35	UDS02	5.50	Deep grey clayey silt.	1.95	1.59	2.61	24 S		TRSH-UU		0.38	0	34	20		CL		11	78	11
							23 T		3.0	0.401										
									2.0	0.391										
									1.0	0.357										

Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
BH35	UDS03	8.50	Deep grey silty clay / clayey silt.	1.95	1.61		22 S		UNCONFD		0.34	0	35	19		CI				
							21 T		0.0	0.359										
									0.0	0.350										
									0.0	0.314										
									REMOULD		0.27	0								
									0.0	0.291										
									0.0	0.284										
									0.0	0.244										
BH35	UDS04	11.50	Brownish grey clayey silt with traces of kankars.	2.05	1.69	2.66	20 S	0.563	TRSH-UU		0.38	0	32	19		CL		7	86	7
							21 T		3.0	0.432										
							23 C		2.0	0.384										
									1.0	0.313										
BH35	UDS07	23.50	Brownish grey clayey silt with traces of kankars.	2.07	1.73	2.69	18 S		TRSH-UU		1.02	0	32	19		CL		6	89	5
							20 T		3.0	1.043										
									2.0	1.018										
									1.0	0.999										
BH36	UDS02	5.50	Brownish grey clayey silt with traces of kankars.	2.04	1.66	2.63	22 S	0.543	TRSH-UU		0.39	0	35	17		CI		4	85	11
							23 T		3.0	0.447										
							24 C		2.0	0.370										
									1.0	0.358										
BH36	UDS03	8.50	Brownish grey clayey silt with traces of kankars & sand mixture.	2.02	1.63	2.70	23 S		TRSH-UU		0.65	5	34	18		CL		2	89	9
							24 T		3.0	0.996										
									2.0	0.900										
									1.0	0.805										
BH36	UDS04	11.50	Brownish grey clayey silt with traces of kankars.	2.03	1.65	2.69	22 S		TRSH-UU		0.55	8	35	17		CI		4	88	8
							23 T		3.0	1.118										
									2.0	0.956										
									1.0	0.794										
BH36	UDS06	17.50	Brownish grey clayey silt with calcareous noduls.	2.02	1.64	2.73	23 S		TRSH-UU		0.78	0	34	16		CL		19	71	10
							23 T		3.0	0.806										
									2.0	0.787										
									1.0	0.756										
BH36	UDS07	20.50	Brownish grey clayey silt with traces of kankars.				23 S						35	18		CI				
BH36	SPT21	31.50	Brownish grey silty clay / clayey silt with sand mixture.										35	14		CI				

Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
BH37	UDS03	8.50	Brownish grey clayey silt with traces of kankars.	2.03	1.65	2.73	22 S	0.626	TRSH-UU		0.66	0	32	23		CL		5	87	8
							23 T		3.0	0.714										
							23 C		2.0	0.658										
									1.0	0.614										
BH37	UDS04	11.50	Yellowish brown silty clay / clayey silt.	2.02	1.67		22 S		UNCONFD		0.71	0	35	19		CI				
							21 T		0.0	0.737										
									0.0	0.720										
									0.0	0.686										
									REMOULD		0.62	0								
									0.0	0.646										
									0.0	0.631										
									0.0	0.592										
BH37	UDS06	17.50	Brownish grey clayey silt with traces of kankars.	2.03	1.67	2.65	21 S		TRSH-UU		0.58	0	33	18		CL		2	92	6
							22 T		3.0	0.614										
									2.0	0.570										
									1.0	0.558										
BH37	UDS07	20.50	Brownish grey silty clay with kankars, sand mixture & traces of calcareous nodules.	2.09	1.76	2.78	19 S		TRSH-UU		0.74	10	31	16		CL		2	91	7
							19 T		3.0	1.557										
									2.0	1.235										
									1.0	1.135										
BH37	SPT22	33.00	Brownish grey silty clay / clayey silt with sand mixture.										37	20		CI				
BH38	UDS01	2.50	Brownish grey clayey silt with traces of sand mixture	1.96	1.54	2.72	27 S	0.710	TRSH-UU		0.30	0	36	18		CI		11	81	8
							27 T		3.0	0.368										
							28 C		2.0	0.303										
									1.0	0.214										
BH38	UDS02	5.50	Brownish grey clayey silt with traces of kankars.	2.00	1.60	2.70	24 S		TRSH-UU		0.40	10	36	18		CI		9	82	9
							25 T		3.0	1.169										
									2.0	0.858										
									1.0	0.736										

Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
BH38	UDS04	11.50	Brownish grey clayey silt with traces of sand mixture.	1.92	1.49	2.72	27 S		TRSH-UU		0.67	0	36	18		CI		4	88	8
							28 T		3.0	0.781										
									2.0	0.614										
									1.0	0.603										
BH38	UDS05	14.50	Brownish grey clayey silt with traces of sand mixture.				29 S						34	21		CL				
BH38	UDS07	20.50	Brownish grey clayey silt with traces of sand mixture.	1.95	1.57	2.66	25 S		TRSH-UU		0.67	0	33	17		CI		6	84	10
							24 T		3.0	0.692										
									2.0	0.676										
									1.0	0.639										
BH38	SPT20	30.00	Yellowish grey clayey silt.				25 S						38	21		CI				
BH39	UDS02	5.50	Brownish grey, clayey silt with traces of kankar	2.00	1.61	2.70	23 S	0.654	TRSH-UU		0.65	0	35	18		CI		2	88	10
							24 T		3.0	0.658										
							24 C		2.0	0.658										
									1.0	0.634										
BH39	UDS03	8.50	Yellowish grey clayey silt.				23 S						33	17		CL				
BH39	UDS05	14.50	Brownish grey clayey silt with traces of kankars.	1.98	1.58	2.71	24 S		TRSH-UU		0.62	0	33	21		CL		6	88	6
							25 T		3.0	0.658										
									2.0	0.614										
									1.0	0.592										
BH39	UDS06	17.50	Brownish grey clayey silt with traces of kankars.	1.99	1.60	2.68	23 S		TRSH-UU		0.62	0	41	18		CI		2	88	10
							25 T		3.0	0.645										
									2.0	0.630										
									1.0	0.591										

Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
BH39	UDS07	20.50	Brownish grey clayey silt with traces of kankars.	2.00	1.64	2.61	21 S		TRSH-UU		0.72	0	41	18		CI		10	75	15
							22 T		3.0	0.744										
									2.0	0.726										
									1.0	0.693										
BH39	SPT19	28.50	Yellowish grey clayey silt with sand mixture.										41	20		CI				
BH40	UDS01	2.50	Brownish grey clayey silt.	1.95	1.54	2.75	27 S		TRSH-UU		0.26	0	42	21		CI		2	83	15
							27 T		3.0	0.292										
									2.0	0.270										
									1.0	0.225										
BH40	UDS03	8.50	Brownish grey clayey silt.	1.94	1.51	2.70	28 S	0.733	TRSH-UU		0.33	8	42	21		CI		5	80	15
							29 T		3.0	0.865										
							28 C		2.0	0.703										
									1.0	0.541										
BH40	UDS05	14.50	Brownish grey, clayey silt	1.99	1.60	2.68	24 S		TRSH-UU		0.66	5	32	19		CL		6	89	5
							24 T		3.0	1.007										
									2.0	0.911										
									1.0	0.816										
BH40	UDS06	17.50	Brownish grey silty clay / clayey silt.	2.01	1.65		21 S		UNCONFD		0.71	0	33	16		CL				
							22 T		0.0	0.359										
									0.0	0.350										
									0.0	0.314										
									REMOULD		0.67	0								
									0.0	0.696										
									0.0	0.679										
									0.0	0.644										
BH40	UDS07	20.50	Brownish grey silty clay / clayey silt.	2.03	1.69	2.76	20 S		TRSH-UU		0.82	7	33	16		CL		7	88	5
							20 T		0.0	1.343										
									0.0	1.204										
									0.0	1.066										
BH40	SPT22	33.00	Yellowish grey clayey silt with sand mixture.										40	18	15	CI				

Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
BH41	UDS02	5.50	Brownish grey, clayey silt	1.94	1.53	2.70	26 S	0.707	TRSH-UU		0.48	6	34	20		CL		3	92	5
							27 T		3.0	0.883										
							28 C		2.0	0.767										
									1.0	0.650										
BH41	UDS04	11.50	Brownish grey clayey silt.	1.95	1.54	2.71	25 S		TRSH-UU		0.65	0	34	19		CL		7	86	7
							26 T		3.0	0.747										
									2.0	0.604										
									1.0	0.599										
BH41	UDS05	14.50	Brownish grey silty clay / clayey silt.	1.97	1.60		24 S		UNCONFD		0.65	0	36	14		CI				
							23 T		0.0	0.677										
									0.0	0.661										
									0.0	0.624										
									REMOULD		0.59	0								
									0.0	0.615										
									0.0	0.600										
									0.0	0.561										
BH41	UDS07	20.50	Light brownish grey clayey silt with sand mixture.			2.67										CL*		8	80	12
BH41	SPT20	30.00	Yellowish grey clayey silt with sand mixture.										42	15		CI				
BH41	SPT23	35.05	Brownish grey clayey silt with sand mixture.										38	14		CI				
BH42	UDS02	5.50	Brownish grey clayey silt.	1.97	1.57	2.70	23 S	0.749	TRSH-UU		0.33	0	32	20		CL		3	88	9
							25 T		3.0	0.348										
							28 C		2.0	0.325										
									1.0	0.305										
BH42	UDS03	8.50	Yellowish grey silty clay / clayey silt.	1.95	1.55		25 S		UNCONFD		0.53	0	35	20		CI				
							26 T		0.0	0.551										
									0.0	0.538										
									0.0	0.495										

Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
									REMOULD		0.41	0								
									0.0	0.437										
									0.0	0.427										
									0.0	0.378										
BH42	UDS05	14.50	Light brownish grey clayey silt with sand mixture.			2.69										CL*		4	81	15
BH42	UDS06	17.50	Brownish grey clayey silt	1.97	1.55	2.75	26 S		TRSH-UU		0.79	11	33	18		CL		3	89	8
							27 T		3.0	1.666										
									2.0	1.430										
									1.0	1.194										
BH42	UDS07	20.50	Brownish grey clayey silt.	1.95	1.52	2.71	25 S		TRSH-UU		0.82	0	34	20		CL		8	88	4
							28 T		3.0	0.828										
									2.0	0.820										
									1.0	0.820										
BH42	SPT19	28.50	Light brownish grey clayey silt with sand mixture.										37	18		CI				
BH42	SPT22	33.00	Light brownish grey clayey silt with sand mixture.										35	20	14	CI				
BH43	UDS01	2.50	Deep grey, clayey silt	1.96	1.56	2.71	26 S	0.574	TRSH-UU		0.22	0	31	18		CL		4	84	12
							26 T		3.0	0.236										
							23 C		2.0	0.228										
									1.0	0.204										
BH43	UDS02	5.50	Brownish grey clayey silt with sand mixture.			2.73										CL*		9	82	9
BH43	UDS05	14.50	Yellowish grey silty clay / clayey silt.	1.97	1.61		24 S		UNCONFD		0.77	0	32	17		CL				
							22 T		0.0	0.790										
									0.0	0.771										
									0.0	0.740										

Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
									REMOULD		0.65	0								
									0.0	0.676										
									0.0	0.660										
									0.0	0.623										
BH43	UDS06	17.50	Light grey clayey silt.	2.00	1.58	2.66	24 S		TRSH-UU		0.51	0	32	18		CL		4	78	18
							27 T		3.0	0.531										
									2.0	0.499										
									1.0	0.495										
BH43	UDS07	20.50	Brownish grey, clayey silt	1.99	1.60	2.70	25 S		TRSH-UU		0.78	8	34	20		CL		5	86	9
							24 T		3.0	1.382										
									2.0	1.221										
									1.0	1.059										
BH43	SPT18	27.00	Light brownish grey clayey silt with sand mixture.										35	20		CI				
BH43	SPT21	31.50	Yellowish grey clayey silt with sand mixture.													CI*		7	93 (Silt+Clay)	
BH44	UDS01	2.50	Light grey clayey silt.	2.00	1.61	2.71	22 S	0.636	TRSH-UU		0.30	0	35	18		CI		4	87	9
							24 T		3.0	0.358										
							24 C		2.0	0.303										
									1.0	0.236										
BH44	UDS02	5.50	Light grey clayey silt.			2.72	23 C	0.658								CL*		4	82	14
BH44	UDS04	11.50	Yellowish brown silty clay / clayey silt.	2.00	1.67		21 S		UNCONFD		0.68	0	34	16		CL				
							20 T		0.0	0.701										
									0.0	0.684										
									0.0	0.649										
									REMOULD		0.54	0								
									0.0	0.567										
									0.0	0.554										
									0.0	0.511										

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Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
BH44	UDS05	14.50	Brownish grey clayey silt with traces of kankars.	2.02	1.65	2.72	21 S		TRSH-UU		0.77	5	41	17		CI		4	91	5
							22 T		3.0	1.127										
									2.0	1.031										
									1.0	0.936										
BH44	UDS06	17.50	Brownish grey clayey silt with traces of calcareous nodules & kankars.	2.02	1.65	2.66	22 S		TRSH-UU		1.02	0	36	18		CI		2	86	12
							23 T		3.0	1.066										
									2.0	1.011										
									1.0	0.987										
BH44	SPT16	24.00	Brownish grey silty clay / clayey silt with sand mixture.										41	19		CI				
BH44	SPT22	33.00	Yellowish grey silty clay / clayey silt with sand mixture.													CI*		3	97 (Silt+Clay)	
BH45	UDS01	2.50	Deep grey, clayey silt	2.01	1.63	2.73	23 S	0.678	TRSH-UU		0.38	0	32	18		CL		2	87	11
							23 T		3.0	0.458										
							27 C		2.0	0.381										
									1.0	0.292										
BH45	UDS03	8.50	Yellowish brown silty clay / clayey silt.	2.02	1.66		24 S		UNCONFD		0.56	0	35	18		CI				
							22 T		0.0	0.585										
									0.0	0.571										
									0.0	0.530										
									REMOULD		0.47	0								
									0.0	0.492										
									0.0	0.480										
									0.0	0.435										
BH45	UDS04	11.50	Greyish brown, clayey silt	2.04	1.67	2.71	23 S		TRSH-UU		0.60	8	36	18		CI		3	85	12
							22 T		3.0	1.175										
									2.0	1.014										
									1.0	0.852										
BH45	UDS05	14.50	Light grey clayey silt.			2.74										CL*		9	70	21

Bore Hole	Sample Number	Depth M	Sample Description	Bulk Dens. gms/cc	Dry Dens. gms/cc	Spec. Grav.	Nat. Mois. %	Void Ratio	Strength Test Results Pc/Pn kg/sqcm	Shear kg/sqcm	Cohesn kg/sqcm	Frictn Deg.	Atter. Limits LL %	PL %	SL %	IS Classification	Grain Size Gravl %	Sand %	Silt %	Clay %
BH45	SPT18	27.00	Brownish grey clayey silt with sand mixture.										39	15		CI				
BH45	SPT23	35.05	Yellowish brown clayey silt with sand mixture.										37	21		CI				
BH46	UDS01	2.50	Brownish grey clayey silt with traces of kankars.	2.04	1.67	2.70	23 S	0.666	TRSH-UU		0.53	0	36	18		CI		5	91	4
							22 T		3.0	0.603										
							25 C		2.0	0.503										
									1.0	0.469										
BH46	UDS03	8.50	Brownish grey clayey silt with traces of kankars.			2.69										CL*		8	78	14
BH46	UDS05	14.50	Yellowish brown clayey silt with traces of sand mixture & kankars.				23 S						36	19		CI				
BH46	UDS06	17.50	Brownish grey clayey silt with calcareous nodules.	1.99	1.61	2.56	24 S		TRSH-UU		0.86	6	34	17		CL		3	88	9
							24 T		3.0	1.305										
									2.0	1.189										
									1.0	1.072										
BH46	SPT15	22.50	Brownish grey clayey silt with traces of kankars.				23 S						35	14		CI				
BH46	SPT21	31.50	Yellowish brown clayey silt with traces of kankars.													CI*		6	94 (Silt+Clay)	
BH47	UDS02	5.50	Greyish brown, clayey silt / silty clay with traces of kankars	2.02	1.63	2.76	22 S		TRSH-UU		0.57	0	33	18		CL		4	87	9
							24 T		3.0	0.605										
									2.0	0.565										
									1.0	0.550										
BH47	UDS03	8.50	Brownish grey, clayey silt with traces of kankar	2.04	1.67	2.67	22 S	0.566	TRSH-UU		0.59	6	33	19		CL		5	85	10
							22 T		3.0	1.005										
							22 C		2.0	0.889										
									1.0	0.772										

Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
BH47	UDS05	14.50	Yellowish brown clayey silt with traces of sand mixture & kankars.				22 S						35	18		CI				
BH47	UDS06	17.50	Yellowish brown clayey silt with traces of sand mixture & kankars.			2.66										CL*		5	80	15
BH47	UDS07	20.50	Brownish grey clayey silt.	2.03	1.65	2.68	20 S		TRSH-UU		0.91	6	33	17		CL		8	88	4
							23 T		3.0	1.361										
									2.0	1.244										
									1.0	1.127										
BH47	SPT18	27.00	Yellowish brown clayey silt. Obs. kankars.													CI*		10	90 (Silt+Clay)	
BH47	SPT22	33.00	Brownish grey silty clay / clayey silt with traces of kankars.										39	16		CI				
BH48	UDS02	5.50	Brownish grey, clayey silt	1.97	1.56	2.71	26 S	0.703	TRSH-UU		0.34	0	31	18		CL		4	91	5
							26 T		3.0	0.358										
							28 C		2.0	0.344										
									1.0	0.320										
BH48	UDS04	11.50	Grey, clayey silt with sand mixture.				25 S						33	20		CL				
BH48	UDS05	14.50	Brownish grey clayey silt.	1.94	1.53	2.70	24 S		TRSH-UU		0.51	8	33	19		CL		4	88	8
							27 T		3.0	1.072										
									2.0	0.910										
									1.0	0.748										
BH48	UDS06	17.50	Brownish grey clayey silt	1.99	1.58	2.78	26 S		TRSH-UU		0.84	0	33	19		CL		2	91	7
							26 T		3.0	0.855										
									2.0	0.844										
									1.0	0.825										

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Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
BH48	UDS07	20.50	Yellowish grey, clayey silt with traces of steel grey patches	2.03	1.66	2.73	22 S		TRSH-UU		1.04	5	33	19		CL		7	88	5
							23 T		3.0	1.421										
									2.0	1.326										
									1.0	1.230										
BH48	SPT18	27.00	Yellowish grey clayey silt with sand mixture.										37	19		CI				
BH48	SPT23	35.05	Yellowish brown clayey silt with sand mixture.													CI*		12	88 (Silt+Clay)	
BH49	UDS01	2.50	Brownish grey, clayey silt with traces of kankar	2.06	1.71	2.74	21 S	0.600	TRSH-UU		0.29	0	35	17		CI		7	85	8
							20 T		3.0	0.314										
							21 C		2.0	0.286										
									1.0	0.270										
BH49	UDS03	8.50	Yellowish grey, clayey silt with sand mixture.										36	18		CI				
BH49	UDS05	14.50	Yellowish brown silty clay / clayey silt.	2.02	1.67	2.67	20 S		UNCONFD		0.62	0	35	18		CI		7	77	16
							21 T		0.0	0.645										
									0.0	0.630										
									0.0	0.591										
									REMOULD		0.53	0								
									0.0	0.553										
									0.0	0.540										
									0.0	0.497										
BH49	UDS07	20.50	Brownish grey clayey silt with traces of kankar & sand mixture.	2.03	1.67	2.73	21 S		TRSH-UU		1.02	0	35	18		CI		8	83	9
							21 T		3.0	1.116										
									2.0	1.006										
									1.0	0.962										
BH49	SPT21	31.50	Brownish grey clayey silt with sand mixture.										36	15		CI				

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Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
BH50	UDS02	5.50	Greyish brown, clayey silt	2.01	1.63	2.71	23 S	0.597	TRSH-UU		0.55	0	35	18		CI		9	85	6
							24 T		3.0	0.563										
							23 C		2.0	0.553										
									1.0	0.544										
BH50	UDS04	11.50	Brownish grey silty clay / clayey silt. Obs. sand mixture.	2.00	1.61	2.66	24 S		UNCONFD		0.74	0	36	19		CI		3	85	12
							24 T		0.0	0.762										
									0.0	0.744										
									0.0	0.711										
									REMOULD		0.61	0								
									0.0	0.531										
									0.0	0.518										
									0.0	0.475										
BH50	UDS06	17.50	Brownish grey silty clay / clayey silt. Obs. sand mixture.										33	14		CL				
BH50	UDS07	20.50	Deep brown clayey silt with traces of kankars.	1.99	1.59	2.61	24 S		TRSH-UU		1.08	9	36	19		CI		8	89	3
							25 T		3.0	1.821										
									2.0	1.635										
									1.0	1.450										
BH50	SPT20	30.00	Light yellowish brown silty clay / clayey silt. Obs. sand mixture.										38	17		CI				
BH51	UDS03	8.50	Brownish grey clayey silt with traces of kankars.	2.04	1.68	2.75	23 S	0.621	TRSH-UU		0.42	0	34	20		CL		11	82	7
							21 T		3.0	0.439										
							24 C		2.0	0.423										
									1.0	0.395										
BH51	UDS04	11.50	Greyish brown, clayey silt with traces of kankar	2.01	1.64	2.72	22 S		TRSH-UU		0.66	5	33	20		CL		8	84	8
							23 T		3.0	1.007										
									2.0	0.911										
									1.0	0.816										
BH51	UDS06	17.50	Yellowish grey silty clay / clayey silt. Obs. sand mixture.	1.98	1.58	2.64	24 S		UNCONFD		0.69	0	32	15		CL		5	90	5
							25 T		0.0	0.714										
									0.0	0.697										
									0.0	0.662										

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Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
									REMOULD		0.53	0								
									0.0	0.555										
									0.0	0.542										
									0.0	0.499										
BH51	UDS07	17.50	Yellowish grey silty clay / clayey silt. Obs. sand mixture.										36	20		CI				
BH51	SPT18	27.00	Yellowish brown silty clay / clayey silt. Obs. sand mixture.										35	19		CI				
BH51	SPT22	33.00	Yellowish brown clayey silt. Obs. sand mixture.													CI*		7	93 (Silt+Clay)	
BH52	UDS02	8.50	Brownish grey clayey silt.	2.01	1.62	2.69	22 S	0.627	TRSH-UU		0.44	0	35	18		CI		5	86	9
							24 T		3.0	0.447										
							25 C		2.0	0.436										
									1.0	0.436										
BH52	UDS03	11.50	Yellowish brown clayey silt with sand mixture.										34	18		CL				
BH52	UDS04	14.50	Brownish grey, clayey silt	2.05	1.70	2.68	21 S		TRSH-UU		0.69	12	37	19	12	CI		4	91	5
							20 T		3.0	1.640										
									2.0	1.377										
									1.0	1.115										
BH52	UDS05	17.50	Brownish grey clayey silt / silty clay with sand mixture.													CI*		8	92 (Silt+Clay)	
BH52	UDS06	20.50	Brownish grey, clayey silt with traces of kankars	2.04	1.74	2.73	18 S		TRSH-UU		1.18	0	35	18		CI		3	88	9
							18 T		3.0	1.269										
									2.0	1.180										
									1.0	1.091										
BH52	SPT20	30.00	Yellowish grey clayey silt with sand mixture.										32	15		CL				

Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
IBH01	UDS02	5.50	Yellowish brown silty clay / clayey silt.	2.05	1.74		20 S		UNCONFD		0.51	0	33	20	15	CL				
							18 T		0.0	0.537										
									0.0	0.524										
									0.0	0.481										
									REMOULD		0.42	0								
									0.0	0.446										
									0.0	0.435										
									0.0	0.388										
IBH01	UDS04	11.50	Brownish grey clayey silt with traces of kankars.	2.04	1.68	2.75	22 S	0.581	TRSH-UU		0.76	6	33	18		CL		9	85	6
							22 T		3.0	1.194										
							22 C		2.0	1.078										
									1.0	0.961										
IBH01	UDS05	14.50	Brownish grey clayey silt with kankars.	2.07	1.74	2.64	18 S		TRSH-UU		0.81	8	32	16		CL		4	88	8
							19 T		3.0	1.402										
									2.0	1.213										
									1.0	1.091										
IBH01	UDS07	20.50	Brownish grey clayey silt with traces of kankars.	2.00	1.63	2.73	23 S		TRSH-UU		0.83	0	33	18		CL		3	88	9
							23 T		3.0	0.847										
									2.0	0.825										
									1.0	0.814										
IBH01	SPT19	28.50	Light yellowish grey silty clay / clayey silt with sand mixture.										34	17		CL				
IBH01	SPT22	33.00	Yellowish grey silty clay / clayey silt with sand mixture.													CI*		4	96 (Silt+Clay)	
IBH02	UDS03	8.50	Greyish brown clayey silt wth traces of kankars.	2.01	1.63	2.69	23 S	0.550	TRSH-UU		0.13	0	33	17		CL		14	77	9
							24 T		3.0	0.141										
							20 C		2.0	0.125										
									1.0	0.120										
IBH02	UDS04	11.50	Brownish grey clayey silt with traces of sand mixture.	2.05	1.70	2.73	21 S		TRSH-UU		0.63	0	31	16		CL		7	86	7
							21 T		3.0	0.681										
									2.0	0.614										
									1.0	0.603										

Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
IBH02	UDS05	14.50	Brownish grey silty clay / clayey silt.	2.05	1.74		20 S		UNCONFD		0.68	0	33	17	12	CL				
							18 T		0.0	0.707										
									0.0	0.690										
									0.0	0.655										
									REMOULD		0.51	0								
									0.0	0.534										
									0.0	0.521										
									0.0	0.478										
IBH02	UDS07	20.50	Brownish grey clayey silt.	2.06	1.71	2.70	21 S		TRSH-UU		0.84	7	32	18		CL		8	84	8
							20 T		3.0	1.366										
									2.0	1.227										
									1.0	1.088										
IBH02	SPT20	30.00	Yellowish grey clayey silt with sand mixture.										32	19		CL				
IBH03	UDS02	5.50	Brownish grey clayey silt.	1.98	1.59	2.75	24 S	0.677	TRSH-UU		0.38	0	32	19		CL		2	92	6
							24 T		3.0	0.392										
							27 C		2.0	0.392										
									1.0	0.348										
IBH03	UDS03	8.50	Brownish grey clayey silt.	1.97	1.60	2.74	24 S		TRSH-UU		0.54	0	32	18		CL		4	87	9
							23 T		3.0	0.544										
									2.0	0.536										
									1.0	0.531										
IBH03	UDS04	11.50	Brownish grey clayey silt with traces of kankars.	2.00	1.62	2.74	24 S		TRSH-UU		0.61	0	32	18		CL		6	87	7
							23 T		3.0	0.620										
									2.0	0.615										
									1.0	0.581										
IBH03	UDS06	17.50	Brownish grey clayey silt with traces of sand mixture.			2.63	25 S						32	20		CL		3	91	6
IBH03	UDS07	20.50	Brownish grey clayey silt wth traces of kankars.	1.99	1.58	2.68	25 S		TRSH-UU		0.87	0	35	17		CI		7	88	5
							26 T		3.0	0.903										
									2.0	0.859										
									1.0	0.851										

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CETEST

Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
IBH03	SPT18	27.00	Yellowish grey silty clay with sand mixture.										34	15		CL				
IBH04	UDS02	5.50	Brownish grey silty clay with traces of kankars.										40	17		CI				
IBH04	UDS03	8.50	Brownish grey, clayey silt with traces of sand mixture.				19 S									CL*				
IBH04	UDS04	11.50	Brownish grey clayey silt.										41	17		CI				
IBH04	UDS05	14.60	Brownish grey clayey silt with traces of sand mixtures.			2.63	18 C	0.467								CI*		14	80	6
IBH04	UDS06	17.50	Brownish grey clayey silt with traces of sand mixtures.			2.64										CI*		5	90	5
IBH04	UDS07	20.50	Brownish grey, clayey silt.				20 S						37	15		CI				
IBH04	SPT16	24.00	Yellowish grey clayey silt with sand mixtures and mica.													CI*		28	72 (Silt+Clay)	
IBH04	SPT17	25.50	Yellowish grey clayey silt with sand mixtures.													CI*		33	67 (Silt+Clay)	
IBH04	SPT18	27.00	Brownish grey clayey silt with traces of sand mixtures.			2.68										CI*		11	80	9
IBH04	SPT21	31.50	Brownish grey clayey silt.										29	15		CL				

Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
IBH05	UDS03	7.50	Brownish grey clayey silt with traces of sand mixtures.	2.07	1.74	2.64	18 S	0.512	TRSH-UU		0.46	0	36	22	19	CI		12	77	11
							19 T		3.0	0.516										
							18 C		2.0	0.437										
									1.0	0.437										
IBH05	UDS04	10.50	Brownish grey clayey silt with tracers of kankars.				19 S						35	15		CI				
IBH05	UDS05	13.50	Brownish grey clayey silt with traces of black spot , calcareous nodules and				22 S									CL*				
IBH05	UDS06	16.50	Brownish grey, clayey silt with traces of sand mixture.			2.66							33	19		CL		13	85	2
IBH05	UDS08	22.50	Deep grey, clayey silt with traces of sand mixture.	2.02	1.67		21 S		TRSH-UU		1.19	0	38	19		CI				
							21 T		3.0	1.208										
									2.0	1.183										
									1.0	1.179										
IBH05	UDS09	25.50	Brownish grey clayey silt with traces of sand mixtures.			2.63										CI*		4	93	3
IBH06	UDS02	5.50	Brownish grey silty clay / clayey silt with steel grey spot and traces of kankars				20 S						34	16		CL				
IBH06	UDS03	8.50	Brownish grey clayey silt with traces of sand mixtures.	1.99	1.61	2.63	24 S	0.564	UNCONFD		0.33	0	32	18		CL		19	77	4
							22 C		0.0	0.303										
							24 T		0.0	0.319										
									0.0	0.358										
									REMOULD		0.19	0								
									0.0	0.179										
									0.0	0.185										
									0.0	0.208										
IBH06	UDS05	14.50	Brownish grey, clayey silt.				24 S									CL*				

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Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
IBH06	SPT16	24.10	Brownish grey clayey silt with sand mixtures.			2.68										CL*		14	78	8
IBH06	SPT21	31.50	Brownish grey clayey silt.										36	15		CI				
IBH07	UDS01	2.50	Brownish grey silty clay with rusty spot and calcarious nodules.				19 S									CL*				
IBH07	UDS02	5.50	Brownish grey, clayey silt with traces of sand mixture.			2.63	23 S 23 C	0.571					33	16		CL		15	83	2
IBH07	UDS04	11.50	Brownish grey silty clay / clayey silt with traces of calcareous nodules.				18 S						34	18	15	CL				
IBH07	UDS06	17.50	Brownish grey clayey silt with traces of sand mixtures.	2.06	1.71	2.64	20 S 20 T		TRSH-UU 3.0 2.0 1.0	 0.840 0.832 0.745	0.81	0	35	16		CI		10	82	8
IBH07	UDS08	23.50	Brownish grey clayey silt with traces of sand mixtures.	2.04	1.70	2.64	19 S		UNCONFD 0.0 0.0 0.0 REMOULD 0.0 0.0 0.0	 0.549 0.515 0.536 0.371 0.334 0.359	0.53 0.36	0 0				CI*		31	63	6
IBH07	SPT18	27.00	Brownish grey silty sand with traces of mica.													SM-SP		94	6 (Silt+Clay)	
IBH07	SPT19	28.50	Brownish grey silty sand with traces of mica.													SM-SP		94	6 (Silt+Clay)	
IBH07	SPT20	30.00	Brownish grey clayey silt with traces of sand mixtures.			2.66										CI*		14	76	10

Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
IBH08	UDS02	5.50	Brownish grey silty clay / clayey silt.	1.98	1.58		24 S	0.545	TRSH-UU		0.18	5	35	17		CI				
							25 T		3.0	0.483										
							22 C		2.0	0.387										
									1.0	0.292										
IBH08	UDS03	8.50	Brownish grey clayey silt.	2.03	1.65	2.75	22 S		TRSH-UU		0.32	5	33	18		CL		3	87	10
							23 T		3.0	0.636										
									2.0	0.540										
									1.0	0.445										
IBH08	UDS05	14.50	Brownish grey clayey silt / silty clay with traces of kankars.	2.07	1.72	2.73	20 S		TRSH-UU		0.99	0	35	17		CI		2	85	13
							20 T		3.0	1.085										
									2.0	0.974										
									1.0	0.901										
IBH08	UDS06	17.50	Brownish grey clayey silt with traces of kankars.	2.03	1.65	2.71	22 S		TRSH-UU		0.96	0	33	17		CL		2	92	6
							23 T		3.0	1.006										
									2.0	0.966										
									1.0	0.919										
IBH08	UDS07	20.50	Brownish grey clayey silt wth traces of kankars.	2.01	1.64	2.68	21 S		TRSH-UU		1.01	0	34	17		CL		4	90	6
							23 T		3.0	1.039										
									2.0	0.999										
									1.0	0.995										
IBH08	SPT17	25.50	Yellowish brown clayey silt with sand mixture.										32	14		CL				
IBH09	UDS01	2.50	Brownish grey clayey silt.	2.01	1.63	2.75	22 S	0.556	TRSH-UU		0.23	0	33	18		CL		2	93	5
							24 T		3.0	0.281										
							24 C		2.0	0.214										
									1.0	0.192										
IBH09	UDS03	8.50	Brownish grey clayey silt with traces of kankars.	2.03	1.65	2.76	23 S		TRSH-UU		0.43	0	33	18		CL		4	87	9
							23 T		3.0	0.439										
									2.0	0.431										
									1.0	0.407										
IBH09	UDS05	14.50	Brownish grey clayey silt.	2.02	1.64	2.74	22 S		TRSH-UU		0.58	0	34	17		CL		3	93	4
							23 T		3.0	0.594										
									2.0	0.578										
									1.0	0.571										

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Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
IBH09	UDS06	17.50	Brownish grey clayey silt traces of sand mixture.	2.00	1.63	2.70	23 S		TRSH-UU		0.64	0	34	17		CL		4	92	4
							23 T		3.0	0.670										
									2.0	0.625										
									1.0	0.614										
IBH09	UDS07	20.50	Deep brown clayey silt with traces of kankars.				21 S						35	18		CI				
IBH09	SPT22	33.00	Yellowish brown silty clay / clayey silt with sand mixture.										30	17		CL				
IBH10	UDS01	2.50	Brownish grey clayey silt.	2.00	1.59	2.73	25 S	0.615	TRSH-UU		0.13	0	31	17		CL		4	89	7
							26 T		3.0	0.218										
							25 C		2.0	0.103										
									1.0	0.073										
IBH10	UDS03	8.50	Brownish grey clayey silt.	2.00	1.64	2.76	24 S		TRSH-UU		0.53	0	32	16		CL		3	90	7
							22 T		3.0	0.555										
									2.0	0.542										
									1.0	0.499										
IBH10	UDS05	14.50	Brownish grey clayey silt.				23 S						34	14		CL				
IBH10	UDS06	17.50	Brownish grey silty clay / clayey silt.	2.02	1.67		22 S		UNCONFD		0.62	0	35	18		CI				
							21 T		0.0	0.640										
									0.0	0.624										
									0.0	0.602										
									REMOULD		0.54	0								
									0.0	0.560										
									0.0	0.546										
									0.0	0.520										
IBH10	UDS07	20.50	Grayish brown silty clay / clayey silt with traces of kankars.	2.00	1.62	2.76	23 S		TRSH-UU		0.73	8	35	17		CI		3	88	9
							23 T		3.0	1.325										
									2.0	1.163										
									1.0	1.001										

Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
IBH10	SPT21	31.50	Light brownish grey clayey silt with sand mixture.													CI*		11	89 (Silt+Clay)	
CHT03	UDS01	2.50	Brownish grey clayey silt.	2.00	1.61	2.63	22 S		TRSH-UU		0.25	0	34	15		CL		20	74	6
							24 T		3.0	0.272										
									2.0	0.265										
									1.0	0.225										
CHT03	UDS02	5.50	Brownish grey silty clay / clayey silt.	1.98	1.58		23 S		UNCONFD		0.49	0	33	17		CL				
							25 T		0.0	0.509										
									0.0	0.497										
									0.0	0.467										
									REMOULD		0.35	0								
									0.0	0.371										
									0.0	0.362										
									0.0	0.326										
CHT03	UDS03	8.50	Brownish grey clayey silt.	1.97	1.56	2.73	25 S	0.640	TRSH-UU		0.51	0	32	18		CL		16	77	7
							26 T		3.0	0.531										
							24 C		2.0	0.507										
									1.0	0.499										
CHT03	UDS06	17.50	Brownish grey clayey silt traces of kankars.	1.97	1.56	2.77	24 S		TRSH-UU		0.66	0	35	19		CI		2	89	9
							26 T		3.0	0.662										
									2.0	0.659										
									1.0	0.659										
CHT03	SPT15	22.50	Yellowish grey silty sand with clay binder.													SM		87	13 (Silt+Clay)	
CHT03	SPT19	28.50	Yellowish grey silty sand with clay binder.													SM		79	21 (Silt+Clay)	

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CETEST

Bore	Sample	Depth	Sample Description	Bulk	Dry	Spec.	Nat.	Void	Strength Test Results				Atter. Limits			IS	Grain Size			
Hole	Number	M		Dens.	Dens.	Grav.	Mois.	Ratio	Pc/Pn	Shear	Cohesn	Frictn	LL	PL	SL	Classification	Gravl	Sand	Silt	Clay
				gms/cc	gms/cc		%		kg/sqcm	kg/sqcm	kg/sqcm	Deg.	%	%	%		%	%	%	%
CHT03	SPT20	30.00	Brownish grey clayey silt with sand mixture.										34	18		CL				
*** - Classification in this case is based on average layer properties.**																				

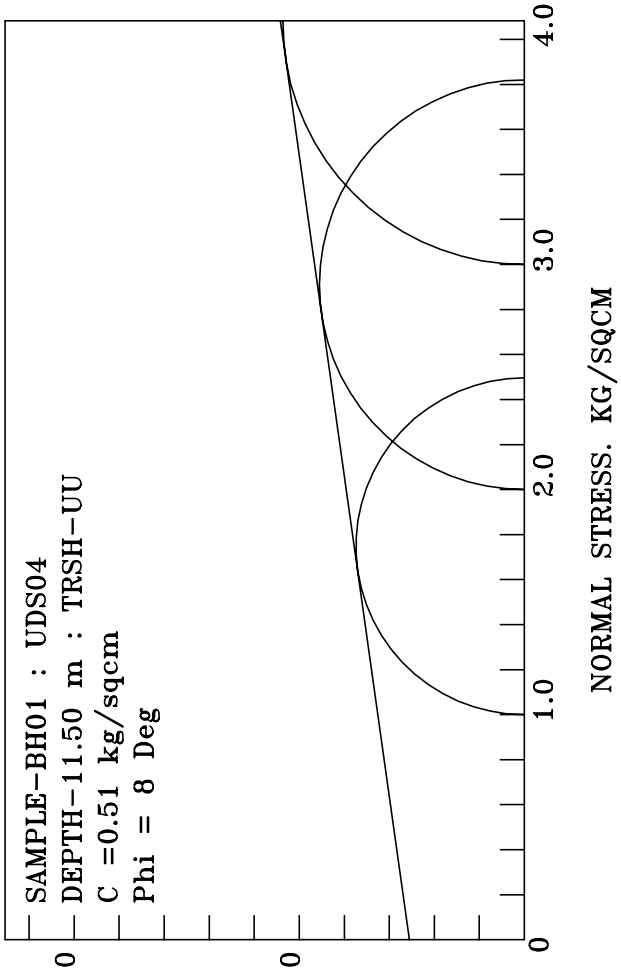
SWELLING TEST RESULTS

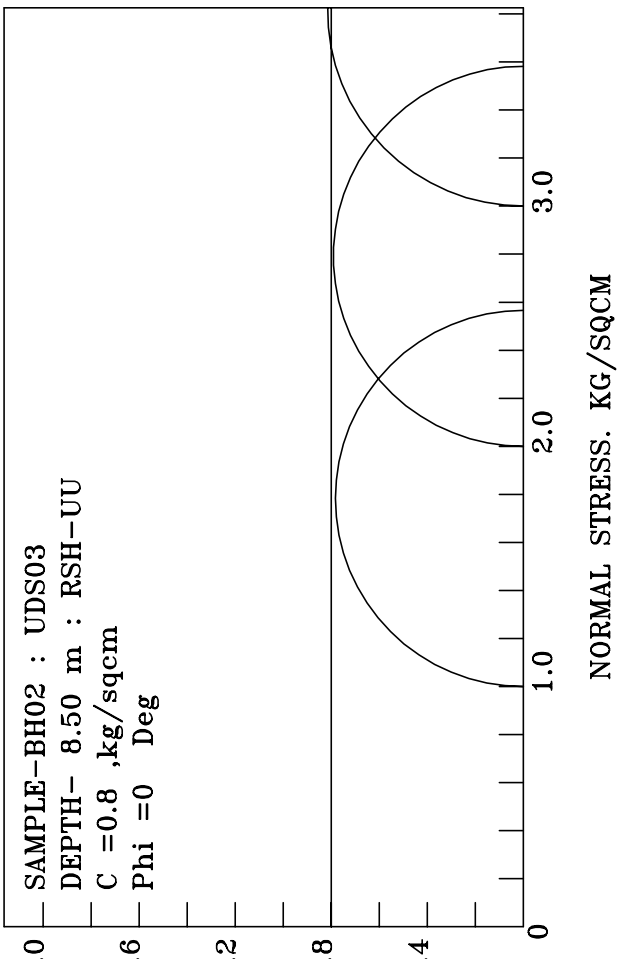
Bore Hole No.	Sample No.	Depth (M)	Description	Free Swell Index, (%)	Swelling Pressure, (kg/sqcm)	Moisture Content (%)	Plasticity Index (%)
BH-02	UDS-03	8.50	Brownish grey clayey silt with traces of kankar.	11.36	0.00	21	19
BH-03	UDS-02	5.50	Brownish grey clayey silt with traces of rusty spots	11.90	0.03	21	20
BH-04	UDS-02	2.50	Brownish grey clayey silt with traces of calcareous nodules.	9.09	0.00	22	17
BH-11	UDS-01	2.50	Light grey clayey silt with traces of calcareous nodules.	9.09	0.13	21	20
BH-12	UDS-01	2.50	Brownish grey clayey silt.	9.76	0.00	26	8
BH-14	UDS-02	5.50	Brownish grey clayey silt.	17.50	0.00	21	--
BH-18	UDS-03	8.50	Yellowish grey clayey silt.	12.20	0.000	19	14
BH-23	UDS-01	2.50	Yellowish grey clayey silt.	21.95	0.00	24	--
BH-24	UDS-02	5.50	Brownish grey clayey silt with traces of kankar.	9.09	0.01	23	16
BH-31	UDS-01	2.50	Light grey clayey silt with traces of calcareous nodules.	11.90	0.01	25	14
BH-33	UDS-02	5.50	Brownish grey clayey silt with traces of kankar.	2.33	0.01	23	17
BH-35	UDS-04	11.50	Brownish grey clayey silt with traces of kankars.	5.33	0.00	23	13
BH-40	UDS-03	8.50	Brownish grey clayey silt.	2.04	0.00	28	21
BH-50	UDS-02	5.50	Greyish brown, clayey silt	8.01	0.00	23	17
BH-51	UDS-03	8.50	Brownish grey clayey silt with traces of kankars.	7.75	0.00	24	14
IBH-04	UDS-05	14.60	Brownish grey clayey silt with sand mixture.	10.00	0.00	18	--
IBH-07	UDS-02	5.50	Yellowish grey clayey silt with sand mixture.	11.63	0.00	23	17
IBH-08	UDS-02	5.50	Brownish grey silty clay / clayey silt.	3.12	0.00	22	18
IBH-10	UDS-01	2.50	Brownish grey clayey silt.	4.69	0.00	25.00	14

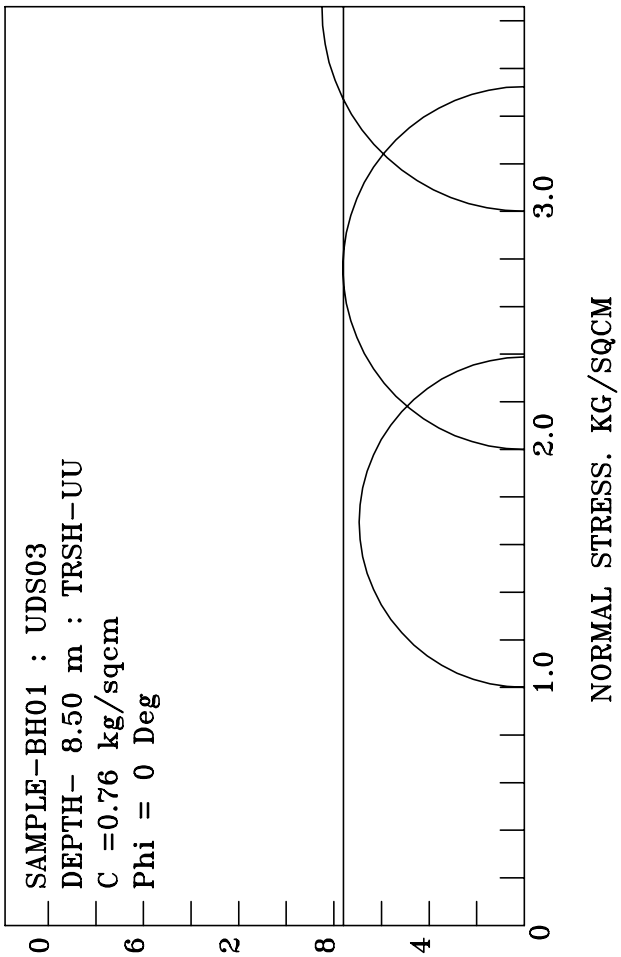
SUMMERISED LABORATORY COMPACTION & CBR TEST RESULTS

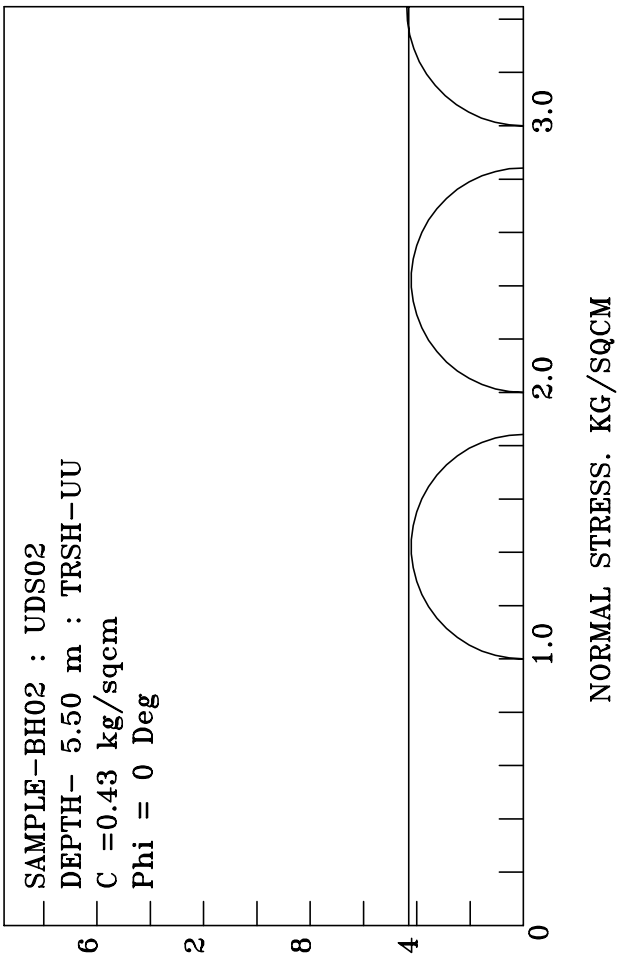
SL No	Test No.	Sample No	Depth (M)	Description	Standard Proctor Compaction Test		Soaked CBR on samples compected at 95% of MDD		Recommended Soaked CBR (%)
					OMC (%)	MDD (gm/cc)	2.50mm Pentn	5.00mm Pentn	
1	TP01	DS04	4.00	Yellowish brown clayey silt with sand mixture.	13.34	1.906	--	--	--
2	TP02	DS02	2.00	Dark grey clayey silt with traces of rock pieces & coal dust.	17.70	1.680	8.86	8.78	8
3	TP03	DS02	2.00	Brownish grey clayey silt / silty clay.	17.50	1.718	2.77	2.56	2
4	TP04	DS01	1.00	Light grey clayey silt.	14.40	1.847	5.71	5.56	5
5	TP05	DS03	3.00	Brownish grey clayey silt.	12.50	1.945	9.31	8.71	9
6	TP06	DS02	2.00	Brownish grey clayey silt.	15.41	1.806	--	--	--
7	ITP01	DS03	3.00	Yellowish grey clayey silt.	14.00	1.841	6.00	5.16	6

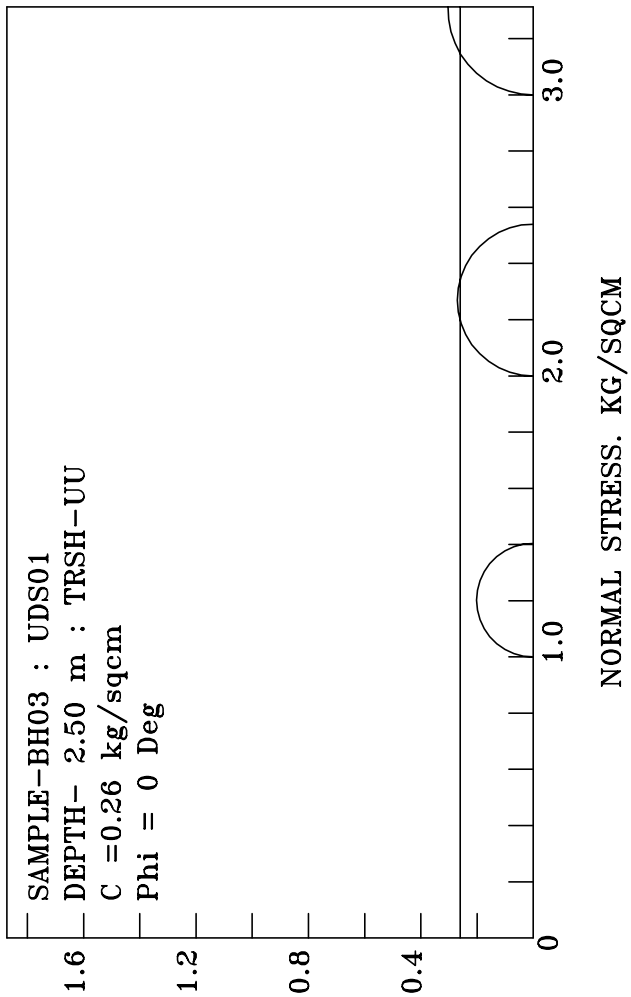
PART III: CHARTS & GRAPHS

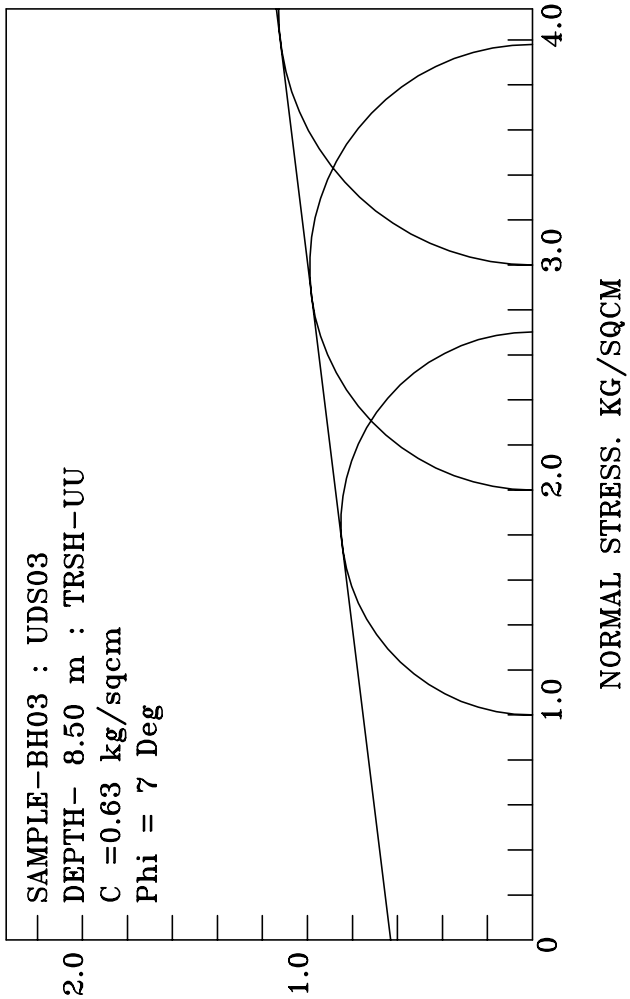

SAMPLE-BH01 : UDS04
DEPTH-11.50 m : TRSH-UU
C =0.51 kg/sqcm
Phi = 8 Deg
NORMAL STRESS. KG/SQCM

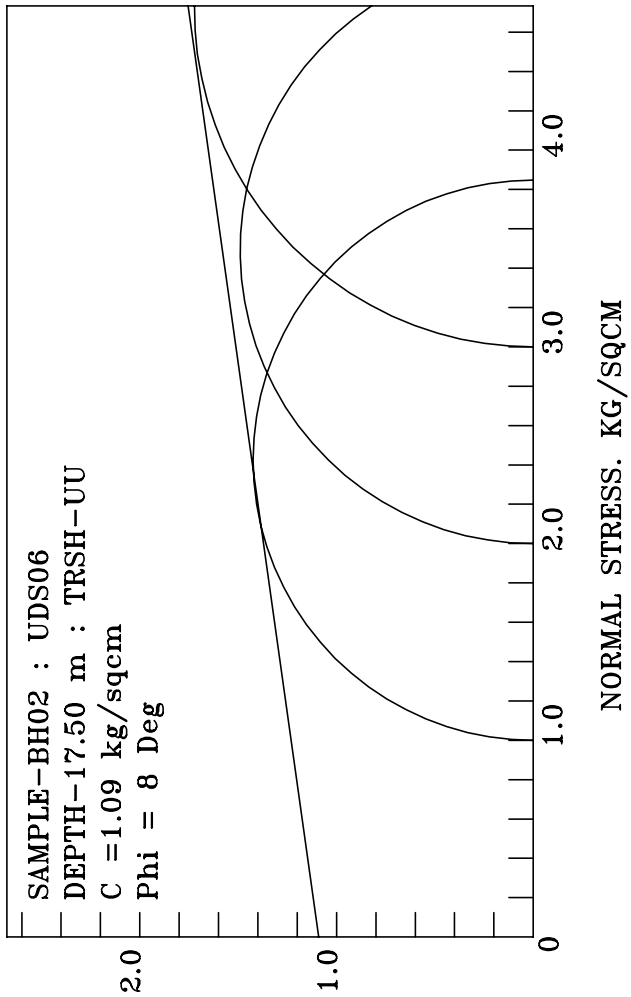

SAMPLE-BH02 : UDS03
DEPTH- 8.50 m : RSH-UU
C =0.8 ,kg/sqcm
Phi =0 Deg
NORMAL STRESS. KG/SQCM

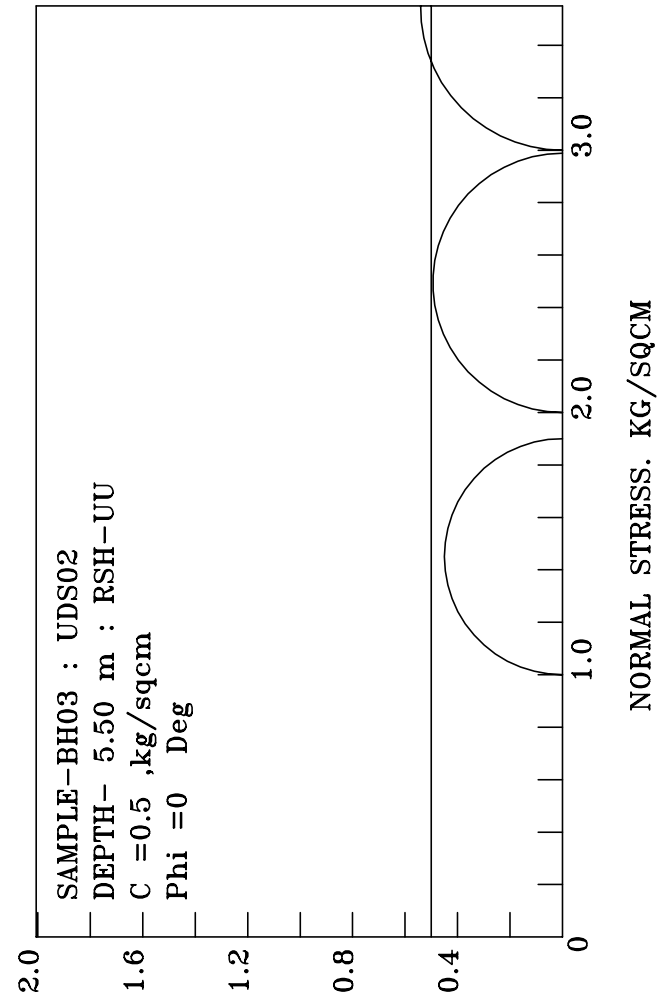

SAMPLE-BH01 : UDS03
DEPTH- 8.50 m : TRSH-UU
C =0.76 kg/sqcm
Phi = 0 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM

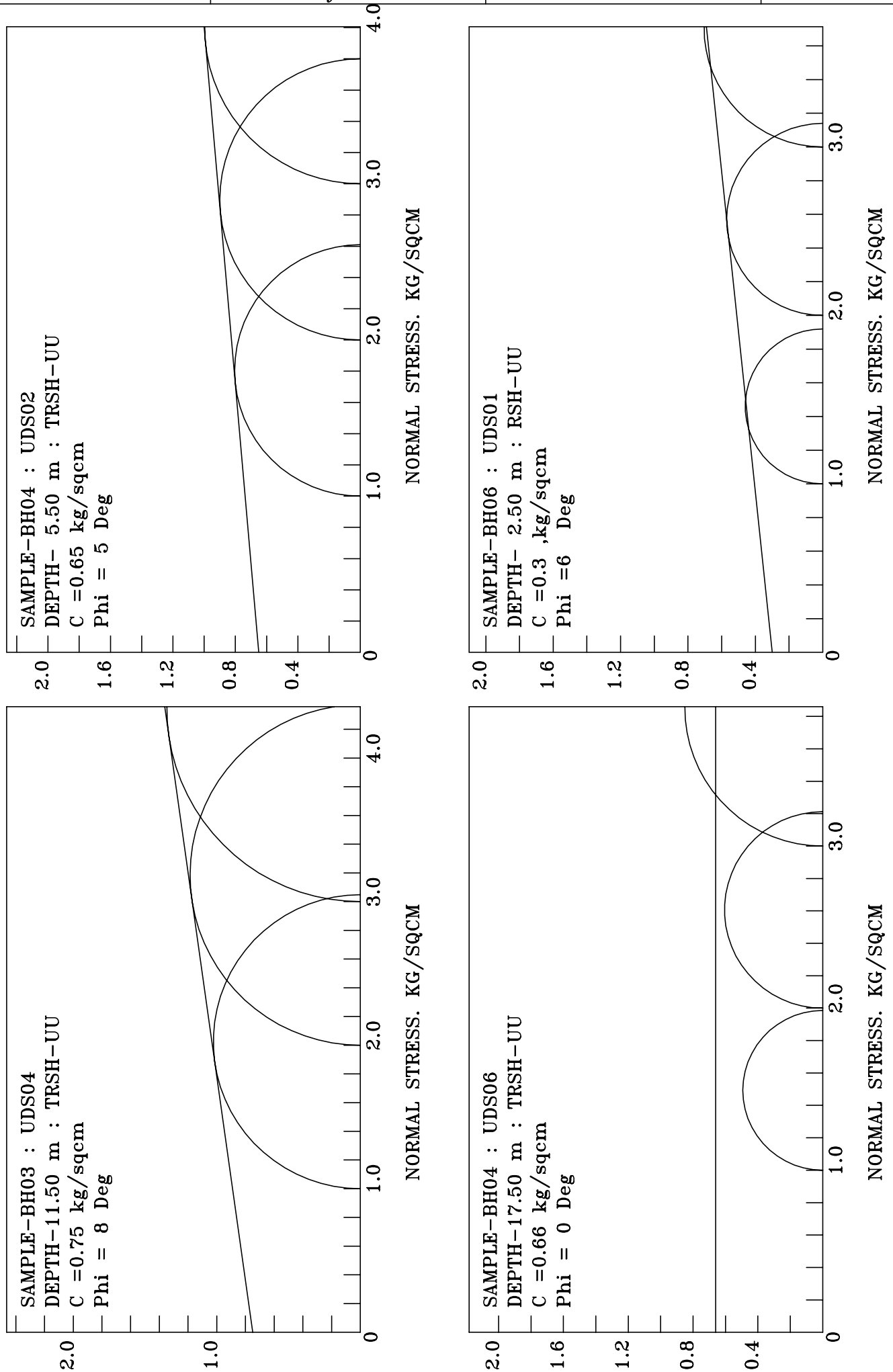

SAMPLE-BH02 : UDS02
DEPTH- 5.50 m : TRSH-UU
C =0.43 kg/sqcm
Phi = 0 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM

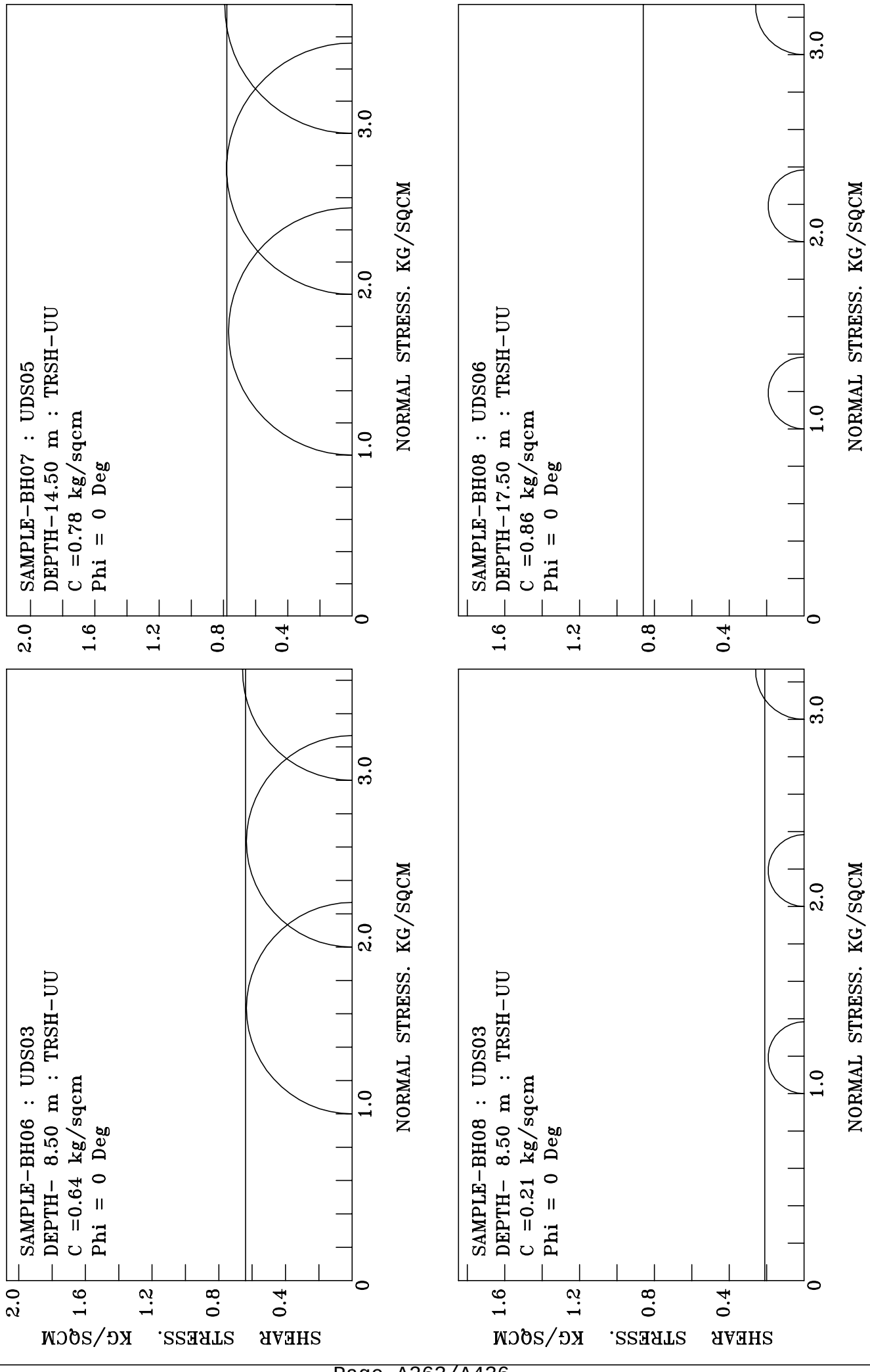

SAMPLE-BH03 : UDS01
DEPTH- 2.50 m : TRSH-UU
C =0.26 kg/sqcm
Phi = 0 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM

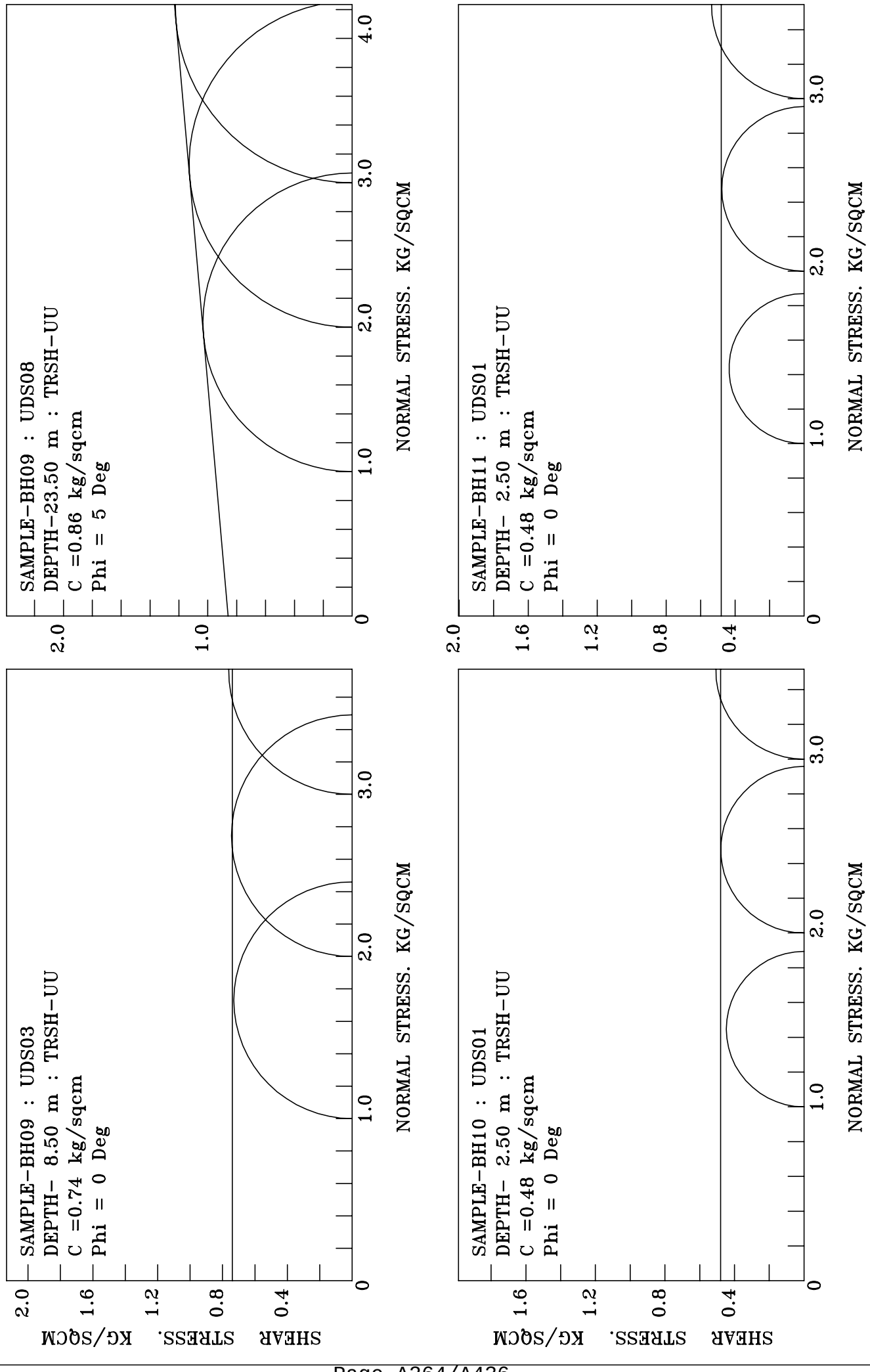

SAMPLE-BH03 : UDS03
DEPTH- 8.50 m : TRSH-UU
C =0.63 kg/sqcm
Phi = 7 Deg
NORMAL STRESS. KG/SQCM

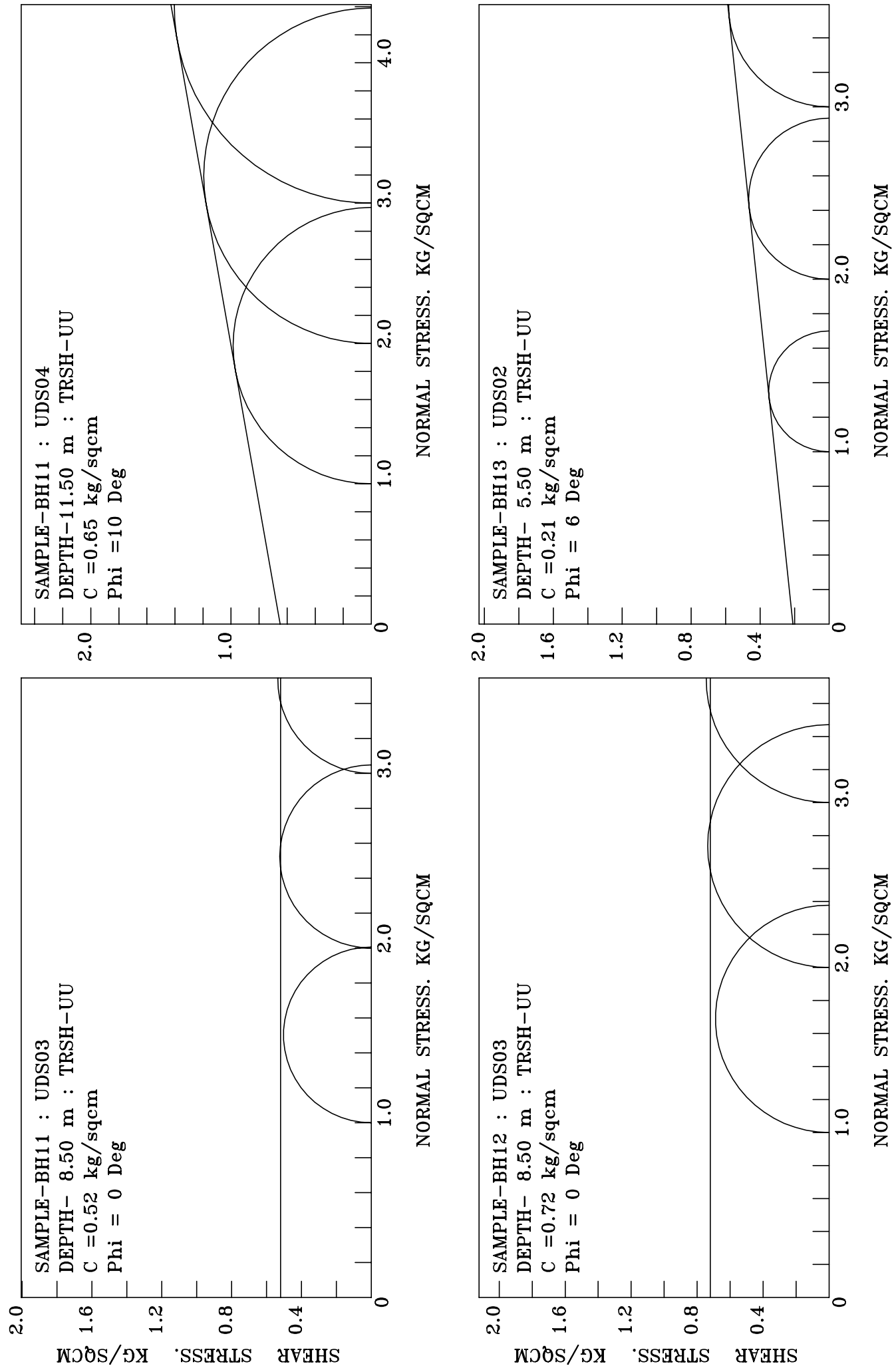

SAMPLE-BH02 : UDS06
DEPTH-17.50 m : TRSH-UU
C =1.09 kg/sqcm
Phi = 8 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM

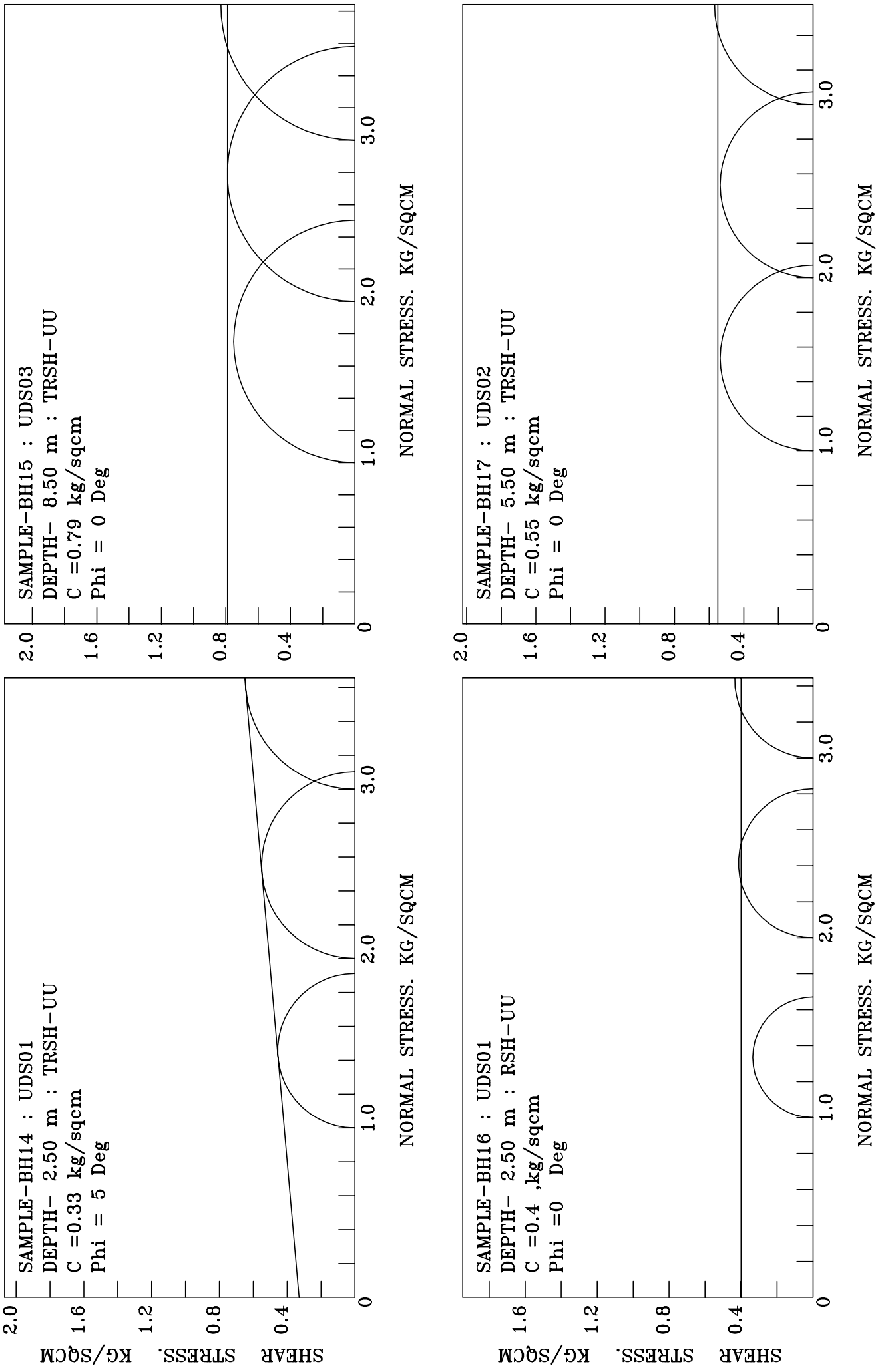

SAMPLE-BH03 : UDS02
DEPTH- 5.50 m : RSH-UU
C =0.5 ,kg/sqcm
Phi =0 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM

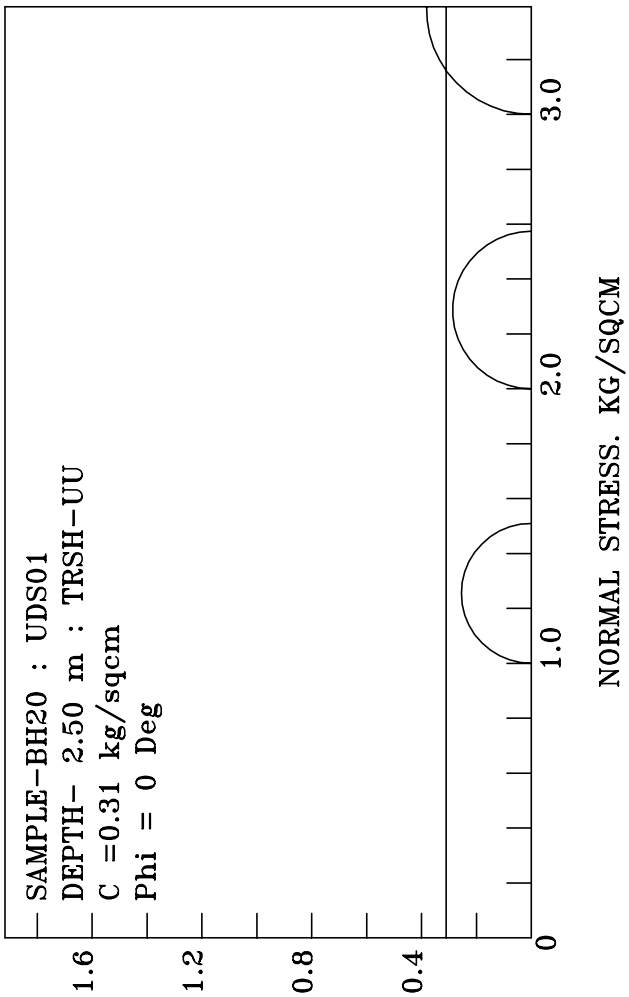

SAMPLE-BH04 : UDS02
DEPTH- 5.50 m : TRSH-UU
C =0.65 kg/sqcm
Phi = 5 Deg
SAMPLE-BH06 : UDS01
DEPTH- 2.50 m : RSH-UU
C =0.3 ,kg/sqcm
Phi =6 Deg
SAMPLE-BH03 : UDS04
DEPTH-11.50 m : TRSH-UU
C =0.75 kg/sqcm
Phi = 8 Deg
SAMPLE-BH04 : UDS06
DEPTH-17.50 m : TRSH-UU
C =0.66 kg/sqcm
Phi = 0 Deg
NORMAL STRESS. KG/SQCM
SHEAR STRESS. KG/SQCM

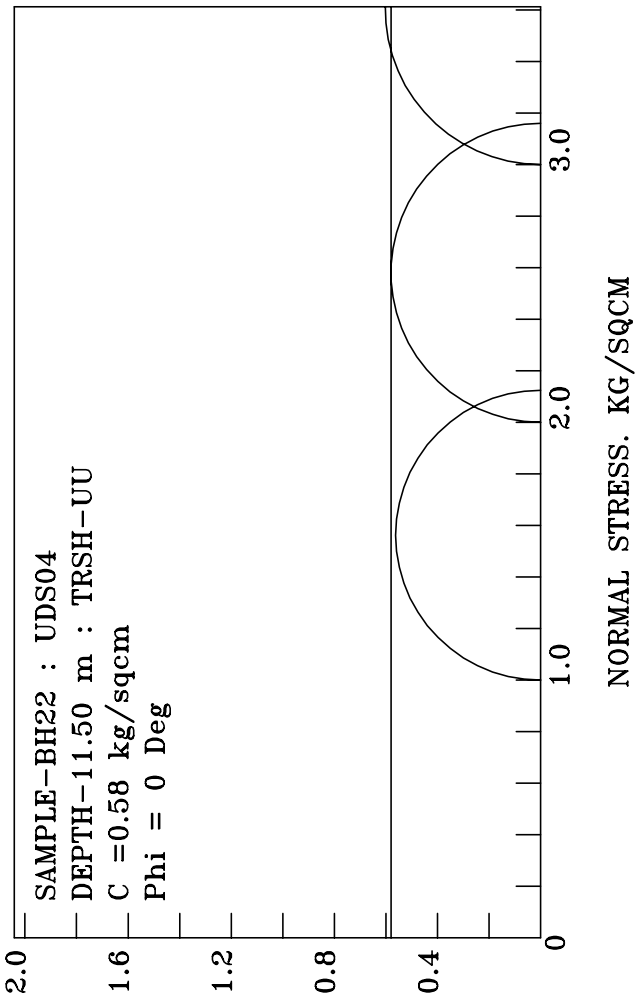

SAMPLE-BH07 : UDS05
DEPTH-14.50 m : TRSH-UU
C =0.78 kg/sqcm
Phi = 0 Deg
SAMPLE-BH08 : UDS06
DEPTH-17.50 m : TRSH-UU
C =0.86 kg/sqcm
Phi = 0 Deg
SAMPLE-BH06 : UDS03
DEPTH- 8.50 m : TRSH-UU
C =0.64 kg/sqcm
Phi = 0 Deg
SAMPLE-BH08 : UDS03
DEPTH- 8.50 m : TRSH-UU
C =0.21 kg/sqcm
Phi = 0 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM
0
0.4
0.8
1.2
1.6
2.0
1.0
2.0
3.0

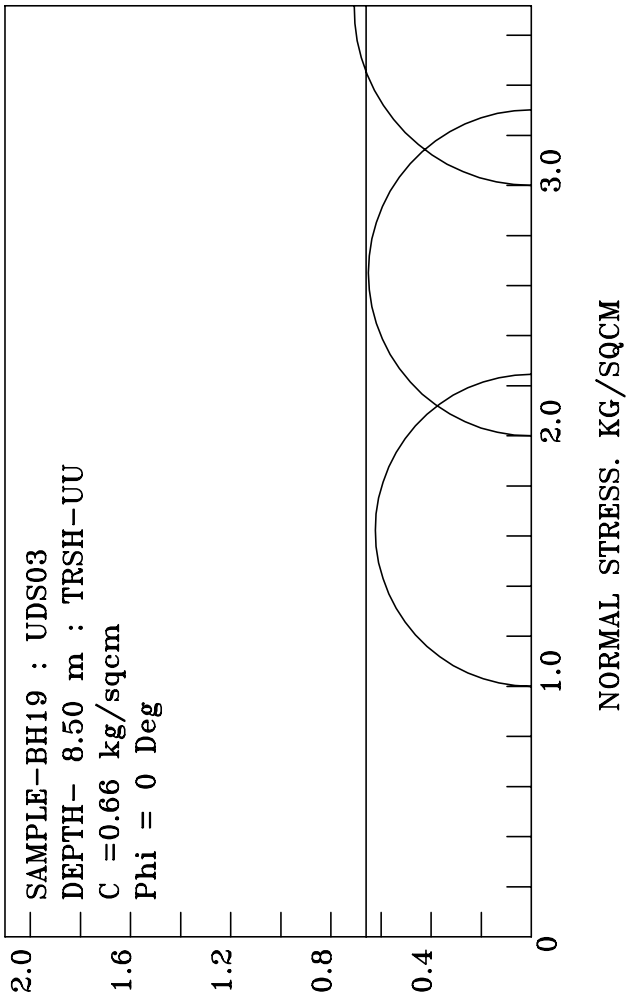

SAMPLE-BH09 : UDS08
DEPTH-23.50 m : TRSH-UU
C =0.86 kg/sqcm
Phi = 5 Deg
SAMPLE-BH11 : UDS01
DEPTH- 2.50 m : TRSH-UU
C =0.48 kg/sqcm
Phi = 0 Deg
SAMPLE-BH09 : UDS03
DEPTH- 8.50 m : TRSH-UU
C =0.74 kg/sqcm
Phi = 0 Deg
SAMPLE-BH10 : UDS01
DEPTH- 2.50 m : TRSH-UU
C =0.48 kg/sqcm
Phi = 0 Deg
NORMAL STRESS. KG/SQCM
SHEAR STRESS. KG/SQCM

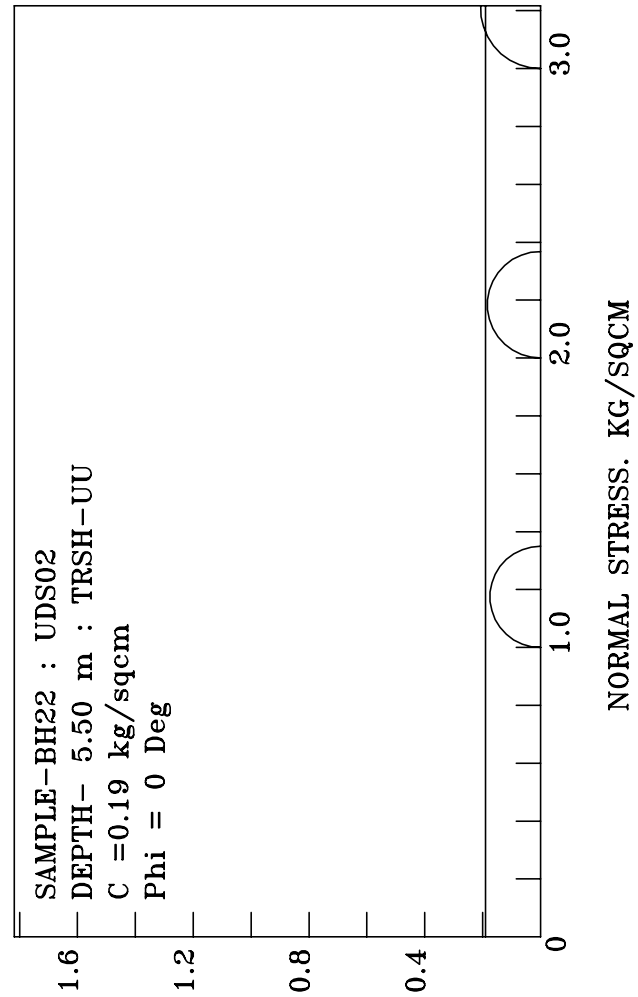

SAMPLE-BH11 : UDS04
DEPTH-11.50 m : TRSH-UU
C =0.65 kg/sqcm
Phi =10 Deg
NORMAL STRESS. KG/SQCM
SAMPLE-BH13 : UDS02
DEPTH- 5.50 m : TRSH-UU
C =0.21 kg/sqcm
Phi = 6 Deg
NORMAL STRESS. KG/SQCM
SAMPLE-BH11 : UDS03
DEPTH- 8.50 m : TRSH-UU
C =0.52 kg/sqcm
Phi = 0 Deg
NORMAL STRESS. KG/SQCM
SHEAR STRESS. KG/SQCM
SAMPLE-BH12 : UDS03
DEPTH- 8.50 m : TRSH-UU
C =0.72 kg/sqcm
Phi = 0 Deg
NORMAL STRESS. KG/SQCM
SHEAR STRESS. KG/SQCM

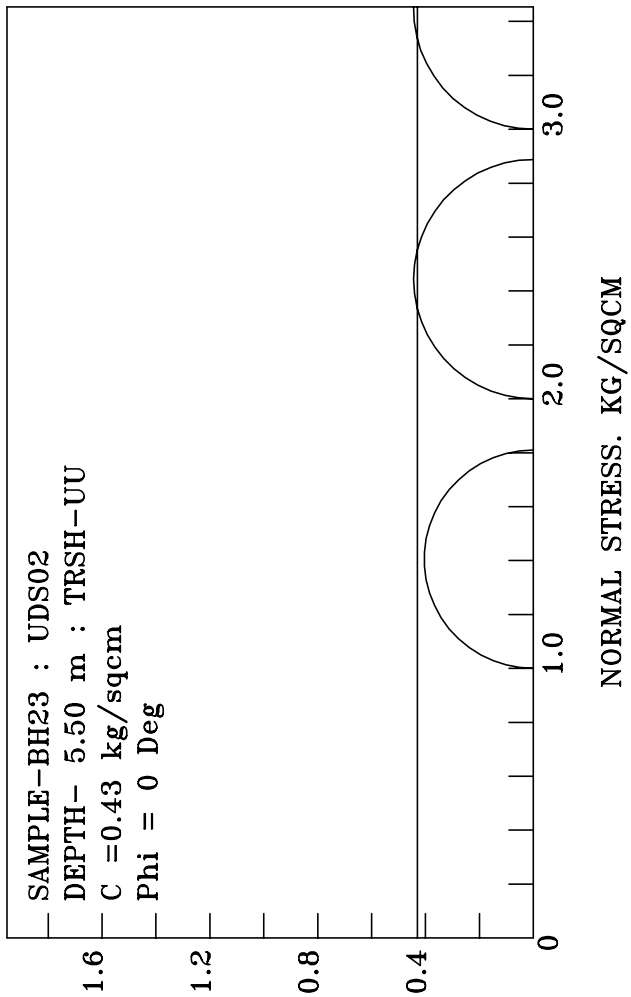

SAMPLE-BH15 : UDS03
DEPTH- 8.50 m : TRSH-UU
C =0.79 kg/sqcm
Phi = 0 Deg
SAMPLE-BH17 : UDS02
DEPTH- 5.50 m : TRSH-UU
C =0.55 kg/sqcm
Phi = 0 Deg
SAMPLE-BH14 : UDS01
DEPTH- 2.50 m : TRSH-UU
C =0.33 kg/sqcm
Phi = 5 Deg
SAMPLE-BH16 : UDS01
DEPTH- 2.50 m : RSH-UU
C =0.4 ,kg/sqcm
Phi =0 Deg
NORMAL STRESS. KG/SQCM
SHEAR STRESS. KG/SQCM
0
0.4
0.8
1.2
1.6
2.0
1.0
2.0
3.0

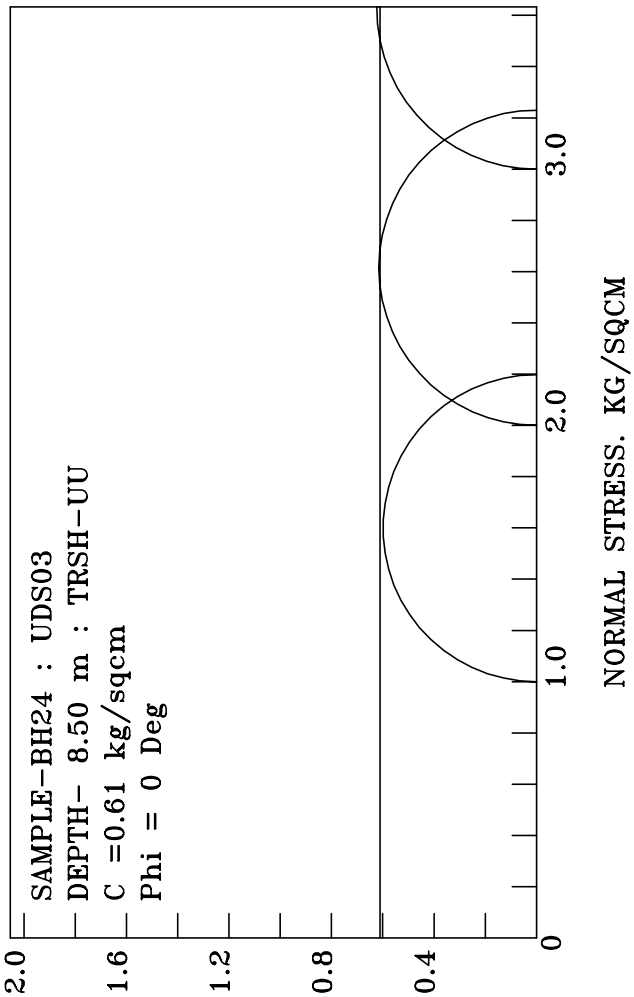

SAMPLE-BH20 : UDS01
DEPTH- 2.50 m : TRSH-UU
C =0.31 kg/sqcm
Phi = 0 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM

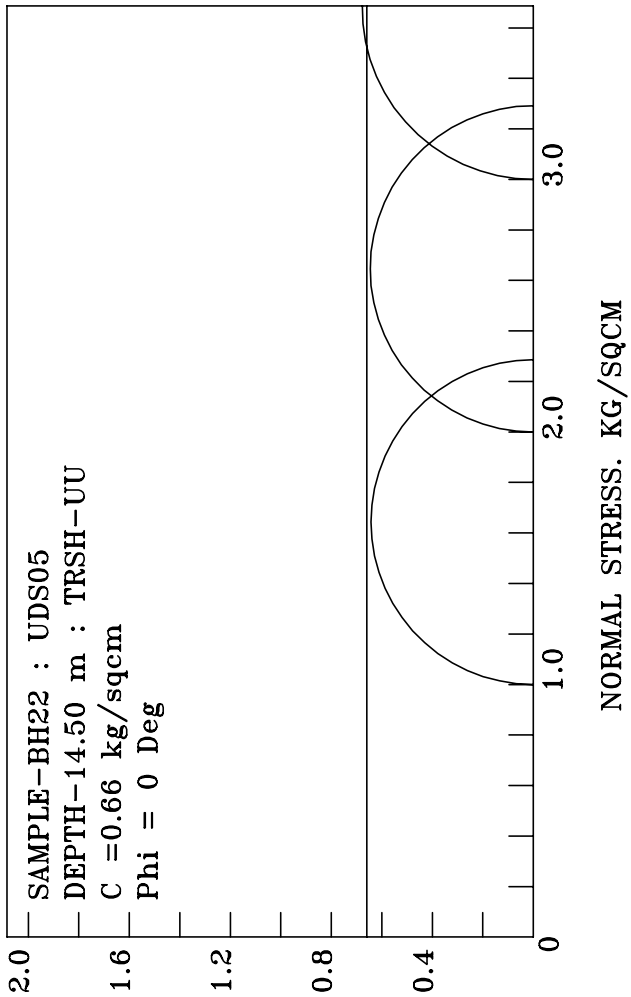

SAMPLE-BH22 : UDS04
DEPTH-11.50 m : TRSH-UU
C =0.58 kg/sqcm
Phi = 0 Deg
NORMAL STRESS. KG/SQCM

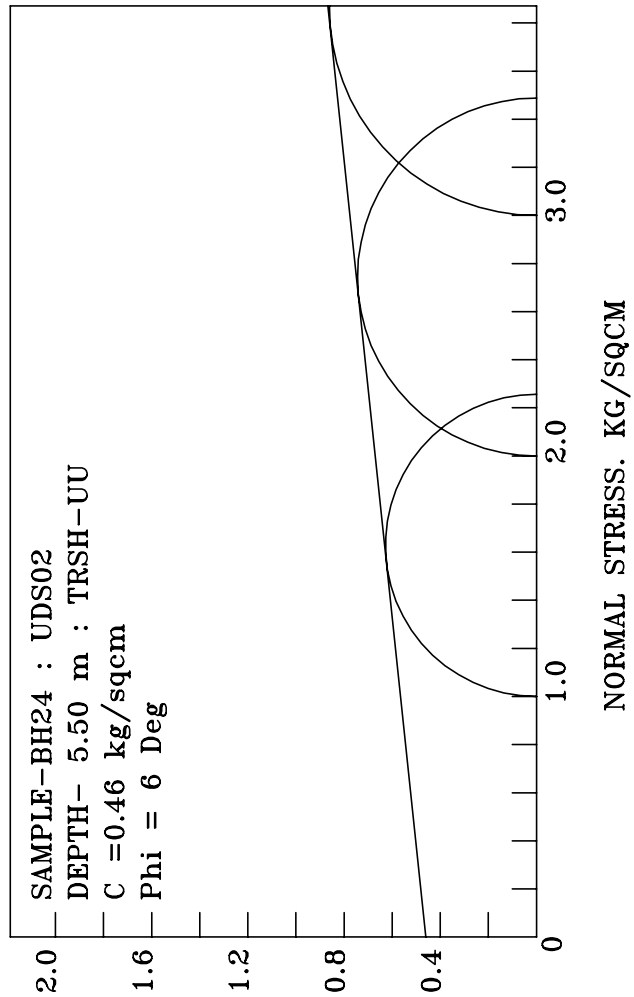

SAMPLE-BH19 : UDS03
DEPTH- 8.50 m : TRSH-UU
C =0.66 kg/sqcm
Phi = 0 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM

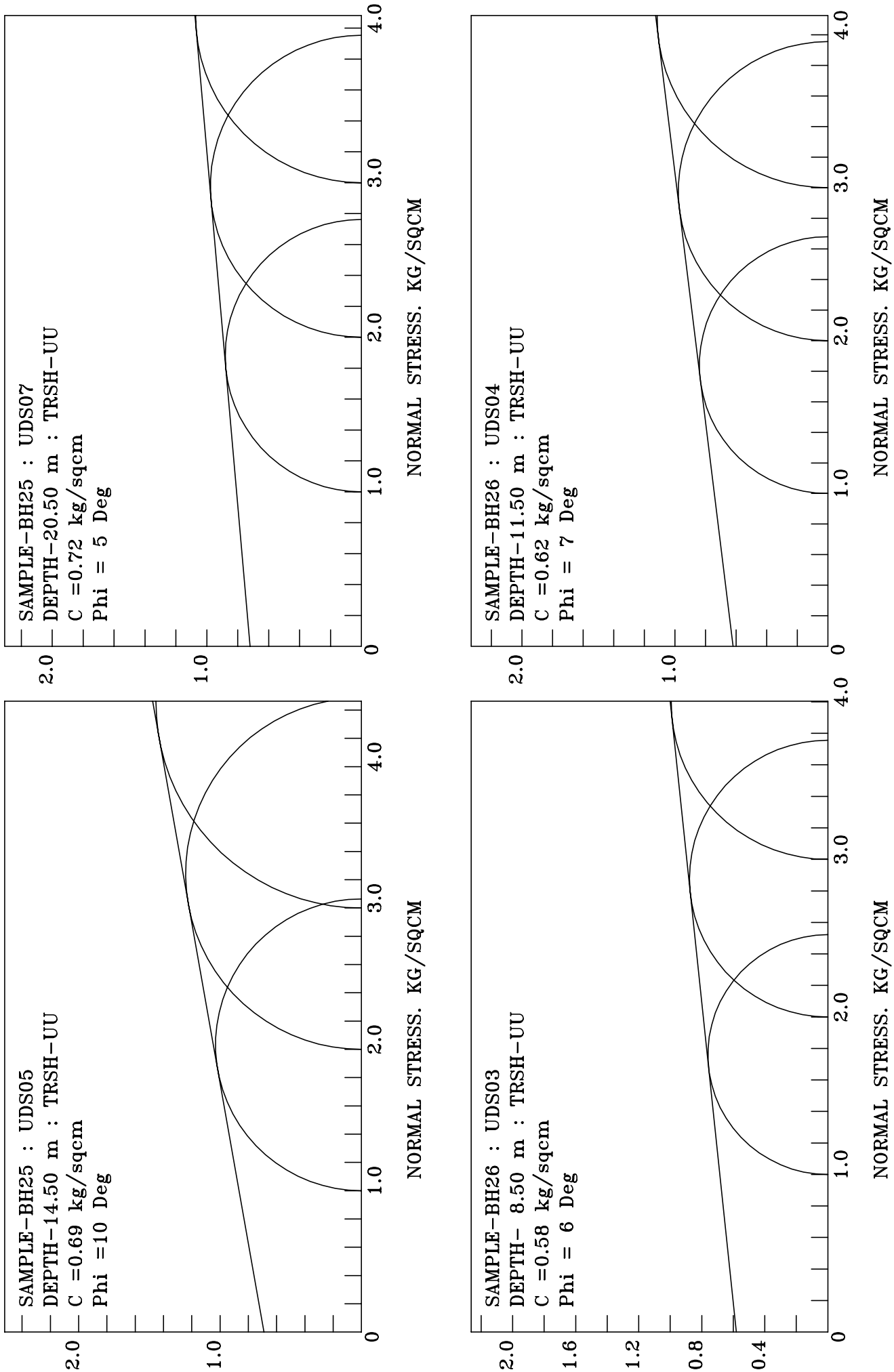

SAMPLE-BH22 : UDS02
DEPTH- 5.50 m : TRSH-UU
C =0.19 kg/sqcm
Phi = 0 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM

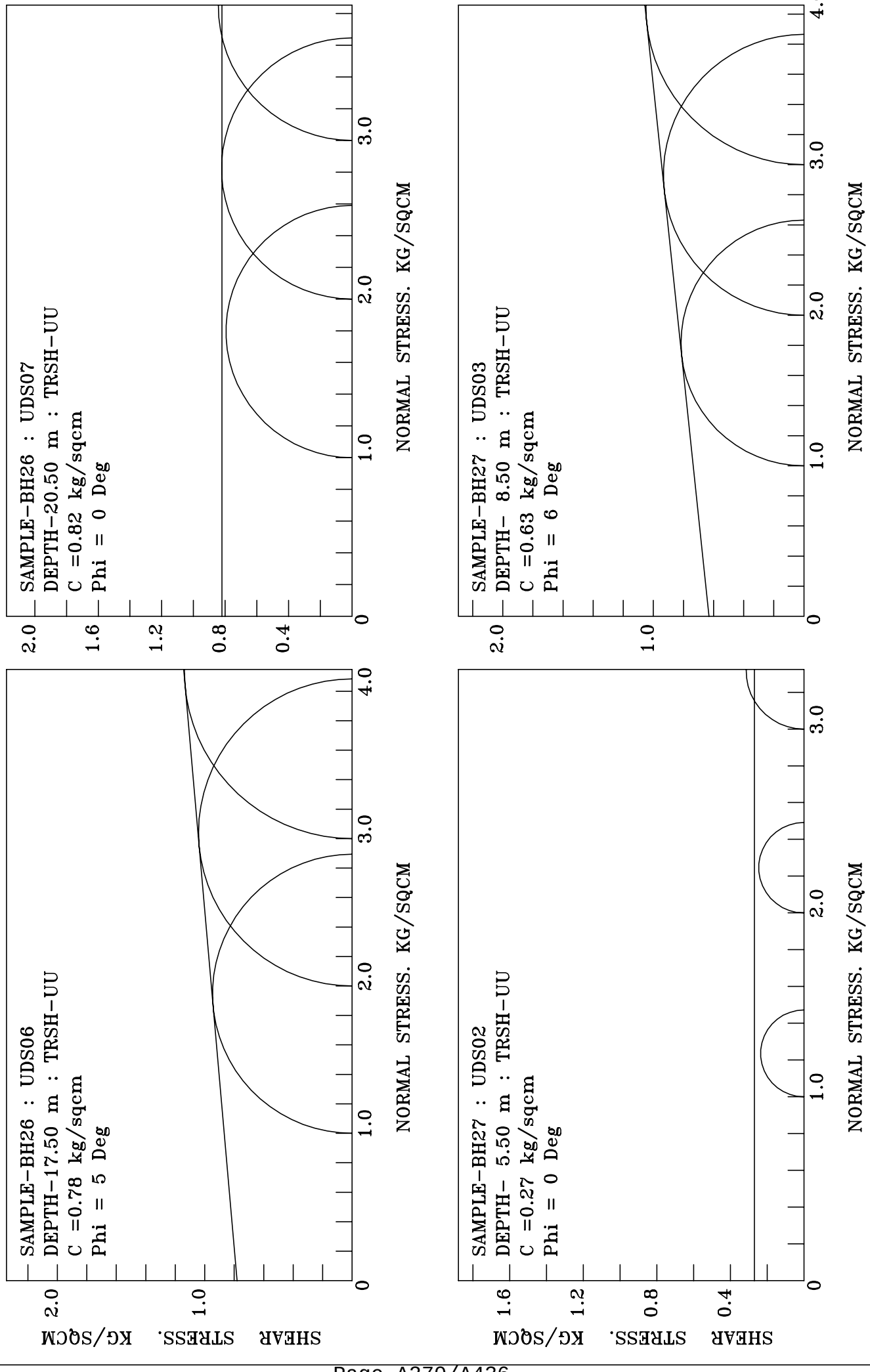

SAMPLE-BH23 : UDS02
DEPTH- 5.50 m : TRSH-UU
C =0.43 kg/sqcm
Phi = 0 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM
0
0.4
0.8
1.2
1.6
1.0
2.0
3.0

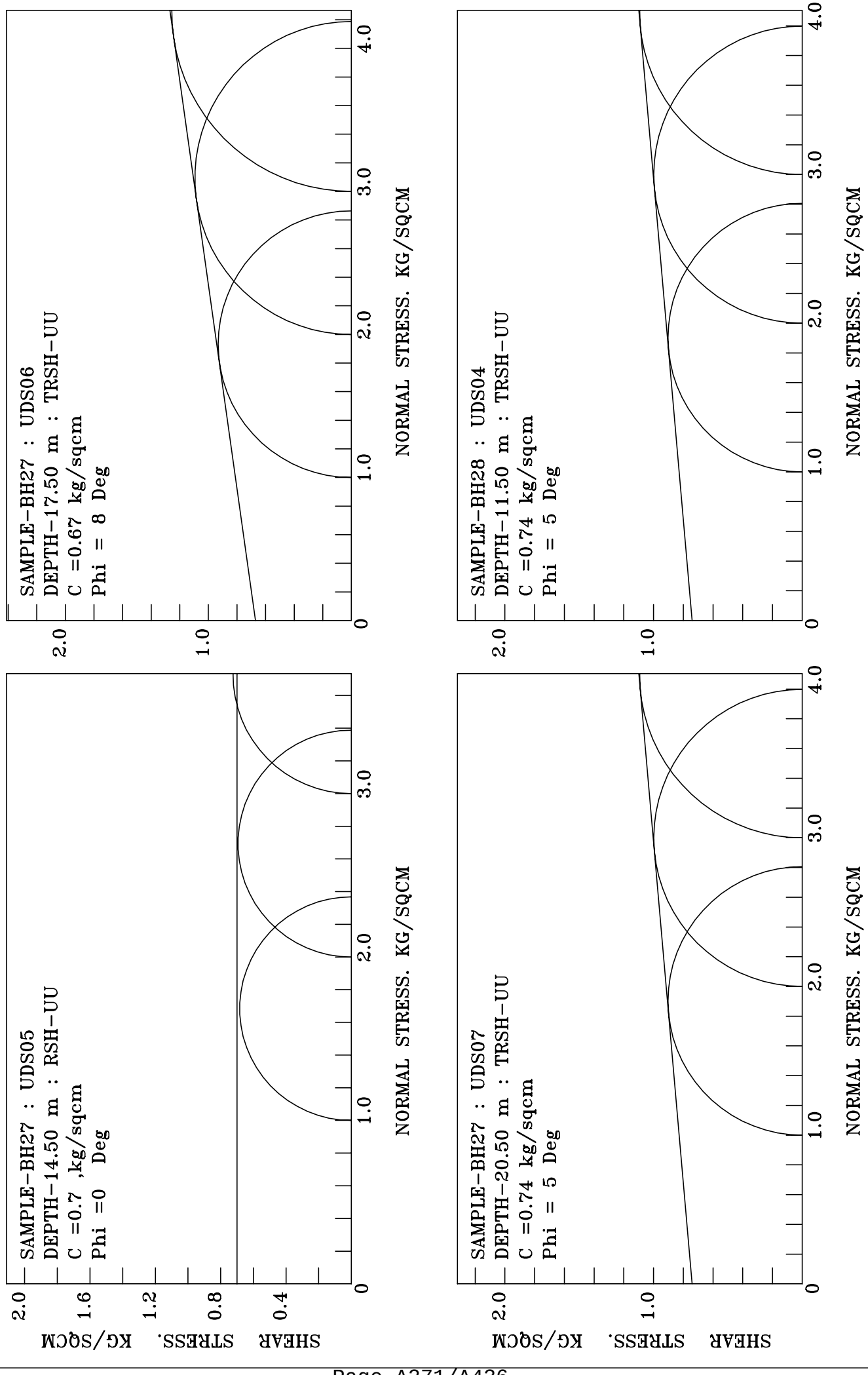

SAMPLE-BH24 : UDS03
DEPTH- 8.50 m : TRSH-UU
C =0.61 kg/sqcm
Phi = 0 Deg
NORMAL STRESS. KG/SQCM
0
0.4
0.8
1.2
1.6
2.0
1.0
2.0
3.0

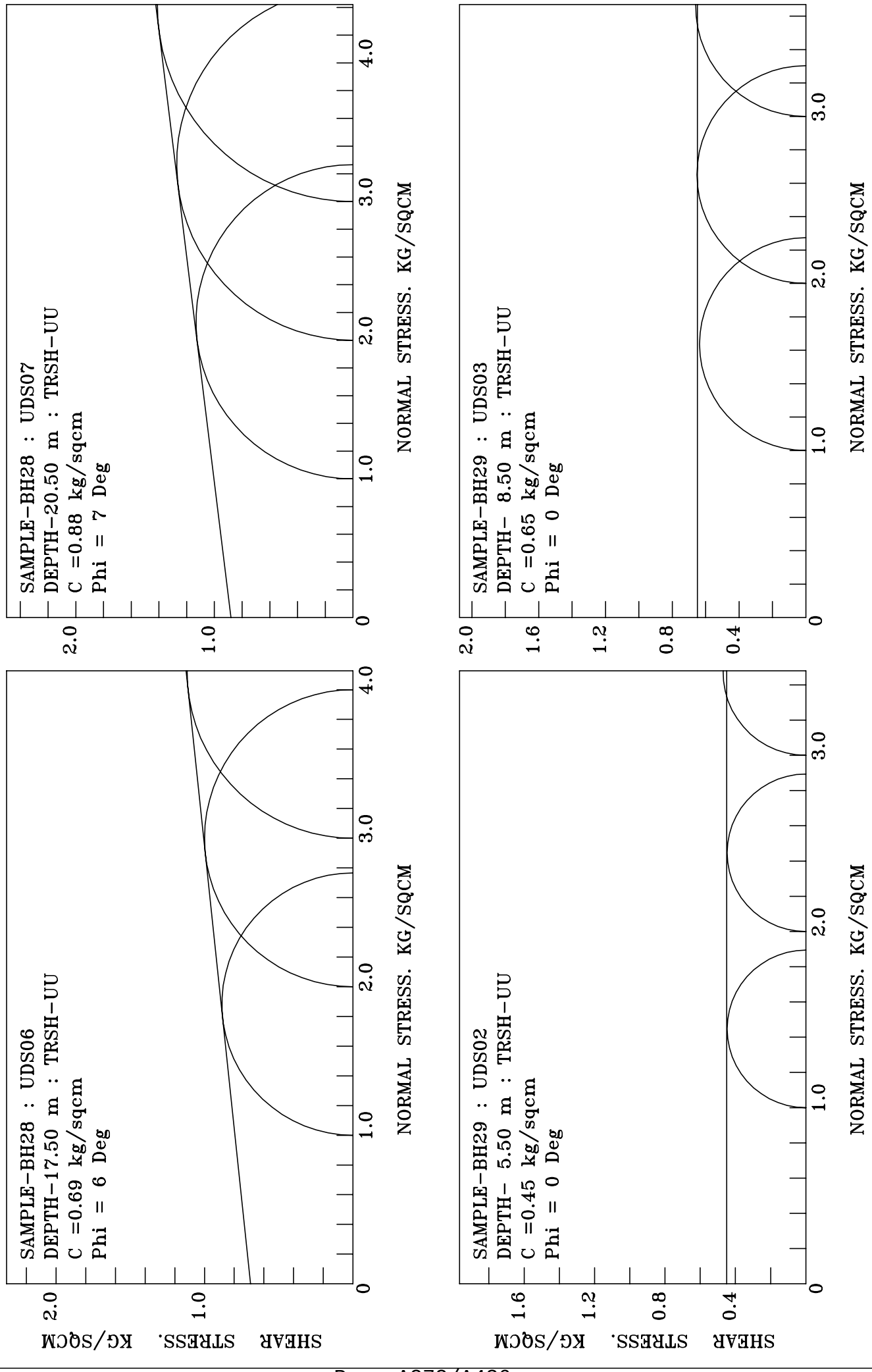

SAMPLE-BH22 : UDS05
DEPTH-14.50 m : TRSH-UU
C =0.66 kg/sqcm
Phi = 0 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM
0
0.4
0.8
1.2
1.6
2.0
1.0
2.0
3.0

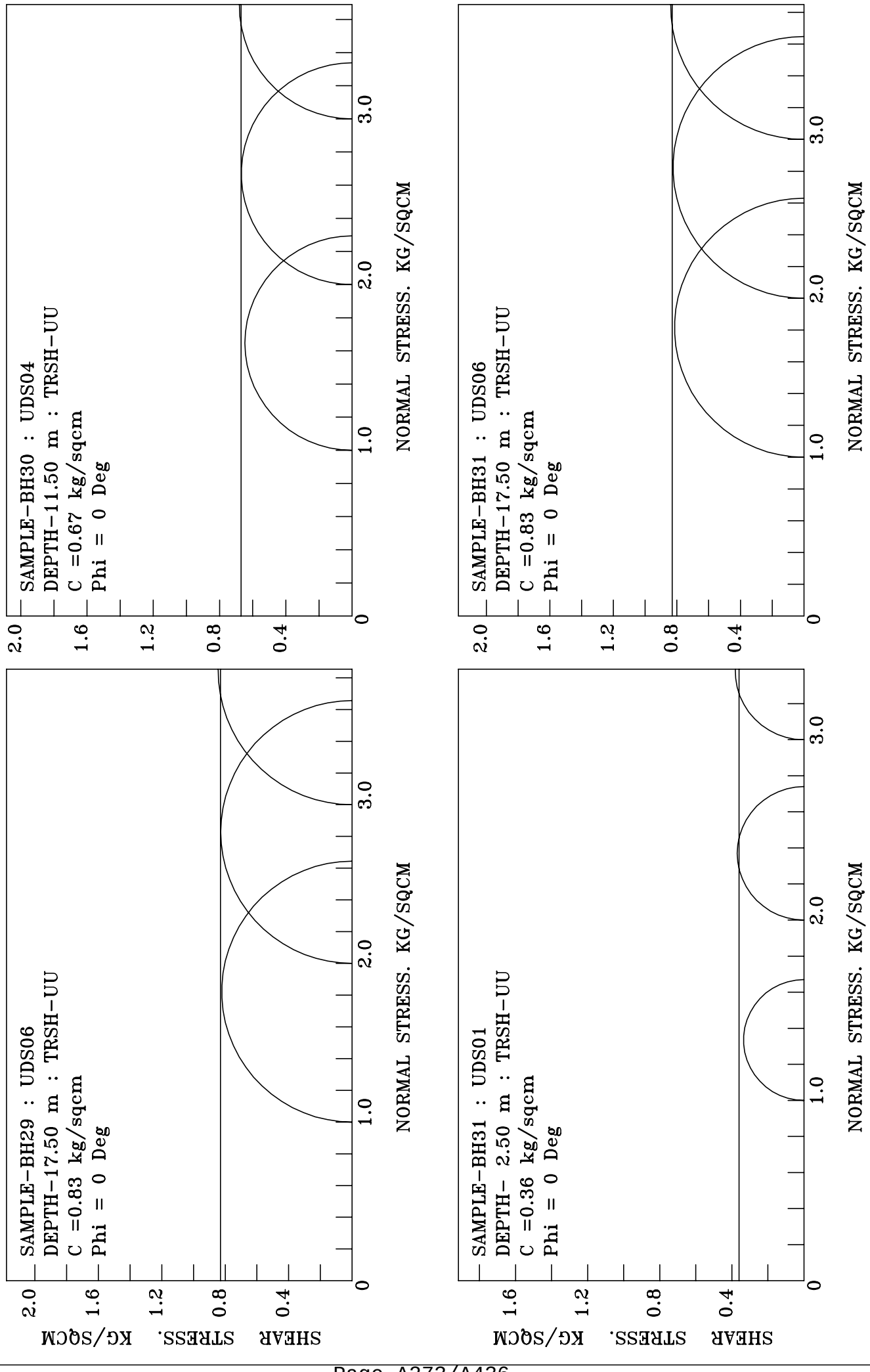

SAMPLE-BH24 : UDS02
DEPTH- 5.50 m : TRSH-UU
C =0.46 kg/sqcm
Phi = 6 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM
0
0.4
0.8
1.2
1.6
2.0
1.0
2.0
3.0

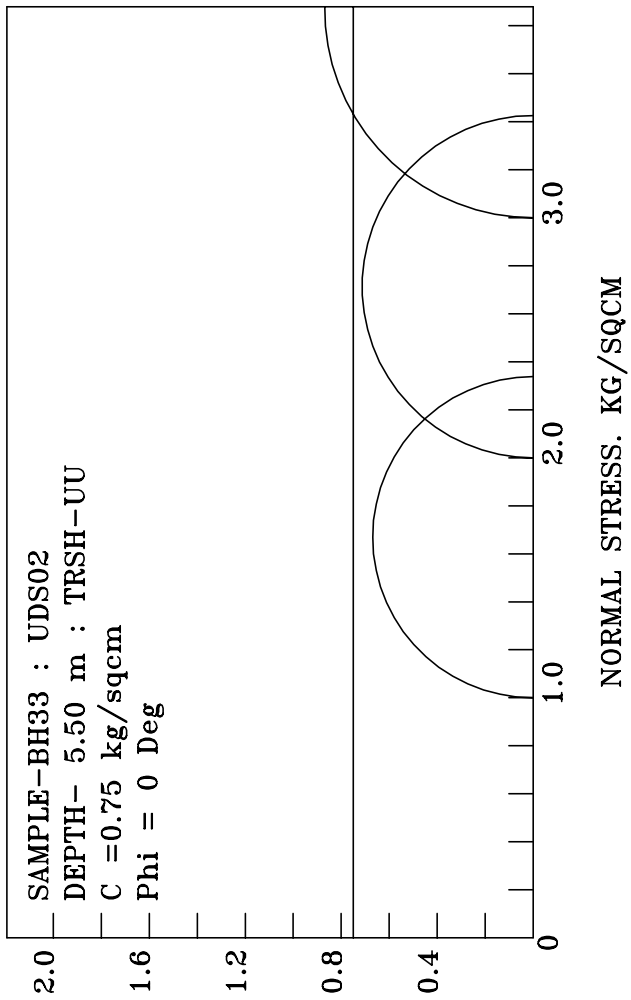

SAMPLE-BH25 : UDS07
DEPTH-20.50 m : TRSH-UU
C =0.72 kg/sqcm
Phi = 5 Deg
SAMPLE-BH26 : UDS04
DEPTH-11.50 m : TRSH-UU
C =0.62 kg/sqcm
Phi = 7 Deg
SAMPLE-BH25 : UDS05
DEPTH-14.50 m : TRSH-UU
C =0.69 kg/sqcm
Phi =10 Deg
SAMPLE-BH26 : UDS03
DEPTH- 8.50 m : TRSH-UU
C =0.58 kg/sqcm
Phi = 6 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM
0
1.0
2.0
3.0
4.0
0.4
0.8
1.2
1.6

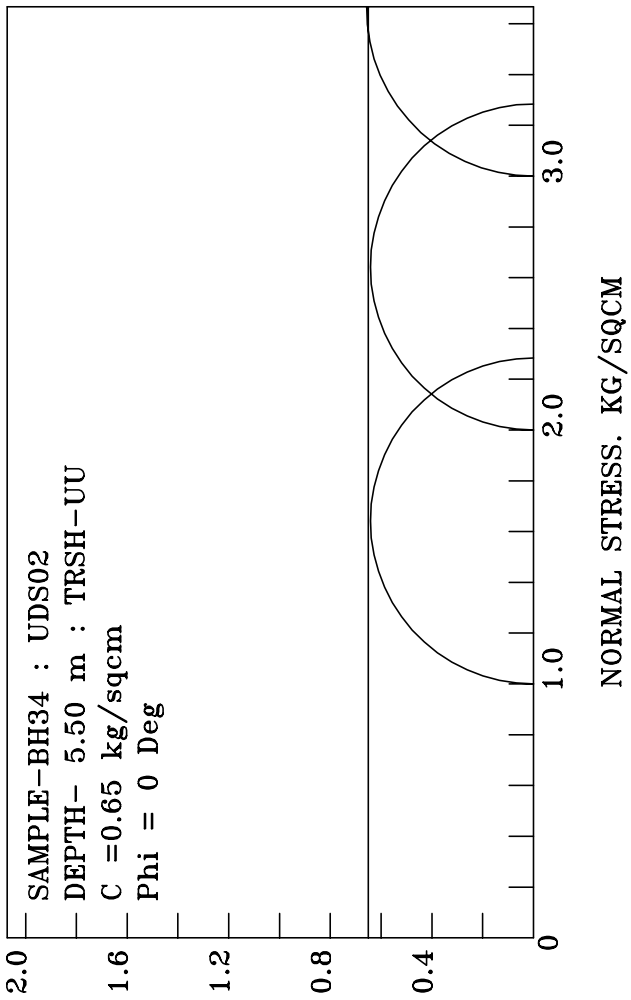

SAMPLE-BH26 : UDS07
DEPTH-20.50 m : TRSH-UU
C =0.82 kg/sqcm
Phi = 0 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM
SAMPLE-BH27 : UDS03
DEPTH- 8.50 m : TRSH-UU
C =0.63 kg/sqcm
Phi = 6 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM
SAMPLE-BH26 : UDS06
DEPTH-17.50 m : TRSH-UU
C =0.78 kg/sqcm
Phi = 5 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM
SAMPLE-BH27 : UDS02
DEPTH- 5.50 m : TRSH-UU
C =0.27 kg/sqcm
Phi = 0 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM

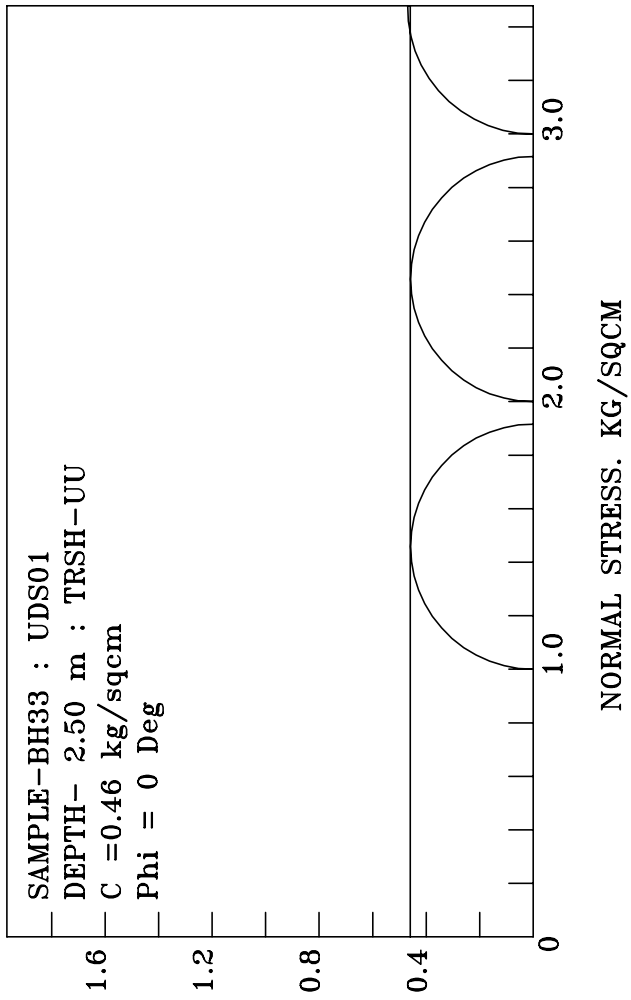

SAMPLE-BH27 : UDS06
DEPTH-17.50 m : TRSH-UU
C =0.67 kg/sqcm
Phi = 8 Deg
SAMPLE-BH28 : UDS04
DEPTH-11.50 m : TRSH-UU
C =0.74 kg/sqcm
Phi = 5 Deg
SAMPLE-BH27 : UDS05
DEPTH-14.50 m : RSH-UU
C =0.7 ,kg/sqcm
Phi =0 Deg
SAMPLE-BH27 : UDS07
DEPTH-20.50 m : TRSH-UU
C =0.74 kg/sqcm
Phi = 5 Deg
NORMAL STRESS. KG/SQCM
SHEAR STRESS. KG/SQCM

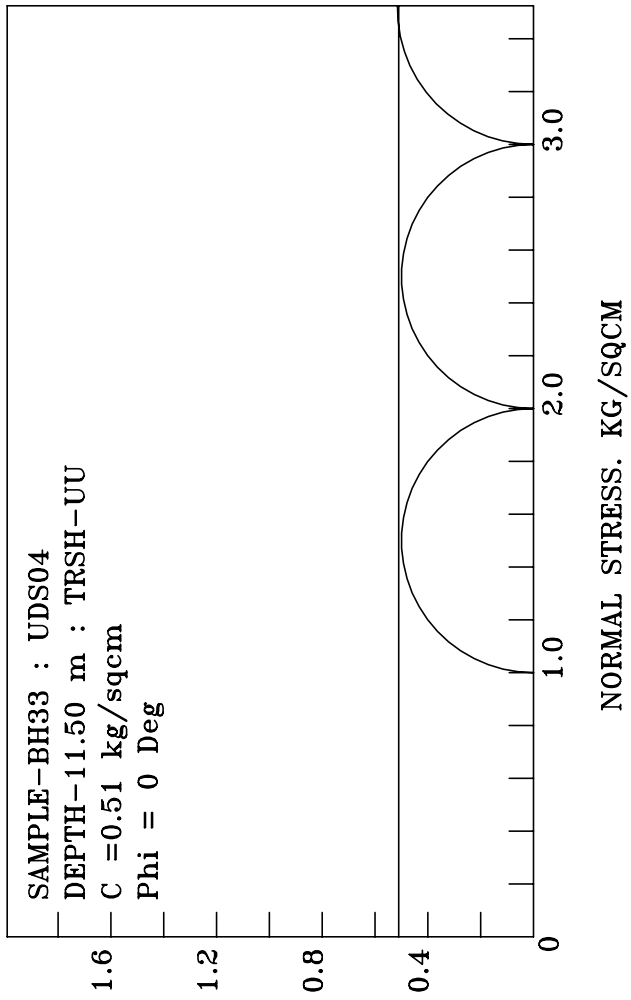

SAMPLE-BH28 : UDS07
DEPTH-20.50 m : TRSH-UU
C =0.88 kg/sqcm
Phi = 7 Deg
SAMPLE-BH29 : UDS03
DEPTH- 8.50 m : TRSH-UU
C =0.65 kg/sqcm
Phi = 0 Deg
SAMPLE-BH28 : UDS06
DEPTH-17.50 m : TRSH-UU
C =0.69 kg/sqcm
Phi = 6 Deg
SAMPLE-BH29 : UDS02
DEPTH- 5.50 m : TRSH-UU
C =0.45 kg/sqcm
Phi = 0 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM

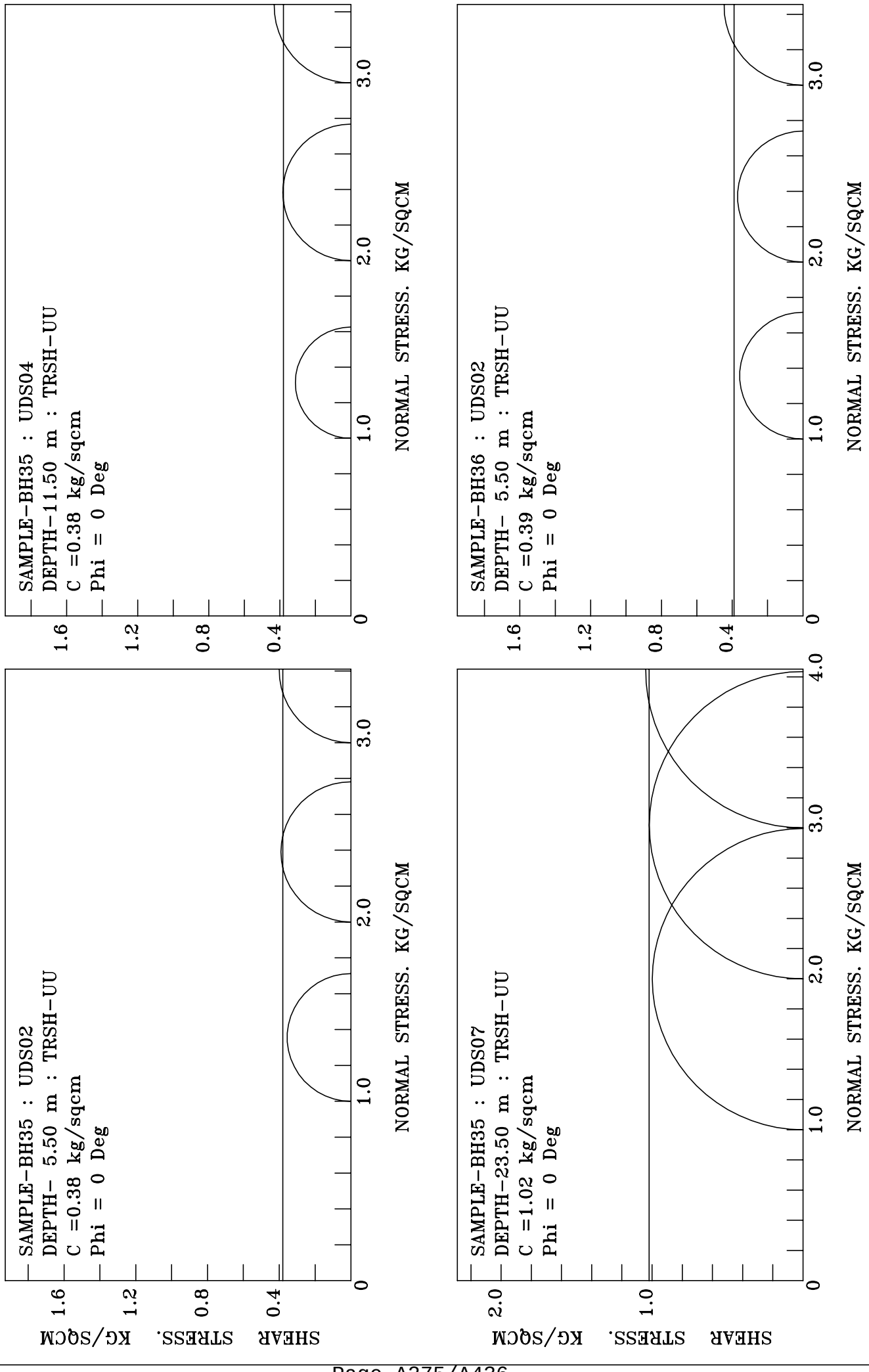

SAMPLE-BH30 : UDS04
DEPTH-11.50 m : TRSH-UU
C =0.67 kg/sqcm
Phi = 0 Deg
SAMPLE-BH31 : UDS06
DEPTH-17.50 m : TRSH-UU
C =0.83 kg/sqcm
Phi = 0 Deg
SAMPLE-BH29 : UDS06
DEPTH-17.50 m : TRSH-UU
C =0.83 kg/sqcm
Phi = 0 Deg
SAMPLE-BH31 : UDS01
DEPTH- 2.50 m : TRSH-UU
C =0.36 kg/sqcm
Phi = 0 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM
0
0.4
0.8
1.2
1.6
2.0
1.0
2.0
3.0

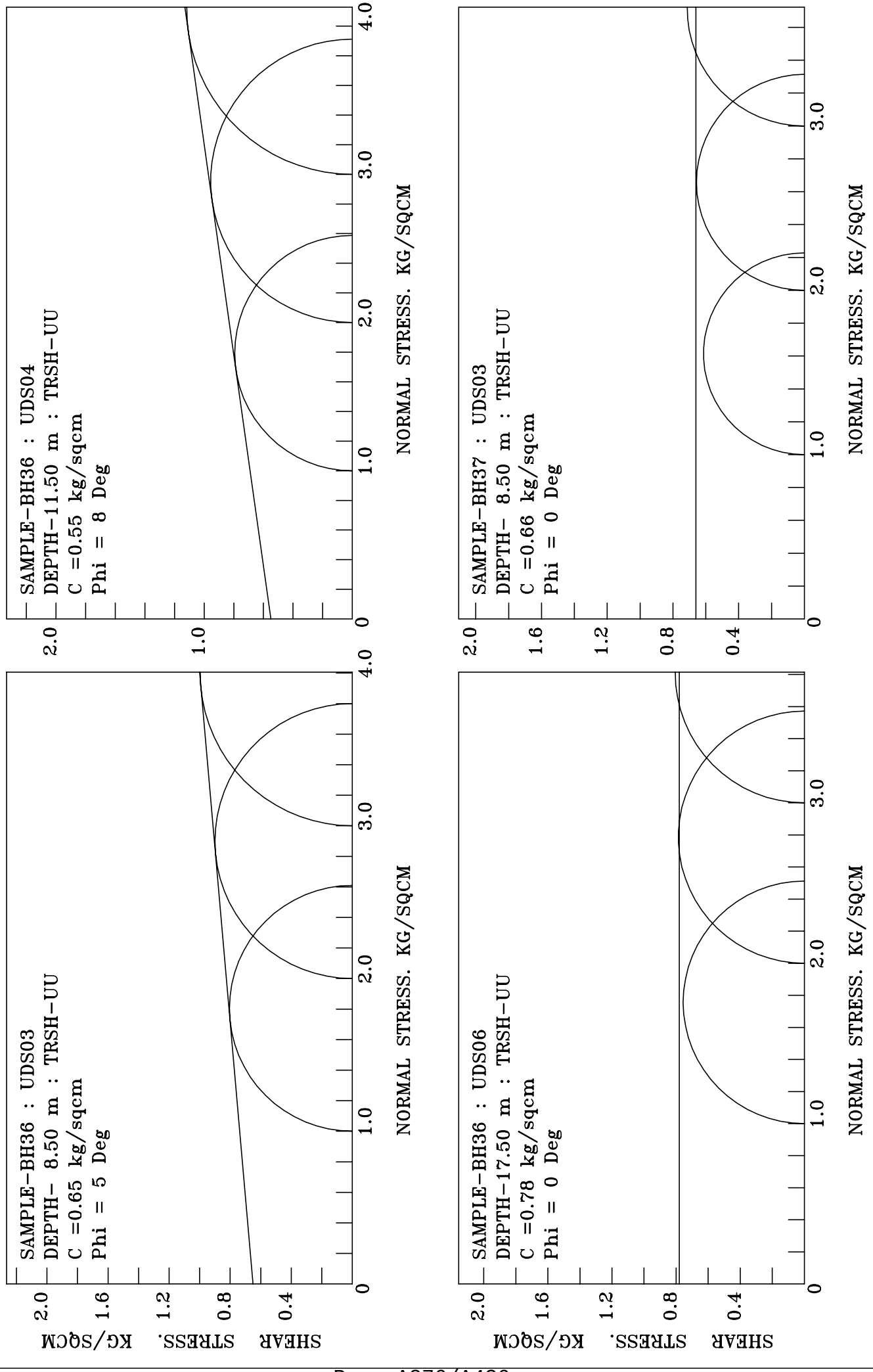

SAMPLE-BH33 : UDS02
DEPTH- 5.50 m : TRSH-UU
C =0.75 kg/sqcm
Phi = 0 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM
0.4
0.8
1.2
1.6
2.0
0
1.0
2.0
3.0

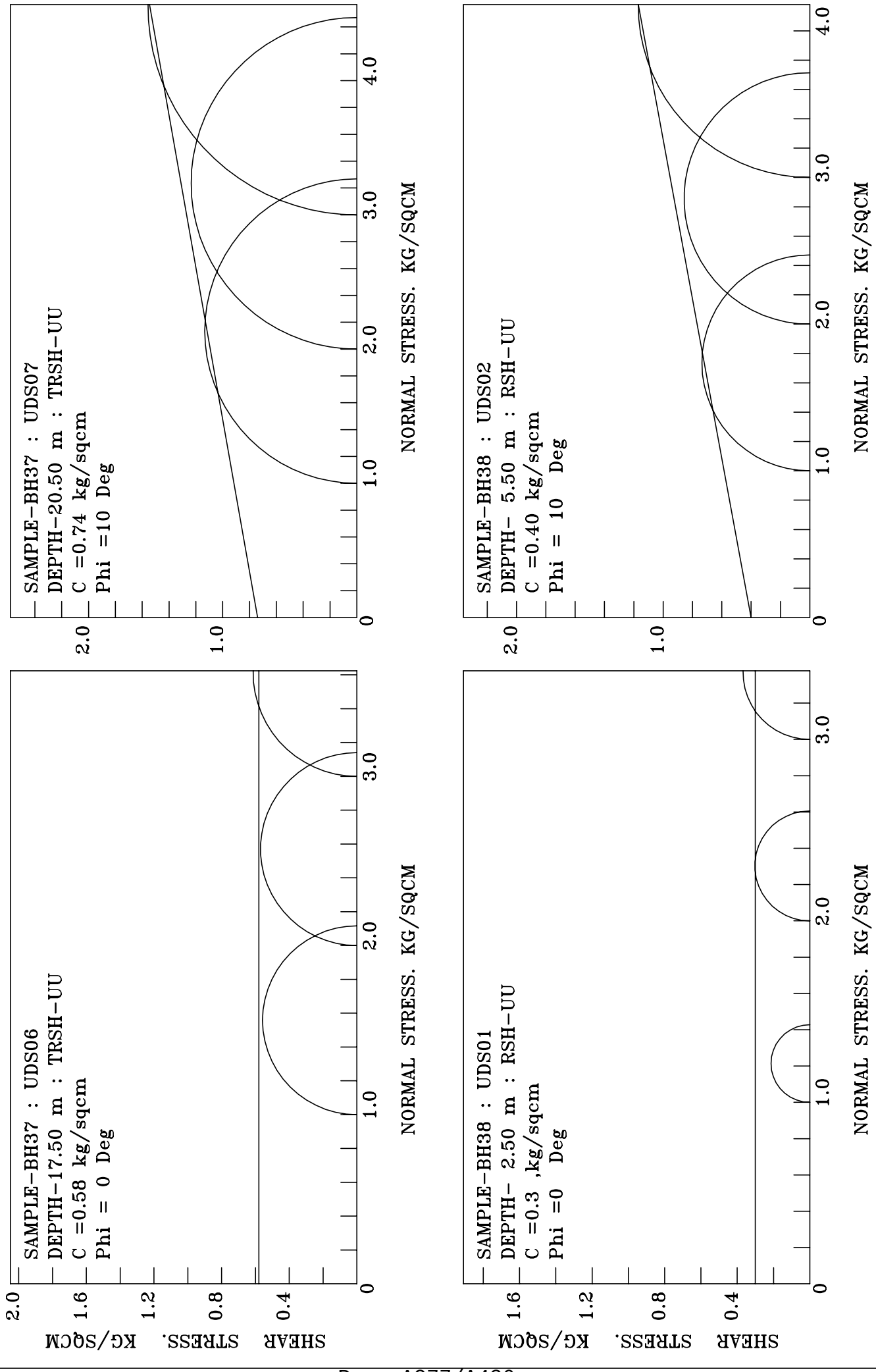

SAMPLE-BH34 : UDS02
DEPTH- 5.50 m : TRSH-UU
C =0.65 kg/sqcm
Phi = 0 Deg
NORMAL STRESS. KG/SQCM
0.4
0.8
1.2
1.6
2.0
0
1.0
2.0
3.0

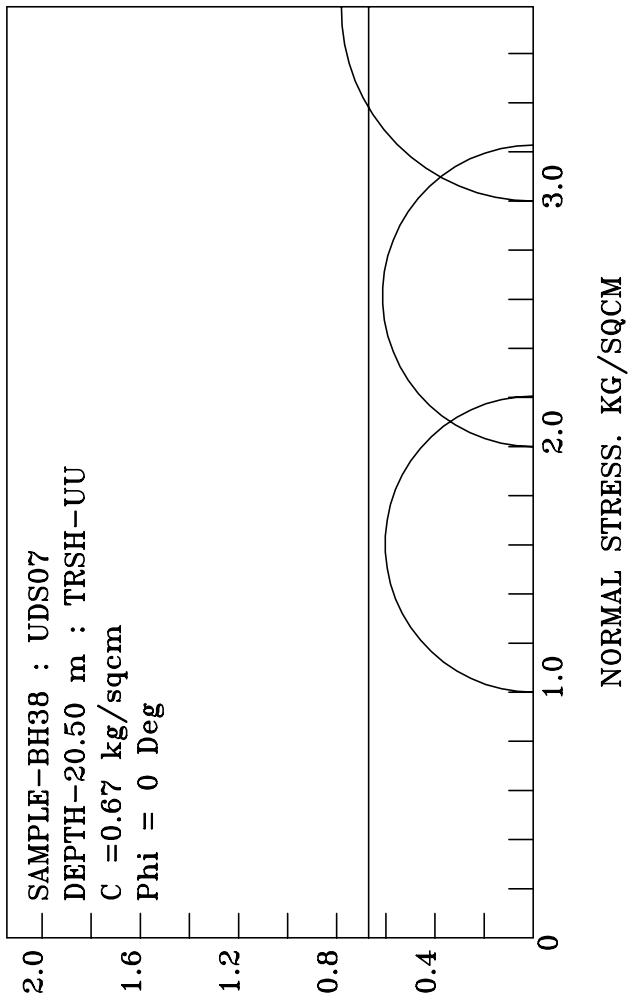

SAMPLE-BH33 : UDS01
DEPTH- 2.50 m : TRSH-UU
C =0.46 kg/sqcm
Phi = 0 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM
0.4
0.8
1.2
1.6
0
1.0
2.0
3.0

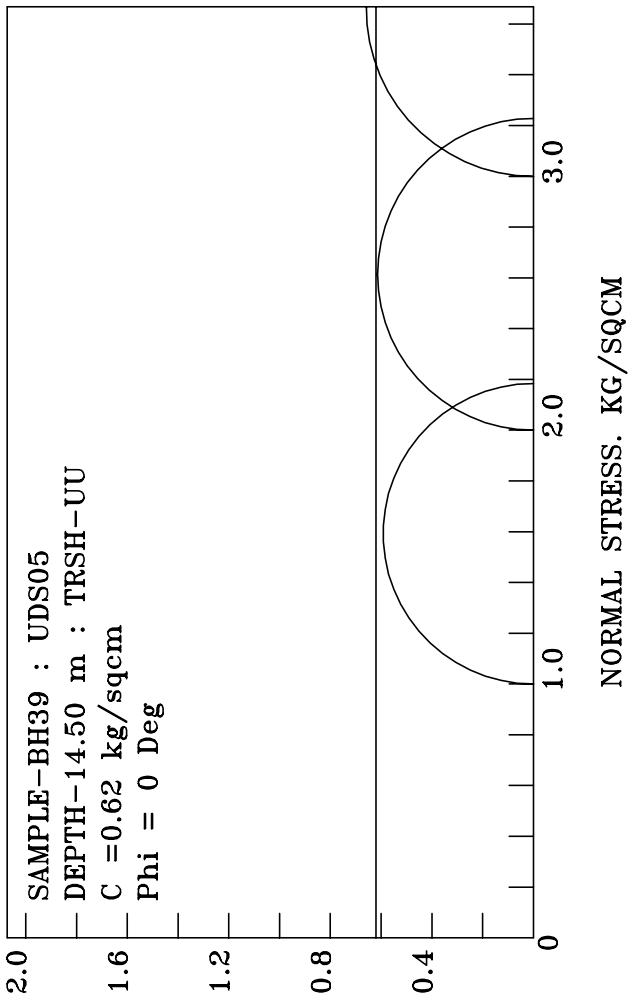

SAMPLE-BH33 : UDS04
DEPTH-11.50 m : TRSH-UU
C =0.51 kg/sqcm
Phi = 0 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM
0.4
0.8
1.2
1.6
0
1.0
2.0
3.0

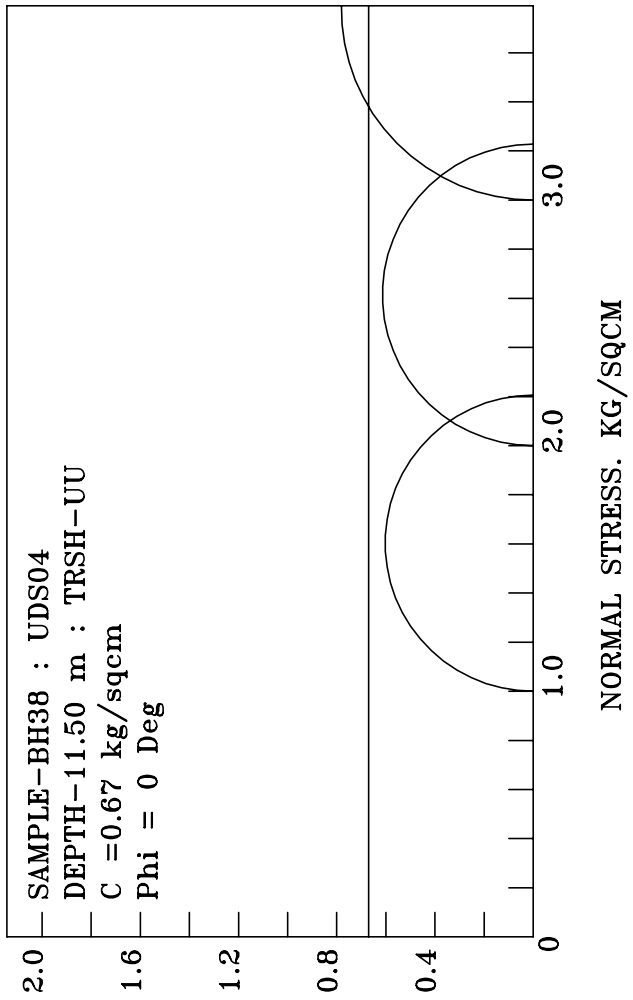

SAMPLE-BH35 : UDS04
DEPTH-11.50 m : TRSH-UU
C =0.38 kg/sqcm
Phi = 0 Deg
SAMPLE-BH36 : UDS02
DEPTH- 5.50 m : TRSH-UU
C =0.39 kg/sqcm
Phi = 0 Deg
SAMPLE-BH35 : UDS02
DEPTH- 5.50 m : TRSH-UU
C =0.38 kg/sqcm
Phi = 0 Deg
SAMPLE-BH35 : UDS07
DEPTH-23.50 m : TRSH-UU
C =1.02 kg/sqcm
Phi = 0 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM

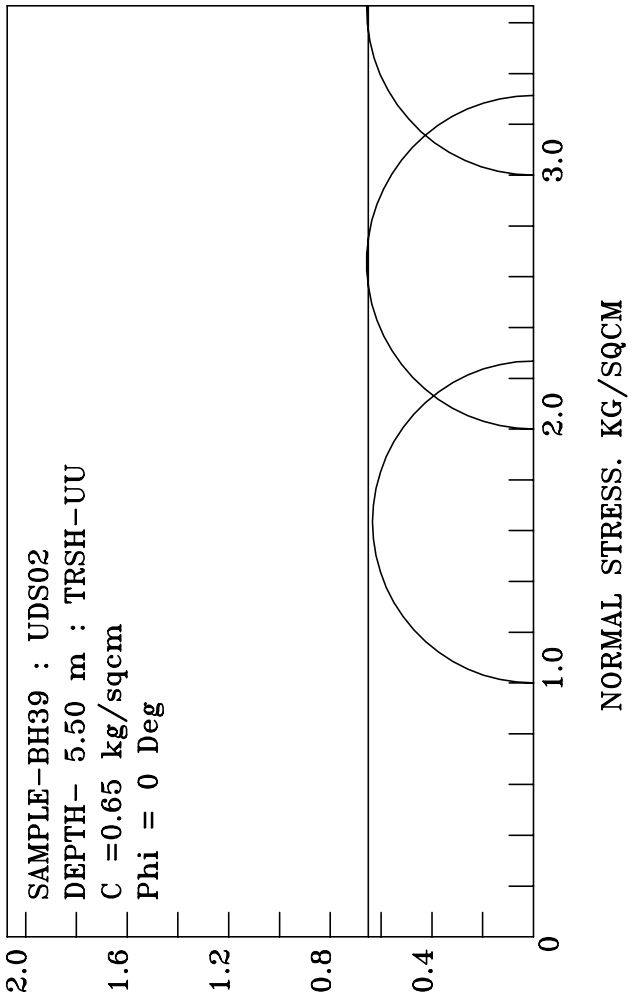

SAMPLE-BH36 : UDS04
DEPTH-11.50 m : TRSH-UU
C =0.55 kg/sqcm
Phi = 8 Deg
SAMPLE-BH37 : UDS03
DEPTH- 8.50 m : TRSH-UU
C =0.66 kg/sqcm
Phi = 0 Deg
SAMPLE-BH36 : UDS03
DEPTH- 8.50 m : TRSH-UU
C =0.65 kg/sqcm
Phi = 5 Deg
SAMPLE-BH36 : UDS06
DEPTH-17.50 m : TRSH-UU
C =0.78 kg/sqcm
Phi = 0 Deg
NORMAL STRESS. KG/SQCM
SHEAR STRESS. KG/SQCM

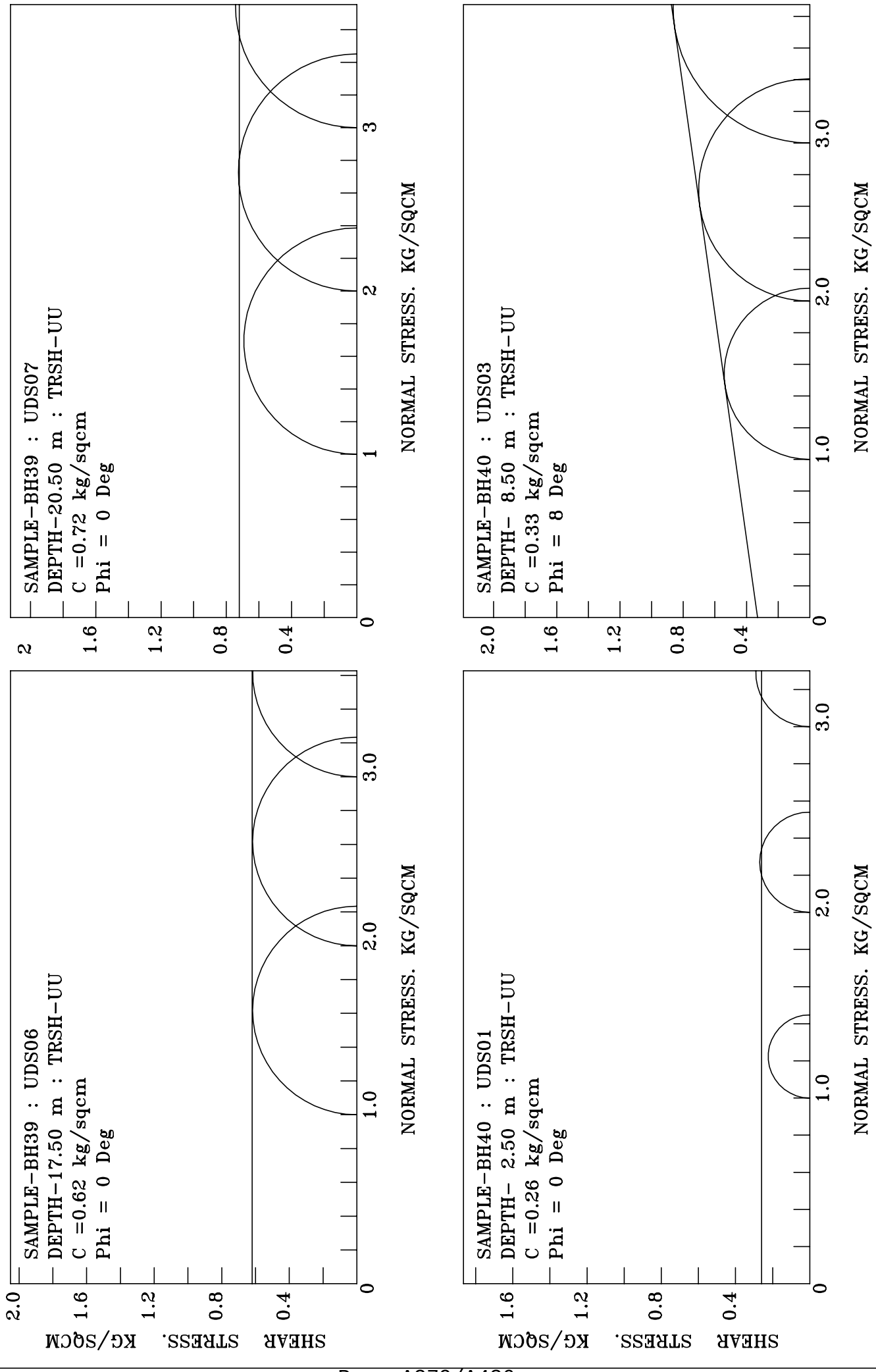

SAMPLE-BH37 : UDS07
DEPTH-20.50 m : TRSH-UU
C =0.74 kg/sqcm
Phi =10 Deg
SAMPLE-BH38 : UDS02
DEPTH- 5.50 m : RSH-UU
C =0.40 kg/sqcm
Phi = 10 Deg
SAMPLE-BH37 : UDS06
DEPTH-17.50 m : TRSH-UU
C =0.58 kg/sqcm
Phi = 0 Deg
SAMPLE-BH38 : UDS01
DEPTH- 2.50 m : RSH-UU
C =0.3 ,kg/sqcm
Phi =0 Deg
NORMAL STRESS. KG/SQCM
SHEAR STRESS. KG/SQCM

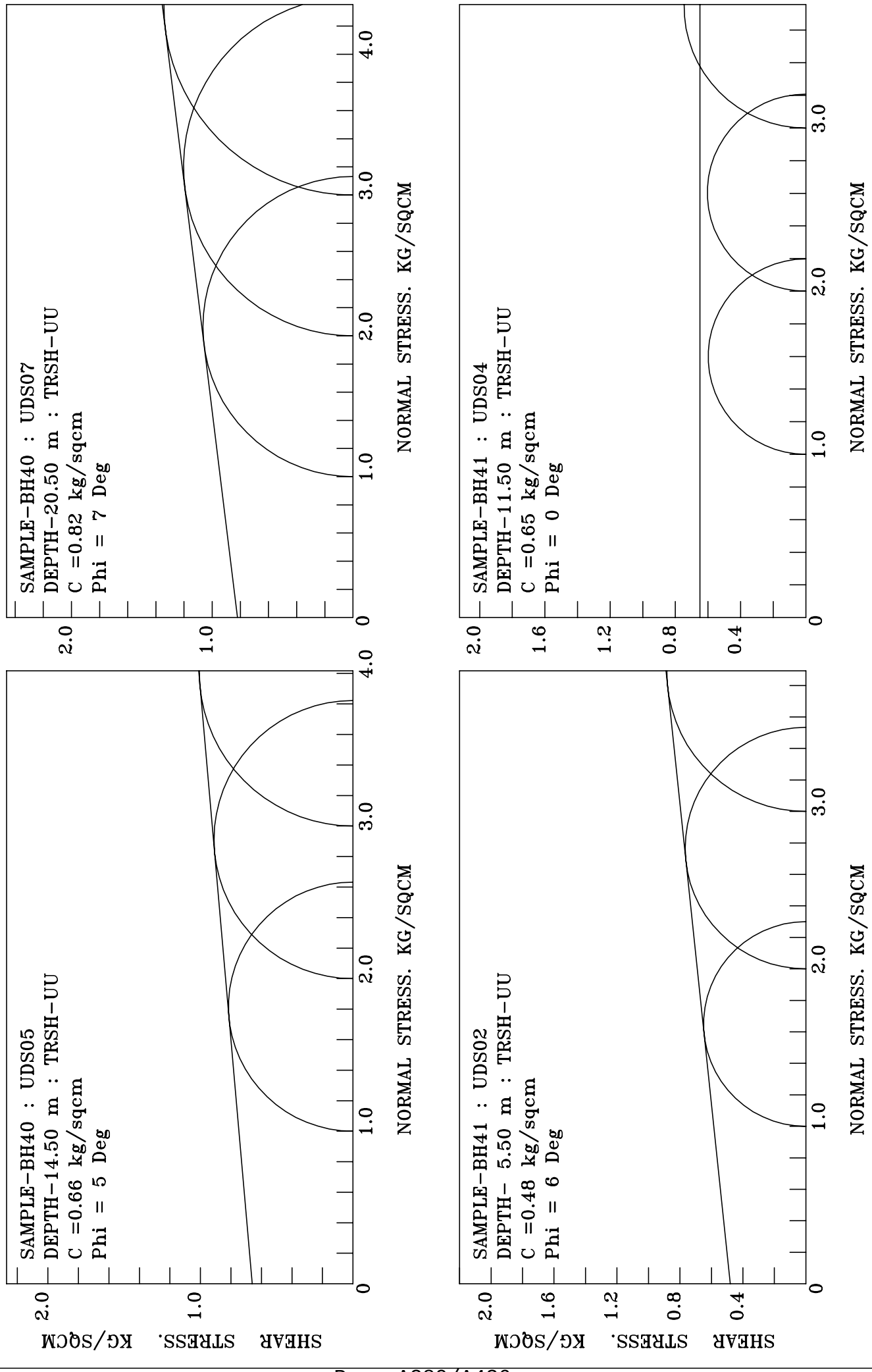

SAMPLE-BH38 : UDS07
DEPTH-20.50 m : TRSH-UU
C =0.67 kg/sqcm
Phi = 0 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM
0
0.4
0.8
1.2
1.6
2.0
1.0
2.0
3.0

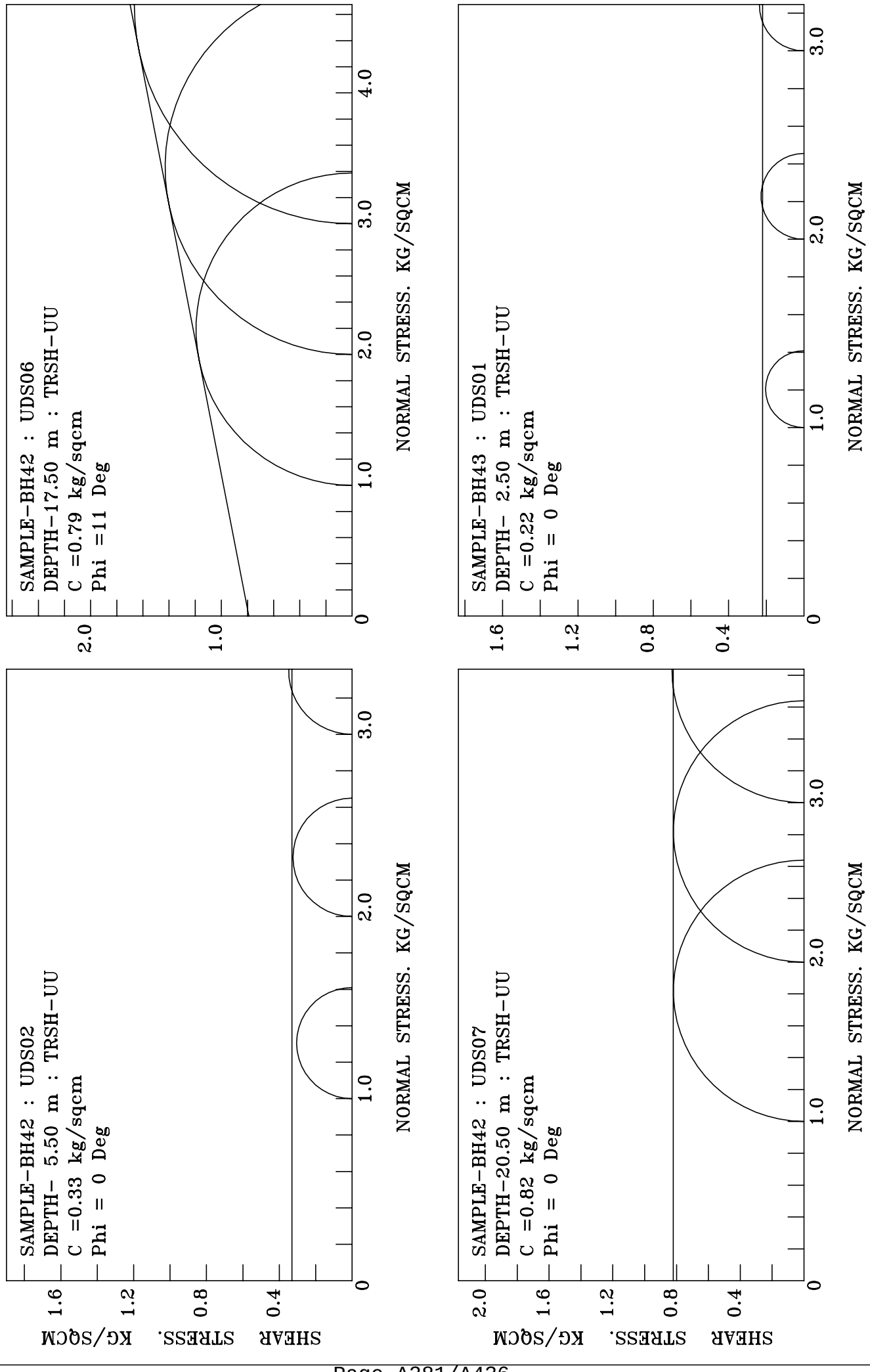

SAMPLE-BH39 : UDS05
DEPTH-14.50 m : TRSH-UU
C =0.62 kg/sqcm
Phi = 0 Deg
NORMAL STRESS. KG/SQCM
0
0.4
0.8
1.2
1.6
2.0
1.0
2.0
3.0

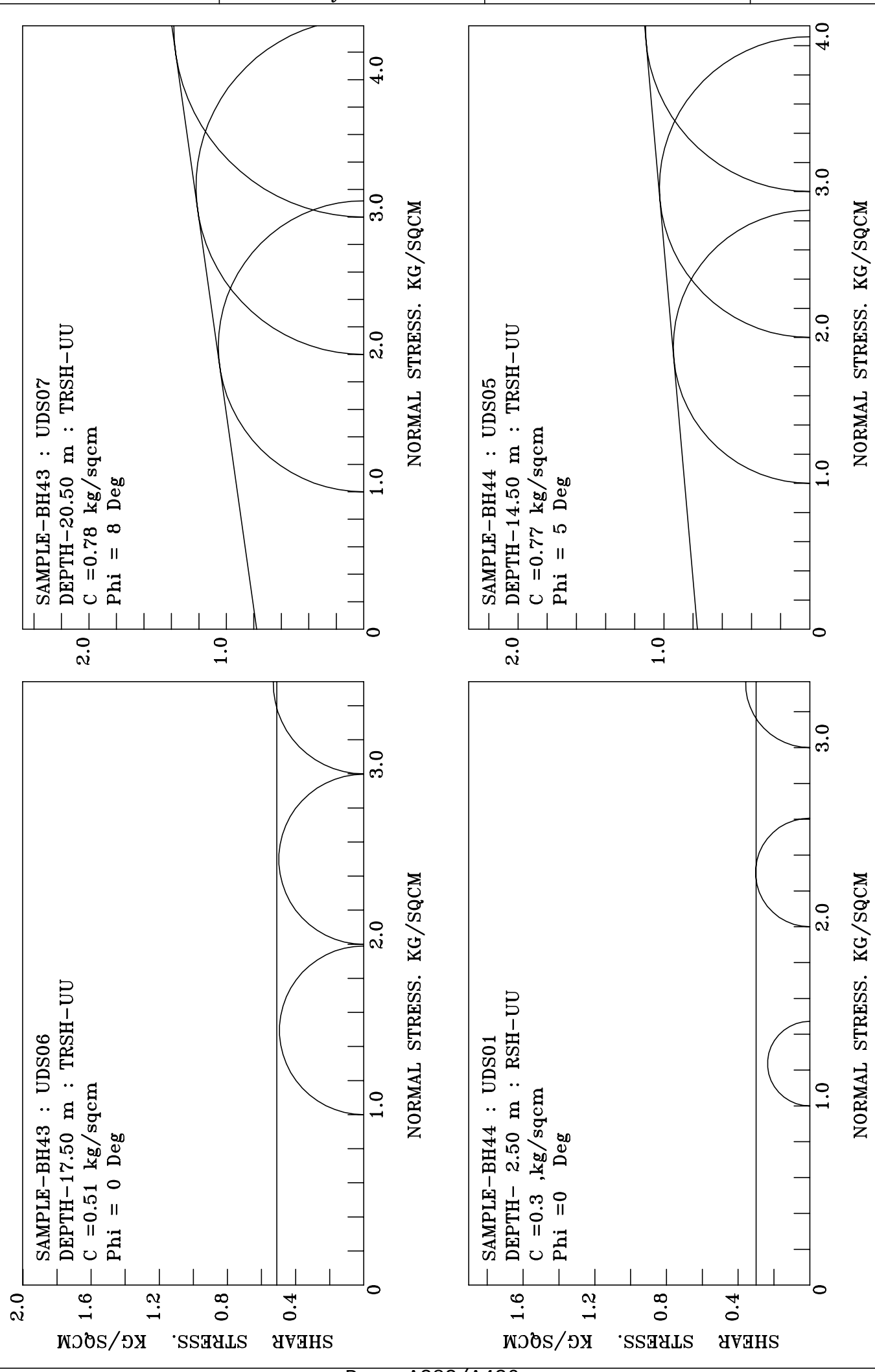

SAMPLE-BH38 : UDS04
DEPTH-11.50 m : TRSH-UU
C =0.67 kg/sqcm
Phi = 0 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM
0
0.4
0.8
1.2
1.6
2.0
1.0
2.0
3.0

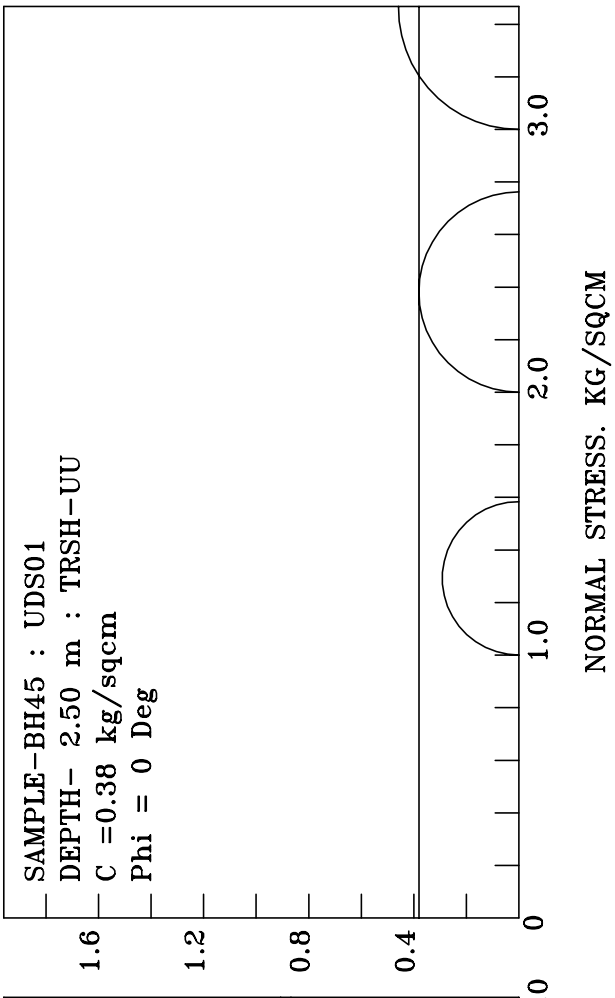

SAMPLE-BH39 : UDS02
DEPTH- 5.50 m : TRSH-UU
C =0.65 kg/sqcm
Phi = 0 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM
0
0.4
0.8
1.2
1.6
2.0
1.0
2.0
3.0

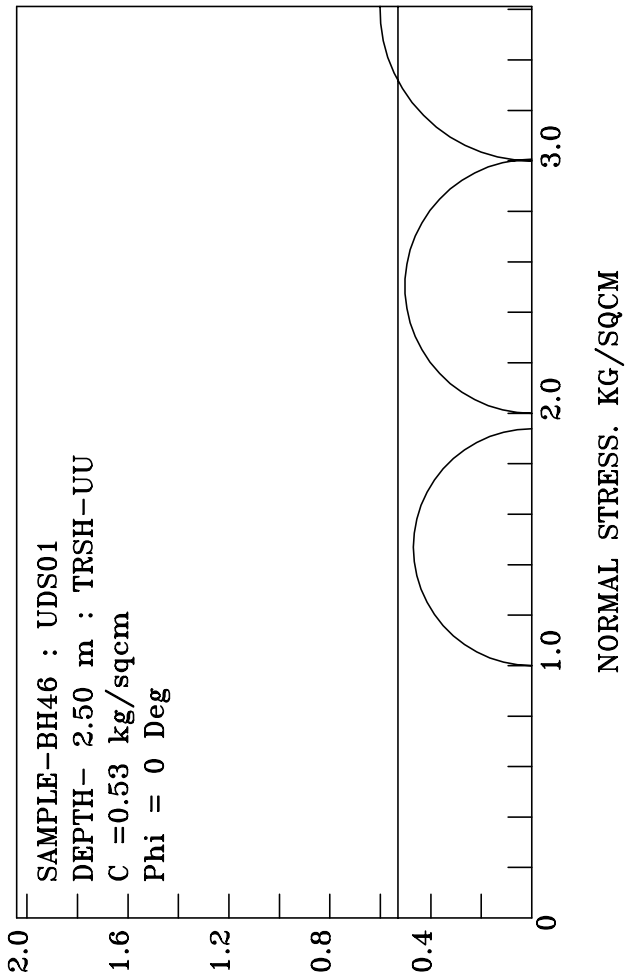

SAMPLE-BH39 : UDS07
DEPTH-20.50 m : TRSH-UU
C =0.72 kg/sqcm
Phi = 0 Deg
SAMPLE-BH40 : UDS03
DEPTH- 8.50 m : TRSH-UU
C =0.33 kg/sqcm
Phi = 8 Deg
SAMPLE-BH39 : UDS06
DEPTH-17.50 m : TRSH-UU
C =0.62 kg/sqcm
Phi = 0 Deg
SAMPLE-BH40 : UDS01
DEPTH- 2.50 m : TRSH-UU
C =0.26 kg/sqcm
Phi = 0 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM

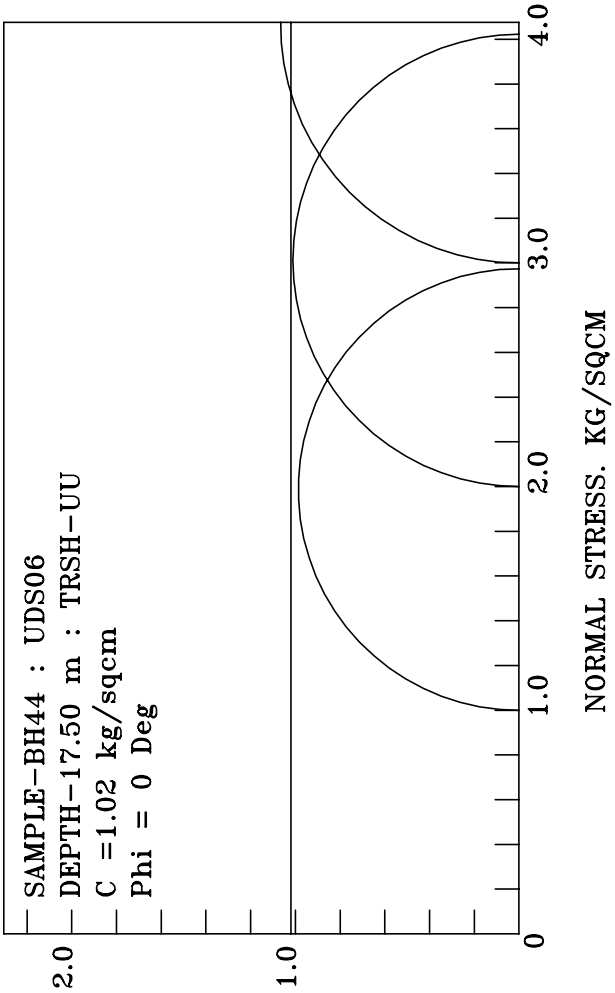

SAMPLE-BH40 : UDS07
DEPTH-20.50 m : TRSH-UU
C =0.82 kg/sqcm
Phi = 7 Deg
SAMPLE-BH41 : UDS04
DEPTH-11.50 m : TRSH-UU
C =0.65 kg/sqcm
Phi = 0 Deg
SAMPLE-BH40 : UDS05
DEPTH-14.50 m : TRSH-UU
C =0.66 kg/sqcm
Phi = 5 Deg
SAMPLE-BH41 : UDS02
DEPTH- 5.50 m : TRSH-UU
C =0.48 kg/sqcm
Phi = 6 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM
0
0.4
0.8
1.2
1.6
2.0
1.0
2.0
3.0
4.0

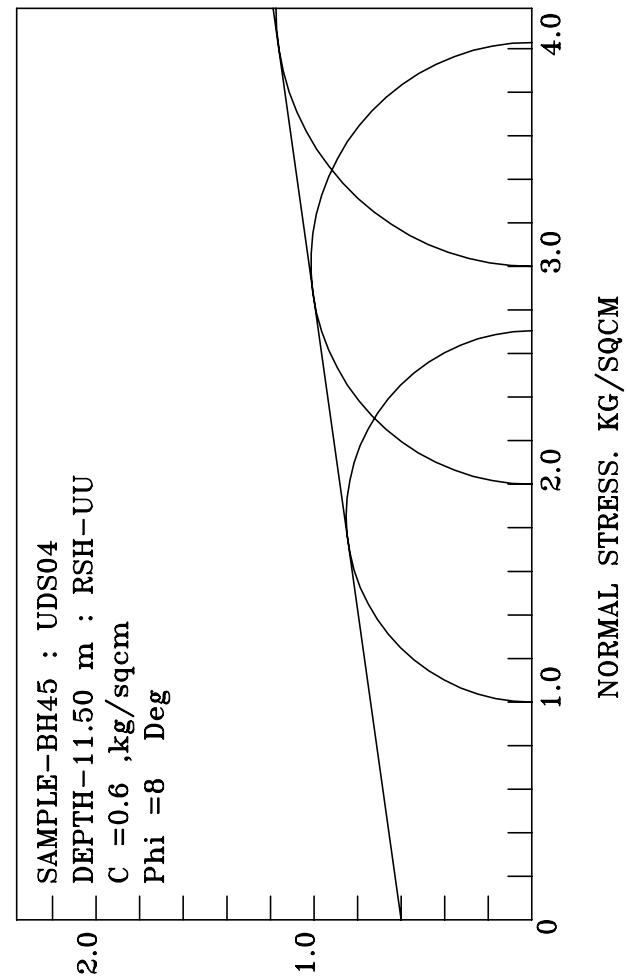

SAMPLE-BH42 : UDS06
DEPTH-17.50 m : TRSH-UU
C =0.79 kg/sqcm
Phi =11 Deg
SAMPLE-BH43 : UDS01
DEPTH- 2.50 m : TRSH-UU
C =0.22 kg/sqcm
Phi = 0 Deg
SAMPLE-BH42 : UDS02
DEPTH- 5.50 m : TRSH-UU
C =0.33 kg/sqcm
Phi = 0 Deg
SAMPLE-BH42 : UDS07
DEPTH-20.50 m : TRSH-UU
C =0.82 kg/sqcm
Phi = 0 Deg
NORMAL STRESS. KG/SQCM
SHEAR STRESS. KG/SQCM

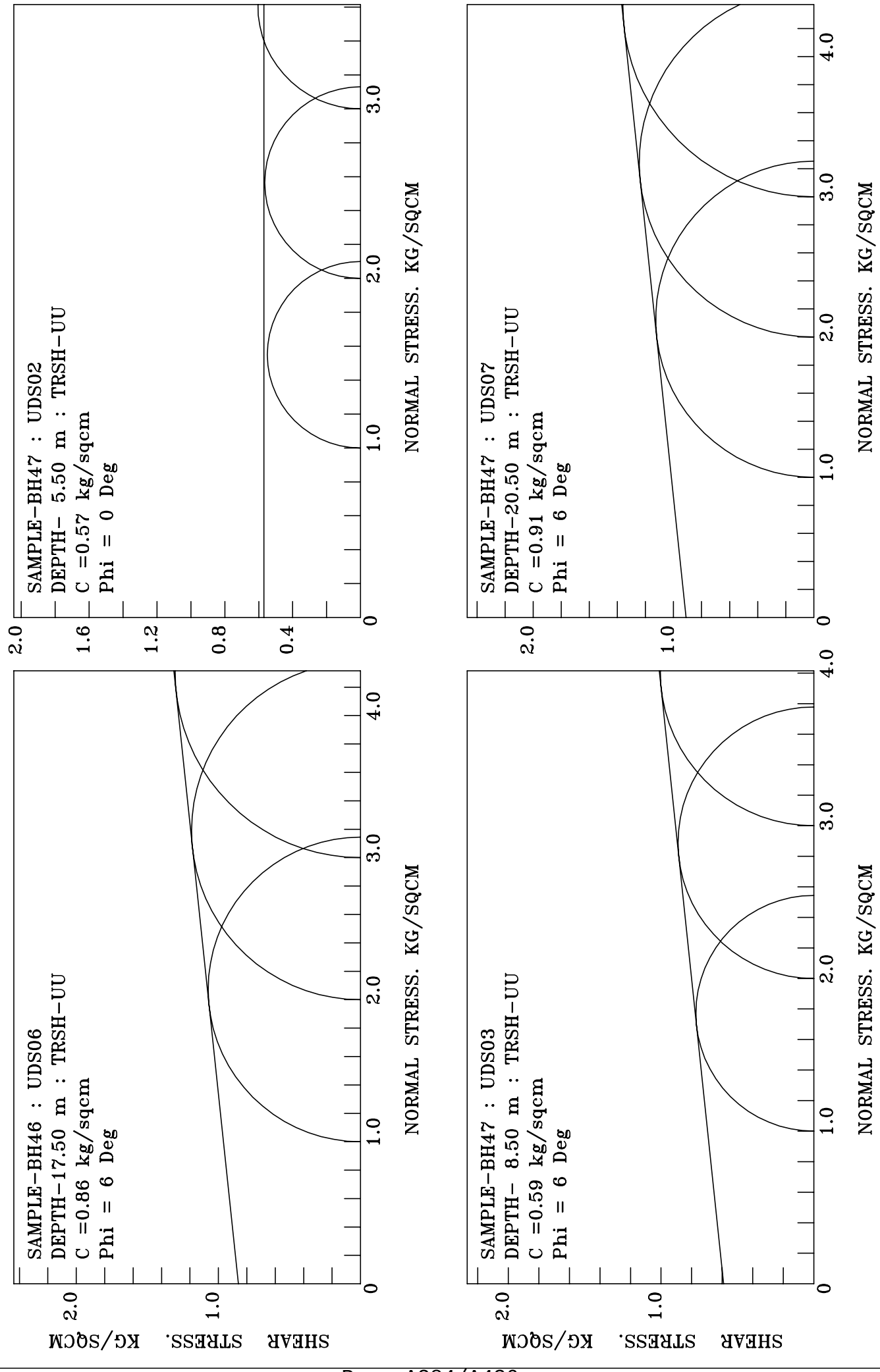

SAMPLE-BH43 : UDS07
DEPTH-20.50 m : TRSH-UU
C =0.78 kg/sqcm
Phi = 8 Deg
SAMPLE-BH44 : UDS05
DEPTH-14.50 m : TRSH-UU
C =0.77 kg/sqcm
Phi = 5 Deg
SAMPLE-BH43 : UDS06
DEPTH-17.50 m : TRSH-UU
C =0.51 kg/sqcm
Phi = 0 Deg
SAMPLE-BH44 : UDS01
DEPTH- 2.50 m : RSH-UU
C =0.3 ,kg/sqcm
Phi =0 Deg
NORMAL STRESS. KG/SQCM
SHEAR STRESS. KG/SQCM

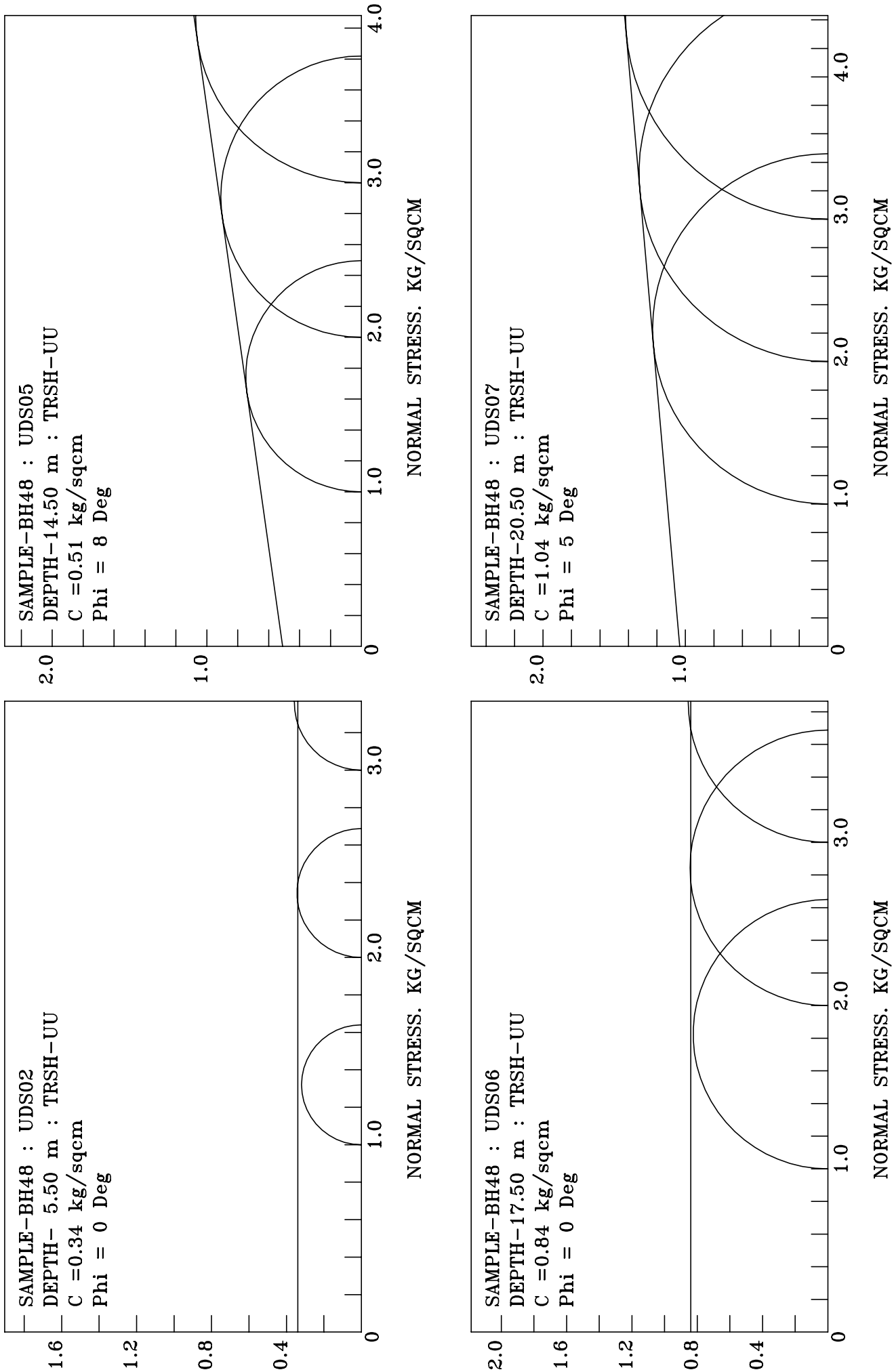

SAMPLE-BH45 : UDS01
DEPTH- 2.50 m : TRSH-UU
C =0.38 kg/sqcm
Phi = 0 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM

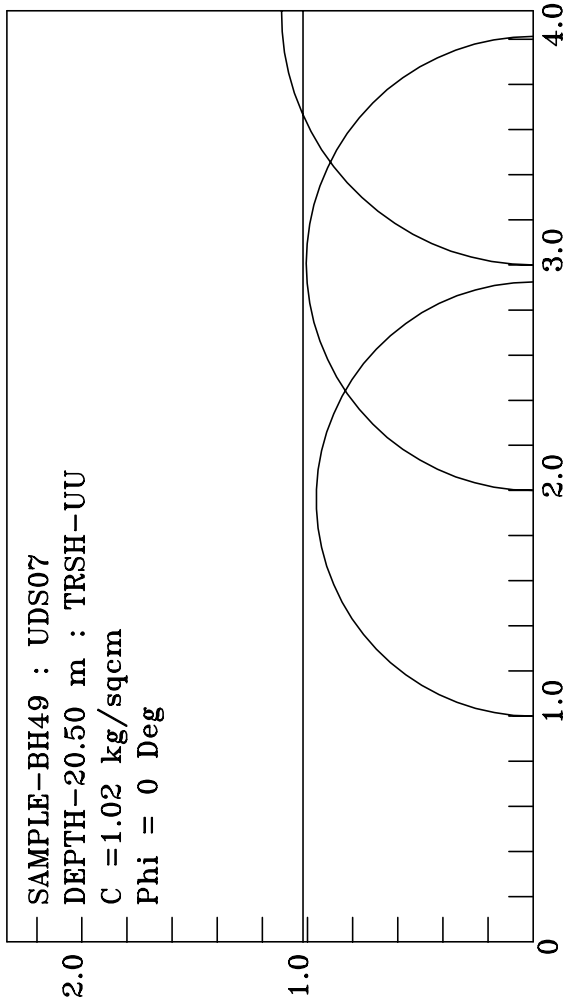

SAMPLE-BH46 : UDS01
DEPTH- 2.50 m : TRSH-UU
C =0.53 kg/sqcm
Phi = 0 Deg
NORMAL STRESS. KG/SQCM

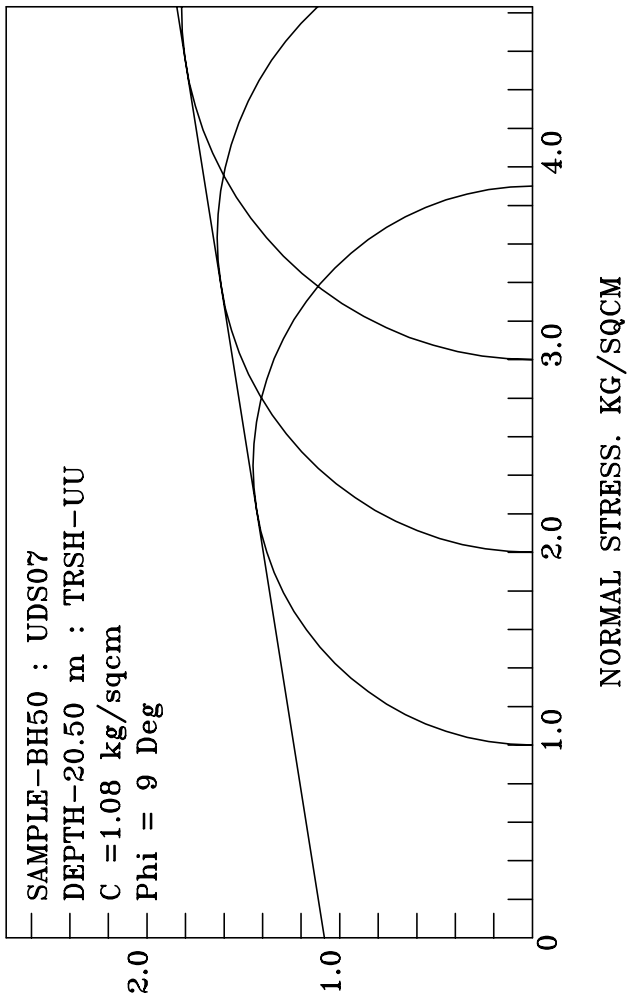

SAMPLE-BH44 : UDS06
DEPTH-17.50 m : TRSH-UU
C =1.02 kg/sqcm
Phi = 0 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM

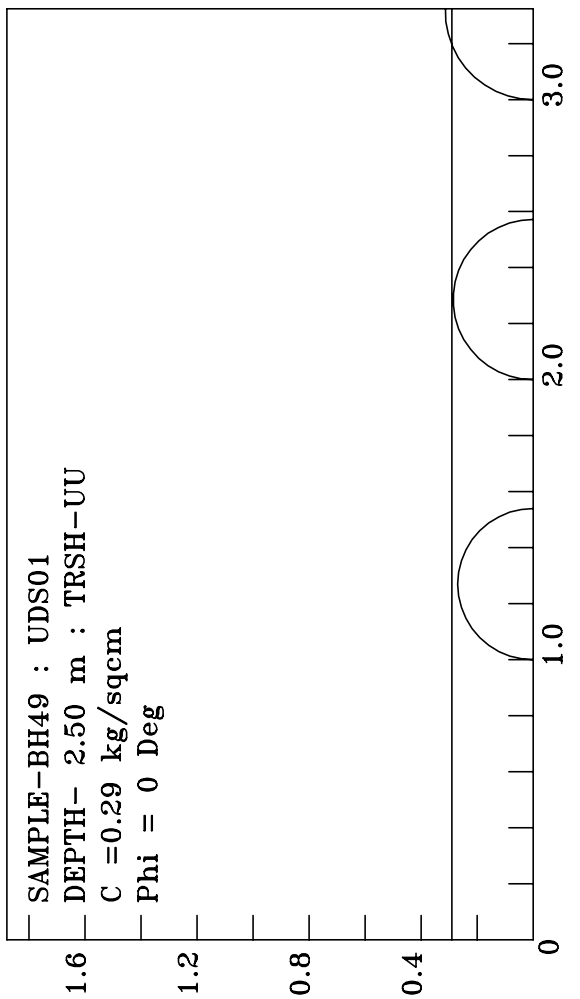

SAMPLE-BH45 : UDS04
DEPTH-11.50 m : RSH-UU
C =0.6 ,kg/sqcm
Phi =8 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM

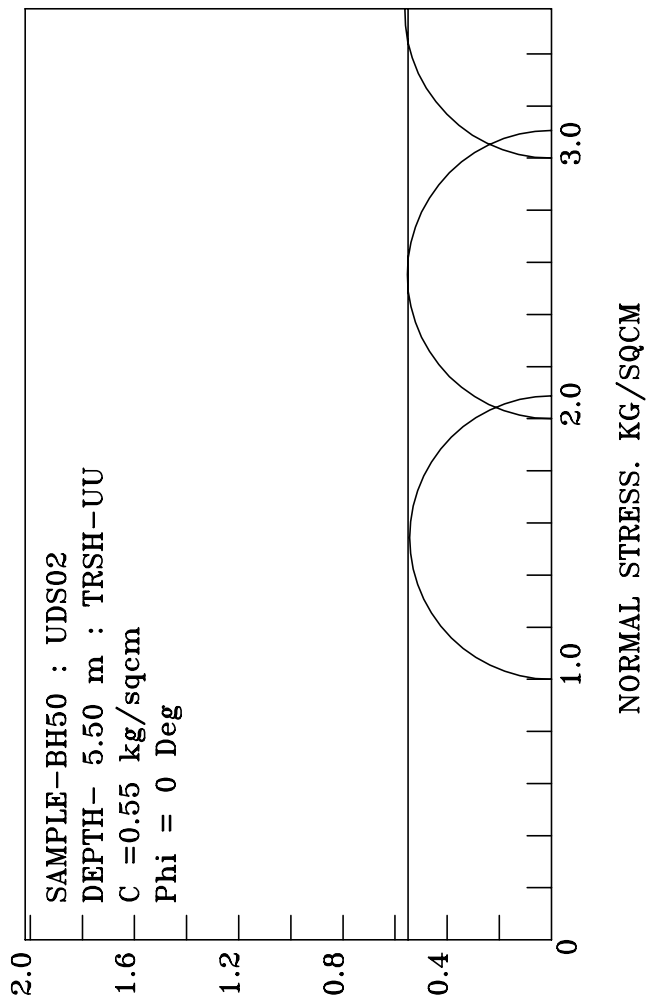

SAMPLE-BH47 : UDS02
DEPTH- 5.50 m : TRSH-UU
C =0.57 kg/sqcm
Phi = 0 Deg
NORMAL STRESS. KG/SQCM
SAMPLE-BH47 : UDS07
DEPTH-20.50 m : TRSH-UU
C =0.91 kg/sqcm
Phi = 6 Deg
NORMAL STRESS. KG/SQCM
SAMPLE-BH46 : UDS06
DEPTH-17.50 m : TRSH-UU
C =0.86 kg/sqcm
Phi = 6 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM
SAMPLE-BH47 : UDS03
DEPTH- 8.50 m : TRSH-UU
C =0.59 kg/sqcm
Phi = 6 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM

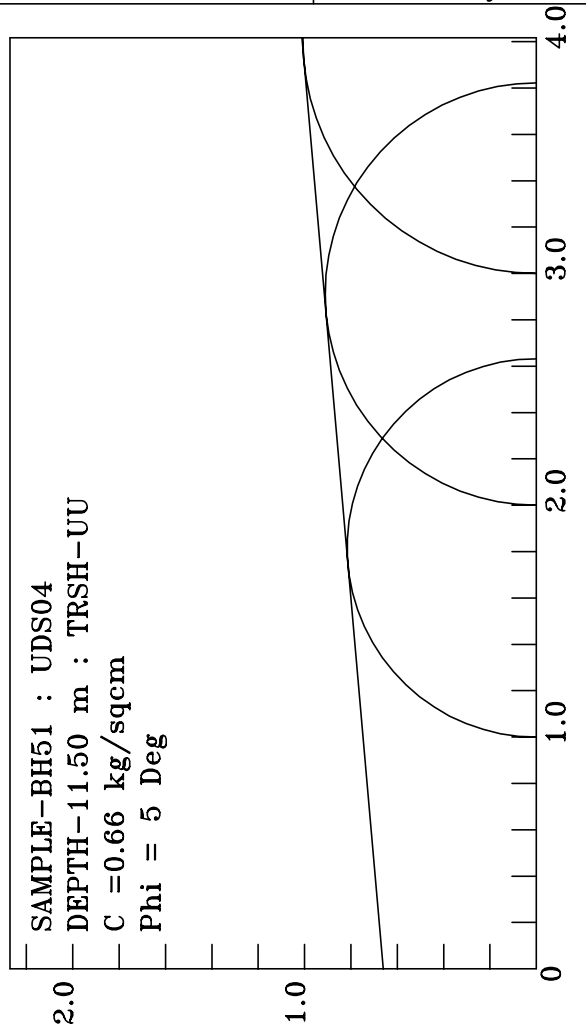

SAMPLE-BH48 : UDS05
DEPTH-14.50 m : TRSH-UU
C =0.51 kg/sqcm
Phi = 8 Deg
SAMPLE-BH48 : UDS07
DEPTH-20.50 m : TRSH-UU
C =1.04 kg/sqcm
Phi = 5 Deg
SAMPLE-BH48 : UDS02
DEPTH- 5.50 m : TRSH-UU
C =0.34 kg/sqcm
Phi = 0 Deg
SAMPLE-BH48 : UDS06
DEPTH-17.50 m : TRSH-UU
C =0.84 kg/sqcm
Phi = 0 Deg
NORMAL STRESS. KG/SQCM
SHEAR STRESS. KG/SQCM

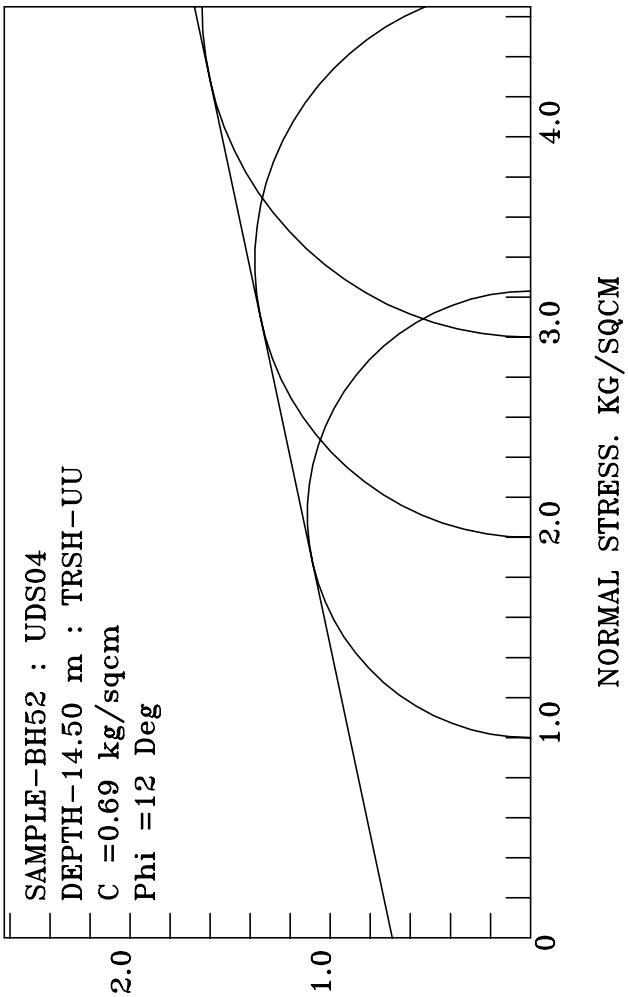

SAMPLE-BH49 : UDS07
DEPTH-20.50 m : TRSH-UU
C =1.02 kg/sqcm
Phi = 0 Deg
NORMAL STRESS. KG/SQCM

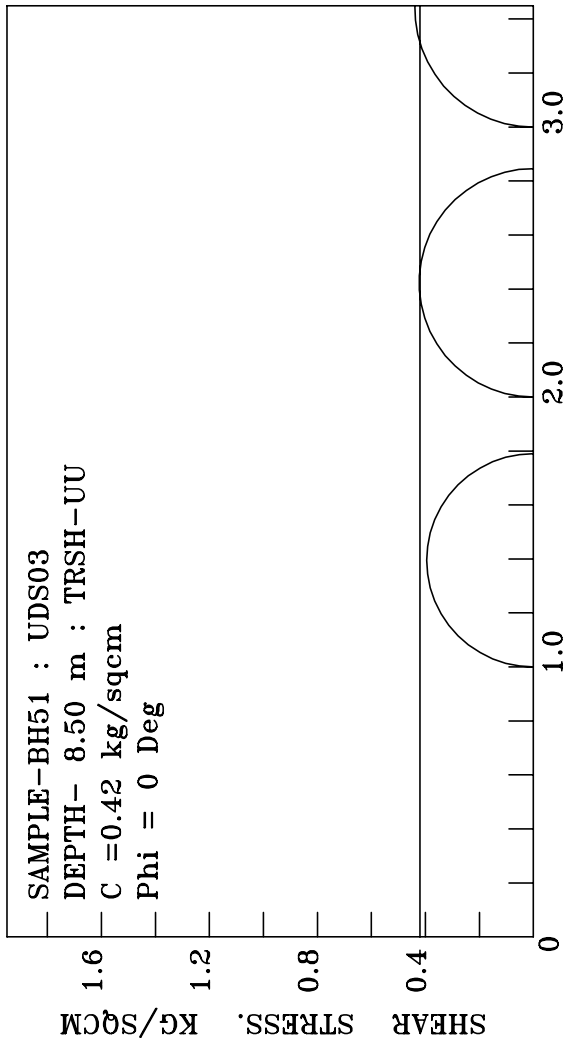

SAMPLE-BH50 : UDS07
DEPTH-20.50 m : TRSH-UU
C =1.08 kg/sqcm
Phi = 9 Deg
NORMAL STRESS. KG/SQCM

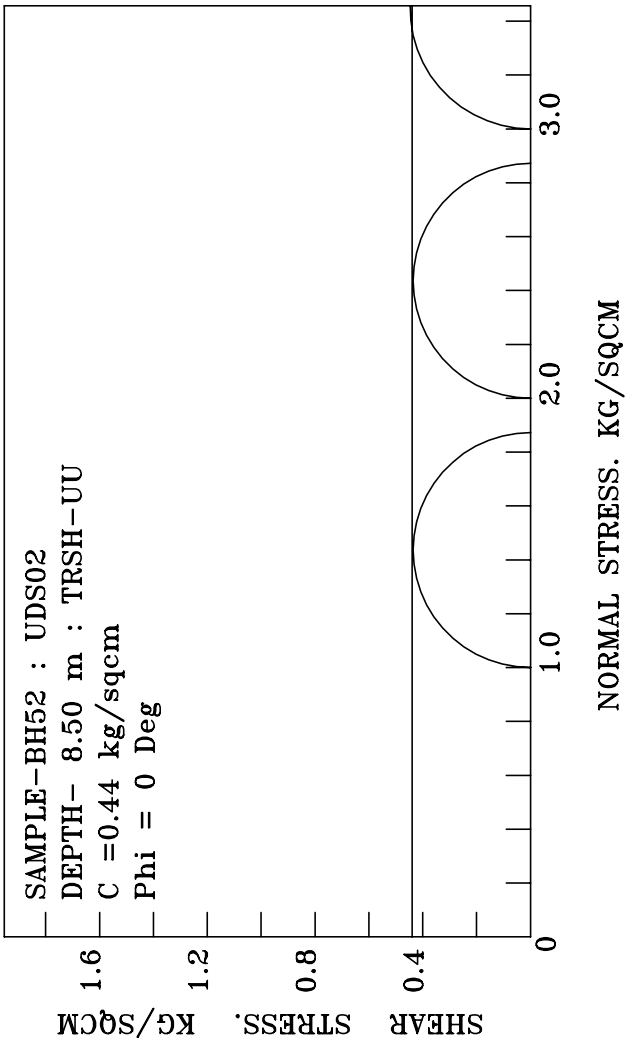

SAMPLE-BH49 : UDS01
DEPTH- 2.50 m : TRSH-UU
C =0.29 kg/sqcm
Phi = 0 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM

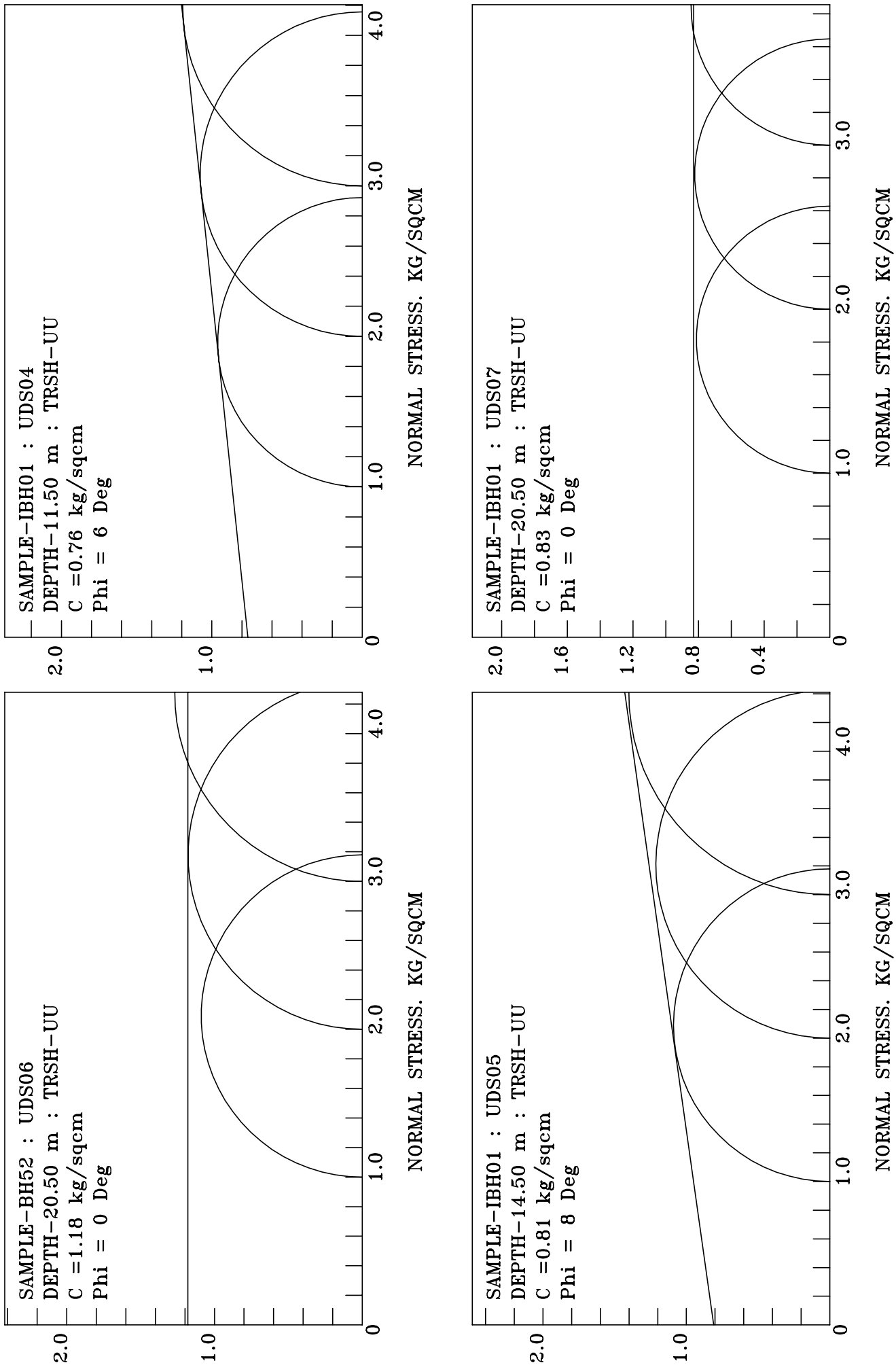

SAMPLE-BH50 : UDS02
DEPTH- 5.50 m : TRSH-UU
C =0.55 kg/sqcm
Phi = 0 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM

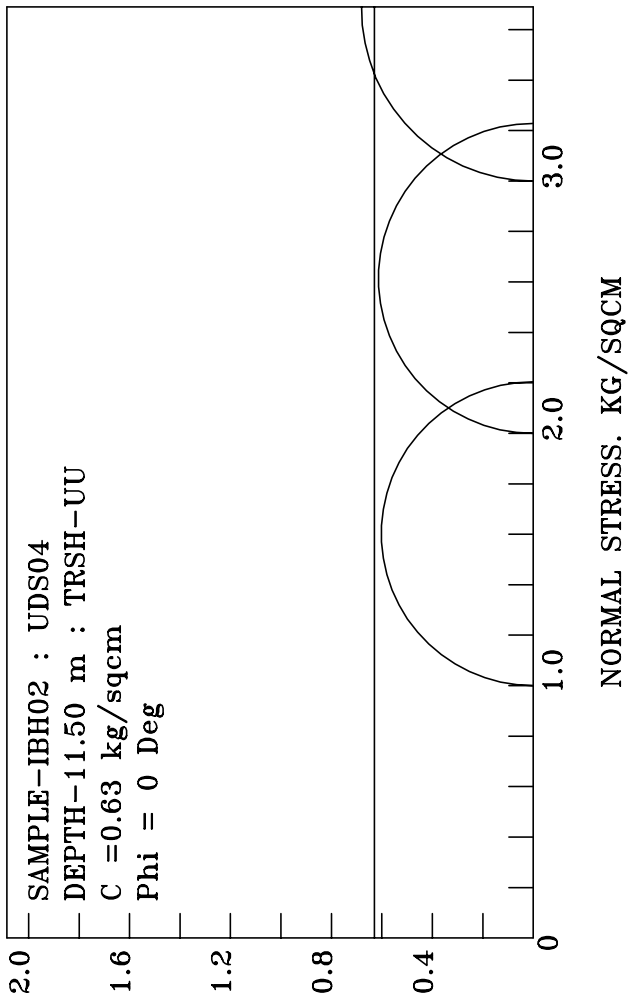

SAMPLE-BH51 : UDS04
DEPTH-11.50 m : TRSH-UU
C =0.66 kg/sqcm
Phi = 5 Deg
NORMAL STRESS. KG/SQCM
0
1.0
2.0
3.0
4.0

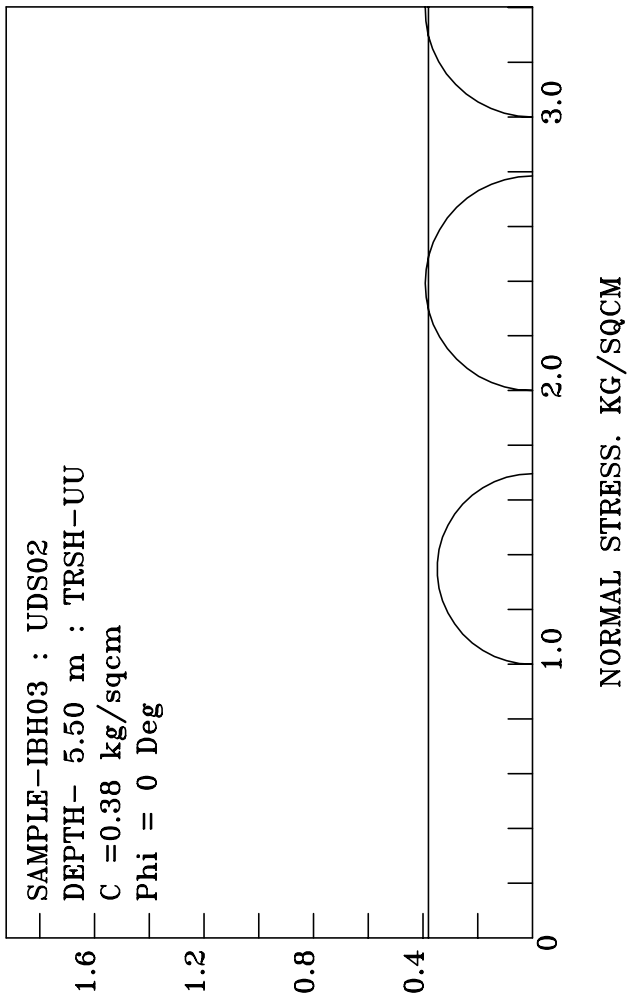

SAMPLE-BH52 : UDS04
DEPTH-14.50 m : TRSH-UU
C =0.69 kg/sqcm
Phi =12 Deg
NORMAL STRESS. KG/SQCM
0
1.0
2.0
3.0
4.0

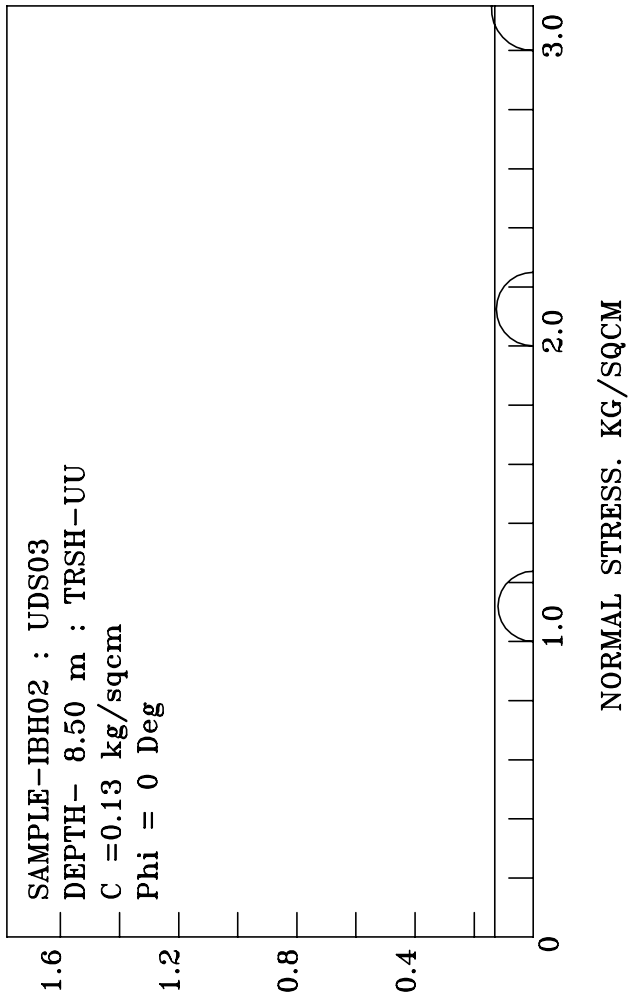

SAMPLE-BH51 : UDS03
DEPTH- 8.50 m : TRSH-UU
C =0.42 kg/sqcm
Phi = 0 Deg
SHEAR STRESS. KG/SQCM
0.4
0.8
1.2
1.6
NORMAL STRESS. KG/SQCM
0
1.0
2.0
3.0

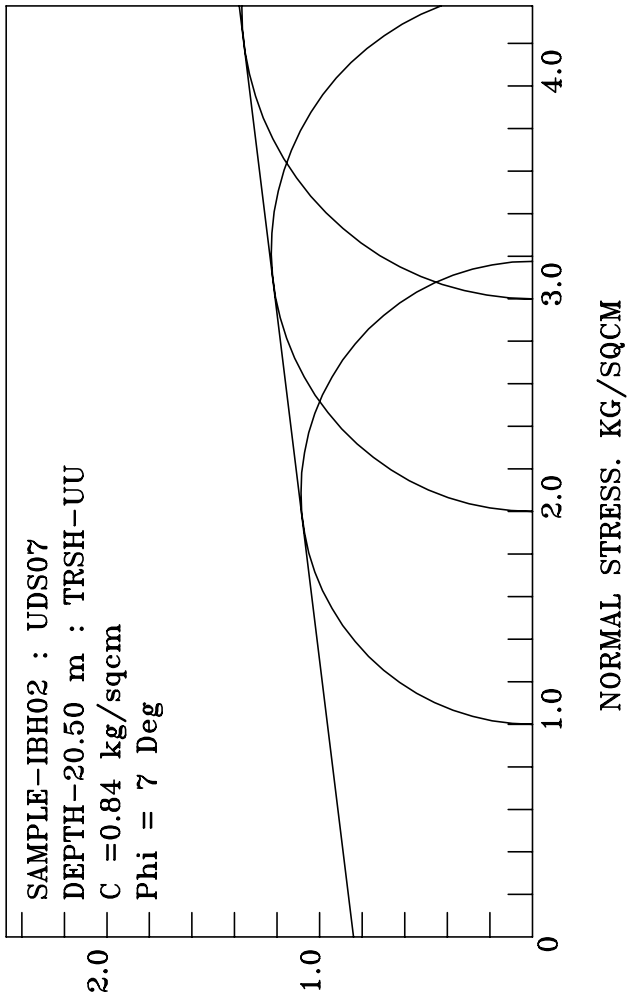

SAMPLE-BH52 : UDS02
DEPTH- 8.50 m : TRSH-UU
C =0.44 kg/sqcm
Phi = 0 Deg
SHEAR STRESS. KG/SQCM
0.4
0.8
1.2
1.6
NORMAL STRESS. KG/SQCM
0
1.0
2.0
3.0

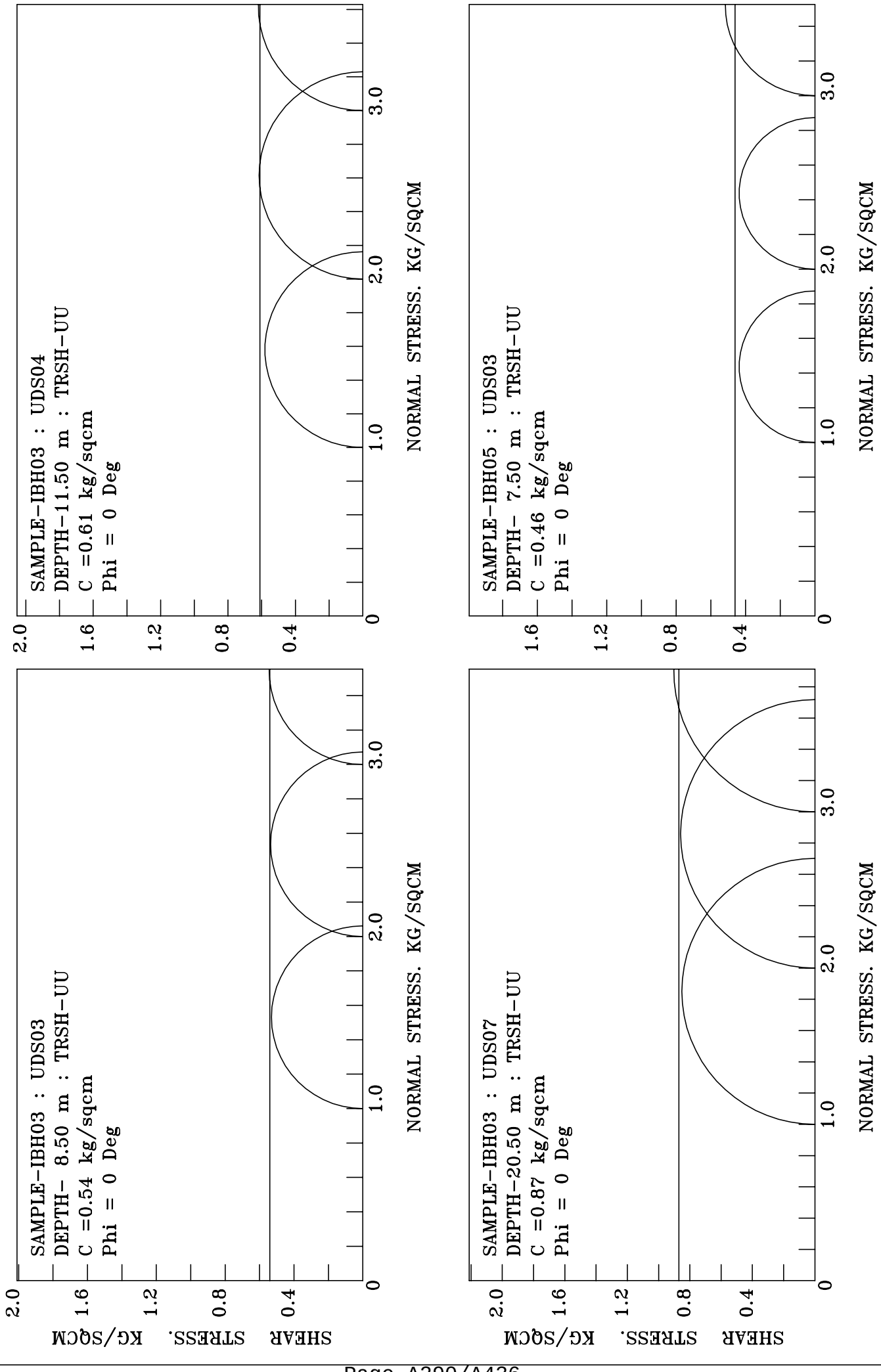

SAMPLE-IBH01 : UDS04
DEPTH-11.50 m : TRSH-UU
C =0.76 kg/sqcm
Phi = 6 Deg
SAMPLE-IBH01 : UDS07
DEPTH-20.50 m : TRSH-UU
C =0.83 kg/sqcm
Phi = 0 Deg
SAMPLE-BH52 : UDS06
DEPTH-20.50 m : TRSH-UU
C =1.18 kg/sqcm
Phi = 0 Deg
SAMPLE-IBH01 : UDS05
DEPTH-14.50 m : TRSH-UU
C =0.81 kg/sqcm
Phi = 8 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM

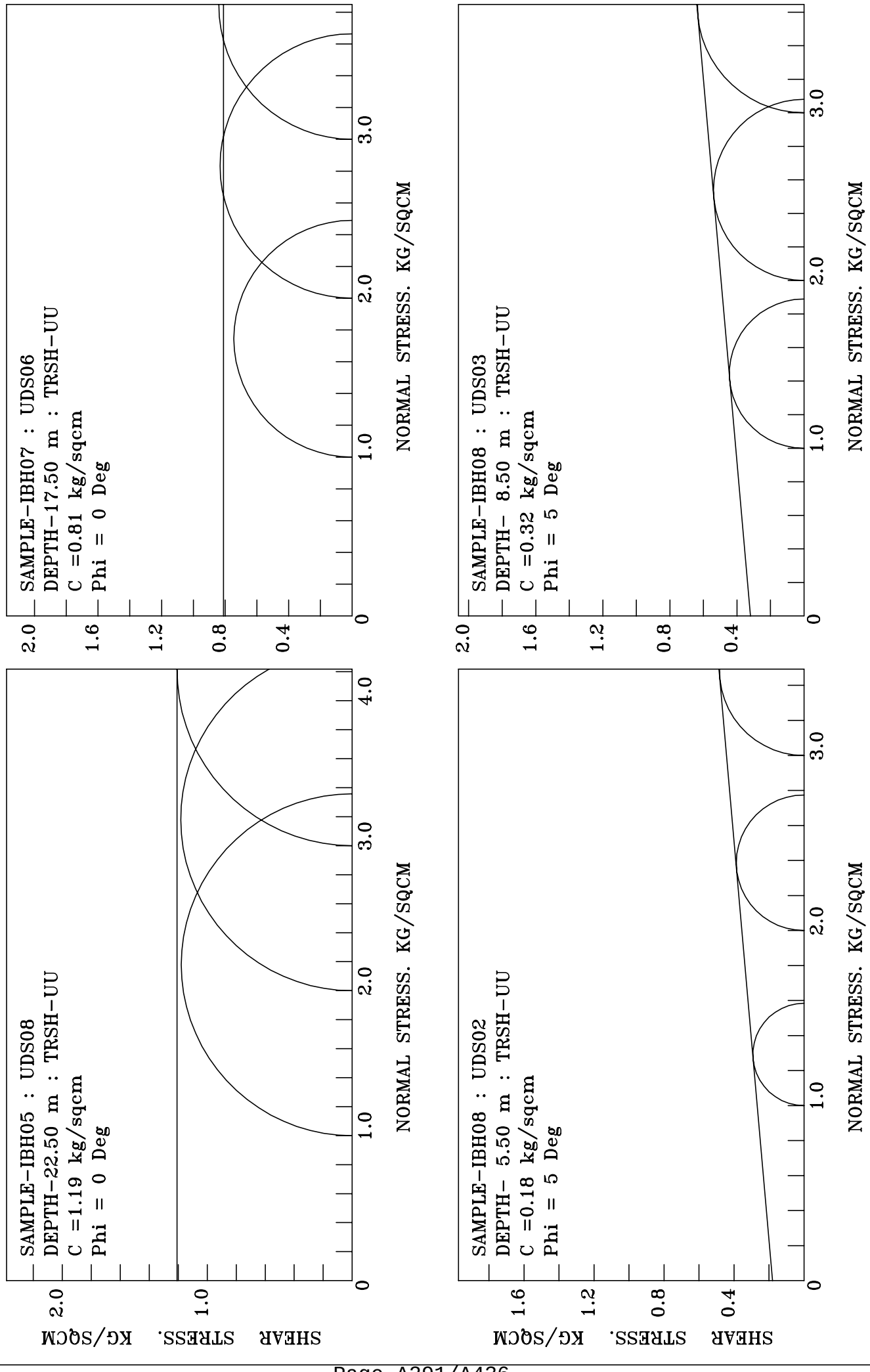

SAMPLE-IBH02 : UDS04
DEPTH-11.50 m : TRSH-UU
C =0.63 kg/sqcm
Phi = 0 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM

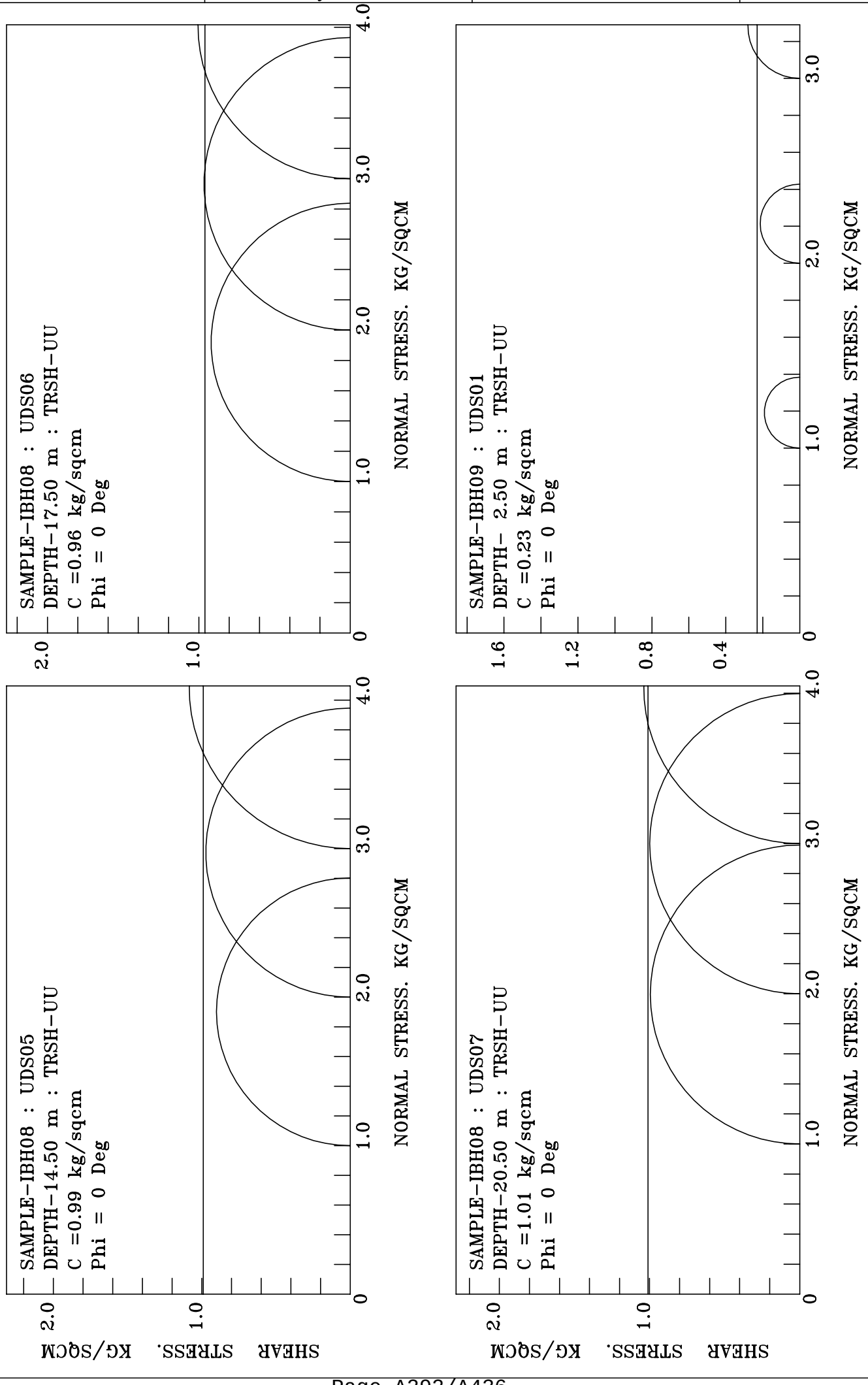

SAMPLE-IBH03 : UDS02
DEPTH- 5.50 m : TRSH-UU
C =0.38 kg/sqcm
Phi = 0 Deg
NORMAL STRESS. KG/SQCM

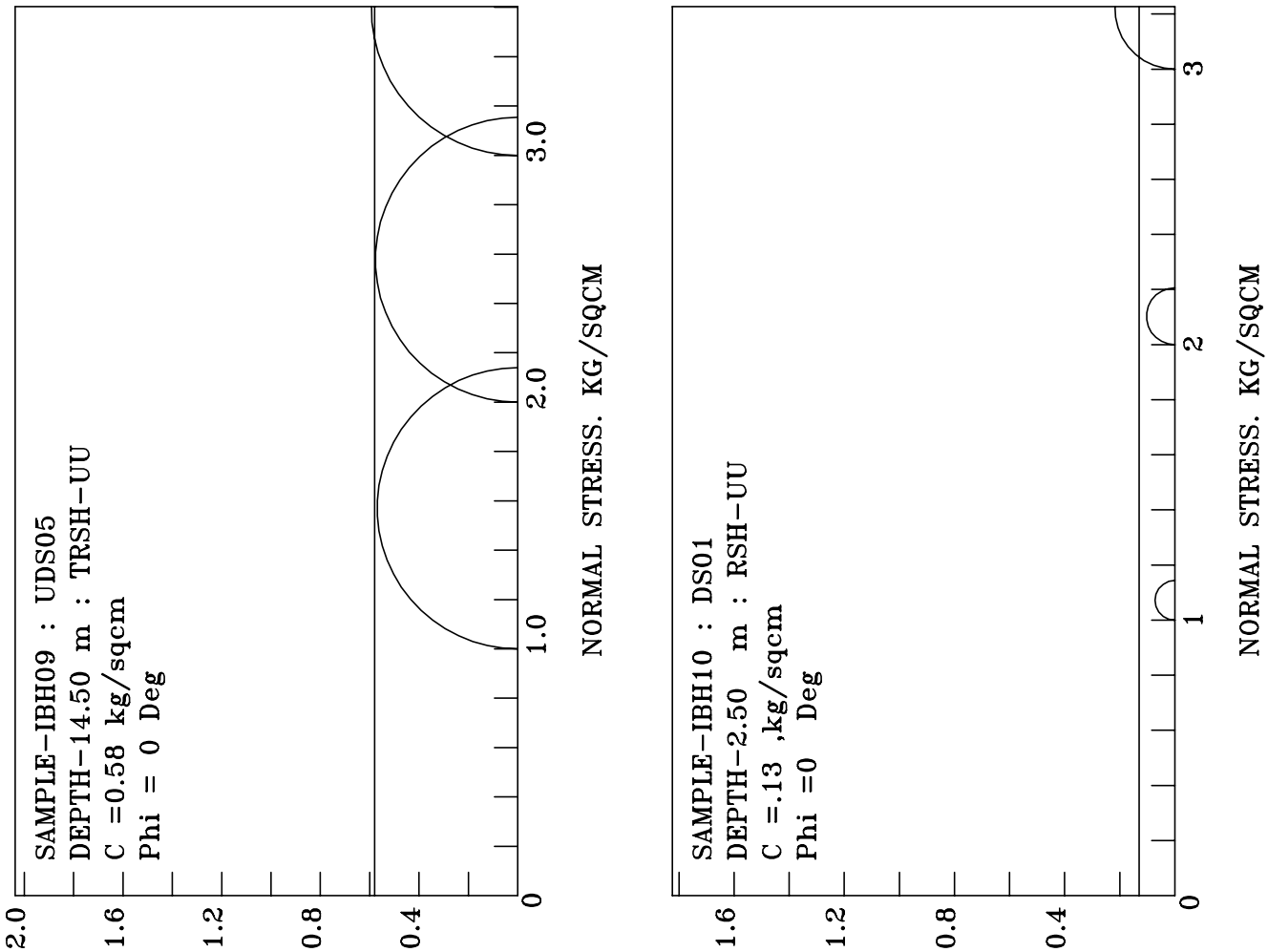

SAMPLE-IBH02 : UDS03
DEPTH- 8.50 m : TRSH-UU
C =0.13 kg/sqcm
Phi = 0 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM

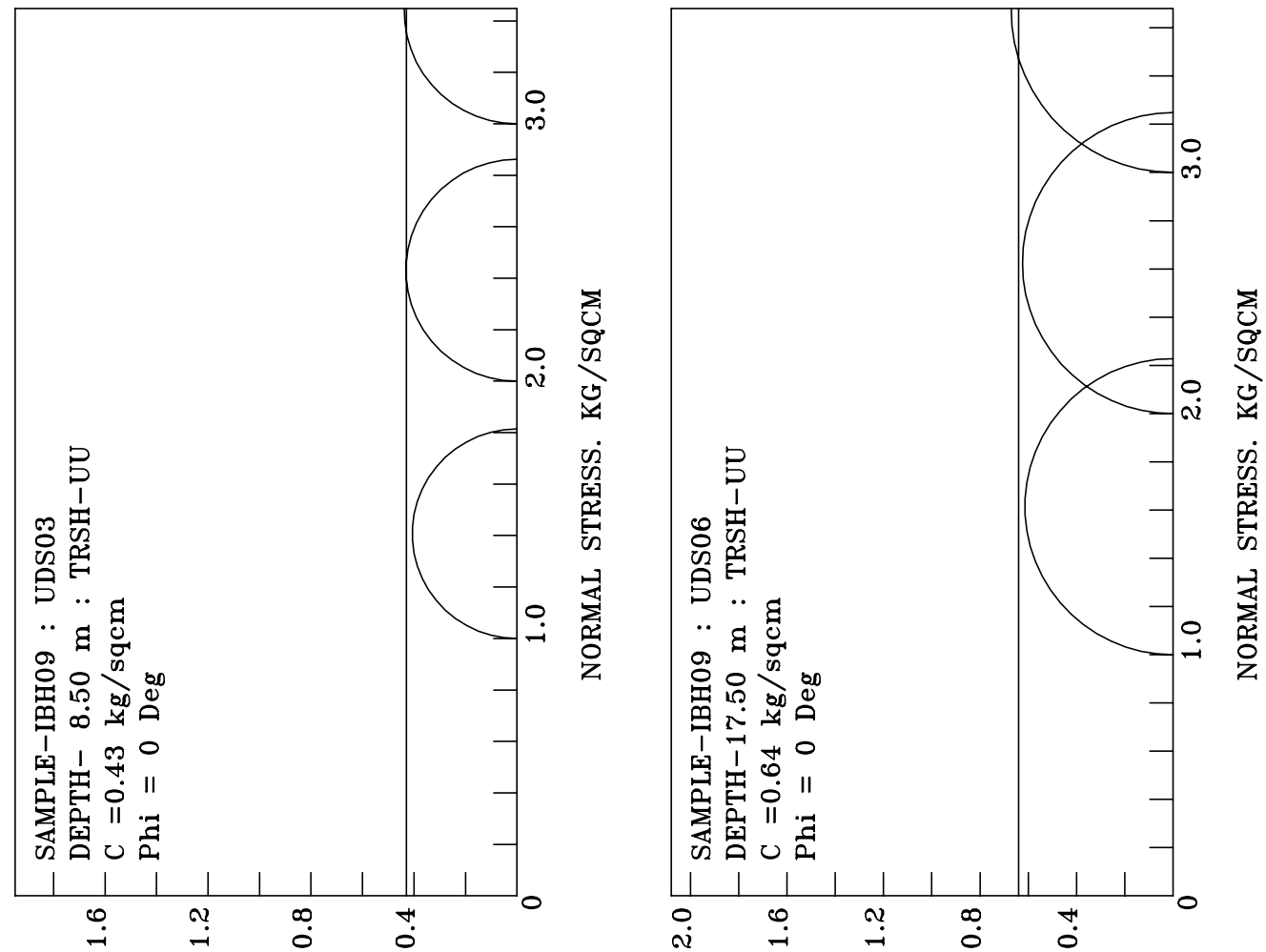

SAMPLE-IBH02 : UDS07
DEPTH-20.50 m : TRSH-UU
C =0.84 kg/sqcm
Phi = 7 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM

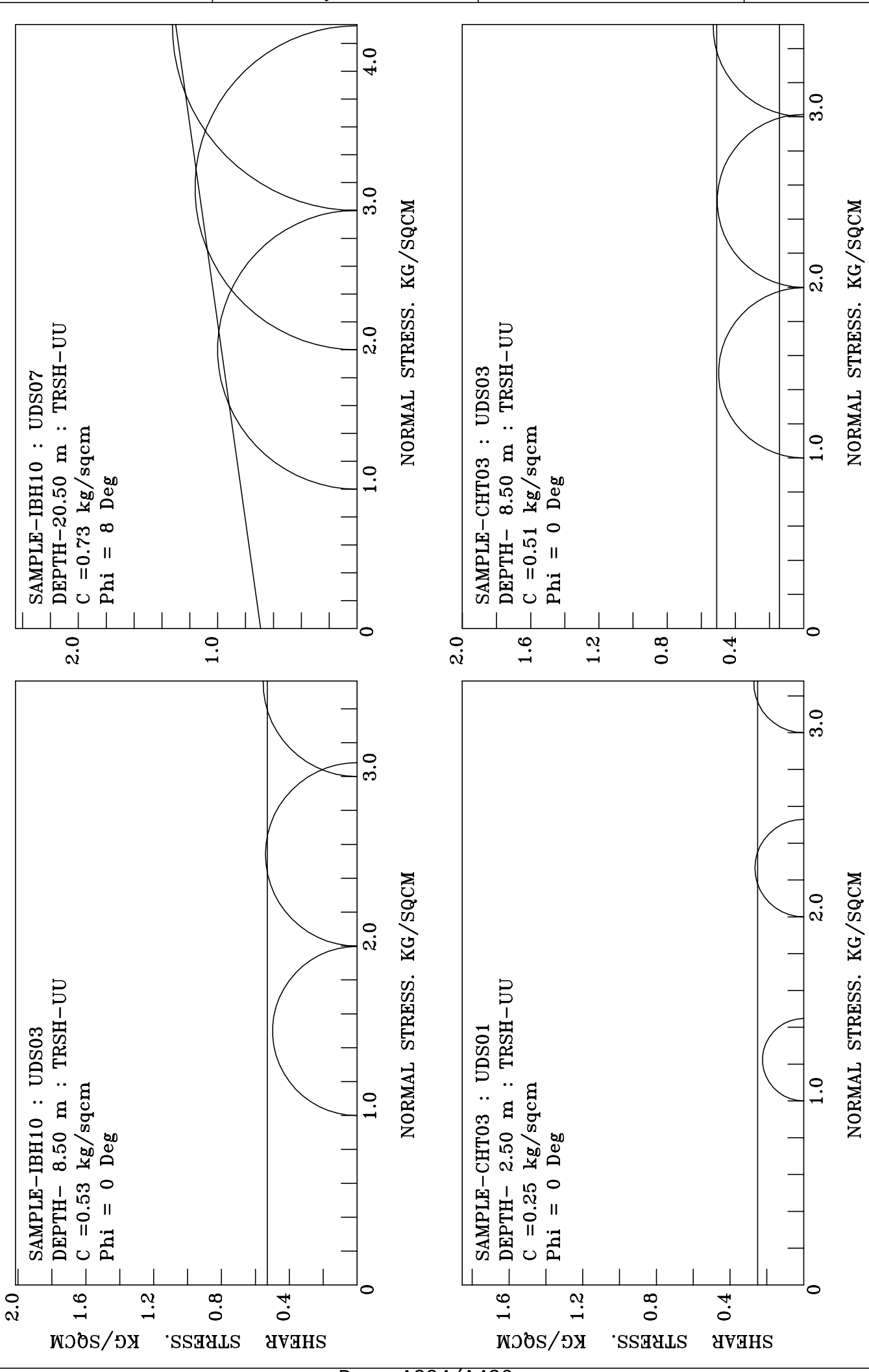

SAMPLE-IBH03 : UDS04
DEPTH-11.50 m : TRSH-UU
C =0.61 kg/sqcm
Phi = 0 Deg
SAMPLE-IBH05 : UDS03
DEPTH- 7.50 m : TRSH-UU
C =0.46 kg/sqcm
Phi = 0 Deg
SAMPLE-IBH03 : UDS03
DEPTH- 8.50 m : TRSH-UU
C =0.54 kg/sqcm
Phi = 0 Deg
SAMPLE-IBH03 : UDS07
DEPTH-20.50 m : TRSH-UU
C =0.87 kg/sqcm
Phi = 0 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM
0
0.4
0.8
1.2
1.6
2.0
1.0
2.0
3.0

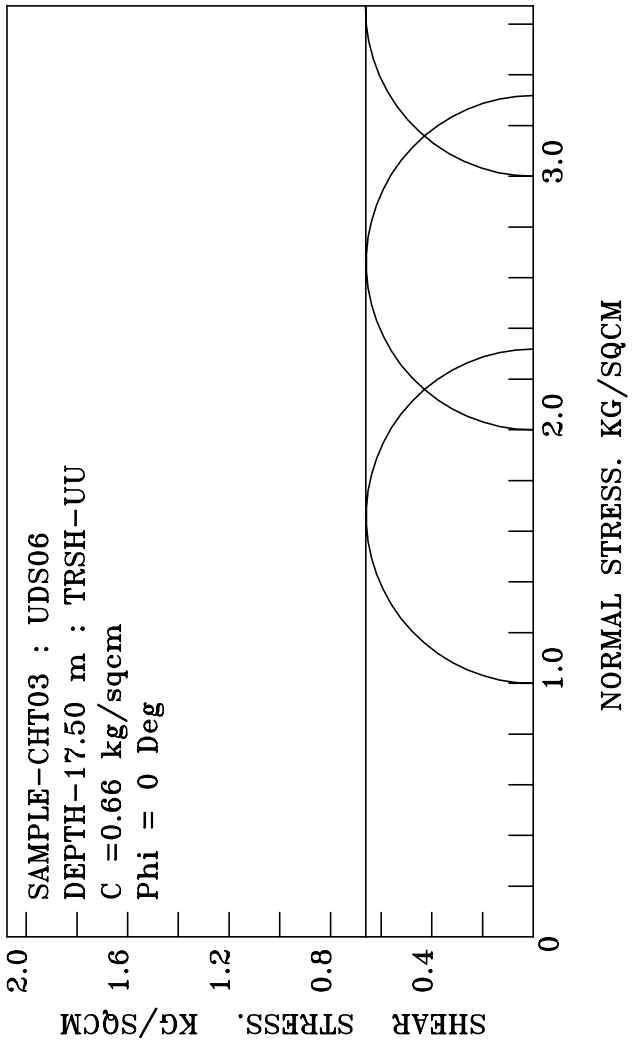

SAMPLE-IBH07 : UDS06
DEPTH-17.50 m : TRSH-UU
C =0.81 kg/sqcm
Phi = 0 Deg
SAMPLE-IBH08 : UDS03
DEPTH- 8.50 m : TRSH-UU
C =0.32 kg/sqcm
Phi = 5 Deg
SAMPLE-IBH05 : UDS08
DEPTH-22.50 m : TRSH-UU
C =1.19 kg/sqcm
Phi = 0 Deg
SAMPLE-IBH08 : UDS02
DEPTH- 5.50 m : TRSH-UU
C =0.18 kg/sqcm
Phi = 5 Deg
NORMAL STRESS. KG/SQCM
SHEAR STRESS. KG/SQCM


SAMPLE-IBH08 : UDS06
DEPTH-17.50 m : TRSH-UU
C =0.96 kg/sqcm
Phi = 0 Deg
SAMPLE-IBH09 : UDS01
DEPTH- 2.50 m : TRSH-UU
C =0.23 kg/sqcm
Phi = 0 Deg
SAMPLE-IBH08 : UDS05
DEPTH-14.50 m : TRSH-UU
C =0.99 kg/sqcm
Phi = 0 Deg
SAMPLE-IBH08 : UDS07
DEPTH-20.50 m : TRSH-UU
C =1.01 kg/sqcm
Phi = 0 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM


SAMPLE-IBH09 : UDS05
DEPTH-14.50 m : TRSH-UU
C =0.58 kg/sqcm
Phi = 0 Deg
SAMPLE-IBH10 : DS01
DEPTH-2.50 m : RSH-UU
C =.13 ,kg/sqcm
Phi =0 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM


SAMPLE-IBH09 : UDS03
DEPTH- 8.50 m : TRSH-UU
C =0.43 kg/sqcm
Phi = 0 Deg
SAMPLE-IBH09 : UDS06
DEPTH-17.50 m : TRSH-UU
C =0.64 kg/sqcm
Phi = 0 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM

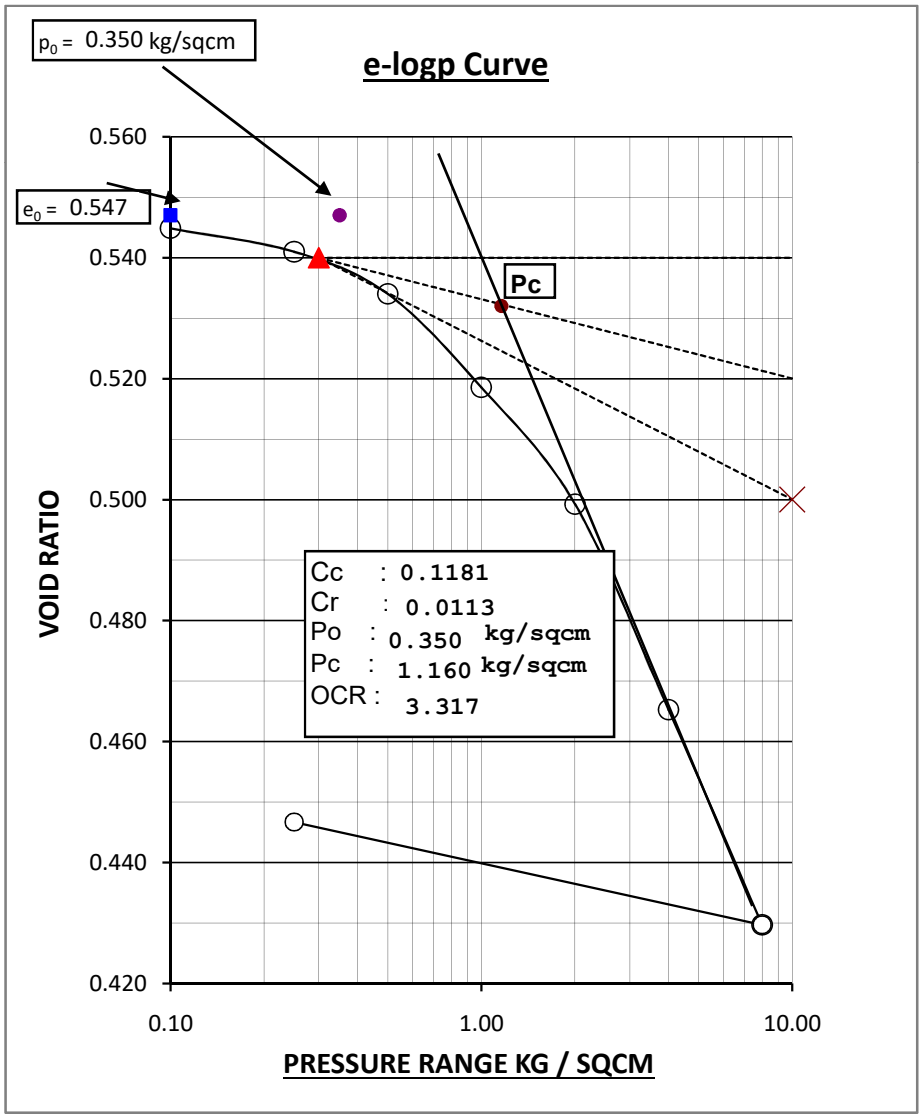

SAMPLE-IBH10 : UDS07
DEPTH-20.50 m : TRSH-UU
C =0.73 kg/sqcm
Phi = 8 Deg
SAMPLE-CHT03 : UDS03
DEPTH- 8.50 m : TRSH-UU
C =0.51 kg/sqcm
Phi = 0 Deg
SAMPLE-IBH10 : UDS03
DEPTH- 8.50 m : TRSH-UU
C =0.53 kg/sqcm
Phi = 0 Deg
SAMPLE-CHT03 : UDS01
DEPTH- 2.50 m : TRSH-UU
C =0.25 kg/sqcm
Phi = 0 Deg
NORMAL STRESS. KG/SQCM
SHEAR STRESS. KG/SQCM


SAMPLE-CHT03 : UDS06
DEPTH-17.50 m : TRSH-UU
C =0.66 kg/sqcm
Phi = 0 Deg
SHEAR STRESS. KG/SQCM
NORMAL STRESS. KG/SQCM
0
0.4
0.8
1.2
1.6
2.0
1.0
2.0
3.0

CONSOLIDATION TEST RESULTS

Sample Number:BH-01/UDS-01 Depth :2.5-2.95 meters
Description :Browish grey clayey silt with kankars.
Water content:Initial=22.3% Final =17.1% Initial Void Ratio =0.547

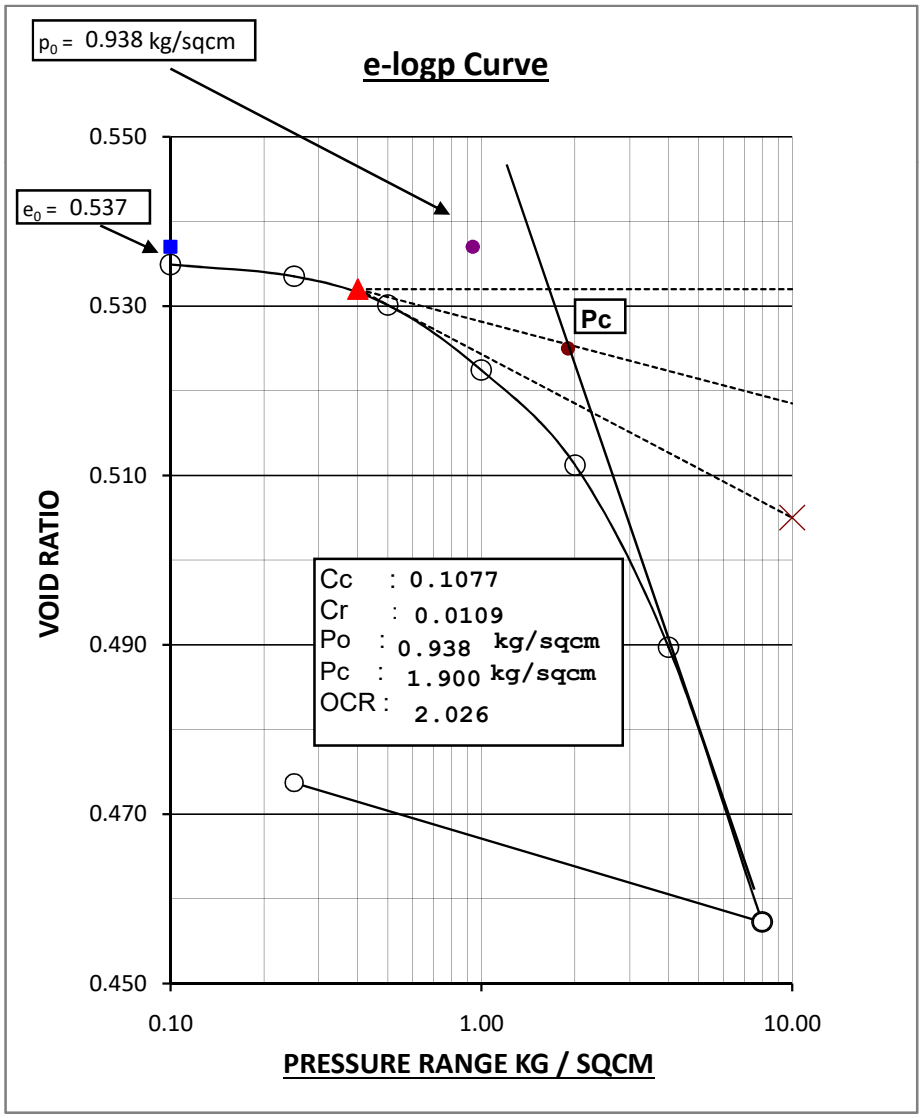
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	3	0.545	0.0150				
0.10 - 0.25	5	0.541	0.0167	20.00	0.0133	104.5	8.042
0.25 - 0.50	9	0.534	0.0181	11.11	0.0160	127.3	6.509
0.50 - 1.00	20	0.519	0.0202	10.00	0.0181	172.1	4.674
1.00 - 2.00	25	0.499	0.0127	16.00	0.0107	210.0	3.656
2.00 - 4.00	44	0.465	0.0113	15.91	0.0095	222.5	3.205
4.00 - 8.00	46	0.430	0.0061	10.87	0.0054	310.6	2.076
8.00 - 0.25	22	0.447	0.0015				



CONSOLIDATION TEST RESULTS

Sample Number:BH-02/UDS-03 Depth :8.5-8.95 meters
Description :Brownish grey clayey silt with kankars
Water content:Initial=20.6% Final =18.4% Initial Void Ratio =0.537

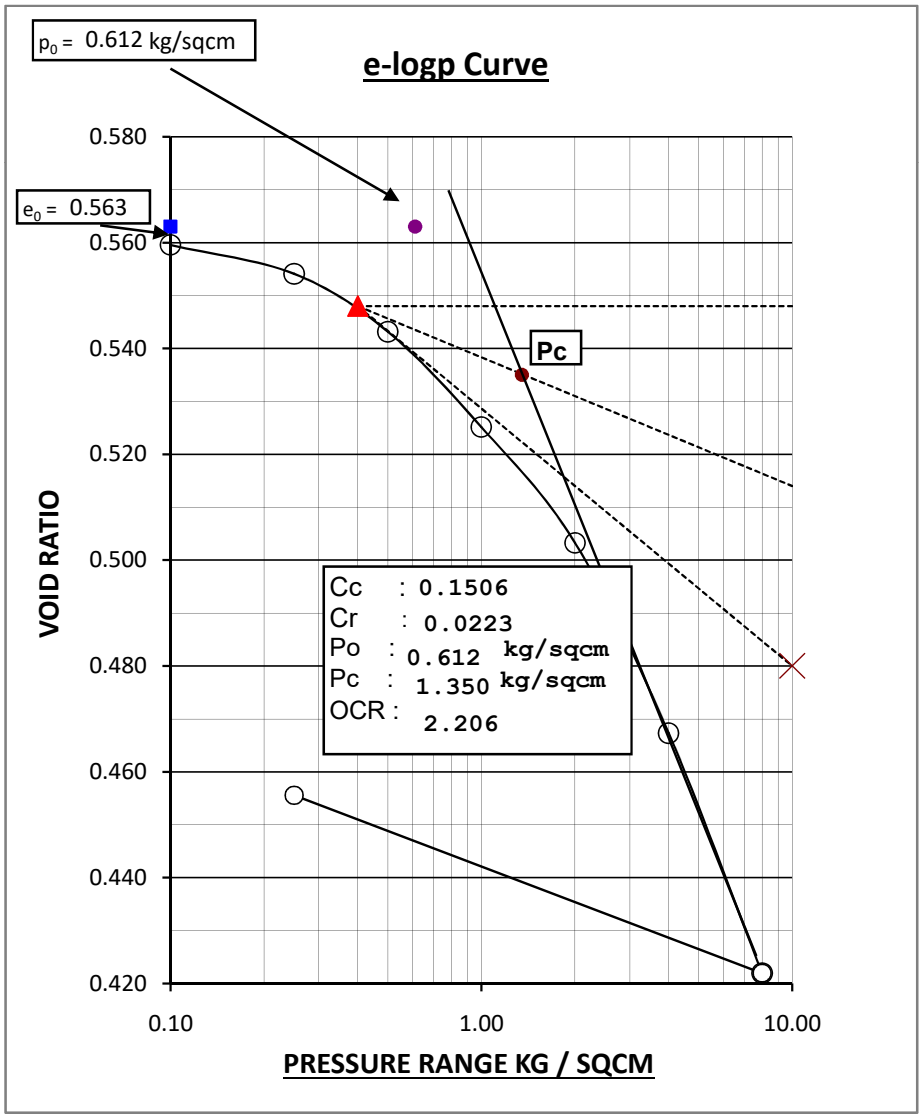
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	11	0.535	0.0110				
0.10 - 0.25	9	0.534	0.0060	11.11	0.0053	207.6	4.057
0.25 - 0.50	22	0.530	0.0088	19.10	0.0071	136.8	6.117
0.50 - 1.00	50	0.522	0.0100	18.00	0.0082	114.6	7.197
1.00 - 2.00	73	0.511	0.0074	26.03	0.0055	342.7	2.347
2.00 - 4.00	140	0.490	0.0071	25.71	0.0053	351.4	2.190
4.00 - 8.00	211	0.457	0.0054	26.07	0.0040	558.2	1.279
8.00 - 0.25	107	0.474	0.0015				



CONSOLIDATION TEST RESULTS

Sample Number:BH-03/UDS-02 Depth :5.5-5.95 meters
Description :Brownish grey clayey silt with traces of rusty spots.
Water content:Initial=20.6% Final =18% Initial Void Ratio =0.563

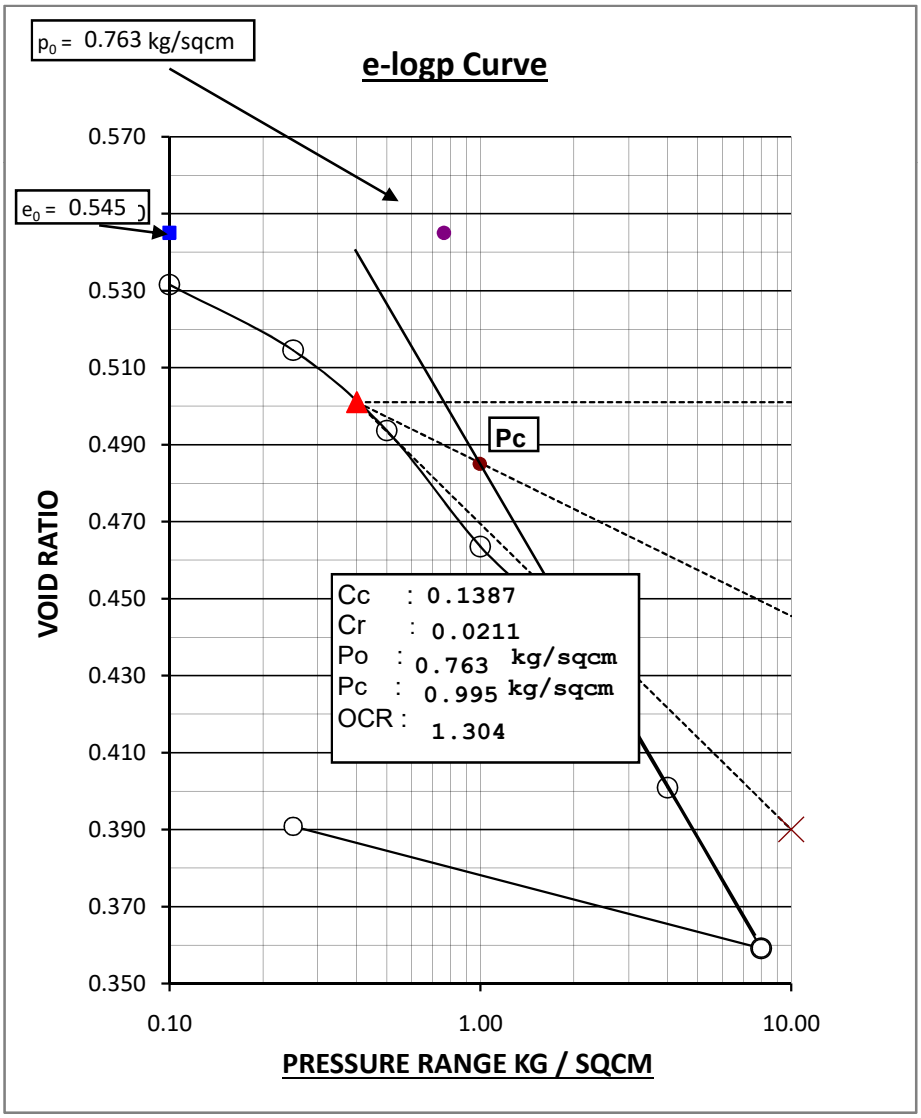
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	5	0.560	0.0250				
0.10 - 0.25	7	0.554	0.0234	28.57	0.0167	101.2	8.235
0.25 - 0.50	14	0.543	0.0282	25.40	0.0210	133.4	6.116
0.50 - 1.00	23	0.525	0.0233	34.78	0.0152	153.2	5.126
1.00 - 2.00	28	0.503	0.0144	14.29	0.0123	163.1	4.563
2.00 - 4.00	46	0.467	0.0120	21.74	0.0094	375.0	1.831
4.00 - 8.00	58	0.422	0.0077	18.97	0.0063	235.0	2.594
8.00 - 0.25	43	0.456	0.0031				



CONSOLIDATION TEST RESULTS

Sample Number:BH-04/UDS-02 Depth :5.5-5.95 meters
Description :Brownish grey, clayey silt with traces of kankars.
Water content:Initial=21.8% Final =16.7% Initial Void Ratio =0.545

P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	18	0.532	0.0901				
0.10 - 0.25	22	0.515	0.0740	18.18	0.0606	188.2	4.243
0.25 - 0.50	27	0.494	0.0551	27.40	0.0400	220.4	3.443
0.50 - 1.00	39	0.464	0.0404	25.90	0.0299	172.2	4.104
1.00 - 2.00	31	0.440	0.0164	16.13	0.0137	198.1	3.299
2.00 - 4.00	50	0.401	0.0134	28.00	0.0097	156.2	3.807
4.00 - 8.00	54	0.359	0.0075	22.22	0.0058	195.4	2.677
8.00 - 0.25	41	0.391	0.0030				

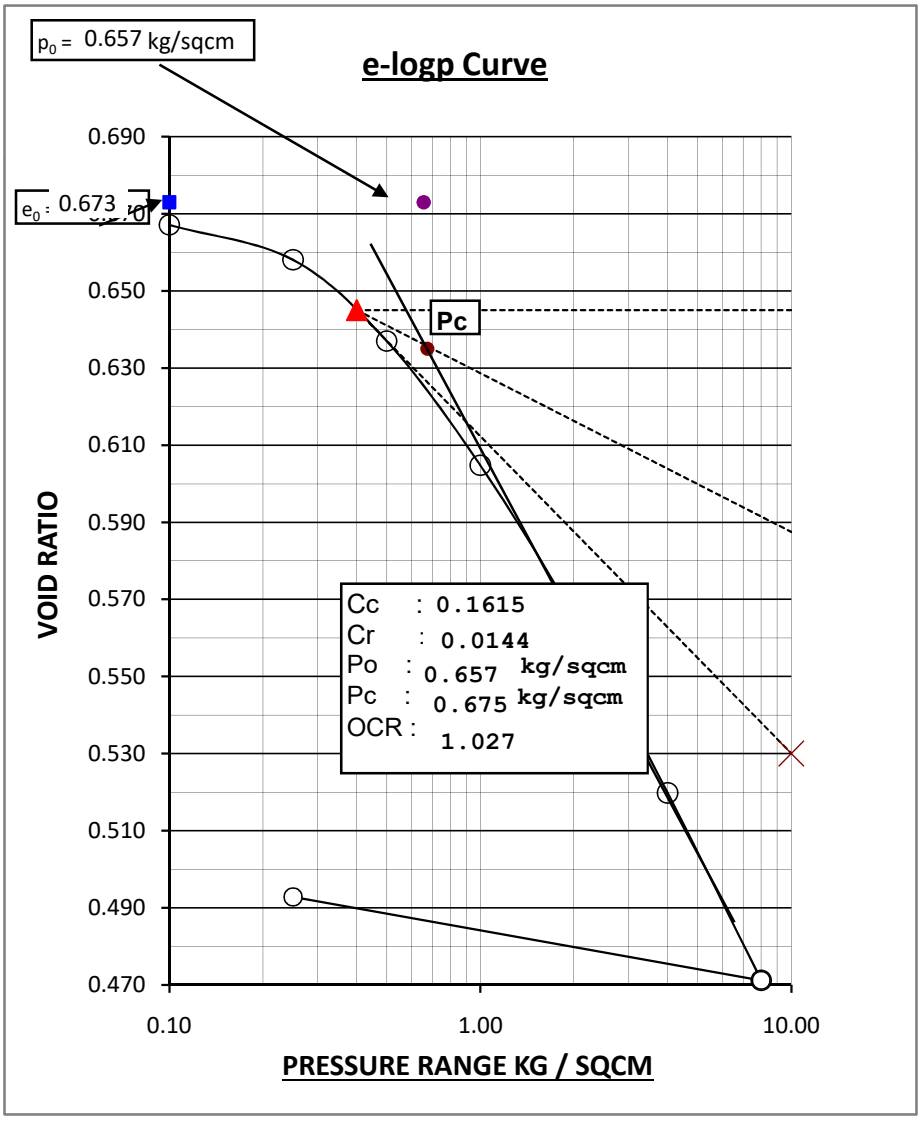


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CONSOLIDATION TEST RESULTS

Sample Number:BH-06/UDS-02 Depth :5.5-5.95 meters
Description :Brownish grey clayey silt with kankars.
Water content:Initial=27% Final =21.5% Initial Void Ratio =0.673

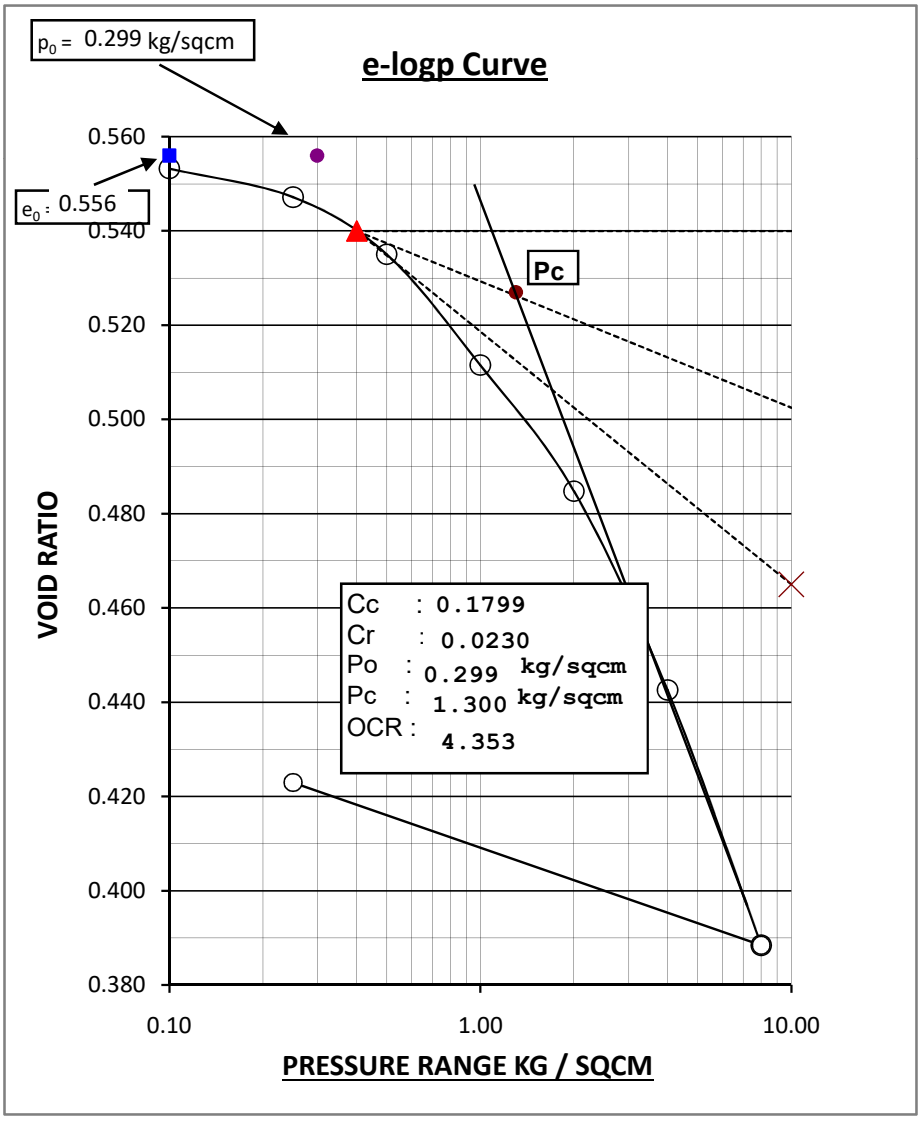
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	35	0.667	0.0351				
0.10 - 0.25	54	0.658	0.0362	18.52	0.0295	351.4	2.345
0.25 - 0.50	126	0.637	0.0510	19.50	0.0410	173.4	4.580
0.50 - 1.00	192	0.605	0.0393	10.94	0.0350	231.4	3.210
1.00 - 2.00	235	0.565	0.0245	17.45	0.0203	197.5	3.426
2.00 - 4.00	272	0.520	0.0146	17.59	0.0120	208.7	2.884
4.00 - 8.00	290	0.471	0.0080	16.91	0.0066	137.7	3.807
8.00 - 0.25	129	0.493	0.0019				



CONSOLIDATION TEST RESULTS

Sample Number:BH-07/UDS-01 Depth :2.5-2.95 meters
Description :Deep grey, silty clay with silt stone.
Water content:Initial=22.4% Final =18.5% Initial Void Ratio =0.556

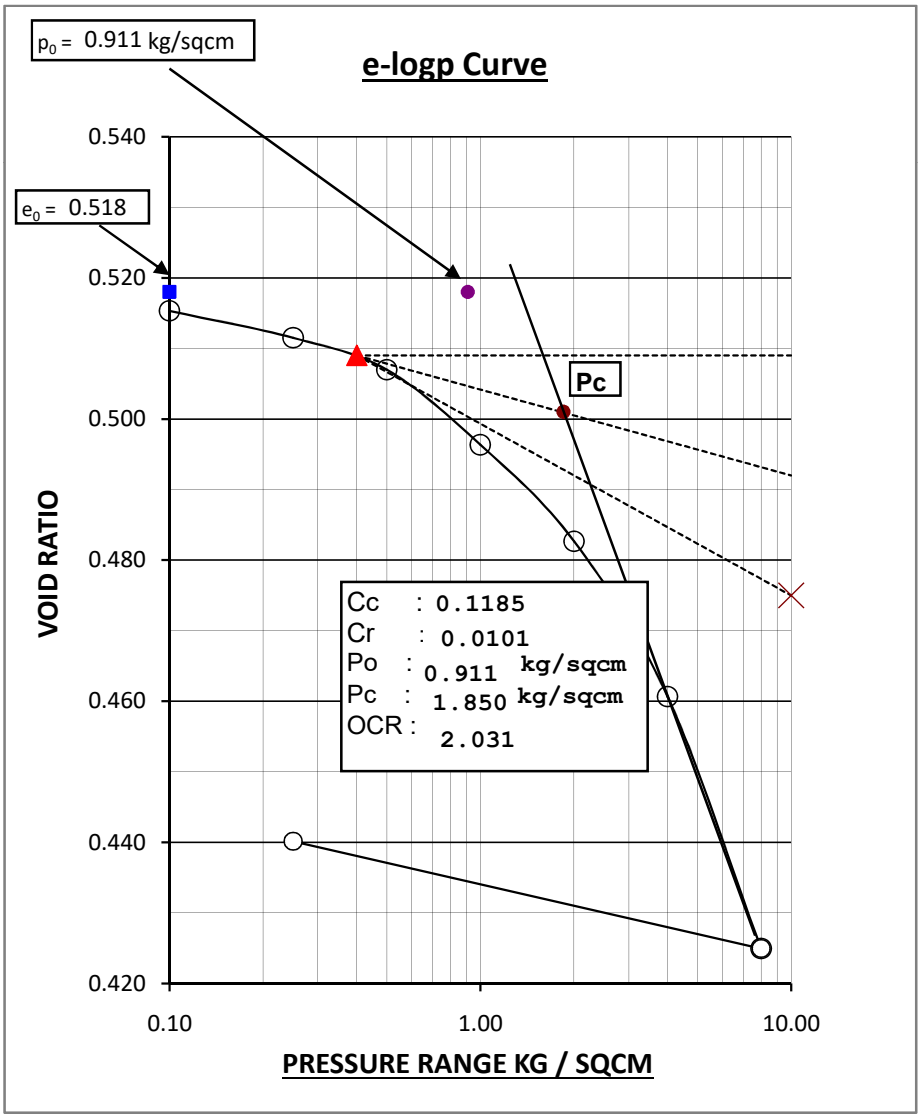
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	19	0.553	0.0190				
0.10 - 0.25	39	0.547	0.0261	20.51	0.0207	457.1	1.826
0.25 - 0.50	78	0.535	0.0314	20.80	0.0249	260.0	3.135
0.50 - 1.00	151	0.512	0.0306	18.54	0.0249	153.6	5.062
1.00 - 2.00	172	0.485	0.0177	12.21	0.0155	653.4	1.111
2.00 - 4.00	271	0.443	0.0142	11.81	0.0125	926.7	0.710
4.00 - 8.00	348	0.388	0.0094	13.79	0.0081	912.6	0.623
8.00 - 0.25	222	0.423	0.0032				



CONSOLIDATION TEST RESULTS

Sample Number:BH-09/UDS-03 Depth :8.5-8.95 meters
Description :Brownish grey clayey silt with traces of calcareous nodules.
Water content:Initial=21.2% Final =17.1% Initial Void Ratio =0.518

P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	3	0.515	0.0150				
0.10 - 0.25	5	0.512	0.0167	20.00	0.0134	104.2	8.038
0.25 - 0.50	6	0.507	0.0121	16.67	0.0100	125.1	6.622
0.50 - 1.00	14	0.496	0.0141	17.10	0.0117	130.3	6.229
1.00 - 2.00	18	0.483	0.0091	22.22	0.0071	121.0	6.491
2.00 - 4.00	29	0.461	0.0074	34.48	0.0049	223.5	3.344
4.00 - 8.00	47	0.425	0.0061	36.17	0.0039	136.8	5.030
8.00 - 0.25	20	0.440	0.0014				

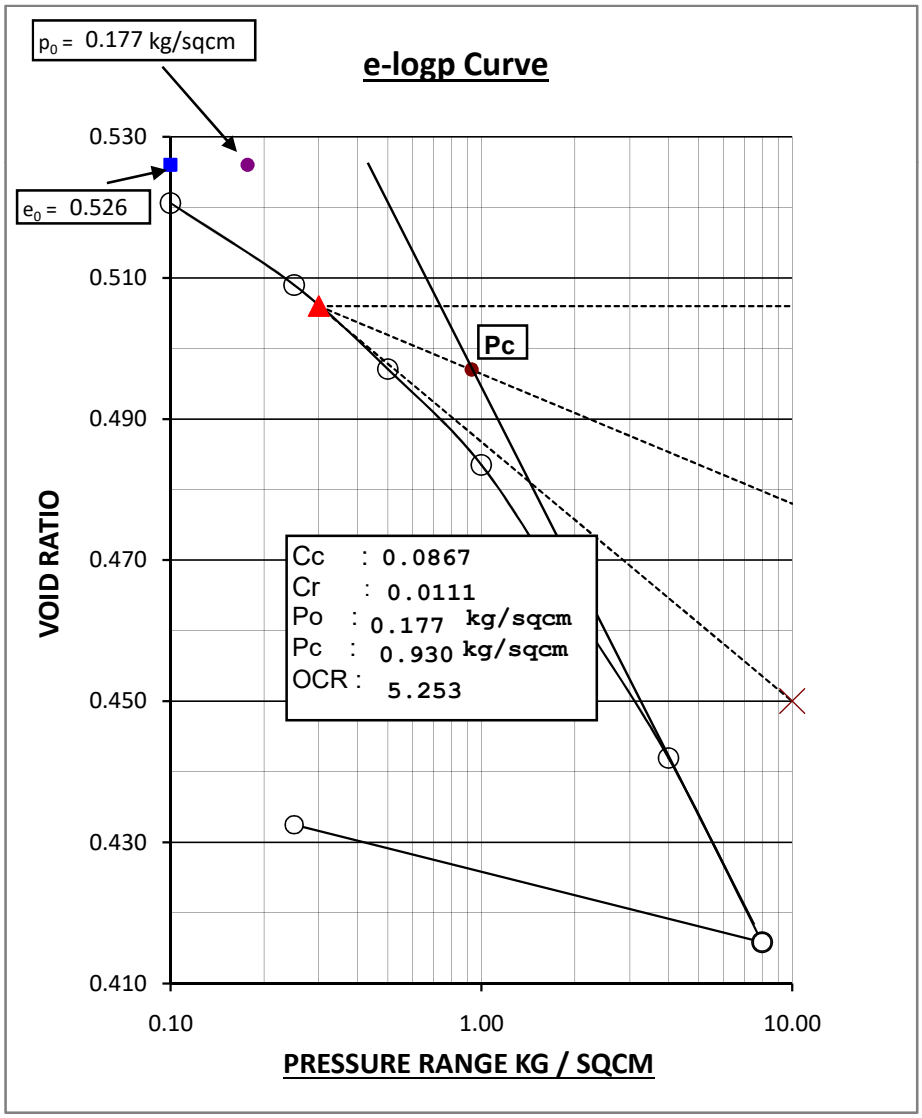


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CONSOLIDATION TEST RESULTS

Sample Number:BH-10/UDS-01 Depth :2.5-2.95 meters
Description :Brownish grey clayey silt with sand mixture.
Water content:Initial=21.5% Final =17.8% Initial Void Ratio =0.526

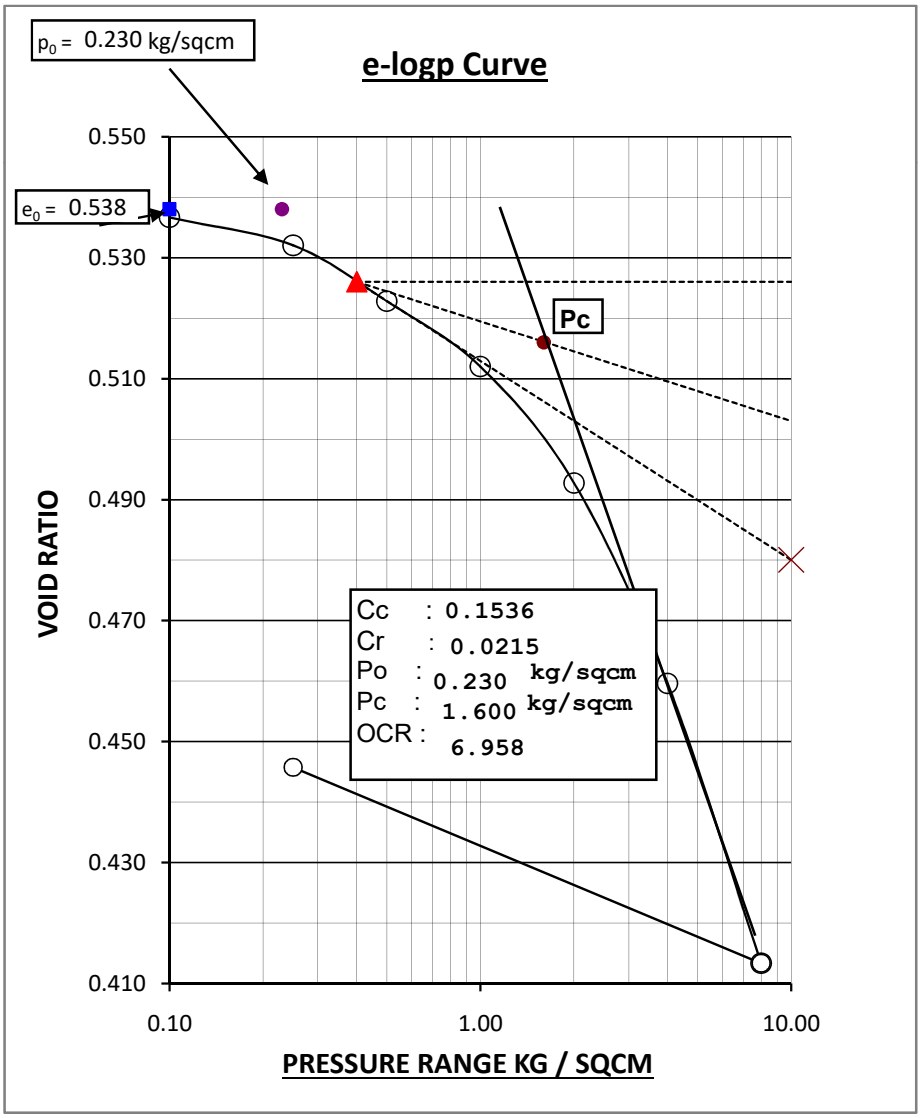
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	35	0.521	0.0350				
0.10 - 0.25	76	0.509	0.0509	32.89	0.0341	357.2	2.302
0.25 - 0.50	78	0.497	0.0316	25.64	0.0235	221.4	3.599
0.50 - 1.00	89	0.483	0.0182	38.20	0.0112	144.2	5.339
1.00 - 2.00	134	0.463	0.0138	42.70	0.0079	185.9	3.950
2.00 - 4.00	138	0.442	0.0072	39.40	0.0044	161.4	4.287
4.00 - 8.00	171	0.416	0.0045	30.80	0.0031	131.4	4.910
8.00 - 0.25	109	0.432	0.0015				



CONSOLIDATION TEST RESULTS

Sample Number:BH-11/UDS-01 Depth :2.5-2.95 meters
Description :Light grey clayey silt with traces of calcareous nodules.
Water content:Initial=20.8% Final =18.5% Initial Void Ratio =0.538

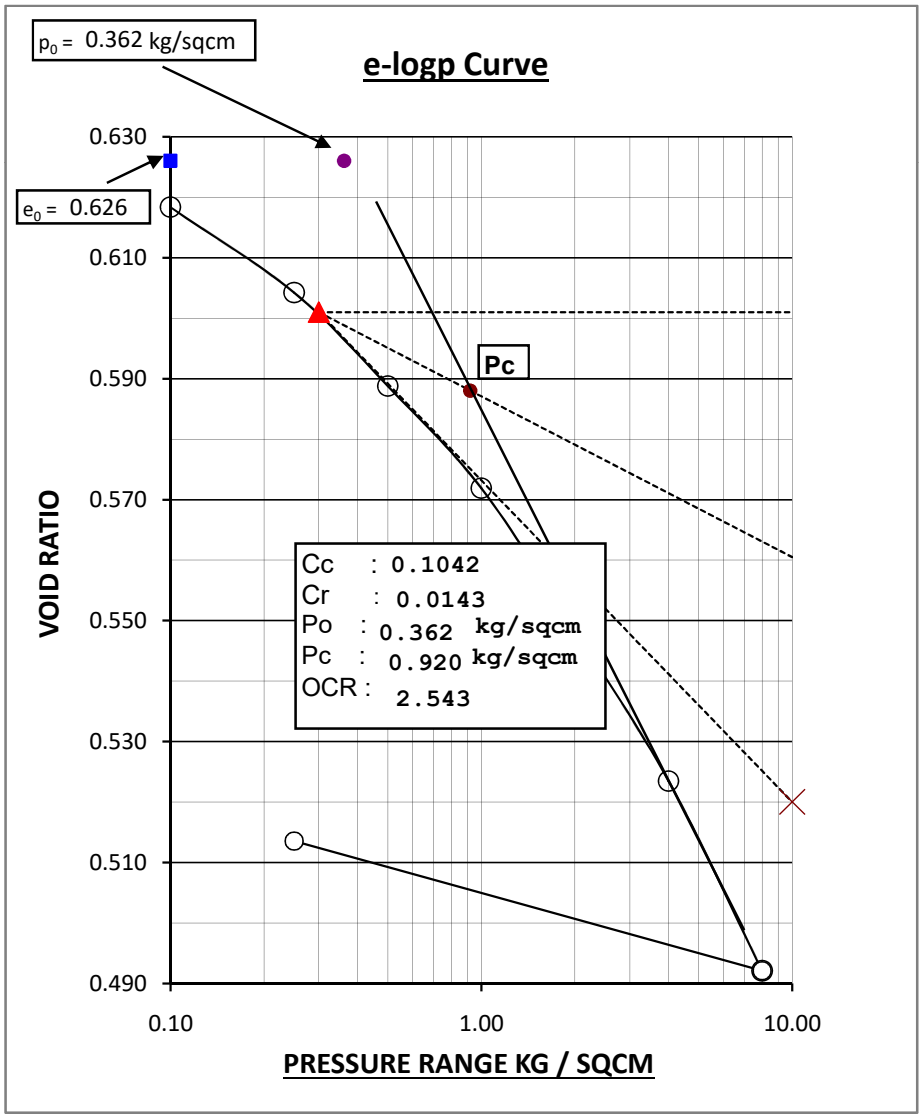
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	2	0.537	0.0100				
0.10 - 0.25	6	0.532	0.0201	16.67	0.0167	112.5	7.434
0.25 - 0.50	12	0.523	0.0241	16.67	0.0201	269.3	3.050
0.50 - 1.00	14	0.512	0.0142	7.14	0.0132	240.9	3.320
1.00 - 2.00	25	0.493	0.0127	20.00	0.0102	104.2	7.369
2.00 - 4.00	43	0.460	0.0111	18.60	0.0090	149.6	4.773
4.00 - 8.00	60	0.413	0.0079	16.67	0.0066	190.7	3.336
8.00 - 0.25	42	0.446	0.0030				



CONSOLIDATION TEST RESULTS

Sample Number:BH-12/UDS-01 Depth :2.5-2.95 meters
Description :Brownish grey clayey silt.
Water content:Initial=25.8% Final =18.8% Initial Void Ratio =0.626

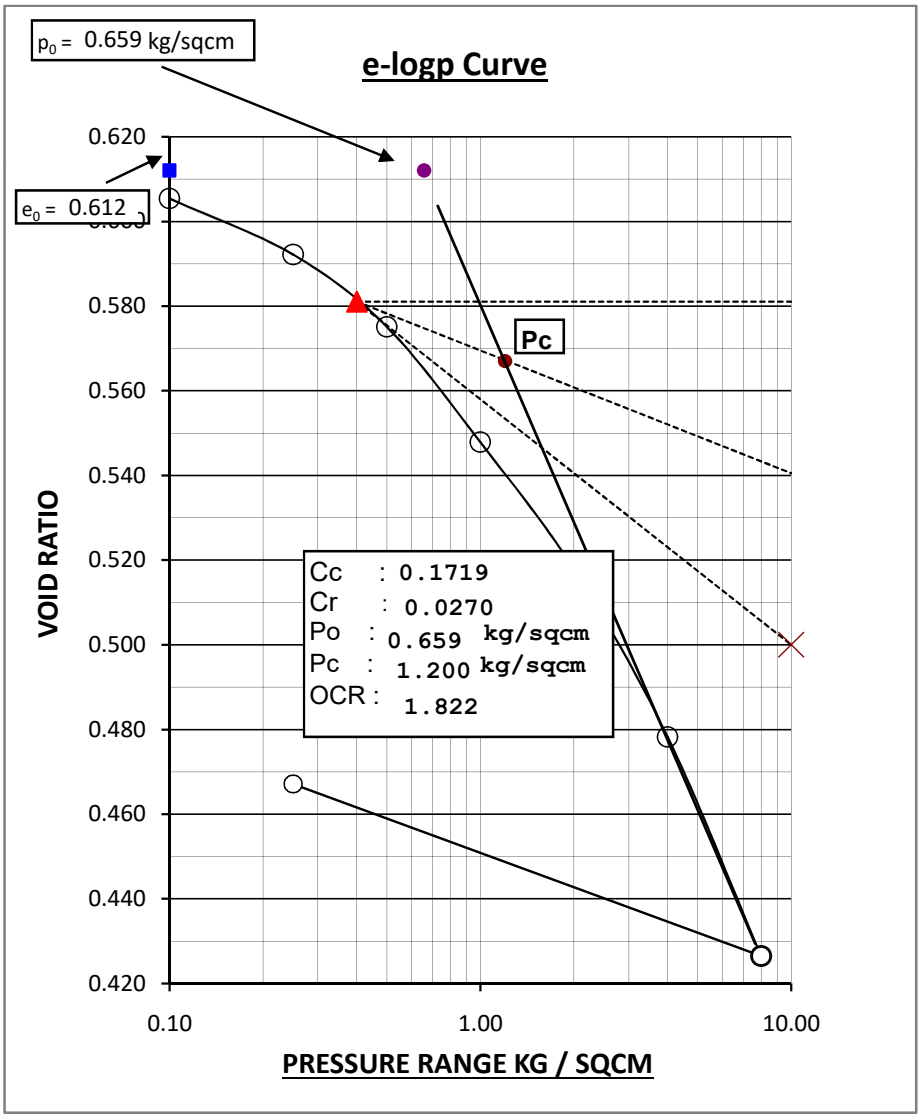
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	46	0.618	0.0460				
0.10 - 0.25	87	0.604	0.0582	37.90	0.0362	205.6	3.982
0.25 - 0.50	95	0.589	0.0385	23.80	0.0293	127.9	6.167
0.50 - 1.00	104	0.572	0.0213	20.19	0.0170	144.2	5.248
1.00 - 2.00	145	0.548	0.0150	40.69	0.0089	192.2	3.730
2.00 - 4.00	153	0.523	0.0080	45.75	0.0044	149.8	4.482
4.00 - 8.00	193	0.492	0.0051	46.11	0.0028	103.0	6.023
8.00 - 0.25	132	0.514	0.0019				



CONSOLIDATION TEST RESULTS

Sample Number:BH-13/UDS-02 Depth :5.5-5.95 meters
Description :Light grey clayey silt.
Water content:Initial=24.2% Final =18.8% Initial Void Ratio =0.612

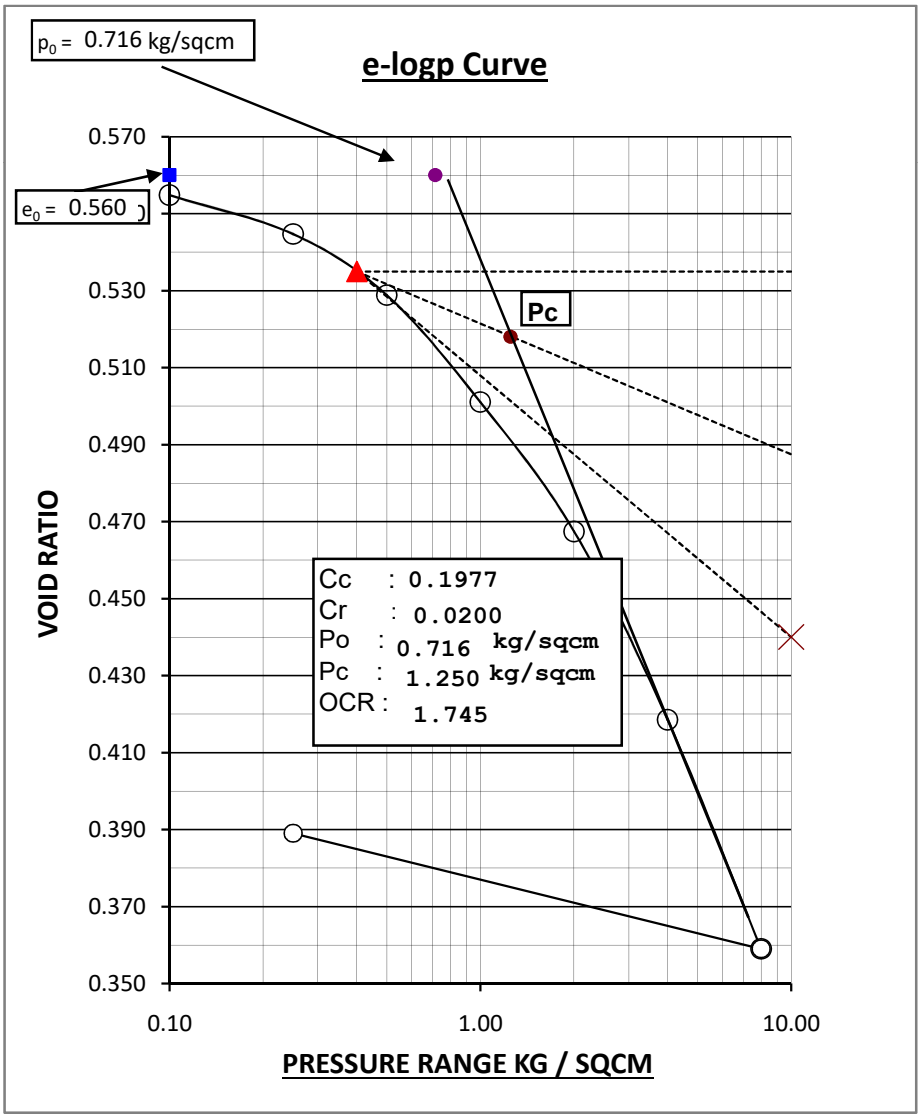
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	42	0.605	0.0420				
0.10 - 0.25	82	0.592	0.0549	29.50	0.0387	211.6	3.877
0.25 - 0.50	106	0.575	0.0429	27.50	0.0311	399.1	1.978
0.50 - 1.00	169	0.548	0.0346	24.26	0.0262	254.5	2.927
1.00 - 2.00	187	0.518	0.0195	21.39	0.0153	399.4	1.726
2.00 - 4.00	245	0.478	0.0130	20.00	0.0104	351.9	1.776
4.00 - 8.00	321	0.426	0.0088	22.12	0.0068	233.4	2.336
8.00 - 0.25	252	0.467	0.0037				



CONSOLIDATION TEST RESULTS

Sample Number:BH-14/UDS-02 Depth :5.5-5.95 meters
Description :Brownish grey clayey silt.
Water content:Initial=21.4% Final =18.6% Initial Void Ratio =0.56

P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	32	0.555	0.0320				
0.10 - 0.25	65	0.545	0.0434	28.50	0.0310	136.4	6.071
0.25 - 0.50	102	0.529	0.0412	27.60	0.0298	256.2	3.124
0.50 - 1.00	178	0.501	0.0363	31.46	0.0249	423.0	1.785
1.00 - 2.00	216	0.467	0.0224	22.22	0.0174	252.8	2.742
2.00 - 4.00	314	0.418	0.0167	21.34	0.0131	231.3	2.656
4.00 - 8.00	382	0.359	0.0105	20.94	0.0083	116.2	4.457
8.00 - 0.25	193	0.389	0.0029				

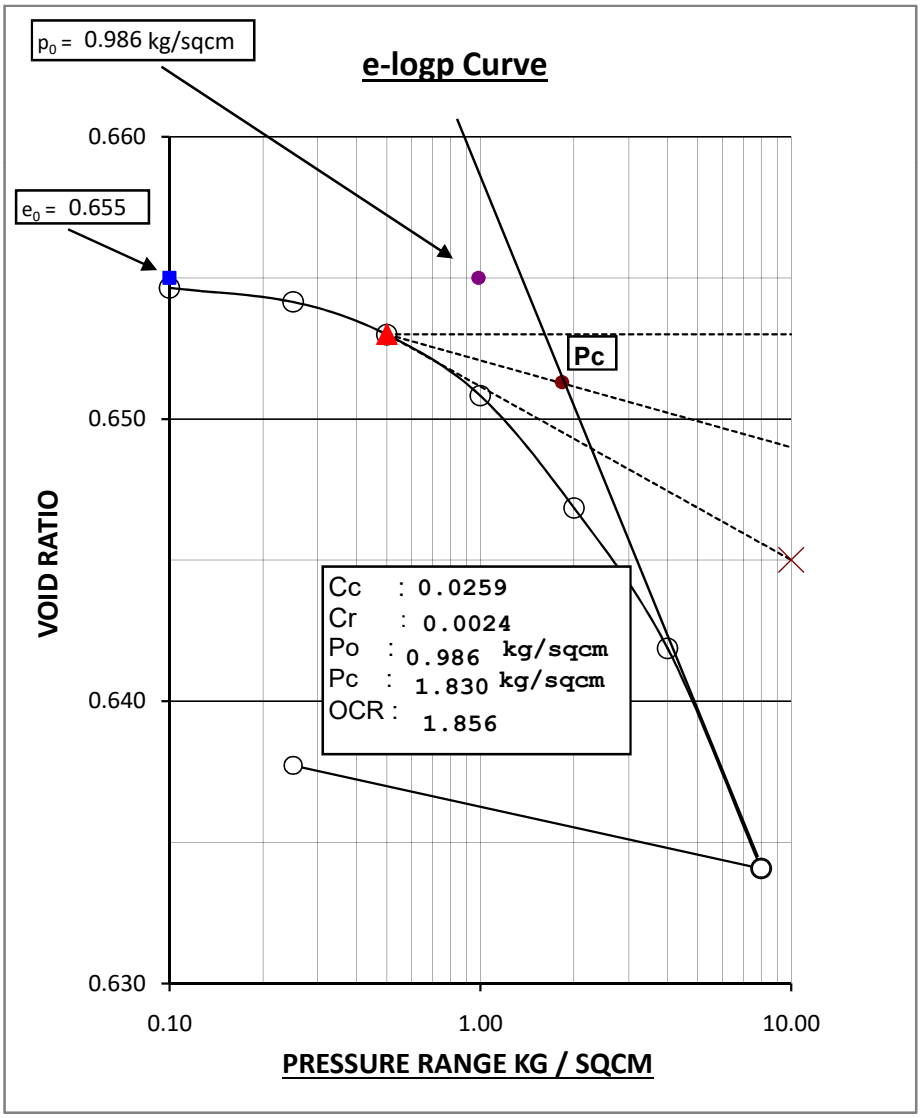


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CONSOLIDATION TEST RESULTS

Sample Number:BH-15/UDS-03 Depth :8.5-8.95 meters
Description :Brownish grey clayey silt with sand mixture.
Water content:Initial=26.2% Final =20.4% Initial Void Ratio =0.655

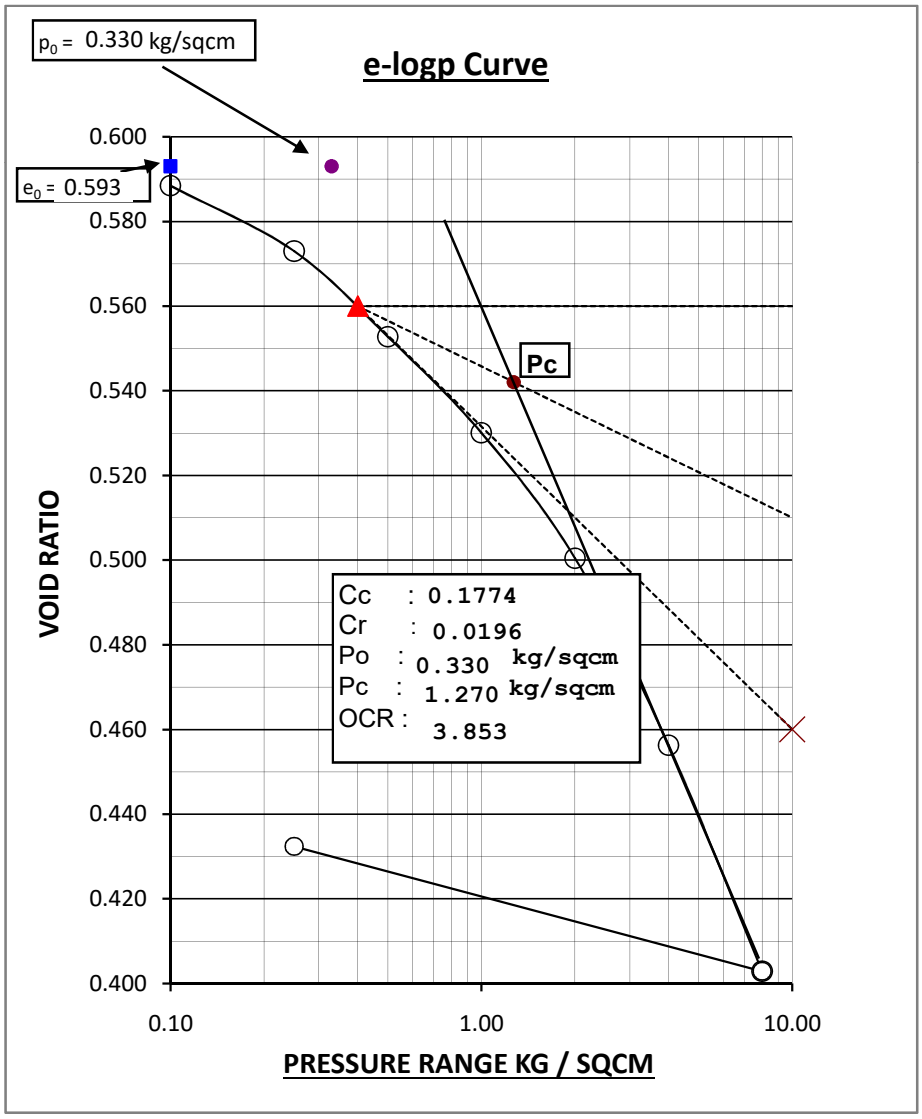
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	2	0.655	0.0020				
0.10 - 0.25	3	0.654	0.0020	20.20	0.0016	79.4	10.627
0.25 - 0.50	7	0.653	0.0028	28.57	0.0020	104.1	8.084
0.50 - 1.00	13	0.651	0.0026	15.38	0.0022	158.2	5.298
1.00 - 2.00	24	0.647	0.0024	16.67	0.0020	135.0	6.163
2.00 - 4.00	30	0.642	0.0015	30.00	0.0011	107.7	7.638
4.00 - 8.00	47	0.634	0.0012	38.30	0.0007	106.1	7.633
8.00 - 0.25	22	0.638	0.0003				



CONSOLIDATION TEST RESULTS

Sample Number:BH-16/UDS-01 Depth :2.5-2.95 meters
Description :Brownish grey clayey silt.
Water content:Initial=23.6% Final =18.4% Initial Void Ratio =0.593

P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	29	0.588	0.0290				
0.10 - 0.25	97	0.573	0.0649	24.74	0.0488	328.5	2.498
0.25 - 0.50	127	0.553	0.0515	22.05	0.0401	203.7	3.848
0.50 - 1.00	142	0.530	0.0292	20.42	0.0232	504.6	1.468
1.00 - 2.00	186	0.500	0.0194	27.42	0.0141	269.6	2.558
2.00 - 4.00	277	0.456	0.0147	29.24	0.0104	113.5	5.468
4.00 - 8.00	335	0.403	0.0092	29.85	0.0064	382.4	1.399
8.00 - 0.25	185	0.432	0.0027				

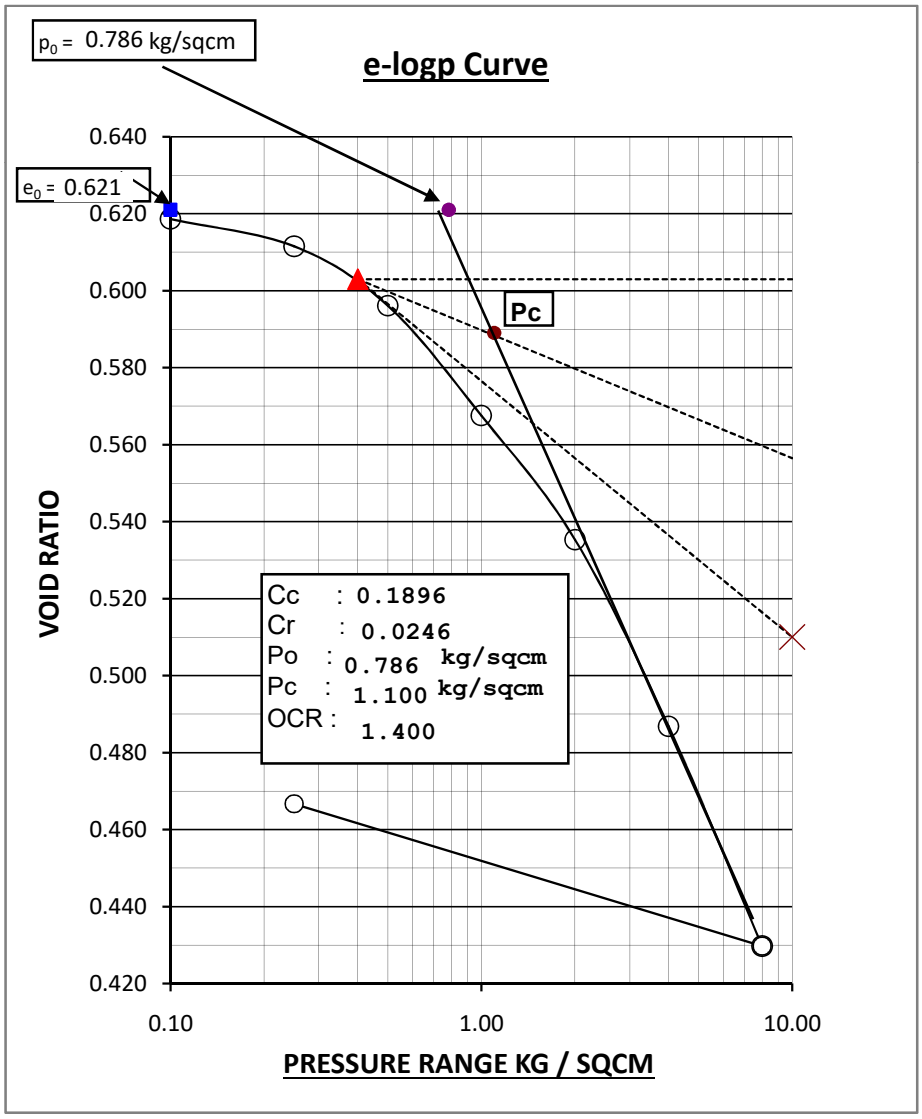


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CONSOLIDATION TEST RESULTS

Sample Number:BH-17/UDS-02 Depth :5.5-5.95 meters
Description :Brownish grey clayey silt
Water content:Initial=24% Final =19% Initial Void Ratio =0.621

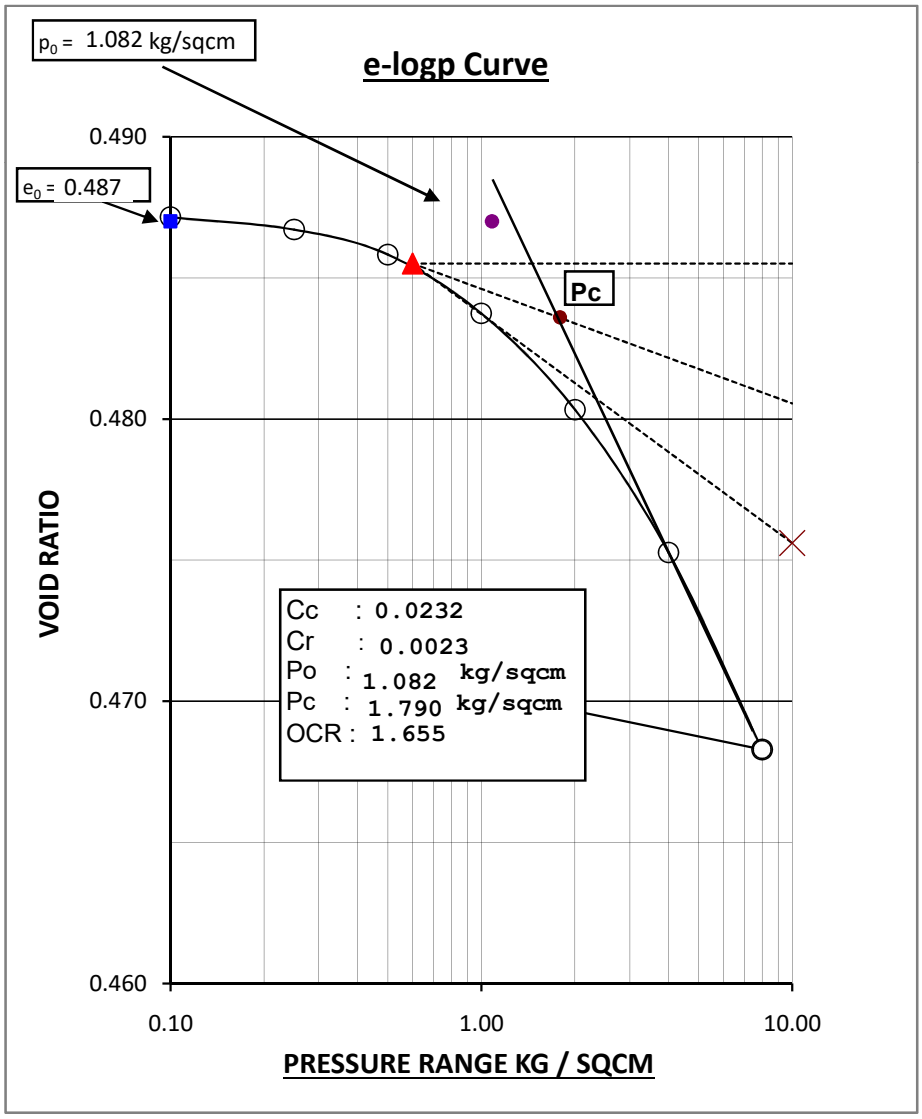
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	16	0.619	0.0160				
0.10 - 0.25	44	0.611	0.0294	36.36	0.0187	174.9	4.771
0.25 - 0.50	95	0.596	0.0382	23.16	0.0294	159.4	5.089
0.50 - 1.00	176	0.568	0.0358	17.61	0.0295	135.4	5.664
1.00 - 2.00	199	0.535	0.0206	23.62	0.0157	128.2	5.520
2.00 - 4.00	299	0.487	0.0158	22.07	0.0123	122.1	5.181
4.00 - 8.00	352	0.430	0.0096	17.90	0.0079	109.9	4.921
8.00 - 0.25	228	0.467	0.0033				



CONSOLIDATION TEST RESULTS

Sample Number:BH-18/UDS-03 Depth :8.5-8.95 meters
Description :Yellowish grey clayey silt.
Water content:Initial=18.9% Final =15.9% Initial Void Ratio =0.487

P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	0	0.487	0.0000				
0.10 - 0.25	3	0.487	0.0020	33.33	0.0013	122.4	6.938
0.25 - 0.50	6	0.486	0.0024	16.67	0.0020	231.2	3.666
0.50 - 1.00	14	0.484	0.0028	21.43	0.0022	393.6	2.145
1.00 - 2.00	23	0.480	0.0023	34.78	0.0015	288.4	2.906
2.00 - 4.00	34	0.475	0.0017	29.41	0.0012	399.1	2.076
4.00 - 8.00	47	0.468	0.0012	23.40	0.0009	295.7	2.756
8.00 - 0.25	23	0.472	0.0003				

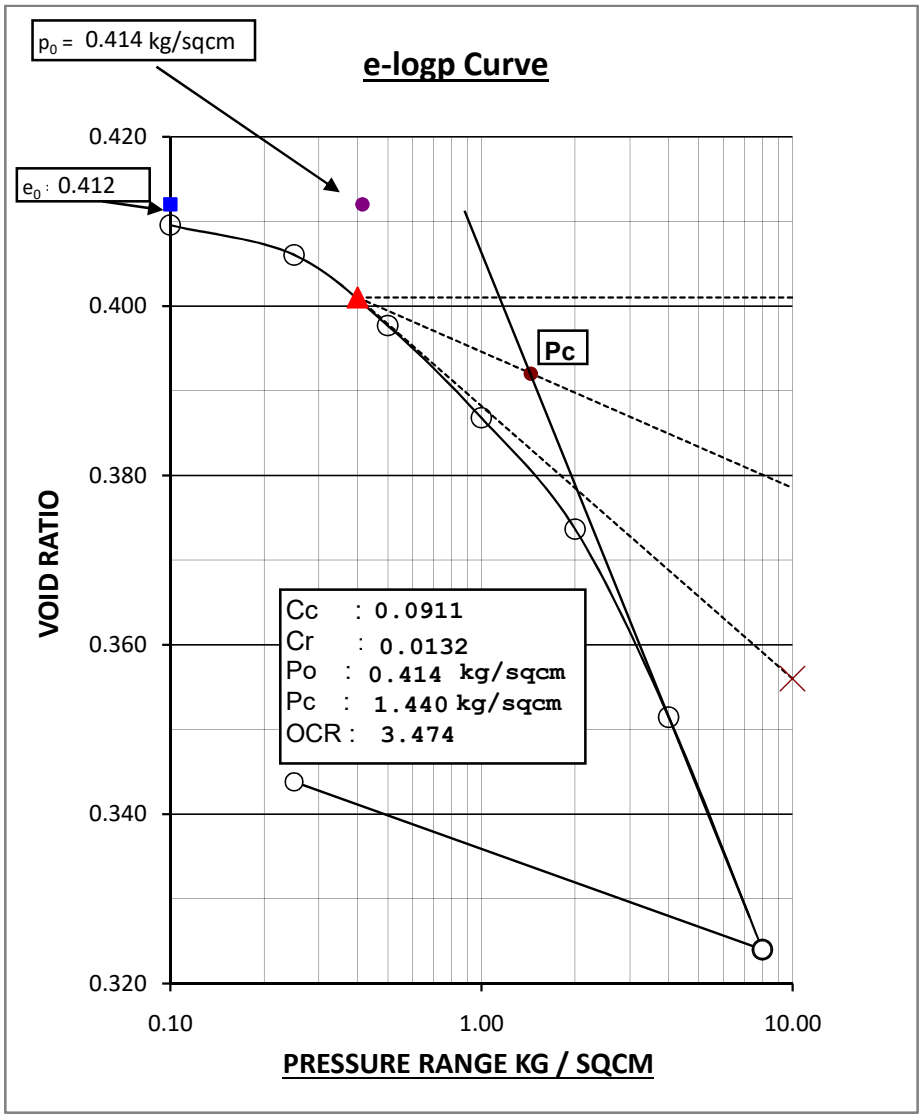


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CONSOLIDATION TEST RESULTS

Sample Number:BH-20/UDS-01 Depth :2.5-2.95 meters
Description :Brownish grey clayey silt
Water content:Initial=15.2% Final =14.2% Initial Void Ratio =0.412

P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	15	0.410	0.0150				
0.10 - 0.25	25	0.406	0.0167	44.00	0.0094	131.4	6.357
0.25 - 0.50	59	0.398	0.0237	38.98	0.0145	244.8	3.355
0.50 - 1.00	77	0.387	0.0156	22.08	0.0121	262.1	3.048
1.00 - 2.00	93	0.374	0.0095	29.03	0.0067	357.2	2.159
2.00 - 4.00	157	0.351	0.0081	43.95	0.0045	214.2	3.414
4.00 - 8.00	194	0.324	0.0051	39.18	0.0031	322.2	2.101
8.00 - 0.25	140	0.344	0.0019				

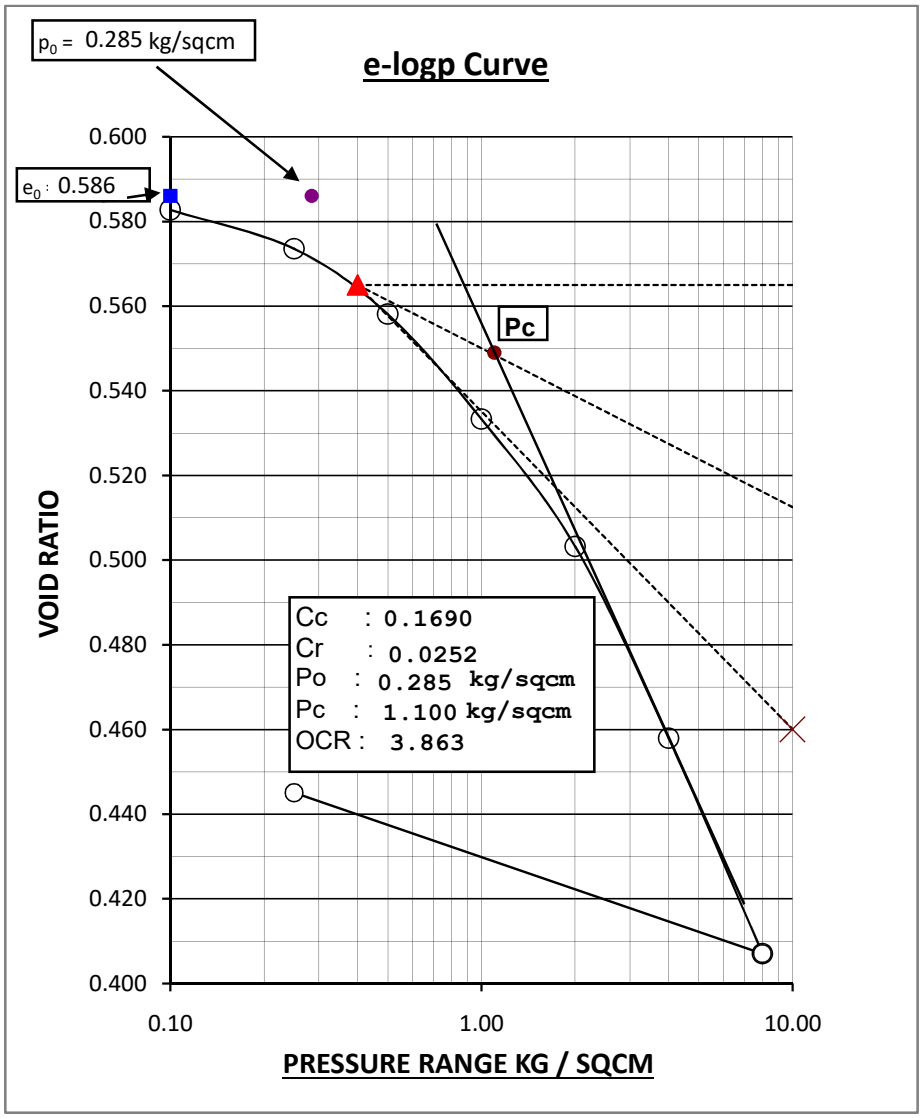


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CONSOLIDATION TEST RESULTS

Sample Number:BH-21/UDS-01 Depth :2.5-2.95 meters
Description :Brownish grey clayey silt.
Water content:Initial=23.4% Final =19% Initial Void Ratio =0.586

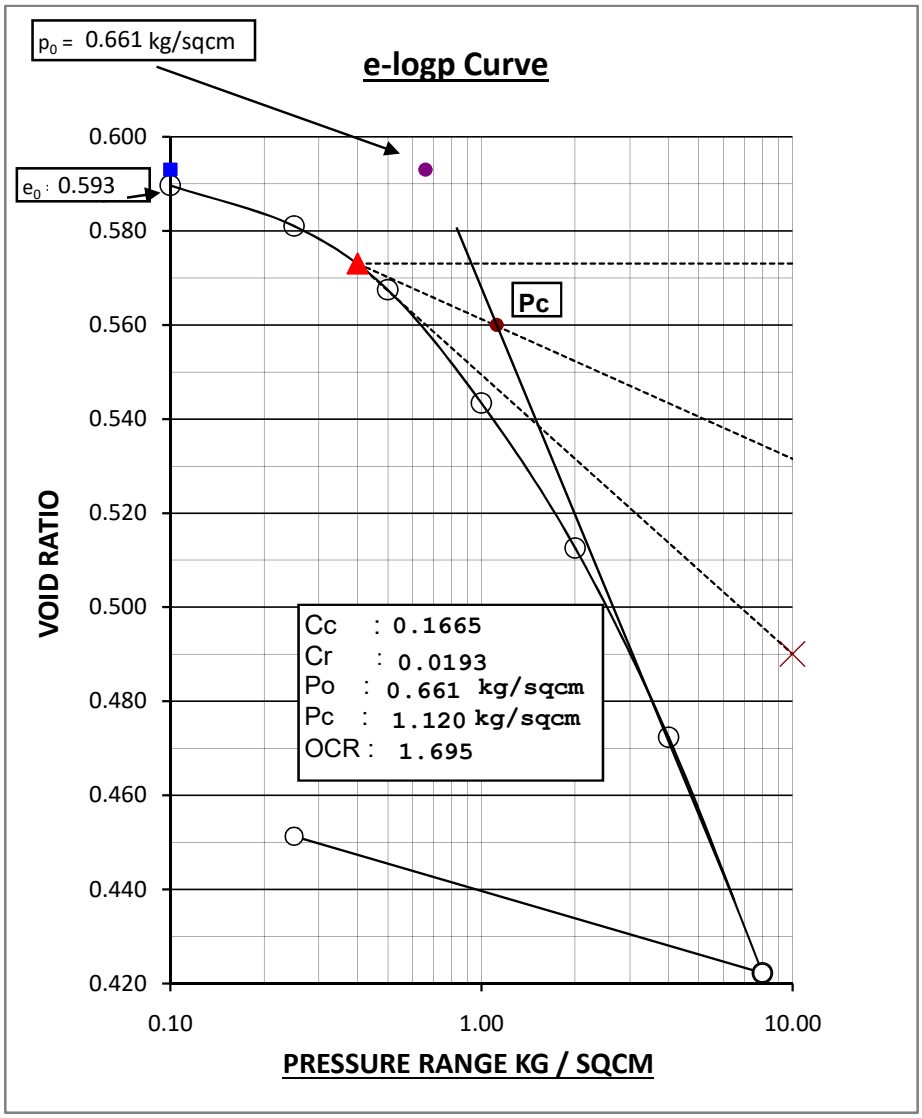
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	19	0.583	0.0190				
0.10 - 0.25	58	0.574	0.0388	29.31	0.0275	192.2	4.304
0.25 - 0.50	97	0.558	0.0392	20.62	0.0311	176.6	4.539
0.50 - 1.00	156	0.533	0.0318	21.15	0.0251	240.0	3.169
1.00 - 2.00	189	0.503	0.0196	19.58	0.0158	230.2	3.067
2.00 - 4.00	285	0.458	0.0151	17.89	0.0124	226.6	2.801
4.00 - 8.00	320	0.407	0.0087	16.88	0.0073	157.3	3.490
8.00 - 0.25	239	0.445	0.0035				



CONSOLIDATION TEST RESULTS

Sample Number:BH-22/UDS-02 Depth :5.5-5.95 meters
Description :Brownish grey clayey silt with traces of kankars.
Water content:Initial=22.4% Final =18.8% Initial Void Ratio =0.593

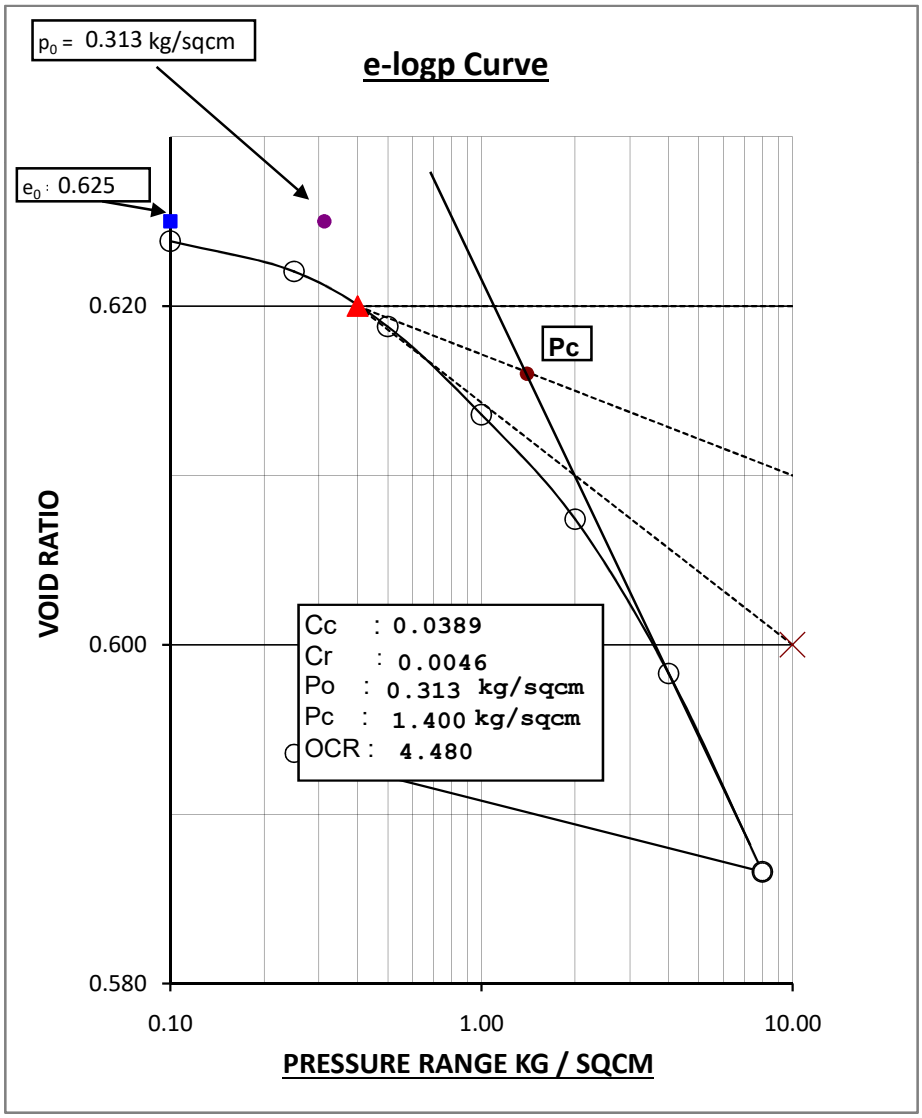
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	19	0.590	0.0190				
0.10 - 0.25	54	0.581	0.0361	14.81	0.0308	203.1	4.081
0.25 - 0.50	85	0.567	0.0343	11.76	0.0303	218.2	3.693
0.50 - 1.00	151	0.543	0.0308	17.22	0.0255	146.0	5.255
1.00 - 2.00	193	0.513	0.0200	15.03	0.0170	228.6	3.118
2.00 - 4.00	252	0.472	0.0133	13.89	0.0114	348.6	1.851
4.00 - 8.00	314	0.422	0.0085	16.56	0.0071	201.8	2.796
8.00 - 0.25	182	0.451	0.0026				



CONSOLIDATION TEST RESULTS

Sample Number:BH-23/UDS-01 Depth :2.5-2.95 meters
Description :Yellowish grey clayey silt.
Water content:Initial=24% Final =18.8% Initial Void Ratio =0.625

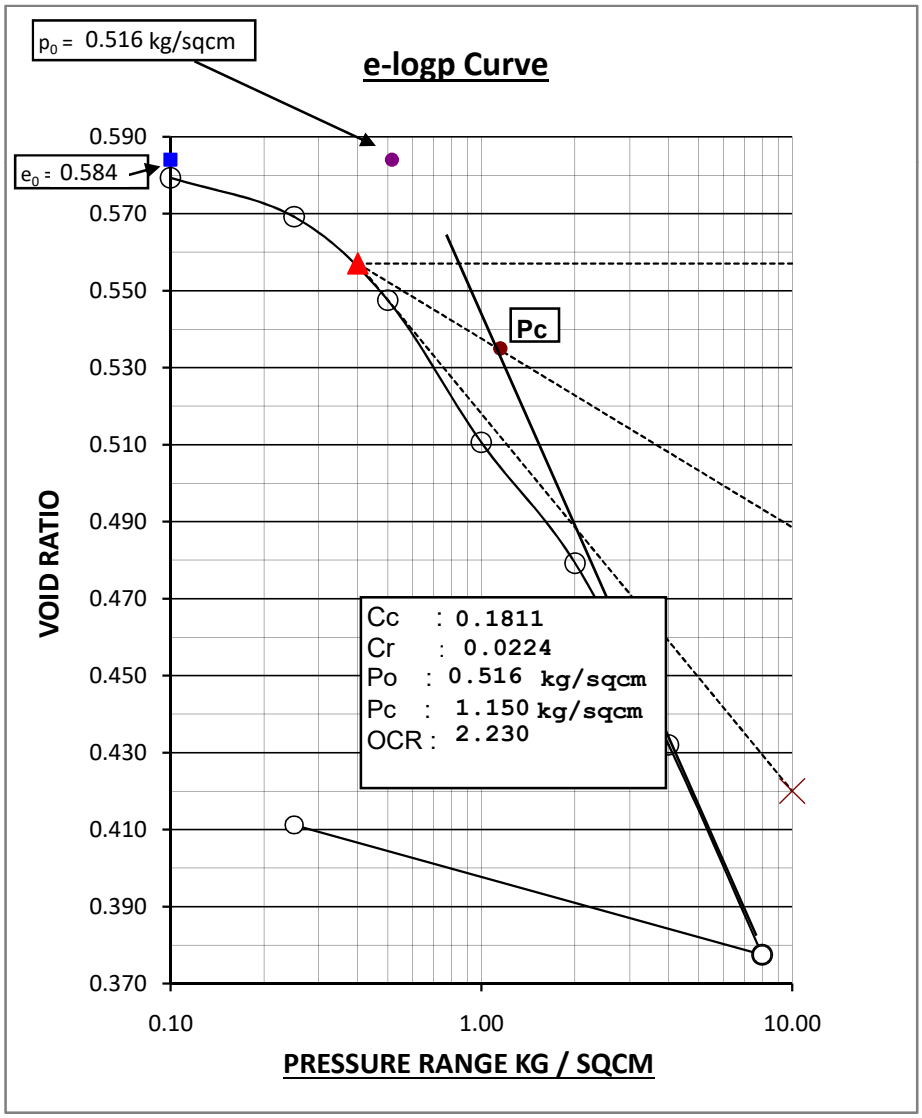
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	7	0.624	0.0070				
0.10 - 0.25	11	0.622	0.0073	27.27	0.0053	223.5	3.771
0.25 - 0.50	20	0.619	0.0080	20.00	0.0064	209.9	3.990
0.50 - 1.00	32	0.614	0.0064	34.38	0.0042	176.6	4.693
1.00 - 2.00	38	0.607	0.0038	27.90	0.0028	166.4	4.910
2.00 - 4.00	56	0.598	0.0028	20.70	0.0022	194.0	4.131
4.00 - 8.00	72	0.587	0.0018	19.44	0.0015	172.2	4.533
8.00 - 0.25	43	0.594	0.0006				



CONSOLIDATION TEST RESULTS

Sample Number:BH-24/UDS-02 Depth :5.5-5.95 meters
Description :Brownish grey clayey silt with traces of kankars.
Water content:Initial=23.2% Final =17.1% Initial Void Ratio =0.584

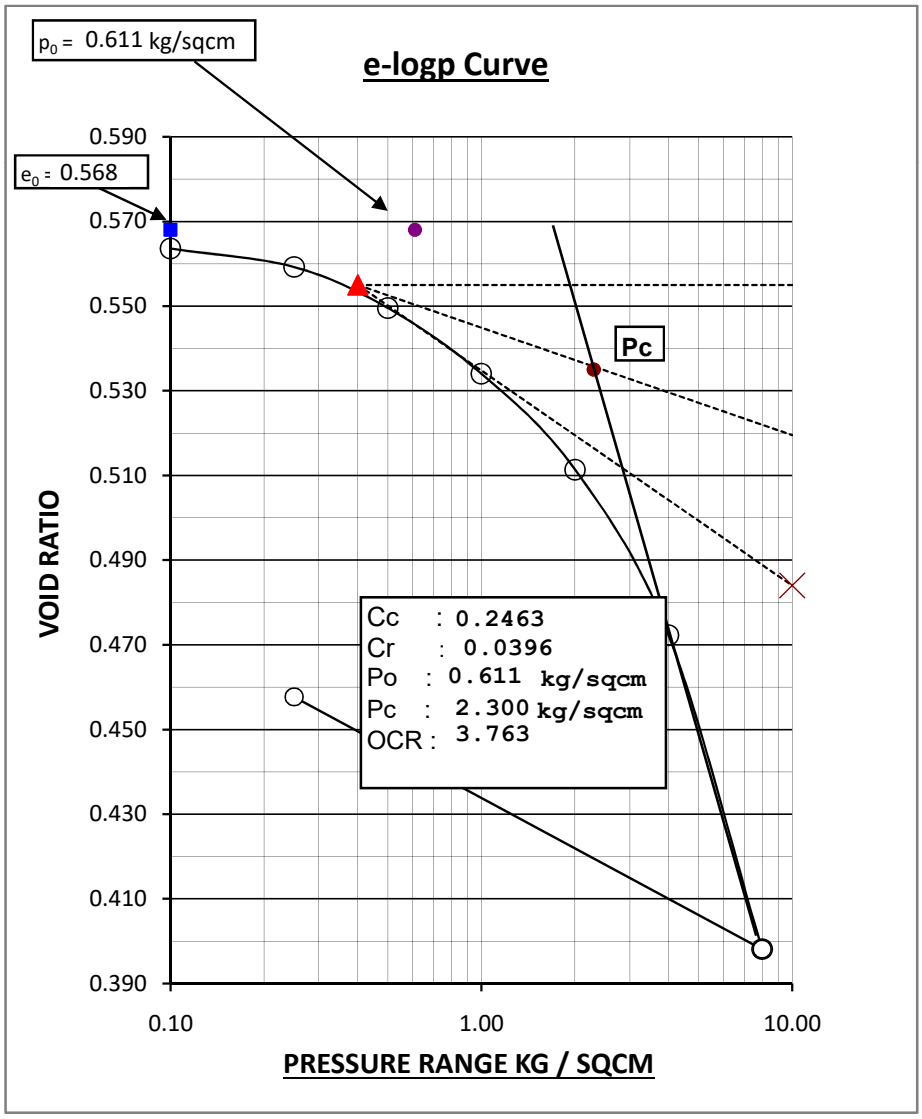
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	27	0.579	0.0270				
0.10 - 0.25	64	0.569	0.0428	25.60	0.0318	399.4	2.071
0.25 - 0.50	137	0.547	0.0553	23.90	0.0421	288.2	2.754
0.50 - 1.00	233	0.511	0.0477	33.48	0.0317	202.5	3.626
1.00 - 2.00	198	0.479	0.0208	22.10	0.0162	130.2	5.129
2.00 - 4.00	298	0.432	0.0160	22.80	0.0123	108.6	5.481
4.00 - 8.00	344	0.377	0.0095	14.83	0.0081	164.2	3.091
8.00 - 0.25	213	0.411	0.0032				



CONSOLIDATION TEST RESULTS

Sample Number:BH-25/UDS-02 Depth :5.5-5.95 meters
Description :Brownish grey, silty clay/ clayey silt with sand mixture.
Water content:Initial=20% Final =22.3% Initial Void Ratio =0.568

P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	10	0.564	0.0100				
0.10 - 0.25	28	0.559	0.0187	40.20	0.0112	234.2	3.590
0.25 - 0.50	62	0.549	0.0249	28.70	0.0177	185.3	4.456
0.50 - 1.00	99	0.534	0.0200	38.60	0.0123	201.1	3.973
1.00 - 2.00	145	0.511	0.0148	27.80	0.0107	195.9	3.876
2.00 - 4.00	250	0.472	0.0129	29.60	0.0091	165.2	4.221
4.00 - 8.00	474	0.398	0.0126	35.10	0.0082	266.1	2.219
8.00 - 0.25	381	0.458	0.0055				

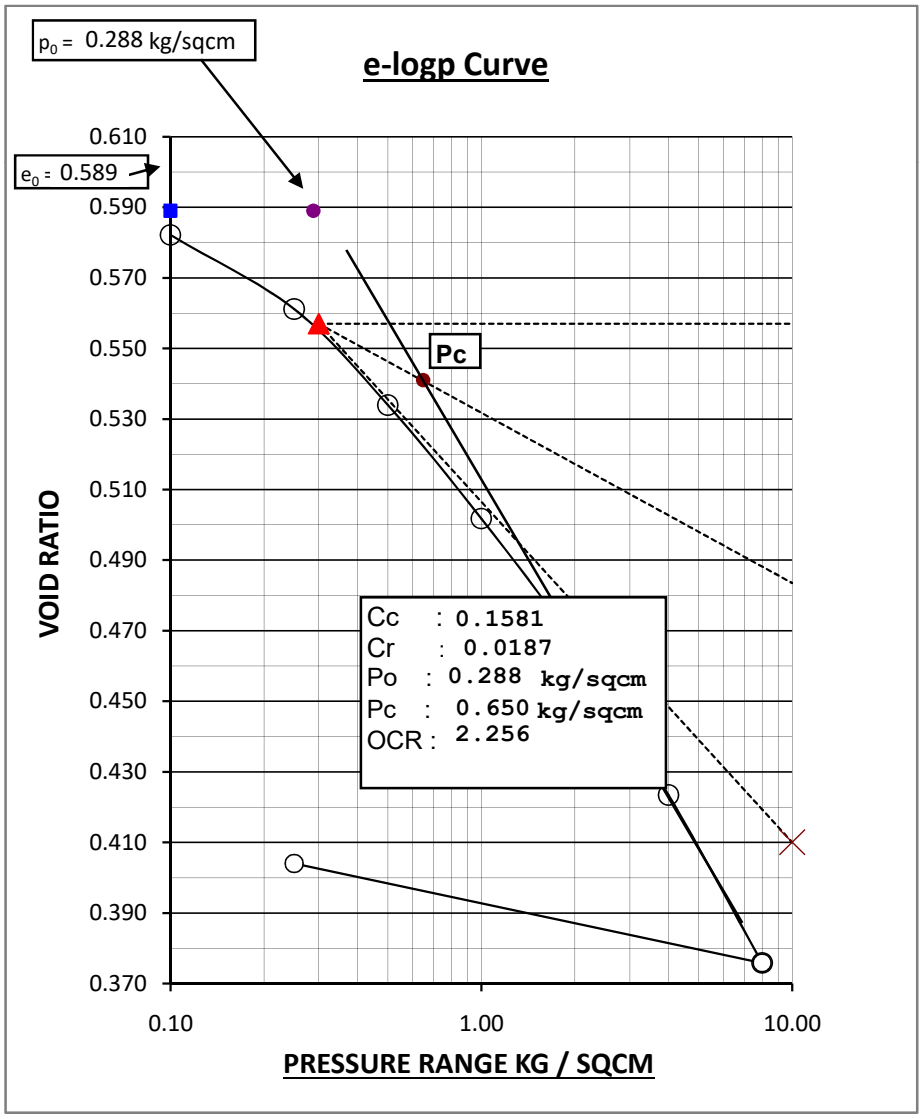


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CONSOLIDATION TEST RESULTS

Sample Number:BH-26/UDS-01 Depth :2.5-2.95 meters
Description :Brownish grey clayey silt with traces of kankars.
Water content:Initial=25.8% Final =18.8% Initial Void Ratio =0.589

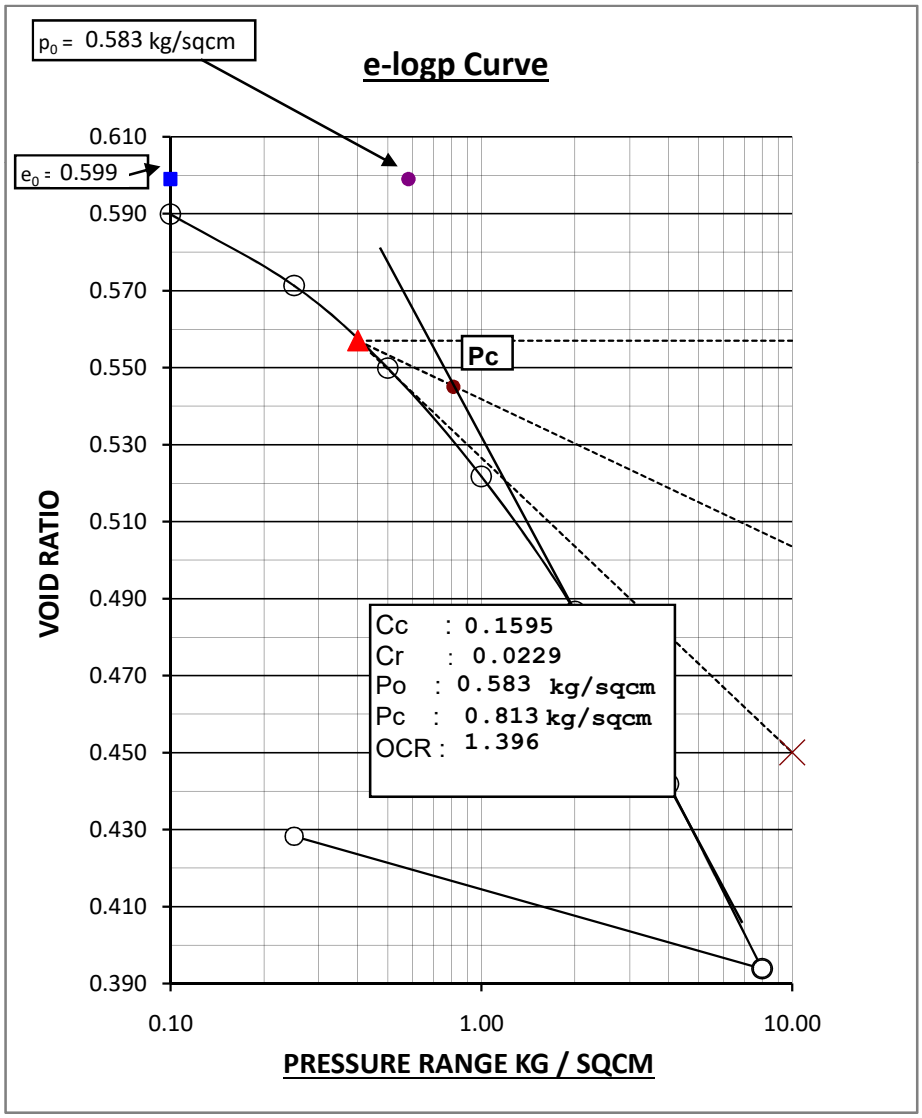
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	46	0.582	0.0461				
0.10 - 0.25	132	0.561	0.0886	16.80	0.0737	308.1	2.622
0.25 - 0.50	171	0.534	0.0698	25.80	0.0518	260.0	2.917
0.50 - 1.00	202	0.502	0.0419	18.75	0.0341	275.5	2.540
1.00 - 2.00	224	0.466	0.0237	15.90	0.0200	185.9	3.420
2.00 - 4.00	268	0.423	0.0146	13.43	0.0126	353.4	1.600
4.00 - 8.00	299	0.376	0.0084	14.72	0.0071	228.2	2.146
8.00 - 0.25	177	0.404	0.0026				



CONSOLIDATION TEST RESULTS

Sample Number:BH-27/UDS-02 Depth :5.5-5.95 meters
Description :Brownish grey clayey silt
Water content:Initial=24.6% Final =18.8% Initial Void Ratio =0.599

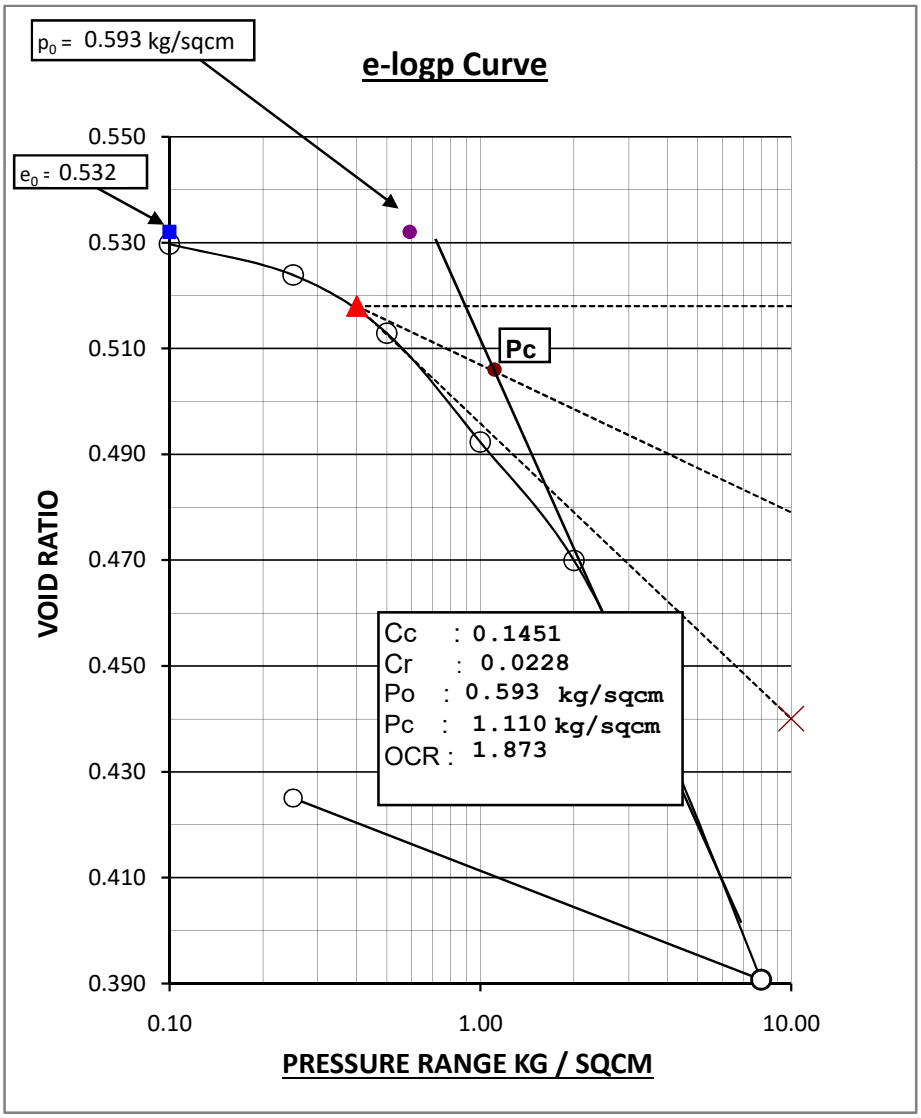
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	57	0.590	0.0571				
0.10 - 0.25	116	0.571	0.0778	12.07	0.0685	470.4	1.718
0.25 - 0.50	134	0.550	0.0546	16.70	0.0455	198.7	3.860
0.50 - 1.00	176	0.522	0.0363	11.36	0.0322	285.5	2.515
1.00 - 2.00	219	0.487	0.0230	23.29	0.0177	299.1	2.199
2.00 - 4.00	280	0.442	0.0151	20.36	0.0120	339.3	1.725
4.00 - 8.00	300	0.394	0.0083	18.00	0.0068	249.4	2.030
8.00 - 0.25	215	0.428	0.0032				



CONSOLIDATION TEST RESULTS

Sample Number:BH-28/UDS-02 Depth :5.5-5.95 meters
Description :Brownish grey clayey silt
Water content:Initial=21.3% Final =19.1% Initial Void Ratio =0.532

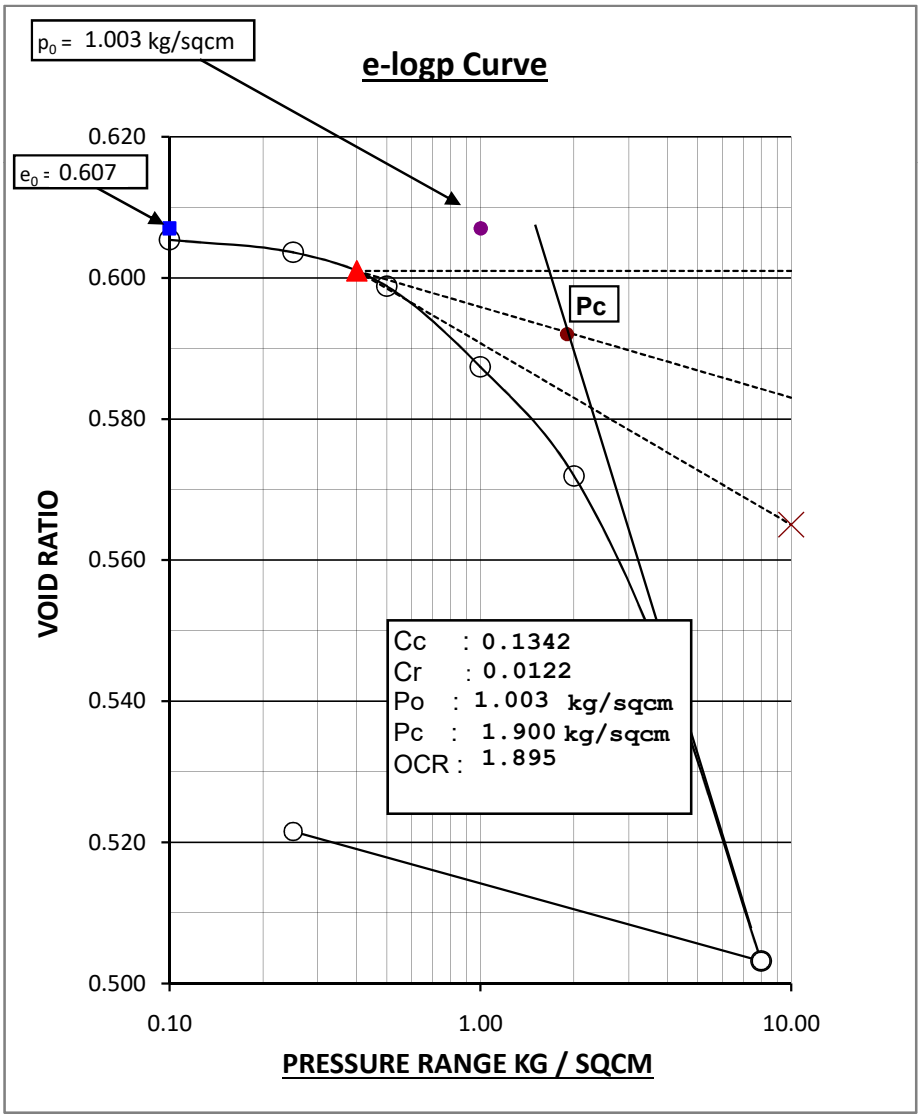
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	12	0.530	0.0120				
0.10 - 0.25	38	0.524	0.0254	13.16	0.0220	525.7	1.591
0.25 - 0.50	72	0.513	0.0290	23.61	0.0221	576.6	1.419
0.50 - 1.00	134	0.492	0.0271	50.00	0.0136	146.0	5.370
1.00 - 2.00	146	0.470	0.0150	23.13	0.0115	298.4	2.477
2.00 - 4.00	232	0.434	0.0121	33.19	0.0081	306.5	2.220
4.00 - 8.00	285	0.391	0.0076	34.39	0.0050	378.0	1.598
8.00 - 0.25	224	0.425	0.0032				



CONSOLIDATION TEST RESULTS

Sample Number:BH-29/UDS-03 Depth :8.5-8.95 meters
Description :Yellowish grey clayey silt.
Water content:Initial=21.9% Final =18.2% Initial Void Ratio =0.607

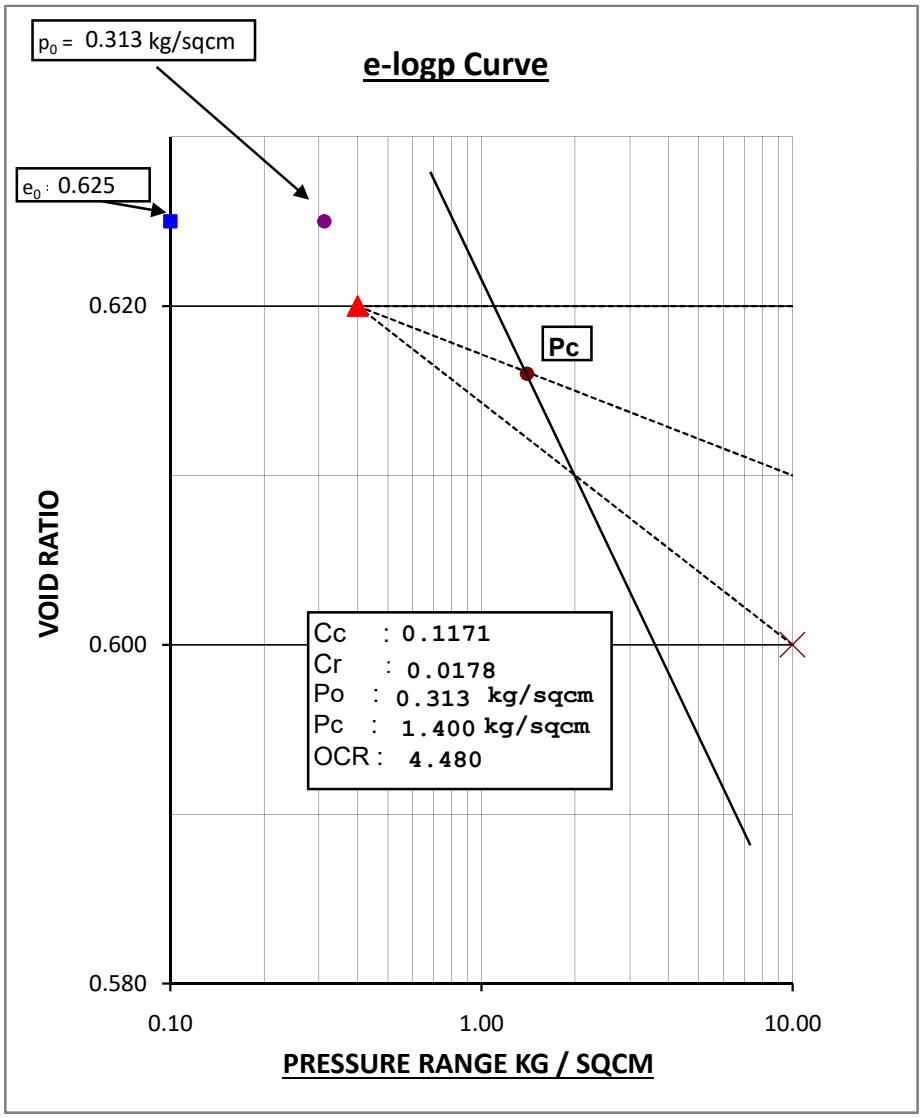
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	8	0.605	0.0080				
0.10 - 0.25	11	0.604	0.0074	18.18	0.0060	283.5	2.964
0.25 - 0.50	30	0.599	0.0120	13.33	0.0104	339.9	2.452
0.50 - 1.00	71	0.587	0.0143	18.50	0.0117	511.6	1.596
1.00 - 2.00	96	0.572	0.0097	18.30	0.0080	259.6	3.039
2.00 - 4.00	176	0.544	0.0090	16.48	0.0075	430.9	1.729
4.00 - 8.00	251	0.503	0.0065	17.53	0.0054	301.1	2.254
8.00 - 0.25	114	0.522	0.0016				



CONSOLIDATION TEST RESULTS

Sample Number:BH-30/UDS-04 Depth :11.5-11.95 meters
Description :Brownish grey clayey silt with traces of rock pieces.
Water content:Initial=20.4% Final =16.9% Initial Void Ratio =0.52

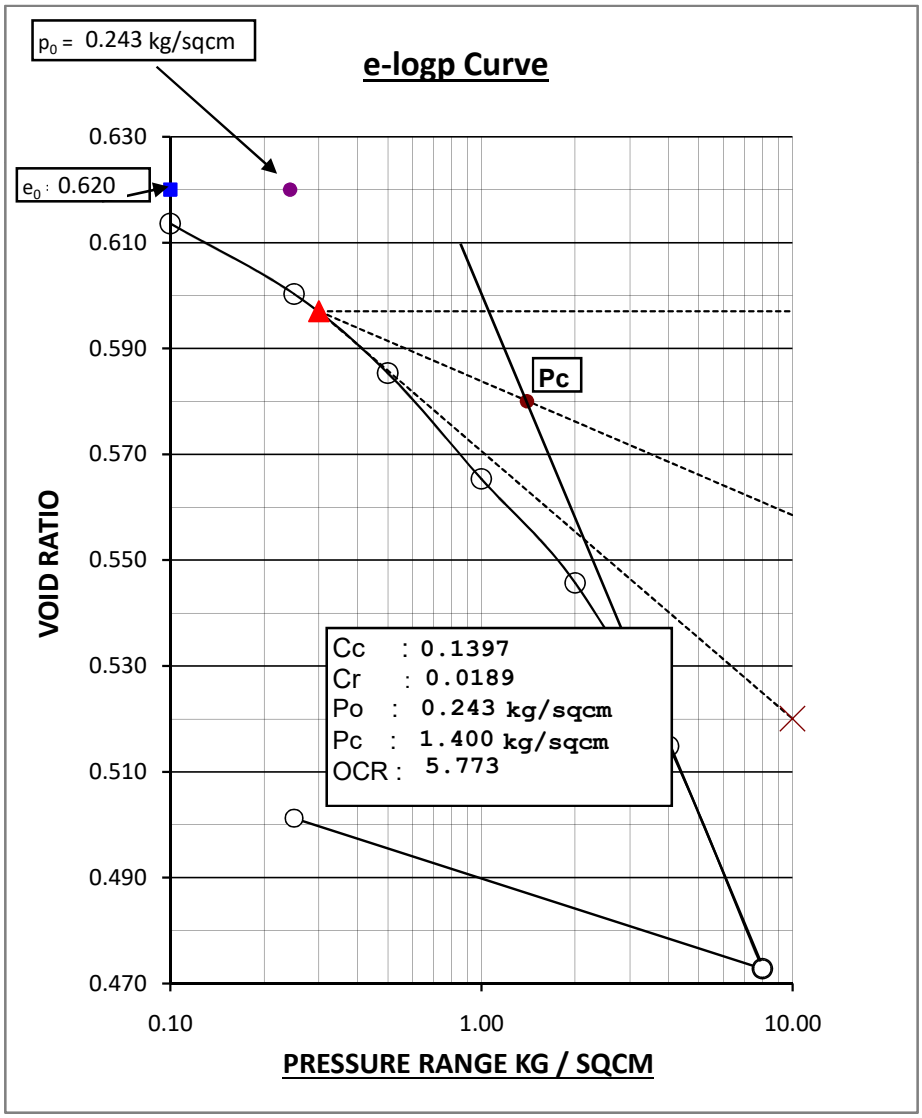
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	-95	0.534	-0.0950				
0.10 - 0.25	18	0.531	0.0119	16.67	0.0099	147.0	5.967
0.25 - 0.50	34	0.526	0.0135	20.59	0.0107	188.4	4.608
0.50 - 1.00	78	0.514	0.0155	17.95	0.0127	215.0	3.949
1.00 - 2.00	96	0.500	0.0096	18.75	0.0078	285.1	2.875
2.00 - 4.00	186	0.471	0.0094	24.19	0.0071	142.3	5.436
4.00 - 8.00	232	0.436	0.0060	29.31	0.0042	342.7	2.064
8.00 - 0.25	176	0.463	0.0024				



CONSOLIDATION TEST RESULTS

Sample Number:BH-31/UDS-01 Depth :2.5-2.95 meters
Description :Light grey clayey silt with traces of calcareosu nodules.
Water content:Initial=24.8% Final =20.5% Initial Void Ratio =0.62

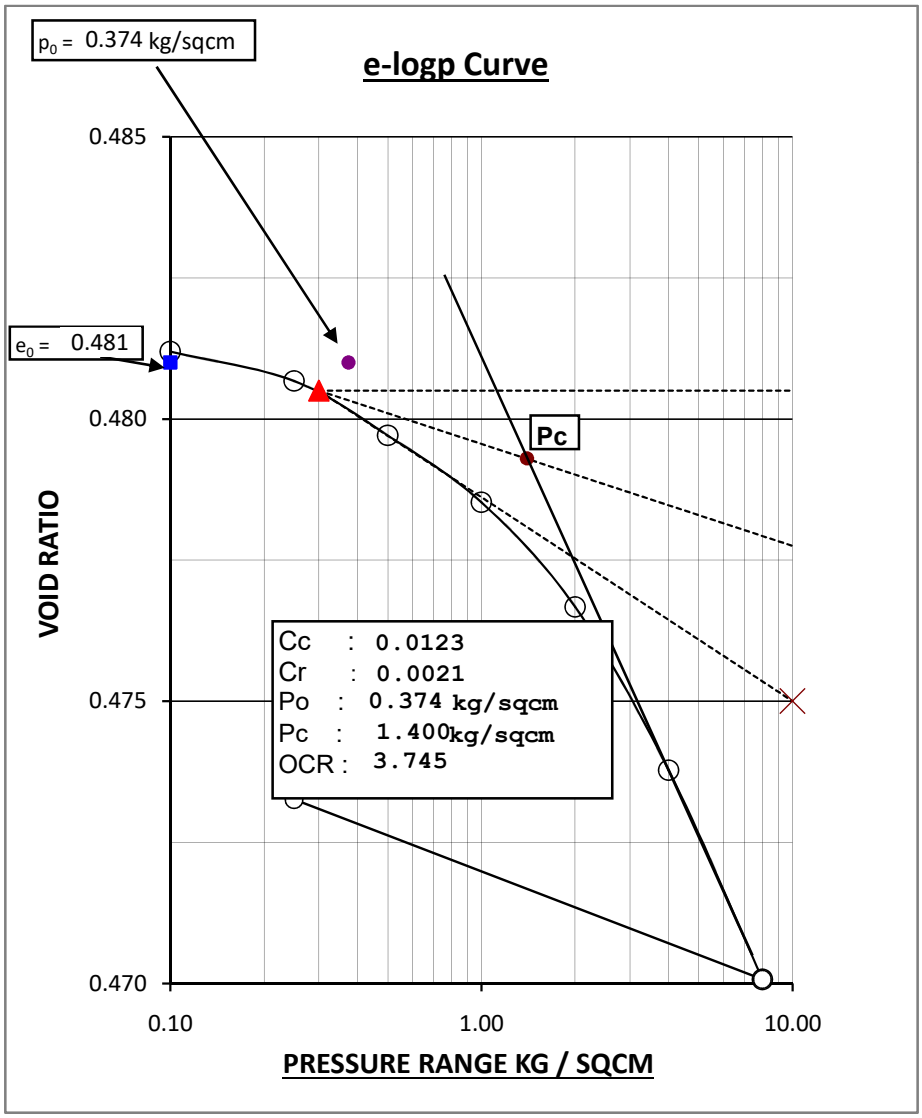
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	42	0.614	0.0421				
0.10 - 0.25	82	0.600	0.0550	29.27	0.0389	295.7	2.761
0.25 - 0.50	92	0.585	0.0373	28.26	0.0268	351.4	2.242
0.50 - 1.00	123	0.565	0.0252	56.10	0.0111	237.6	3.170
1.00 - 2.00	121	0.546	0.0126	34.71	0.0082	181.7	3.934
2.00 - 4.00	190	0.515	0.0100	40.00	0.0060	106.1	6.285
4.00 - 8.00	259	0.473	0.0069	33.59	0.0046	287.8	2.089
8.00 - 0.25	175	0.501	0.0025				



CONSOLIDATION TEST RESULTS

Sample Number:BH-32/UDS-01 Depth :2.95-3.4 meters
Description :Yellowish grey clayey silt with traces of kankars & calcareous nodul
Water content:Initial=19% Final =16.7% Initial Void Ratio =0.481

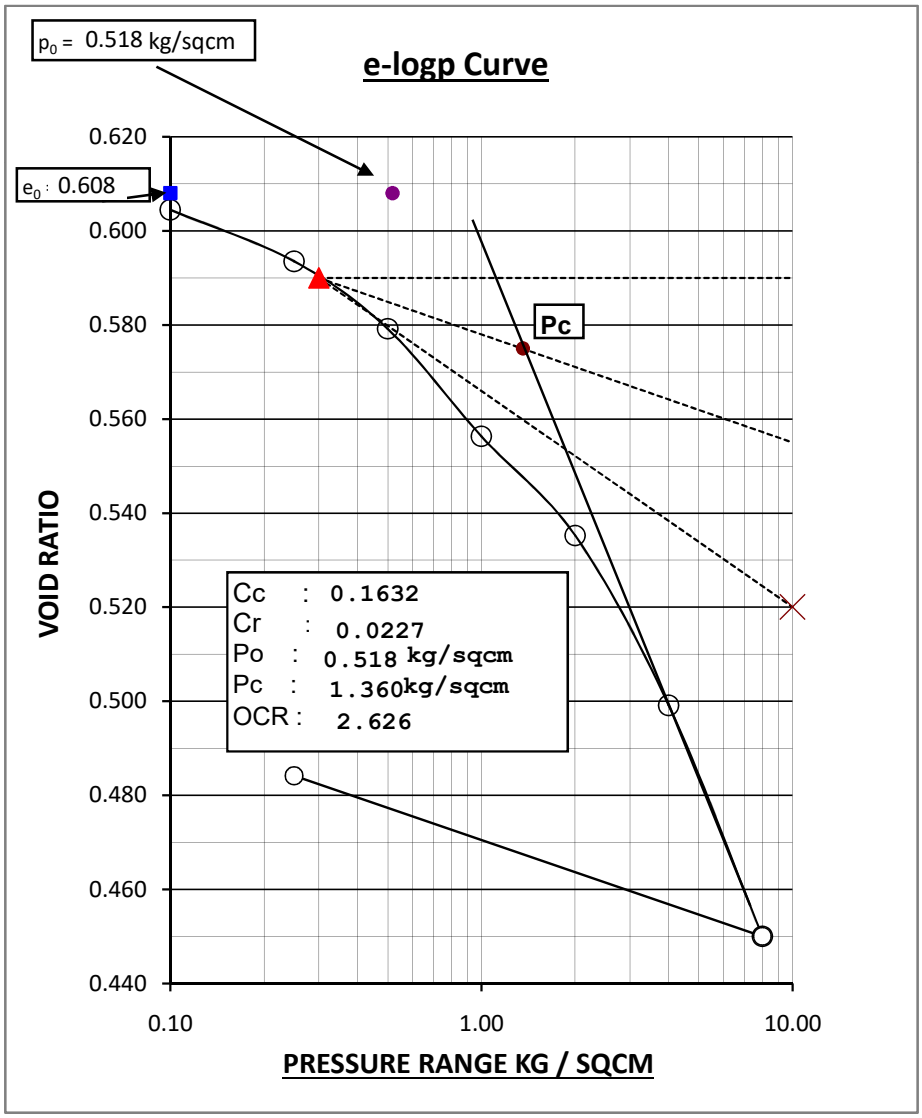
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	2	0.481	0.0010				
0.10 - 0.25	7	0.481	0.0023	28.57	0.0017	202.6	4.173
0.25 - 0.50	13	0.480	0.0026	30.77	0.0018	281.4	2.999
0.50 - 1.00	16	0.479	0.0016	31.25	0.0011	372.6	2.258
1.00 - 2.00	25	0.477	0.0013	20.00	0.0010	477.1	1.756
2.00 - 4.00	39	0.474	0.0010	25.64	0.0007	360.2	2.311
4.00 - 8.00	50	0.470	0.0006	20.00	0.0005	252.8	3.264
8.00 - 0.25	43	0.473	0.0003				



CONSOLIDATION TEST RESULTS

Sample Number:BH-33/UDS-02 Depth :5.5-5.95 meters
Description :Brownish grey clayey silt with traces of kankars.
Water content:Initial=22.5% Final =19.3% Initial Void Ratio =0.608

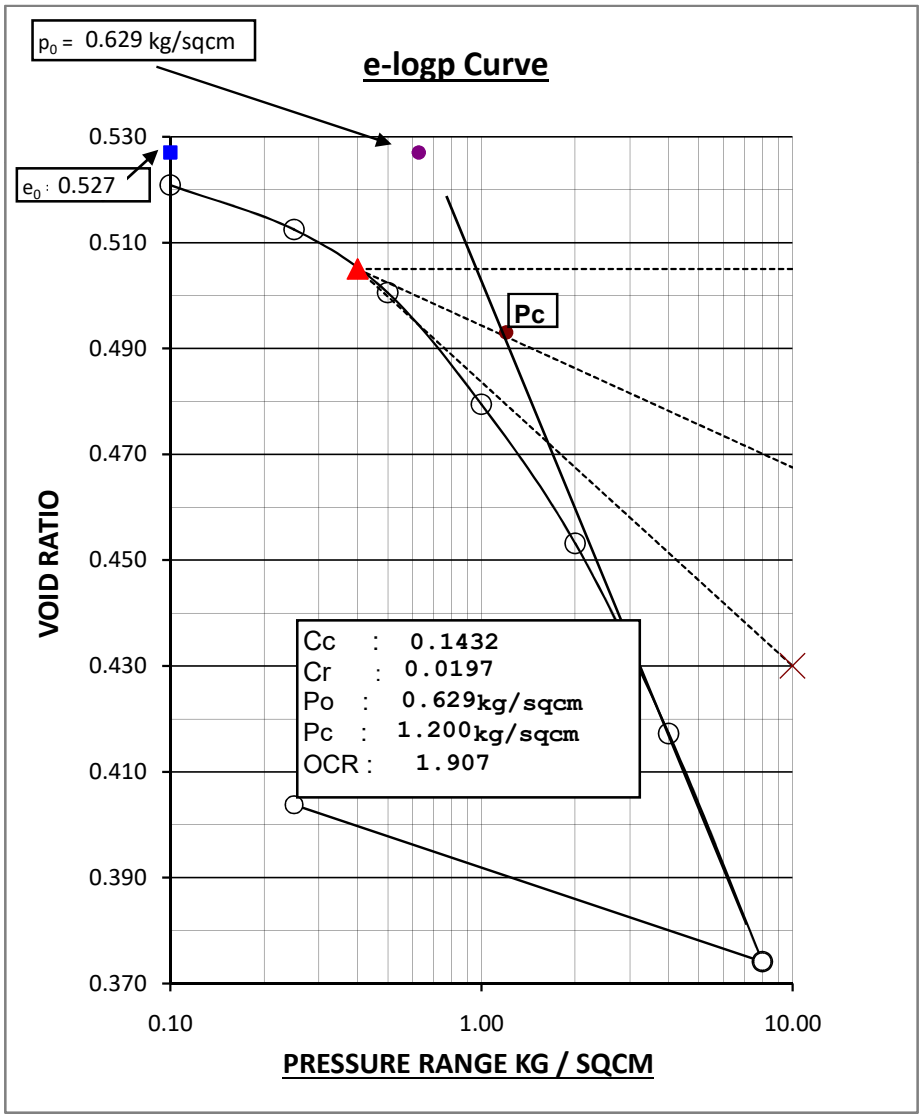
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	21	0.604	0.0210				
0.10 - 0.25	68	0.593	0.0455	39.71	0.0274	317.4	2.605
0.25 - 0.50	89	0.579	0.0360	32.58	0.0243	236.2	3.390
0.50 - 1.00	142	0.556	0.0290	37.32	0.0182	427.7	1.784
1.00 - 2.00	131	0.535	0.0136	24.43	0.0102	366.1	1.966
2.00 - 4.00	224	0.499	0.0117	24.55	0.0089	390.2	1.705
4.00 - 8.00	305	0.450	0.0082	20.66	0.0065	580.3	1.014
8.00 - 0.25	212	0.484	0.0030				



CONSOLIDATION TEST RESULTS

Sample Number:BH-34/UDS-02 Depth :5.5-5.95 meters
Description :Yellowish grey clayey silt
Water content:Initial=20% Final =16.6% Initial Void Ratio =0.527

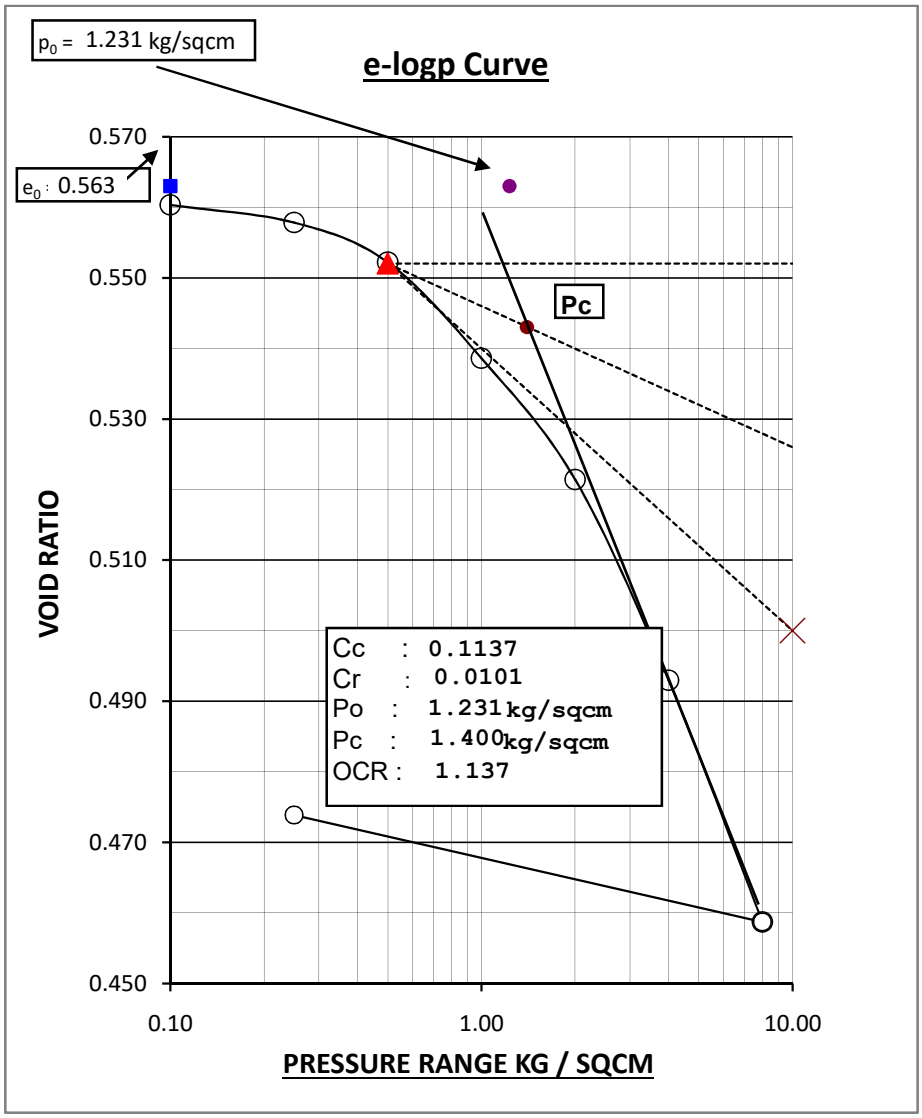
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	42	0.521	0.0420				
0.10 - 0.25	55	0.512	0.0369	23.64	0.0281	129.3	6.366
0.25 - 0.50	78	0.501	0.0315	19.23	0.0255	244.8	3.272
0.50 - 1.00	138	0.479	0.0281	25.36	0.0210	377.4	2.029
1.00 - 2.00	172	0.453	0.0178	26.16	0.0131	293.0	2.446
2.00 - 4.00	235	0.417	0.0124	18.72	0.0100	453.8	1.443
4.00 - 8.00	282	0.374	0.0076	24.47	0.0057	208.4	2.782
8.00 - 0.25	194	0.404	0.0028				



CONSOLIDATION TEST RESULTS

Sample Number:BH-35/UDS-04 Depth :11.5-11.95 meters
Description :Brownish grey clayey silt with traces of kankar.
Water content:Initial=22.5% Final =16.6% Initial Void Ratio =0.563

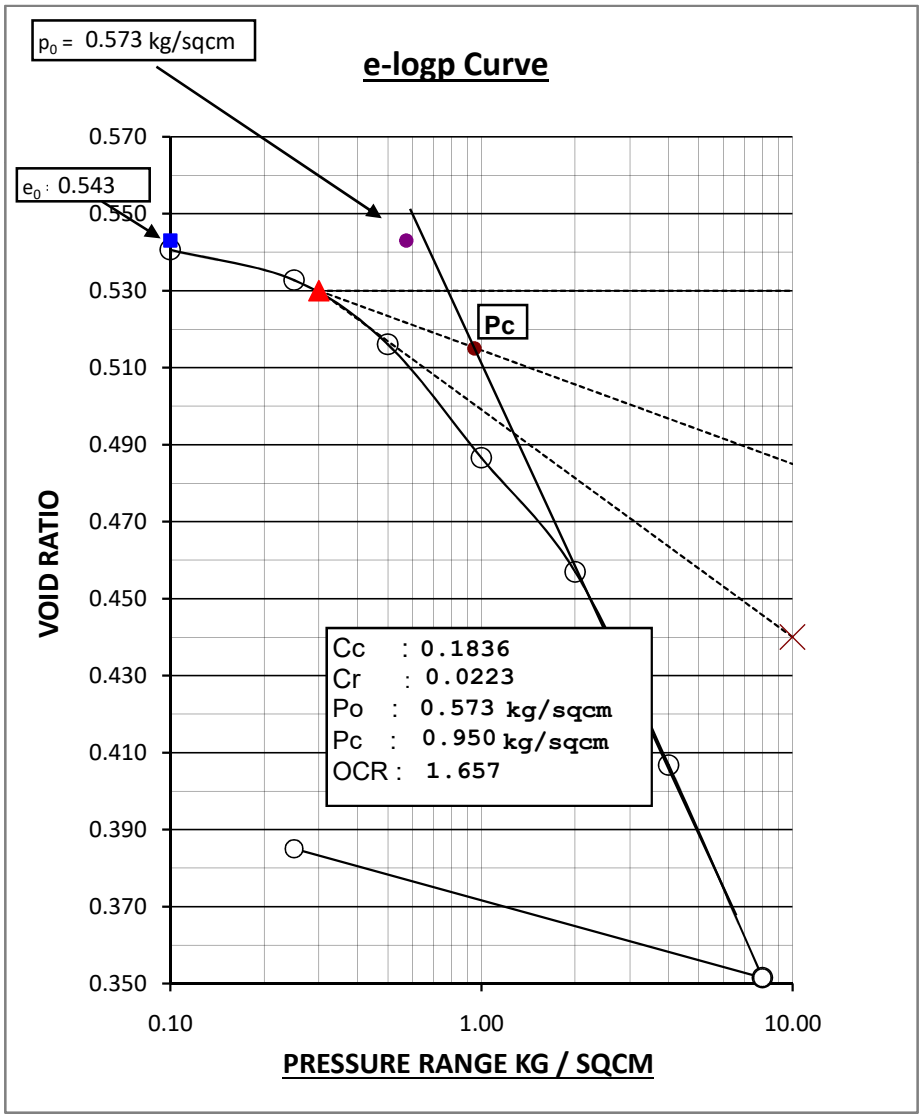
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	17	0.560	0.0170				
0.10 - 0.25	16	0.558	0.0107	31.25	0.0073	196.6	4.269
0.25 - 0.50	36	0.552	0.0145	22.80	0.0112	112.6	7.374
0.50 - 1.00	87	0.539	0.0175	15.70	0.0148	106.0	7.640
1.00 - 2.00	110	0.521	0.0112	19.10	0.0090	107.7	7.217
2.00 - 4.00	182	0.493	0.0094	13.74	0.0081	150.9	4.843
4.00 - 8.00	219	0.459	0.0057	18.72	0.0047	212.1	3.155
8.00 - 0.25	97	0.474	0.0013				



CONSOLIDATION TEST RESULTS

Sample Number:BH-36/UDS-02 Depth :5.5-5.95 meters
Description :Brownish grey clayey silt with traces of kankars
Water content:Initial=23.9% Final =18.9% Initial Void Ratio =0.543

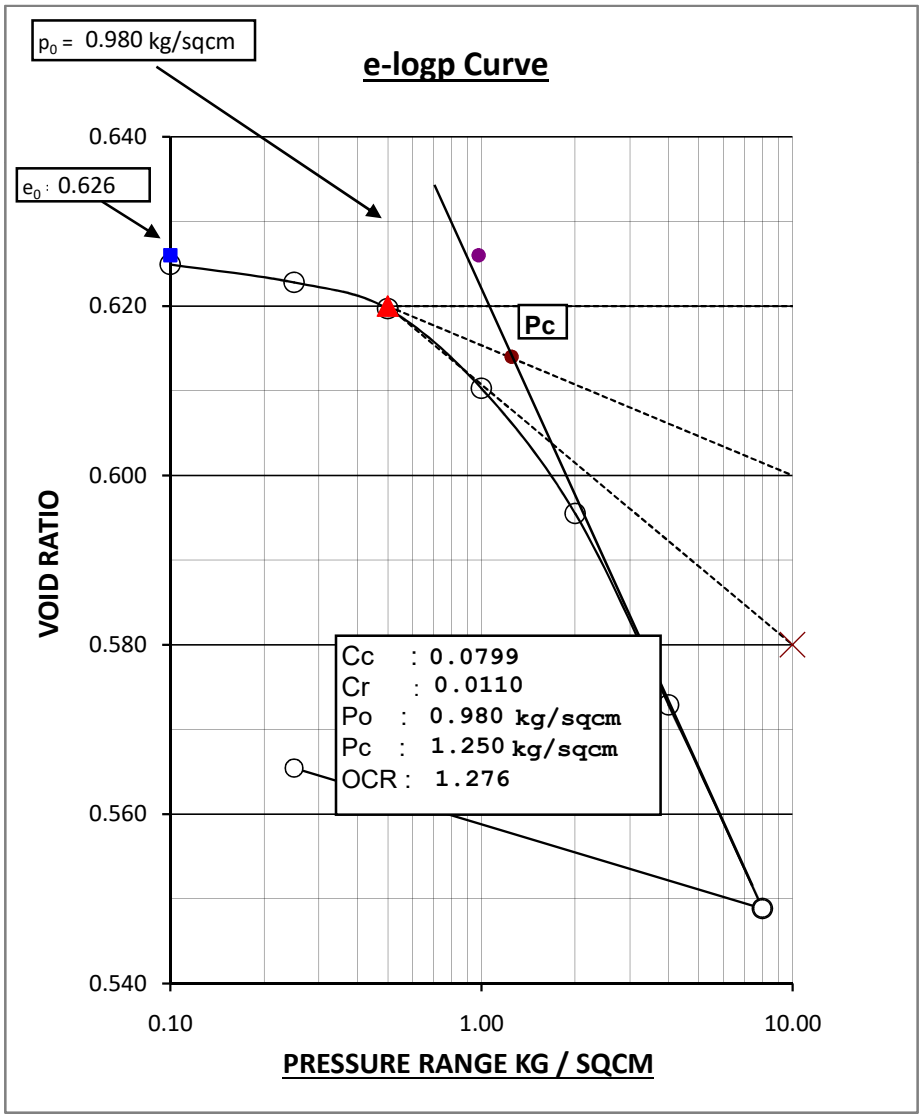
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	15	0.541	0.0150				
0.10 - 0.25	51	0.533	0.0341	17.65	0.0281	536.4	1.554
0.25 - 0.50	108	0.516	0.0435	11.11	0.0387	252.8	3.191
0.50 - 1.00	191	0.487	0.0389	23.96	0.0296	133.2	5.691
1.00 - 2.00	192	0.457	0.0199	11.52	0.0176	258.6	2.699
2.00 - 4.00	325	0.407	0.0172	12.92	0.0150	287.8	2.157
4.00 - 8.00	358	0.351	0.0098	15.64	0.0083	188.9	2.782
8.00 - 0.25	217	0.385	0.0032				



CONSOLIDATION TEST RESULTS

Sample Number:BH-37/UDS-03 Depth :8.5-8.95 meters
Description :Brownish grey clayey silt with traces of sand.
Water content:Initial=22.7% Final =19.2% Initial Void Ratio =0.626

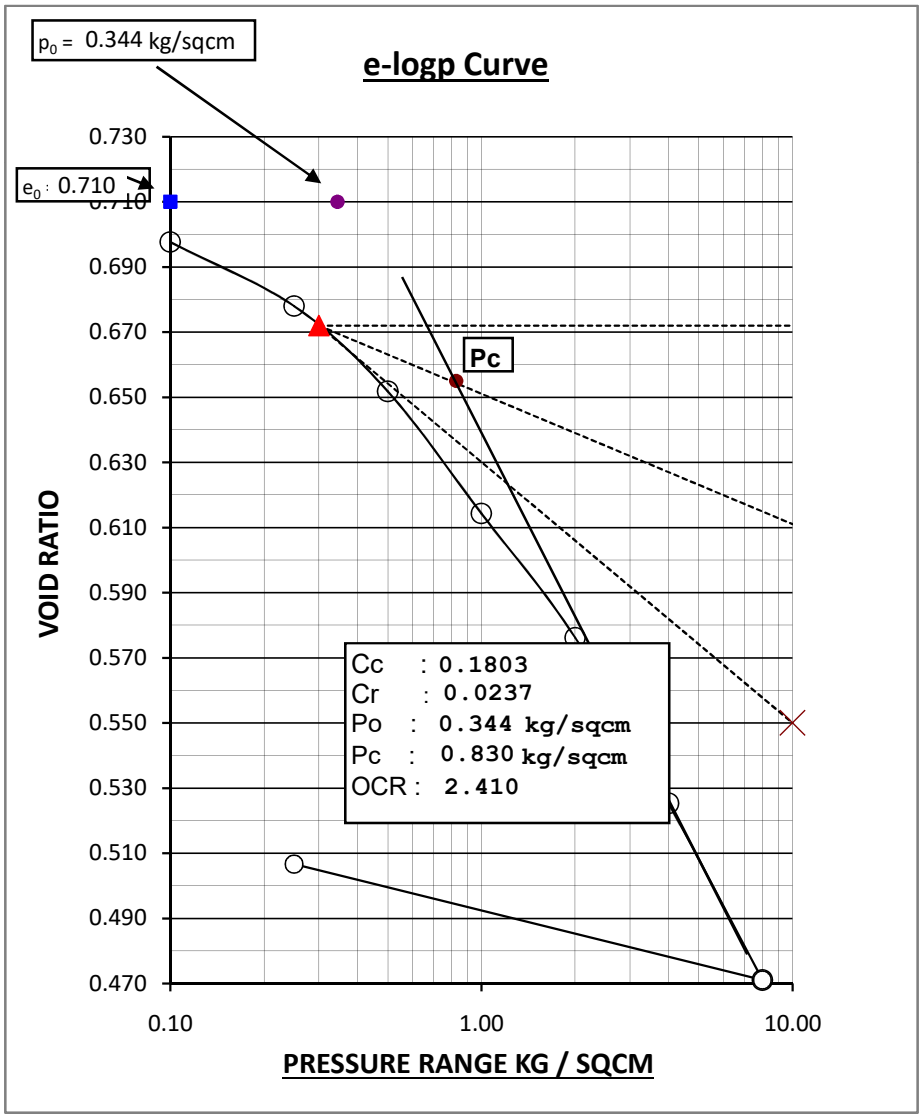
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	6	0.625	0.0060				
0.10 - 0.25	13	0.623	0.0087	23.08	0.0067	369.0	2.289
0.25 - 0.50	19	0.620	0.0076	20.60	0.0060	272.7	3.077
0.50 - 1.00	58	0.610	0.0116	31.03	0.0080	375.0	2.203
1.00 - 2.00	91	0.595	0.0092	20.88	0.0073	106.1	7.552
2.00 - 4.00	139	0.573	0.0071	27.34	0.0051	290.8	2.627
4.00 - 8.00	148	0.549	0.0038	37.16	0.0024	307.9	2.334
8.00 - 0.25	102	0.565	0.0014				



CONSOLIDATION TEST RESULTS

Sample Number:BH-38/UDS-01 Depth :2.5-2.95 meters
Description :Deep grey clayey silt.
Water content:Initial=28% Final =19.9% Initial Void Ratio =0.71

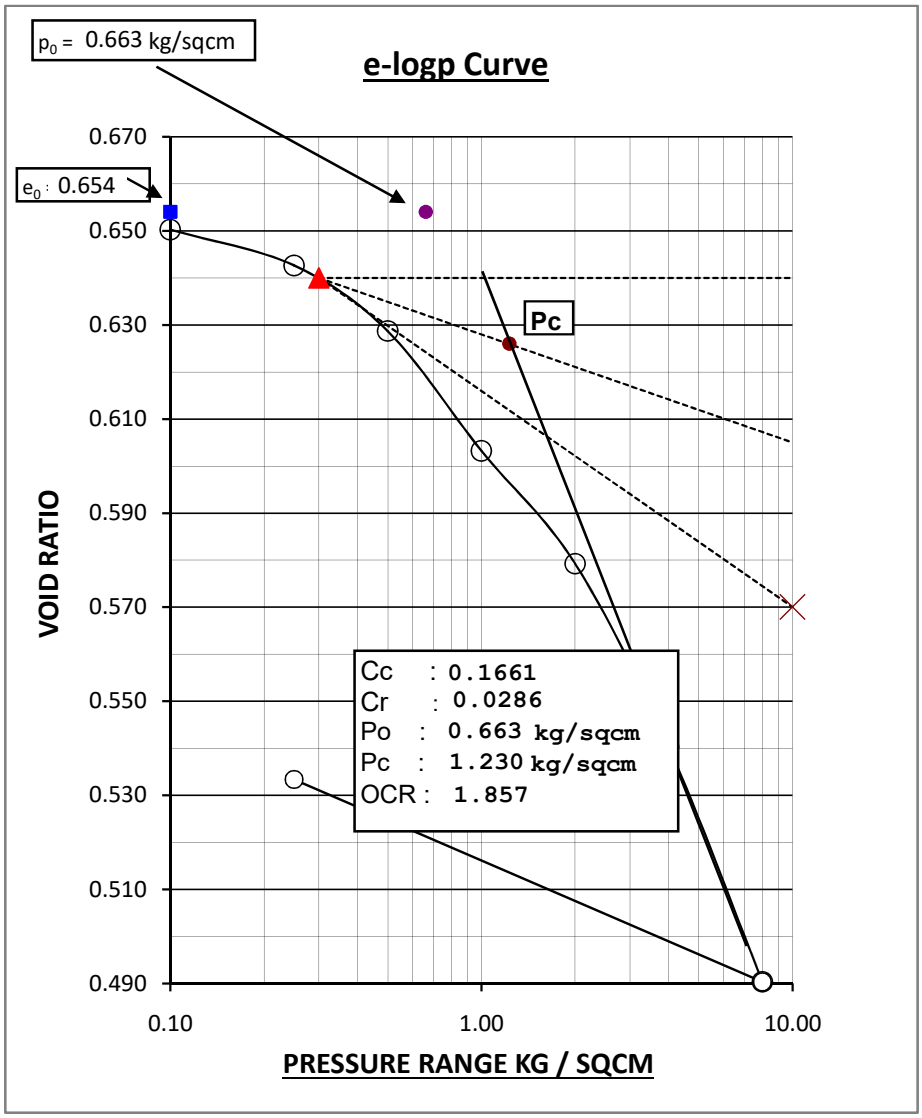
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	73	0.698	0.0731				
0.10 - 0.25	115	0.678	0.0773	12.17	0.0679	104.2	7.705
0.25 - 0.50	153	0.652	0.0624	19.20	0.0504	166.2	4.568
0.50 - 1.00	219	0.614	0.0454	14.16	0.0390	153.4	4.568
1.00 - 2.00	223	0.576	0.0236	13.45	0.0205	128.9	4.920
2.00 - 4.00	297	0.525	0.0161	16.50	0.0135	294.0	1.906
4.00 - 8.00	317	0.471	0.0089	18.93	0.0072	194.0	2.468
8.00 - 0.25	208	0.507	0.0031				



CONSOLIDATION TEST RESULTS

Sample Number:BH-39/UDS-02 Depth :5.5-5.95 meters
Description :Brownish grey clayey silt.
Water content:Initial=24% Final =21.7% Initial Void Ratio =0.654

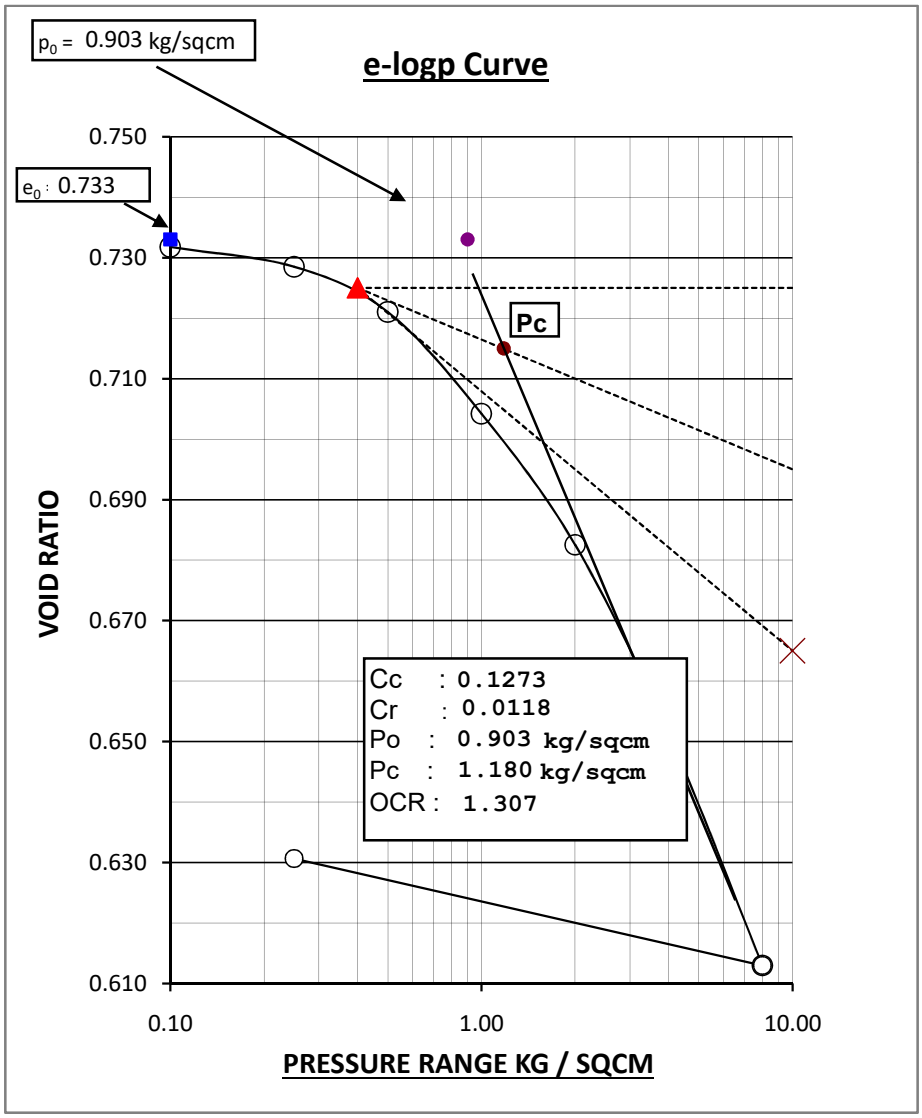
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	24	0.650	0.0240				
0.10 - 0.25	46	0.643	0.0308	34.78	0.0201	267.1	3.111
0.25 - 0.50	84	0.629	0.0339	26.19	0.0250	147.9	5.473
0.50 - 1.00	154	0.603	0.0313	53.90	0.0144	232.9	3.309
1.00 - 2.00	145	0.579	0.0150	24.14	0.0114	366.1	1.975
2.00 - 4.00	235	0.540	0.0123	29.79	0.0086	320.2	2.076
4.00 - 8.00	302	0.490	0.0081	30.46	0.0056	447.2	1.311
8.00 - 0.25	260	0.533	0.0037				



CONSOLIDATION TEST RESULTS

Sample Number:BH-40/UDS-03 Depth :-0.45 meters
Description :Brownish grey clayey silt with traces of sand mixture.
Water content:Initial=28.1% Final =19.9% Initial Void Ratio =0.733

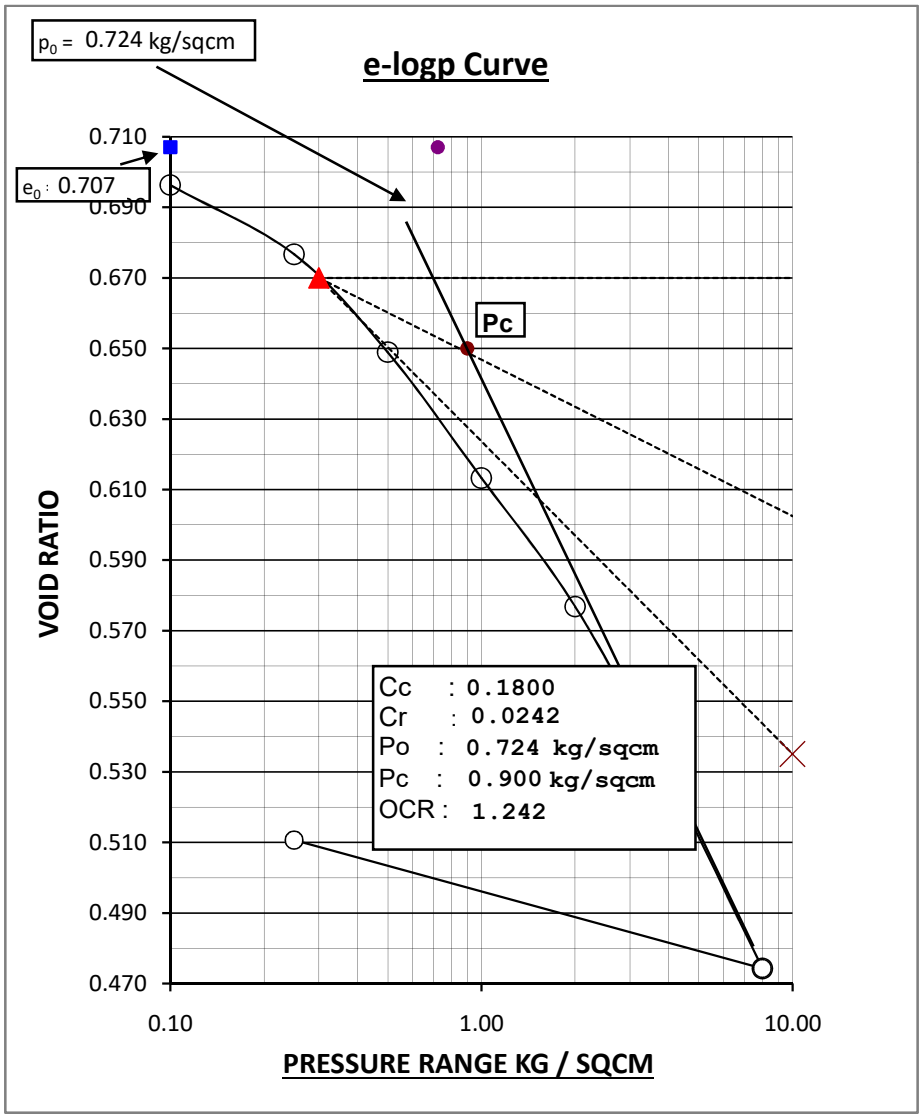
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	8	0.732	0.0080				
0.10 - 0.25	19	0.728	0.0127	15.79	0.0107	292.3	2.877
0.25 - 0.50	43	0.721	0.0173	14.70	0.0147	360.0	2.307
0.50 - 1.00	97	0.704	0.0195	15.20	0.0166	427.7	1.887
1.00 - 2.00	125	0.683	0.0127	10.40	0.0114	580.3	1.329
2.00 - 4.00	180	0.651	0.0093	13.33	0.0080	328.5	2.199
4.00 - 8.00	221	0.613	0.0058	23.08	0.0045	290.4	2.276
8.00 - 0.25	102	0.631	0.0014				



CONSOLIDATION TEST RESULTS

Sample Number:BH-41/UDS-02 Depth :5.5-5.95 meters
Description :Brownish grey clayey silt.
Water content:Initial=27.6% Final =20.5% Initial Void Ratio =0.707

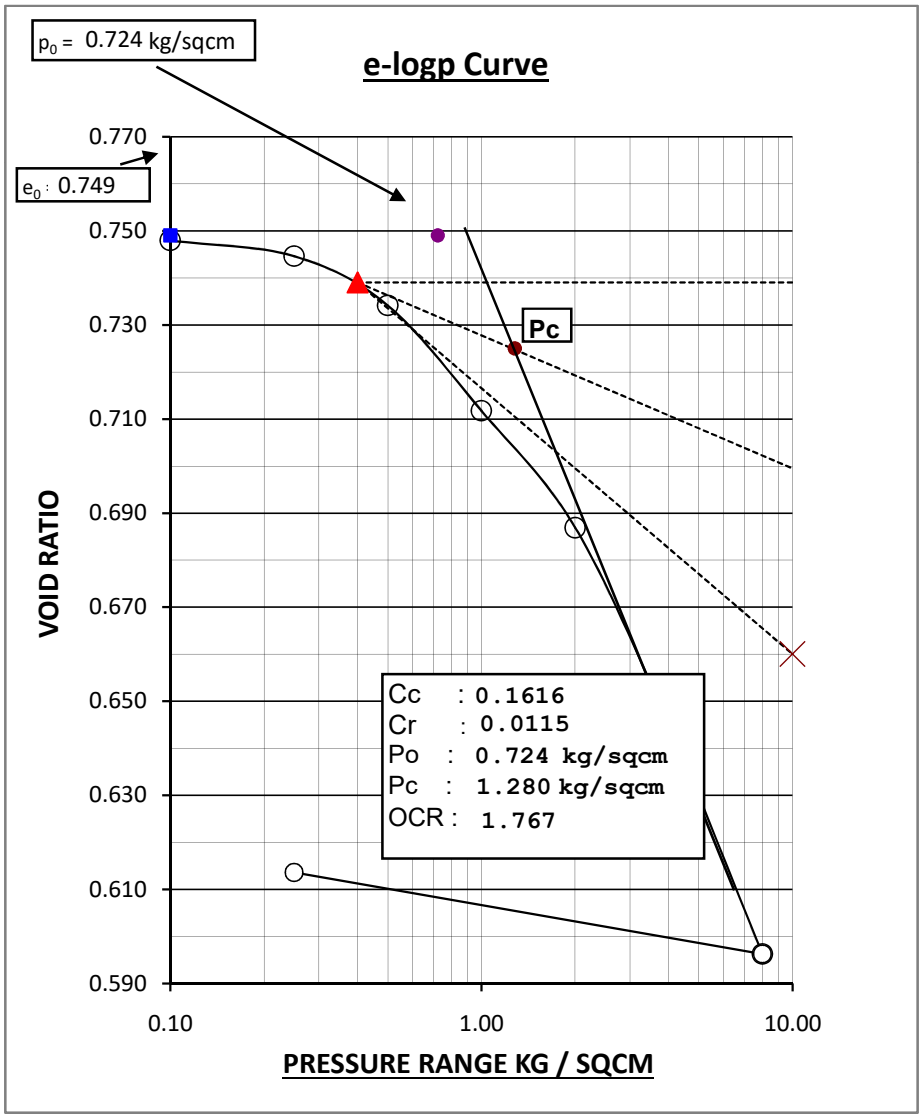
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	62	0.696	0.0621				
0.10 - 0.25	115	0.677	0.0773	13.04	0.0672	161.2	4.995
0.25 - 0.50	162	0.649	0.0661	19.90	0.0529	236.7	3.211
0.50 - 1.00	209	0.613	0.0433	16.75	0.0361	188.9	3.715
1.00 - 2.00	213	0.577	0.0226	11.27	0.0200	166.9	3.823
2.00 - 4.00	283	0.528	0.0153	14.13	0.0132	119.4	4.750
4.00 - 8.00	317	0.474	0.0089	16.09	0.0074	161.8	3.010
8.00 - 0.25	213	0.511	0.0032				



CONSOLIDATION TEST RESULTS

Sample Number:BH-42/UDS-02 Depth :5.5-5.95 meters
Description :Brownish grey clayey silt.
Water content:Initial=28% Final =18.7% Initial Void Ratio =0.749

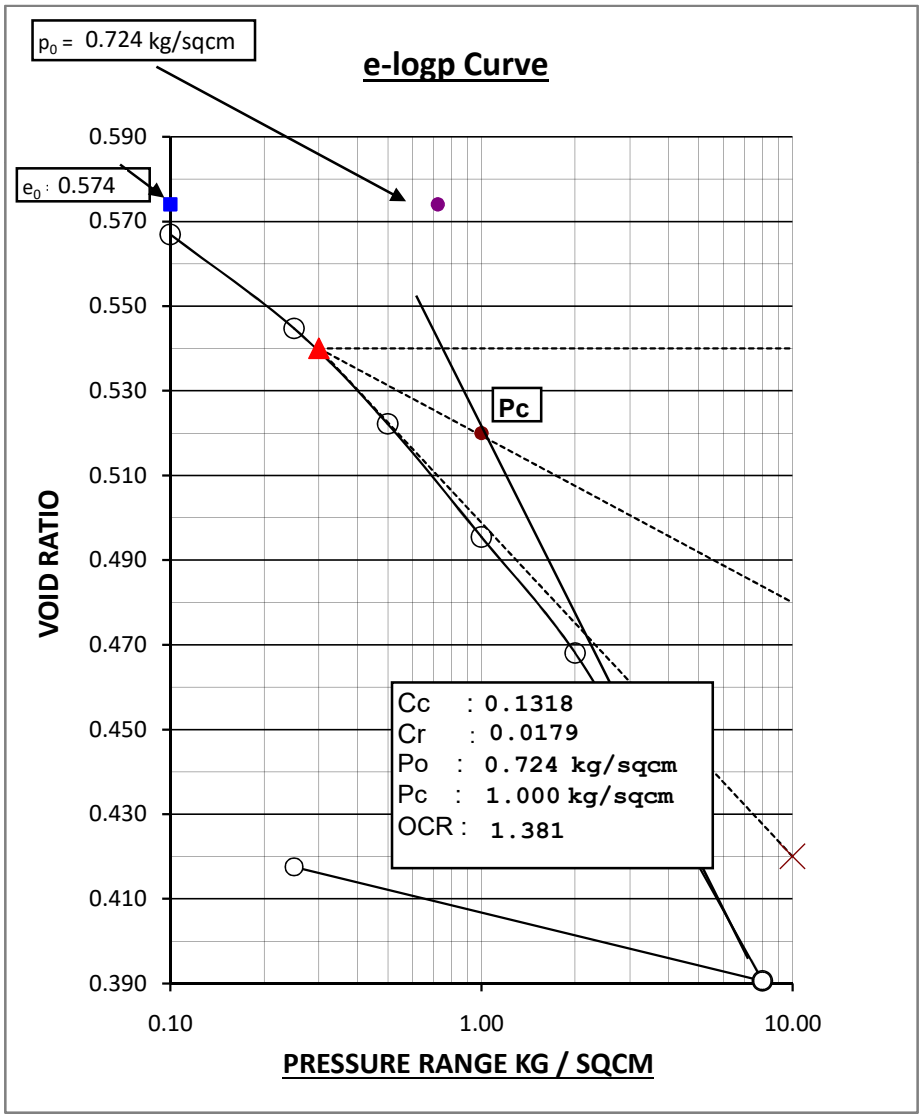
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	5	0.748	0.0050				
0.10 - 0.25	19	0.745	0.0127	15.30	0.0107	121.0	6.963
0.25 - 0.50	60	0.734	0.0241	13.30	0.0209	188.0	4.410
0.50 - 1.00	128	0.712	0.0258	13.90	0.0222	217.0	3.677
1.00 - 2.00	142	0.687	0.0145	12.68	0.0127	443.9	1.699
2.00 - 4.00	240	0.645	0.0124	17.08	0.0103	224.9	3.087
4.00 - 8.00	278	0.596	0.0074	16.19	0.0062	522.2	1.182
8.00 - 0.25	99	0.614	0.0014				



CONSOLIDATION TEST RESULTS

Sample Number:BH-43/UDS-01 Depth :2.5-2.95 meters
Description :Light grey clayey silt.
Water content:Initial=23.1% Final =17.4% Initial Void Ratio =0.574

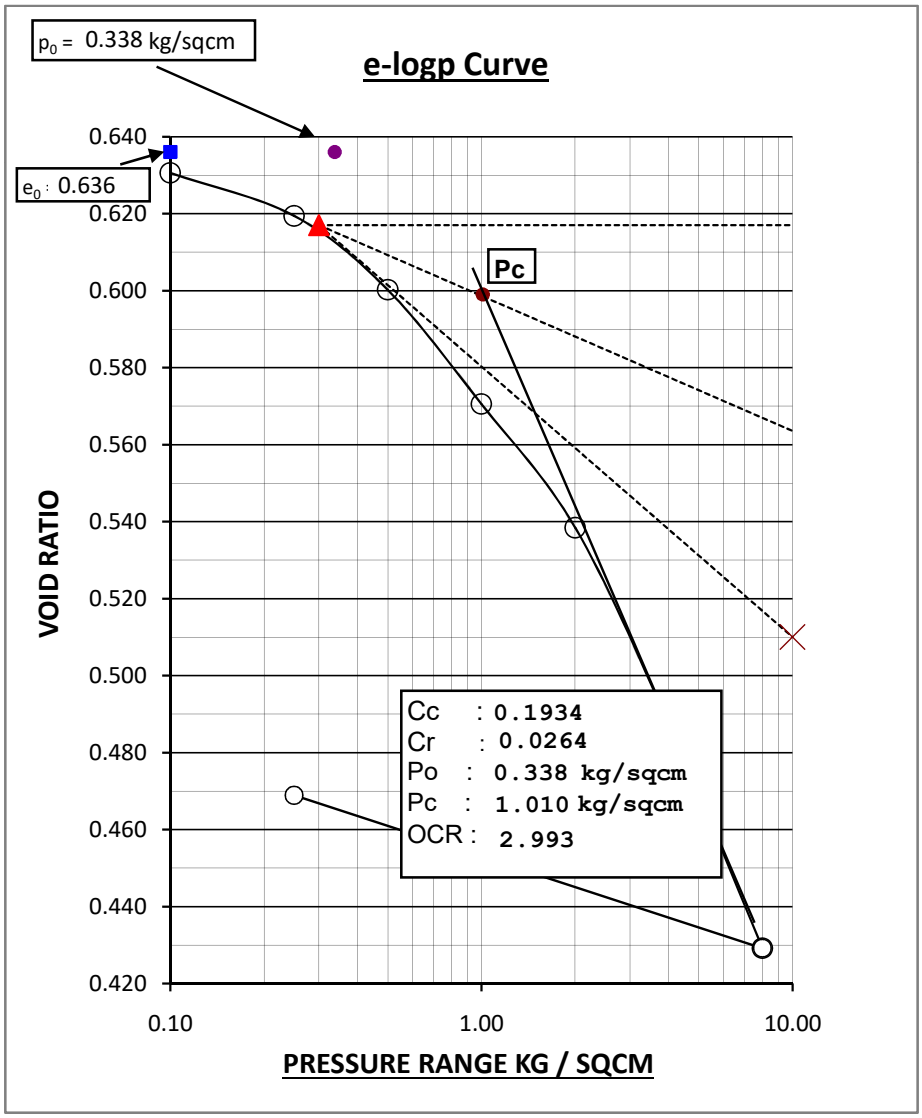
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	43	0.567	0.0430				
0.10 - 0.25	141	0.545	0.0944	14.18	0.0810	252.8	3.203
0.25 - 0.50	143	0.522	0.0583	30.30	0.0406	393.9	1.938
0.50 - 1.00	170	0.495	0.0352	27.59	0.0255	561.8	1.270
1.00 - 2.00	174	0.468	0.0183	20.00	0.0147	483.9	1.366
2.00 - 4.00	240	0.430	0.0129	28.75	0.0092	415.0	1.447
4.00 - 8.00	252	0.391	0.0069	33.33	0.0046	342.7	1.554
8.00 - 0.25	171	0.418	0.0025				



CONSOLIDATION TEST RESULTS

Sample Number:BH-44/UDS-01 Depth :2.5-2.95 meters
Description :Brownish grey silty clay.
Water content:Initial=23.5% Final =18.8% Initial Void Ratio =0.636

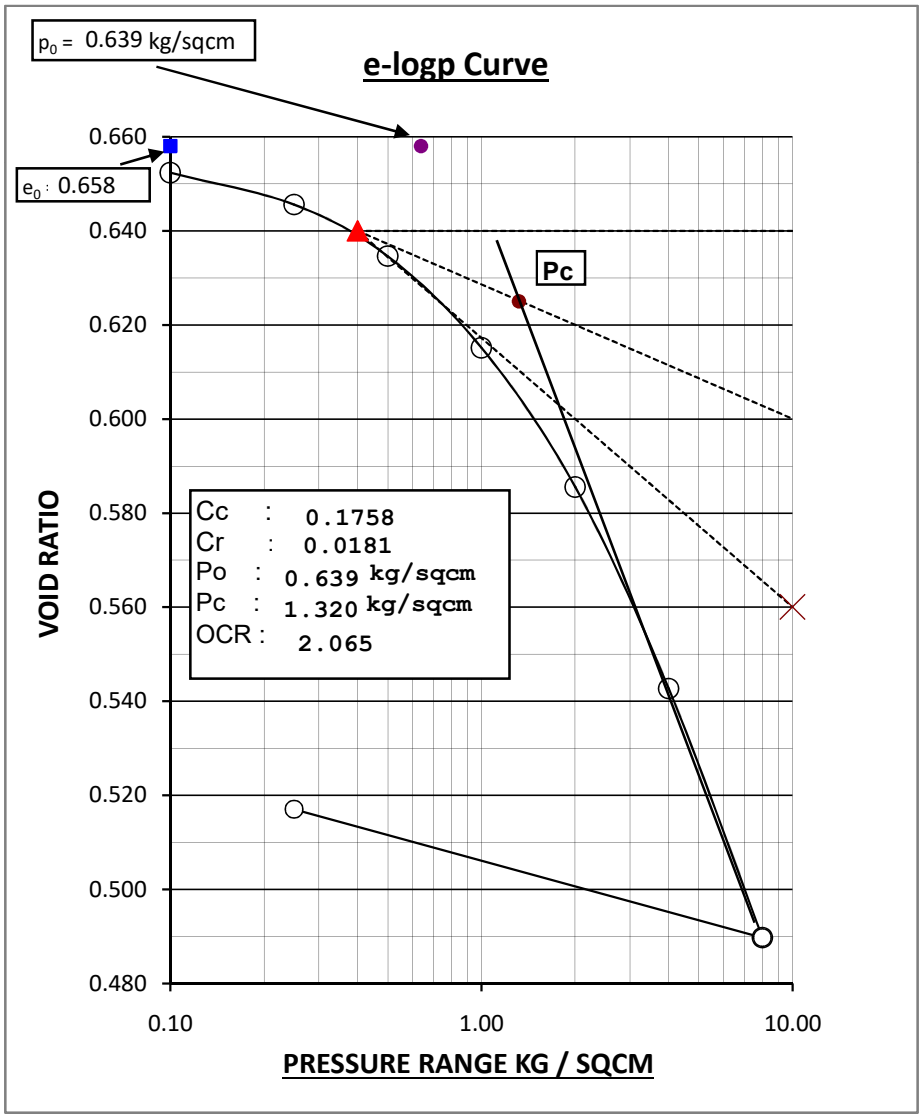
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	32	0.631	0.0321				
0.10 - 0.25	68	0.619	0.0456	17.65	0.0376	203.1	4.044
0.25 - 0.50	117	0.600	0.0474	18.80	0.0385	175.4	4.508
0.50 - 1.00	181	0.571	0.0371	17.68	0.0305	122.7	6.054
1.00 - 2.00	196	0.538	0.0205	11.22	0.0182	177.5	3.854
2.00 - 4.00	311	0.487	0.0166	12.86	0.0144	225.8	2.697
4.00 - 8.00	355	0.429	0.0098	14.37	0.0084	267.4	1.934
8.00 - 0.25	242	0.469	0.0036				



CONSOLIDATION TEST RESULTS

Sample Number:BH-44/UDS-02 Depth :5.5-5.95 meters
Description :Light yellowish brown, silty clay/ clayey silt with sand mixture.
Water content:Initial=23.1% Final =24.6% Initial Void Ratio =0.658

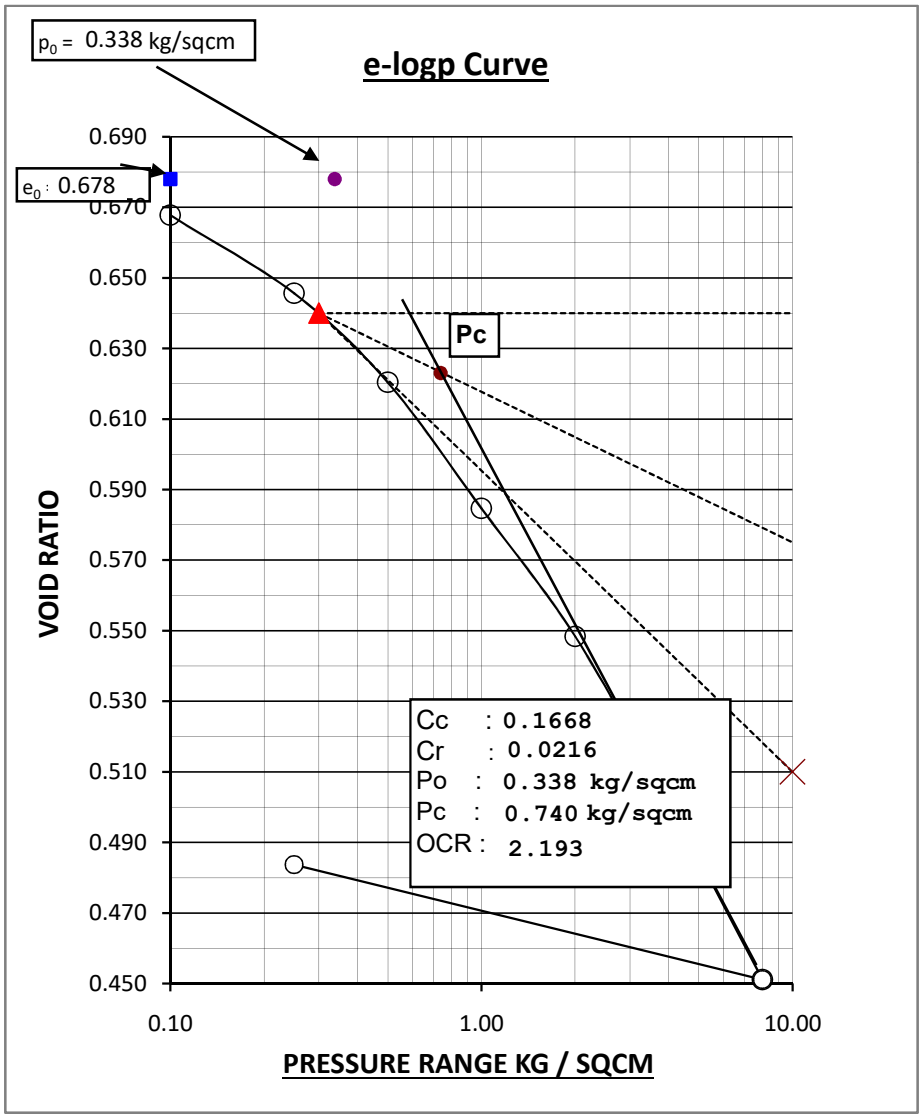
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	16	0.652	0.0160				
0.10 - 0.25	41	0.646	0.0274	21.30	0.0215	192.8	4.340
0.25 - 0.50	66	0.635	0.0265	16.90	0.0221	269.5	3.038
0.50 - 1.00	118	0.615	0.0239	16.30	0.0200	187.7	4.200
1.00 - 2.00	179	0.586	0.0183	24.20	0.0139	347.0	2.134
2.00 - 4.00	259	0.543	0.0135	17.50	0.0111	126.7	5.310
4.00 - 8.00	320	0.490	0.0086	30.60	0.0060	303.3	1.939
8.00 - 0.25	165	0.517	0.0024				



CONSOLIDATION TEST RESULTS

Sample Number:BH-45/UDS-01 Depth :2.5-2.95 meters
Description :Light grey clayey silt.
Water content:Initial=26.6% Final =18.4% Initial Void Ratio =0.678

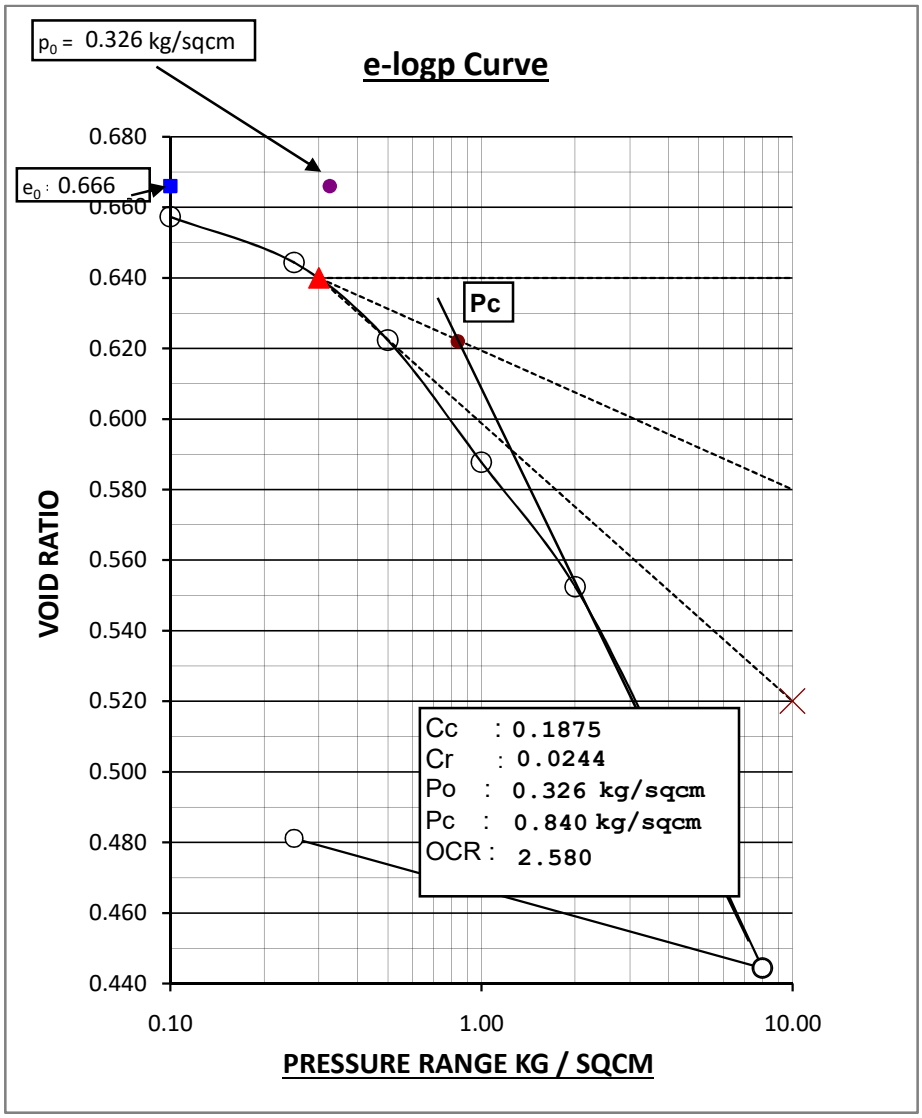
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	62	0.668	0.0621				
0.10 - 0.25	132	0.646	0.0886	17.42	0.0732	390.2	2.060
0.25 - 0.50	150	0.620	0.0612	20.00	0.0490	657.4	1.153
0.50 - 1.00	213	0.585	0.0442	23.94	0.0336	532.8	1.315
1.00 - 2.00	216	0.548	0.0229	13.43	0.0198	483.9	1.314
2.00 - 4.00	280	0.501	0.0152	11.43	0.0135	264.6	2.137
4.00 - 8.00	299	0.451	0.0084	12.71	0.0073	257.1	1.898
8.00 - 0.25	194	0.484	0.0029				



CONSOLIDATION TEST RESULTS

Sample Number:BH-46/UDS-01 Depth :2.5-2.95 meters
Description :Brownish grey clayey silt with traces of kankar.
Water content:Initial=25% Final =19.1% Initial Void Ratio =0.666

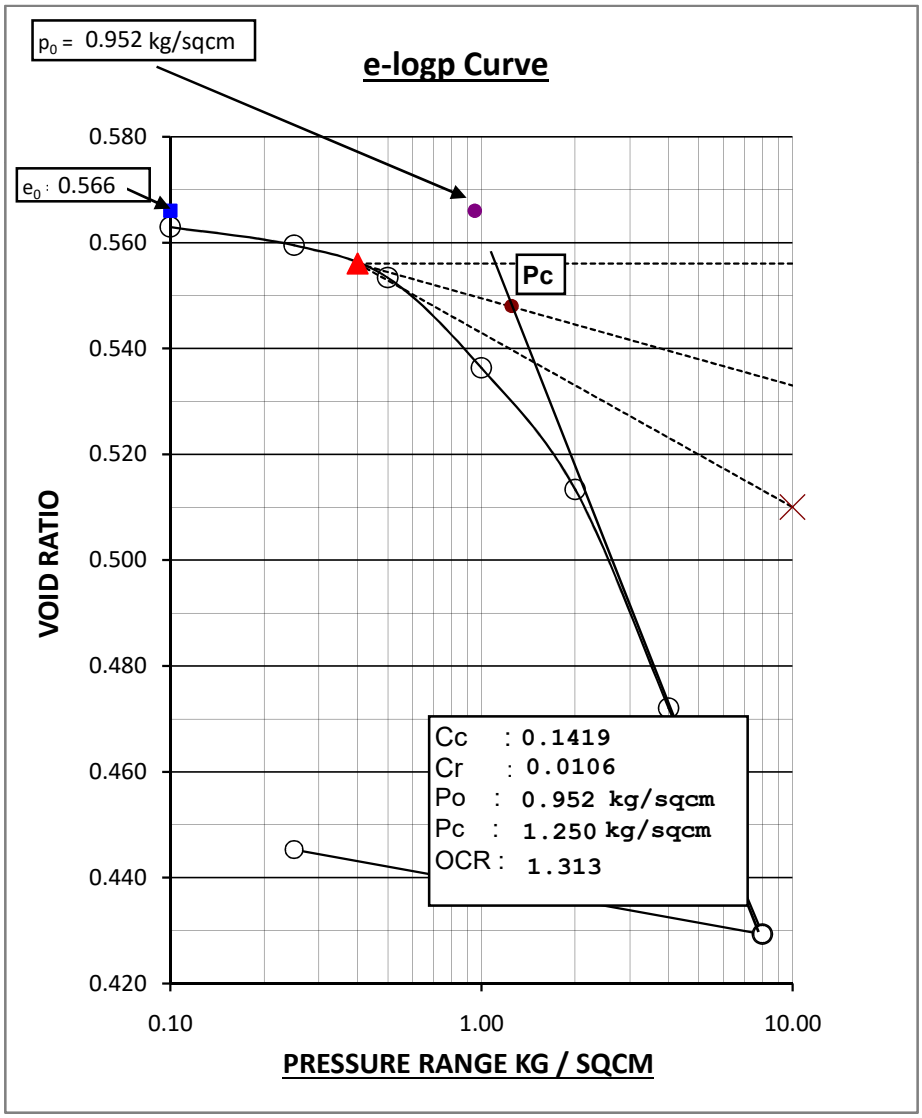
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	54	0.657	0.0540				
0.10 - 0.25	78	0.644	0.0522	19.00	0.0423	89.3	9.161
0.25 - 0.50	132	0.622	0.0535	14.39	0.0458	132.4	5.917
0.50 - 1.00	208	0.588	0.0427	16.51	0.0356	157.5	4.630
1.00 - 2.00	212	0.552	0.0222	12.02	0.0196	144.2	4.610
2.00 - 4.00	310	0.501	0.0166	15.81	0.0140	135.9	4.330
4.00 - 8.00	339	0.444	0.0094	14.45	0.0080	156.3	3.201
8.00 - 0.25	221	0.481	0.0033				



CONSOLIDATION TEST RESULTS

Sample Number:BH-47/UDS-03 Depth :8.5-8.95 meters
Description :Yellowish grey clayey silt.
Water content:Initial=22.1% Final =17.2% Initial Void Ratio =0.566

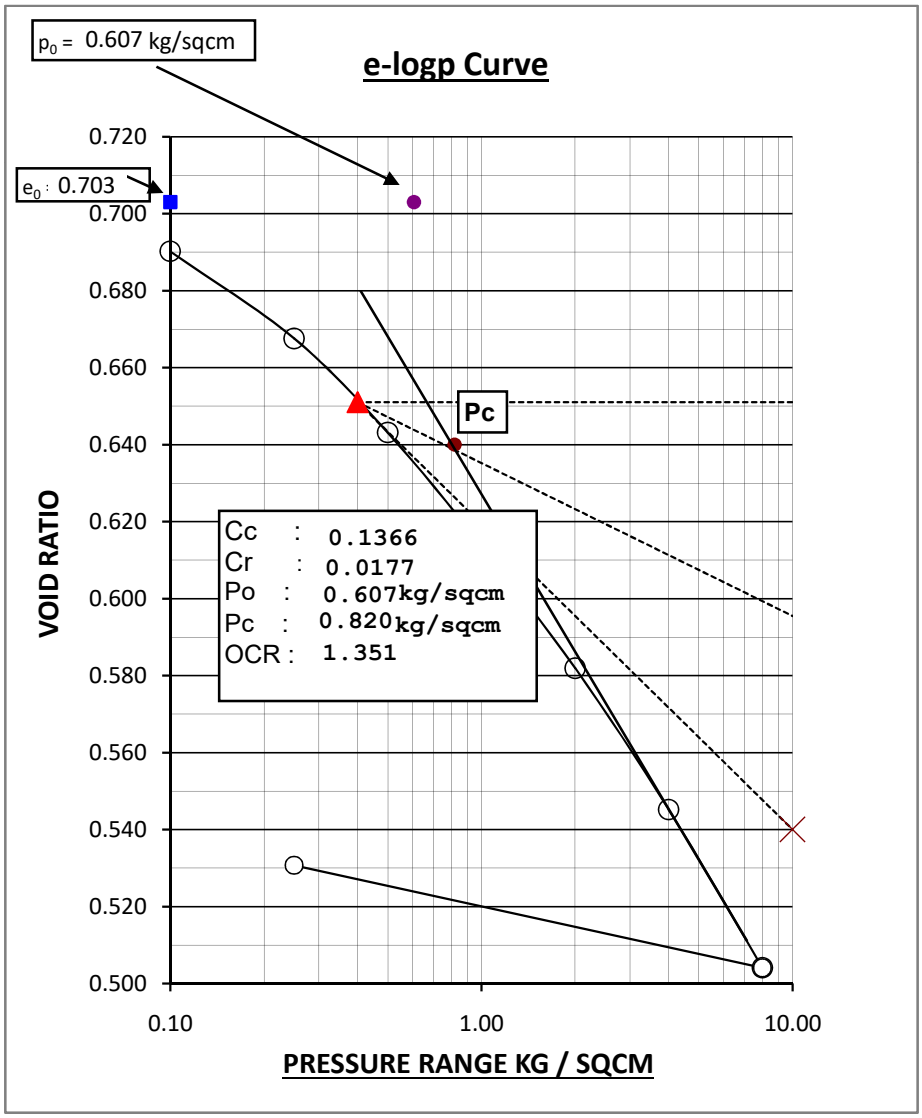
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	21	0.563	0.0210				
0.10 - 0.25	22	0.559	0.0147	13.30	0.0127	75.3	11.148
0.25 - 0.50	39	0.553	0.0157	10.26	0.0140	101.1	8.198
0.50 - 1.00	109	0.536	0.0220	16.51	0.0183	293.0	2.744
1.00 - 2.00	147	0.513	0.0150	17.01	0.0124	171.4	4.449
2.00 - 4.00	264	0.472	0.0136	28.79	0.0097	310.0	2.251
4.00 - 8.00	273	0.429	0.0073	22.71	0.0056	460.4	1.341
8.00 - 0.25	102	0.445	0.0014				



CONSOLIDATION TEST RESULTS

Sample Number:BH-48/UDS-02 Depth :5.5-5.95 meters
Description :Brownish grey clayey silt.
Water content:Initial=28.1% Final =19.2% Initial Void Ratio =0.703

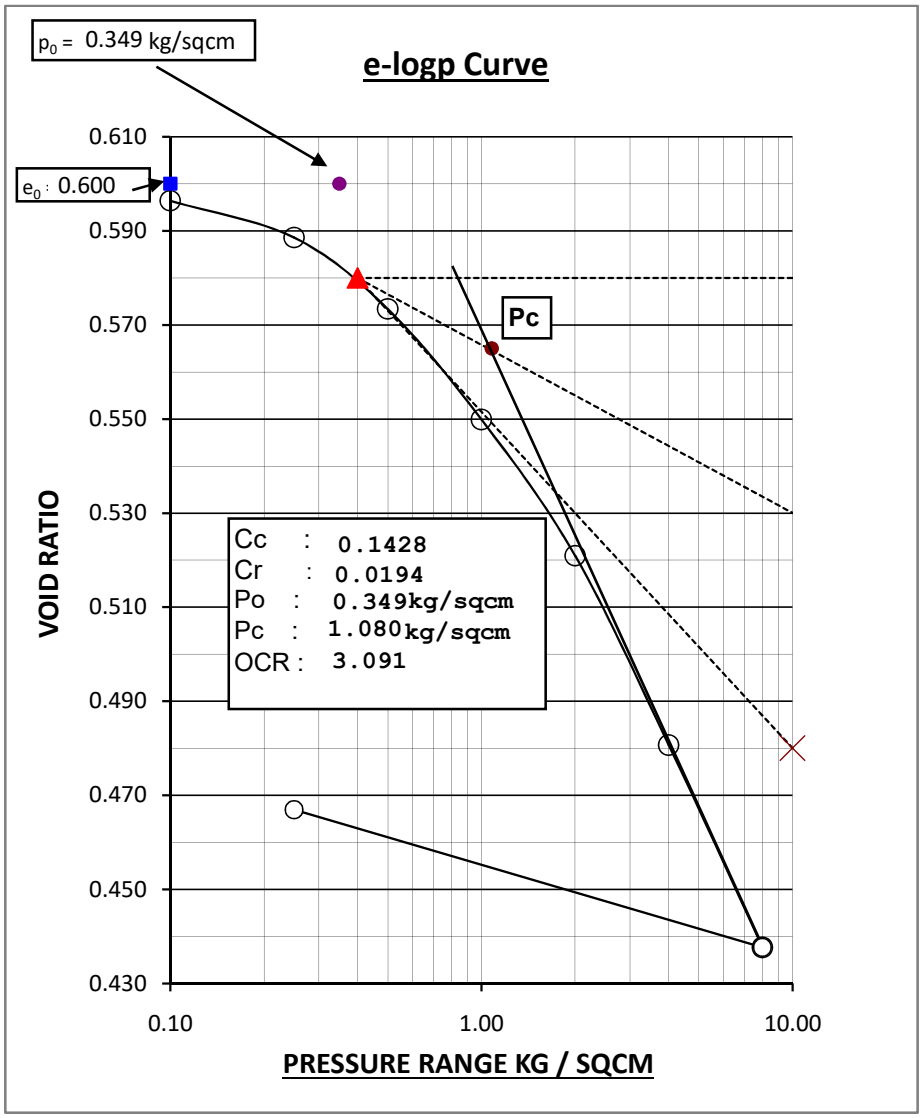
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	74	0.690	0.0742				
0.10 - 0.25	133	0.668	0.0895	19.10	0.0724	232.3	3.433
0.25 - 0.50	143	0.643	0.0585	24.00	0.0445	536.4	1.403
0.50 - 1.00	172	0.614	0.0357	21.93	0.0279	354.3	1.985
1.00 - 2.00	187	0.582	0.0198	18.60	0.0161	565.5	1.148
2.00 - 4.00	215	0.545	0.0116	25.58	0.0086	242.4	2.437
4.00 - 8.00	241	0.504	0.0067	34.02	0.0044	157.5	3.352
8.00 - 0.25	156	0.531	0.0023				



CONSOLIDATION TEST RESULTS

Sample Number:BH-49/UDS-01 Depth :2.5-2.95 meters
Description :Brownish grey clayey silt.
Water content:Initial=21.2% Final =17.4% Initial Void Ratio =0.6

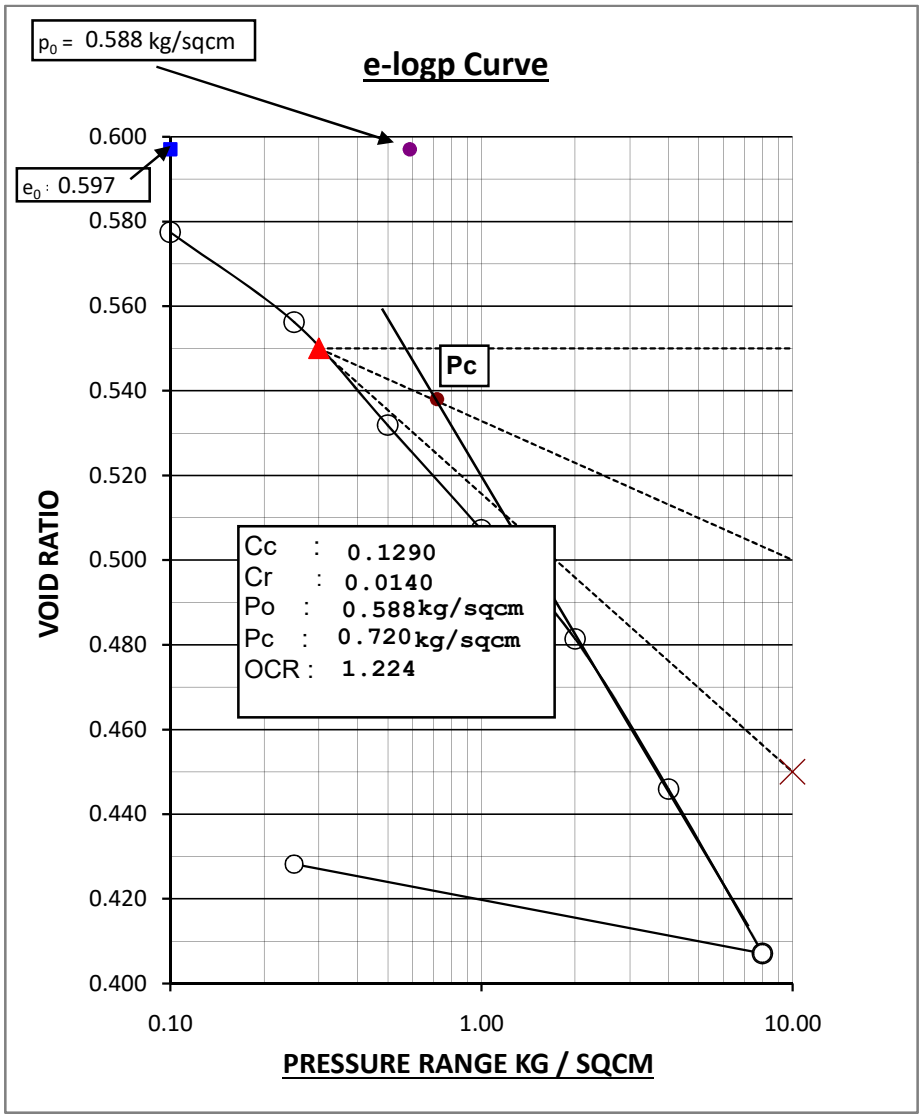
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	22	0.596	0.0220				
0.10 - 0.25	49	0.589	0.0327	30.61	0.0227	360.2	2.316
0.25 - 0.50	95	0.573	0.0382	21.05	0.0302	371.2	2.182
0.50 - 1.00	147	0.550	0.0299	11.56	0.0264	381.0	2.022
1.00 - 2.00	181	0.521	0.0187	17.13	0.0155	955.2	0.752
2.00 - 4.00	252	0.481	0.0132	13.49	0.0115	473.8	1.377
4.00 - 8.00	269	0.438	0.0073	11.52	0.0064	747.7	0.772
8.00 - 0.25	183	0.467	0.0026				



CONSOLIDATION TEST RESULTS

Sample Number:BH-50/UDS-02 Depth :5.5-5.95 meters
Description :Brownish grey clayey silt.
Water content:Initial=23.2% Final =16.9% Initial Void Ratio =0.597

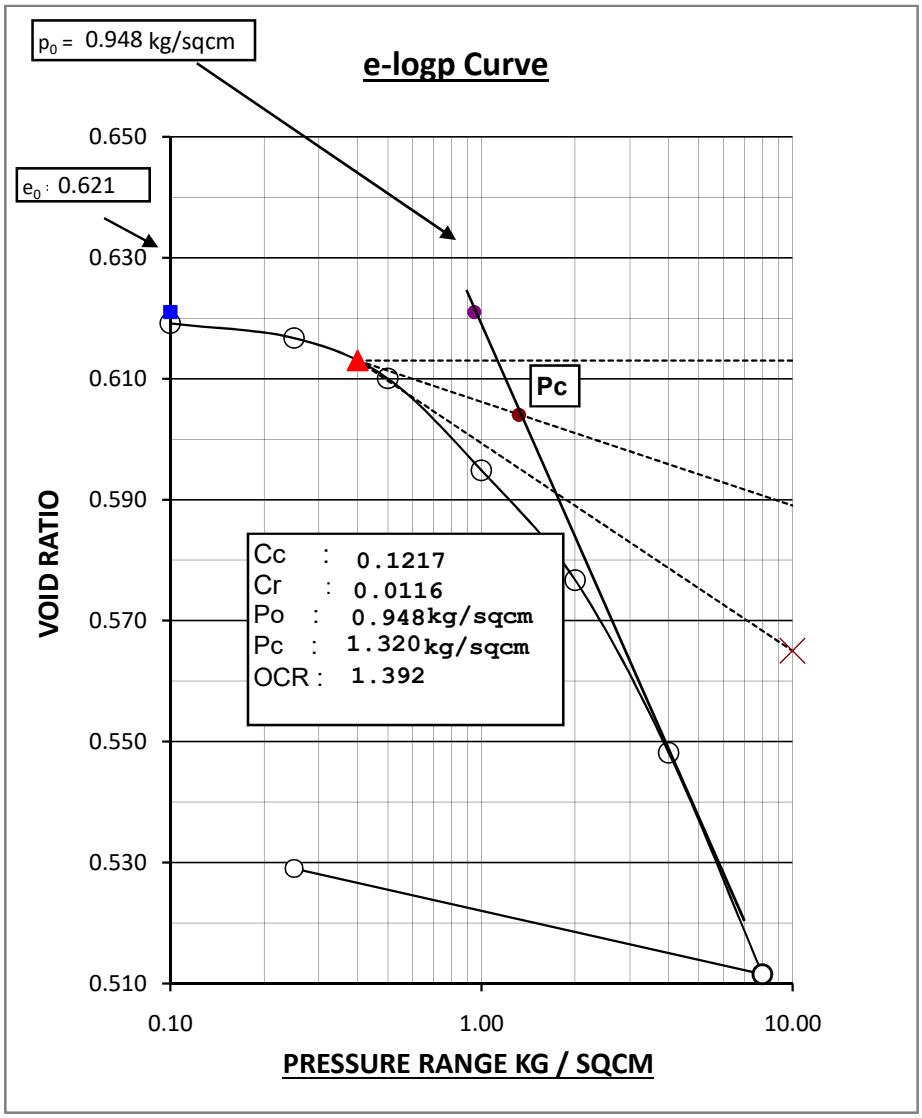
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	123	0.577	0.1231				
0.10 - 0.25	133	0.556	0.0898	14.91	0.0764	252.8	3.101
0.25 - 0.50	152	0.532	0.0624	23.50	0.0478	336.2	2.195
0.50 - 1.00	155	0.507	0.0323	18.05	0.0265	361.8	1.908
1.00 - 2.00	161	0.481	0.0171	19.08	0.0138	348.5	1.845
2.00 - 4.00	222	0.446	0.0120	25.23	0.0090	453.8	1.295
4.00 - 8.00	243	0.407	0.0067	29.22	0.0048	354.3	1.478
8.00 - 0.25	132	0.428	0.0019				



CONSOLIDATION TEST RESULTS

Sample Number:BH-51/UDS-03 Depth :8.5-8.95 meters
Description :Brownish grey clayey silt.
Water content:Initial=24.1% Final =17.4% Initial Void Ratio =0.621

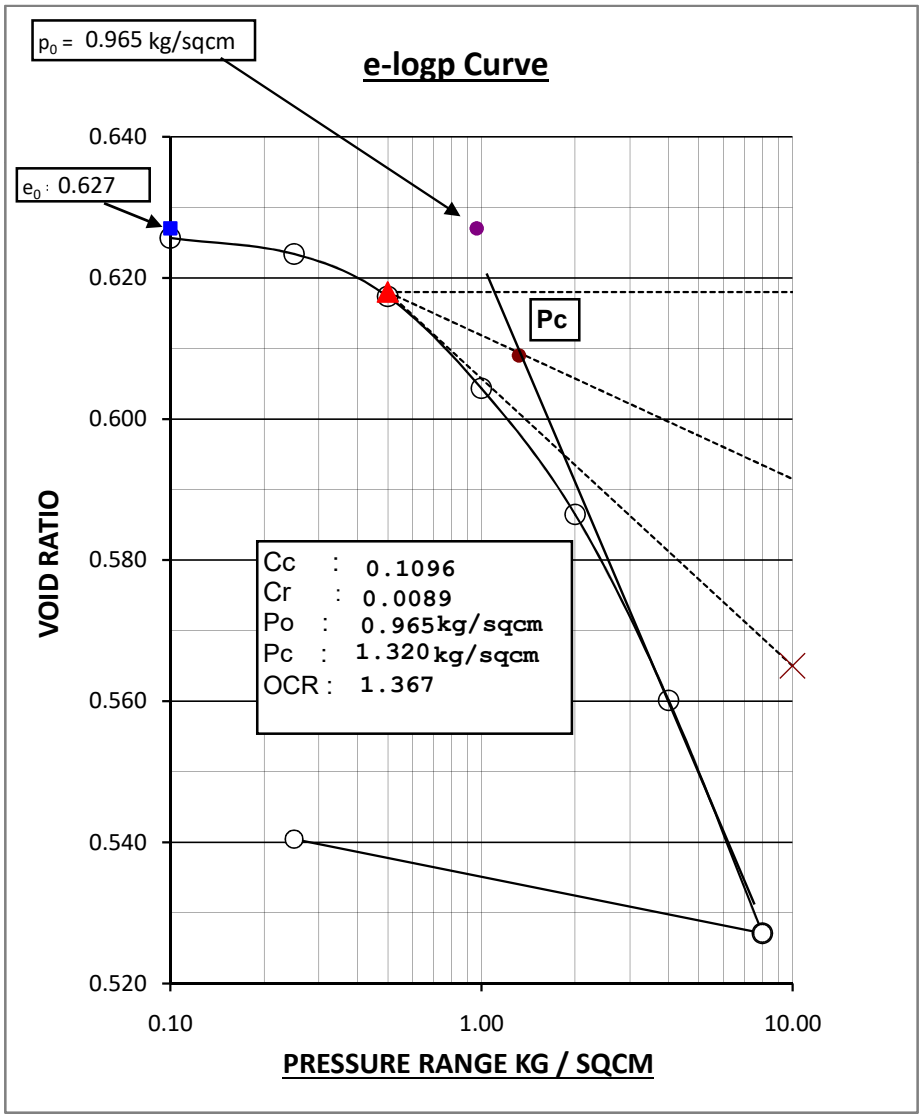
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	12	0.619	0.0120				
0.10 - 0.25	15	0.617	0.0100	13.33	0.0087	433.4	1.942
0.25 - 0.50	41	0.610	0.0164	12.20	0.0144	303.7	2.741
0.50 - 1.00	94	0.595	0.0189	17.40	0.0156	298.8	2.710
1.00 - 2.00	112	0.577	0.0114	10.71	0.0102	381.0	2.037
2.00 - 4.00	176	0.548	0.0090	18.18	0.0074	290.4	2.514
4.00 - 8.00	226	0.512	0.0059	21.24	0.0047	402.5	1.660
8.00 - 0.25	108	0.529	0.0015				



CONSOLIDATION TEST RESULTS

Sample Number:BH-52/UDS-02 Depth :8.5-8.95 meters
Description :Yellowish grey clayey silt.
Water content:Initial=25.4% Final =18.3% Initial Void Ratio =0.627

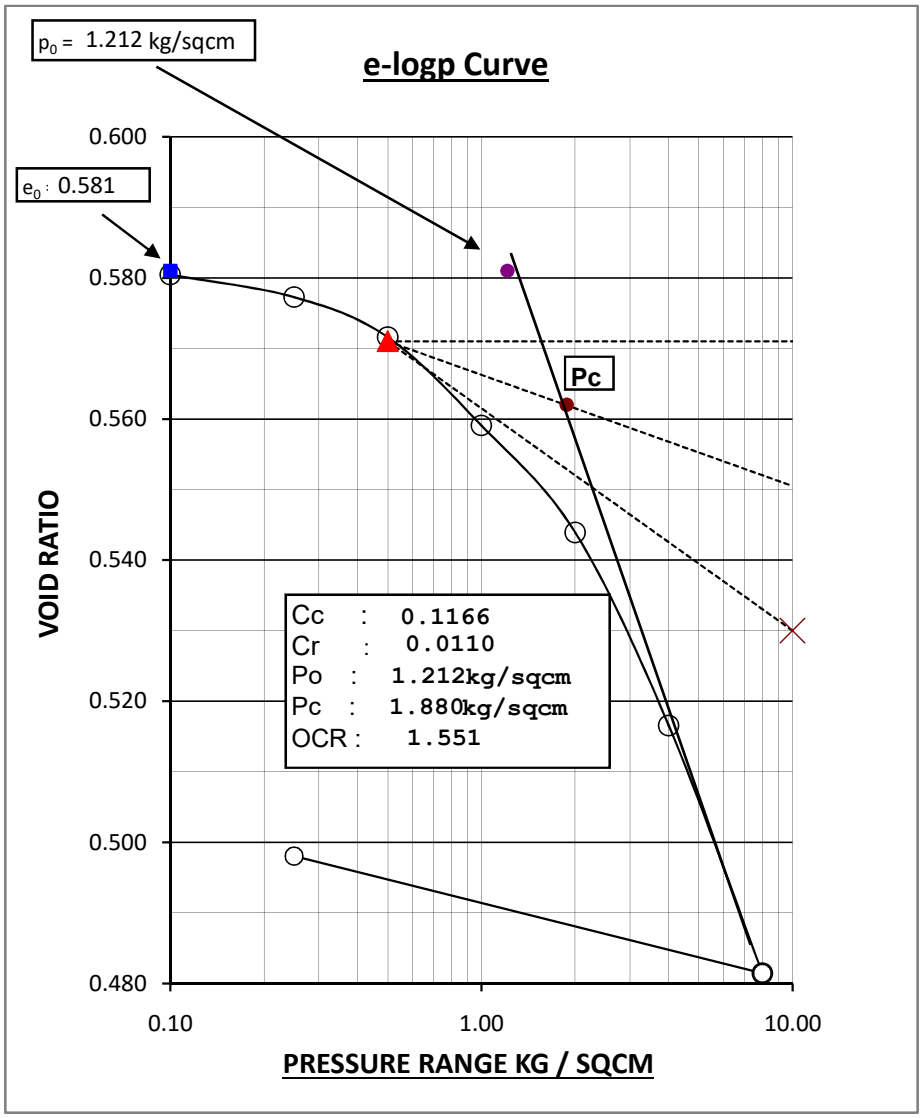
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	7	0.626	0.0070				
0.10 - 0.25	14	0.623	0.0093	14.29	0.0080	102.6	8.227
0.25 - 0.50	37	0.617	0.0148	5.41	0.0140	151.4	5.518
0.50 - 1.00	80	0.604	0.0161	6.25	0.0151	232.9	3.504
1.00 - 2.00	110	0.586	0.0111	8.18	0.0102	207.6	3.780
2.00 - 4.00	162	0.560	0.0083	4.32	0.0079	171.4	4.323
4.00 - 8.00	203	0.527	0.0053	14.78	0.0045	203.1	3.368
8.00 - 0.25	82	0.540	0.0011				



CONSOLIDATION TEST RESULTS

Sample Number:IBH-01/UDS-04 Depth :11.5-11.95 meters
Description :Brownish grey clayey silt with traces of kankars.
Water content:Initial=21.6% Final =16.3% Initial Void Ratio =0.581

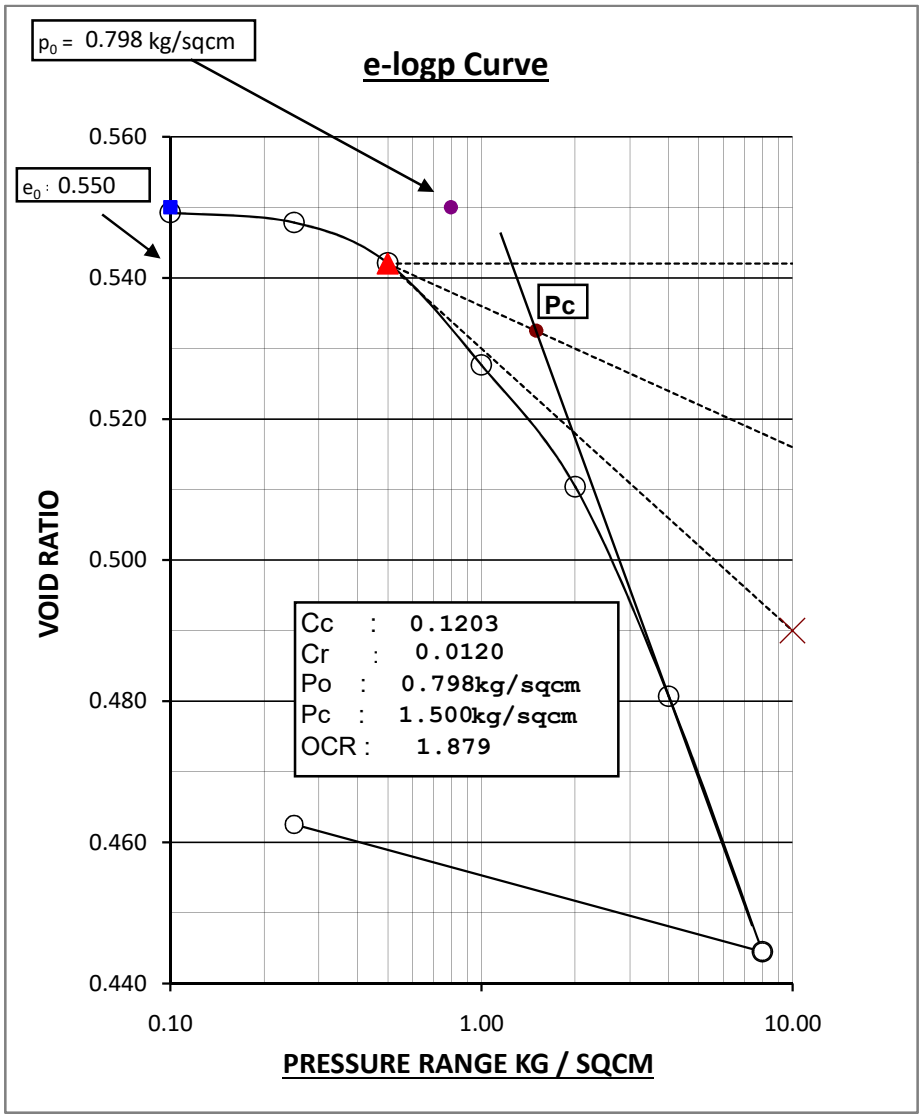
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	3	0.580	0.0030				
0.10 - 0.25	20	0.577	0.0133	35.00	0.0087	72.6	11.610
0.25 - 0.50	36	0.572	0.0144	15.60	0.0122	174.9	4.765
0.50 - 1.00	79	0.559	0.0159	15.10	0.0135	125.8	6.473
1.00 - 2.00	96	0.544	0.0097	13.54	0.0084	198.7	3.952
2.00 - 4.00	173	0.517	0.0089	19.70	0.0071	166.2	4.465
4.00 - 8.00	222	0.481	0.0058	22.52	0.0045	283.9	2.398
8.00 - 0.25	105	0.498	0.0014				



CONSOLIDATION TEST RESULTS

Sample Number:IBH-02/UDS-03 Depth :8.5-8.95 meters
Description :Brownish grey clayey silt with traces of sand mixture
Water content:Initial=20.2% Final =15.3% Initial Void Ratio =0.55

P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	5	0.549	0.0050				
0.10 - 0.25	9	0.548	0.0060	22.22	0.0047	102.1	8.231
0.25 - 0.50	37	0.542	0.0149	15.40	0.0126	180.3	4.618
0.50 - 1.00	93	0.528	0.0187	19.70	0.0151	288.6	2.810
1.00 - 2.00	111	0.510	0.0113	11.71	0.0100	210.8	3.688
2.00 - 4.00	191	0.481	0.0098	16.80	0.0082	161.4	4.519
4.00 - 8.00	233	0.444	0.0061	11.59	0.0054	190.1	3.493
8.00 - 0.25	116	0.463	0.0016				

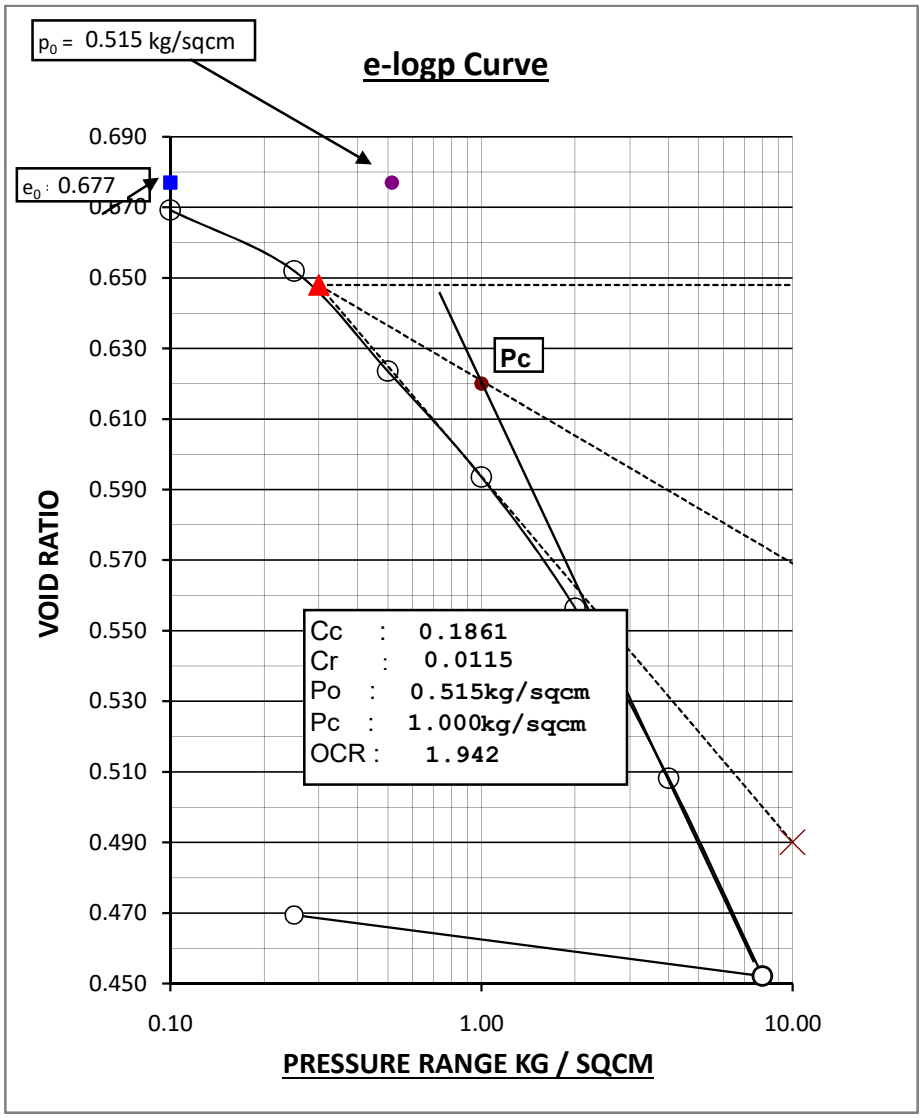


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CONSOLIDATION TEST RESULTS

Sample Number:IBH-03/UDS-02 Depth :5.5-5.95 meters
Description :Brownish grey clayey silt.
Water content:Initial=26.5% Final =19.6% Initial Void Ratio =0.677

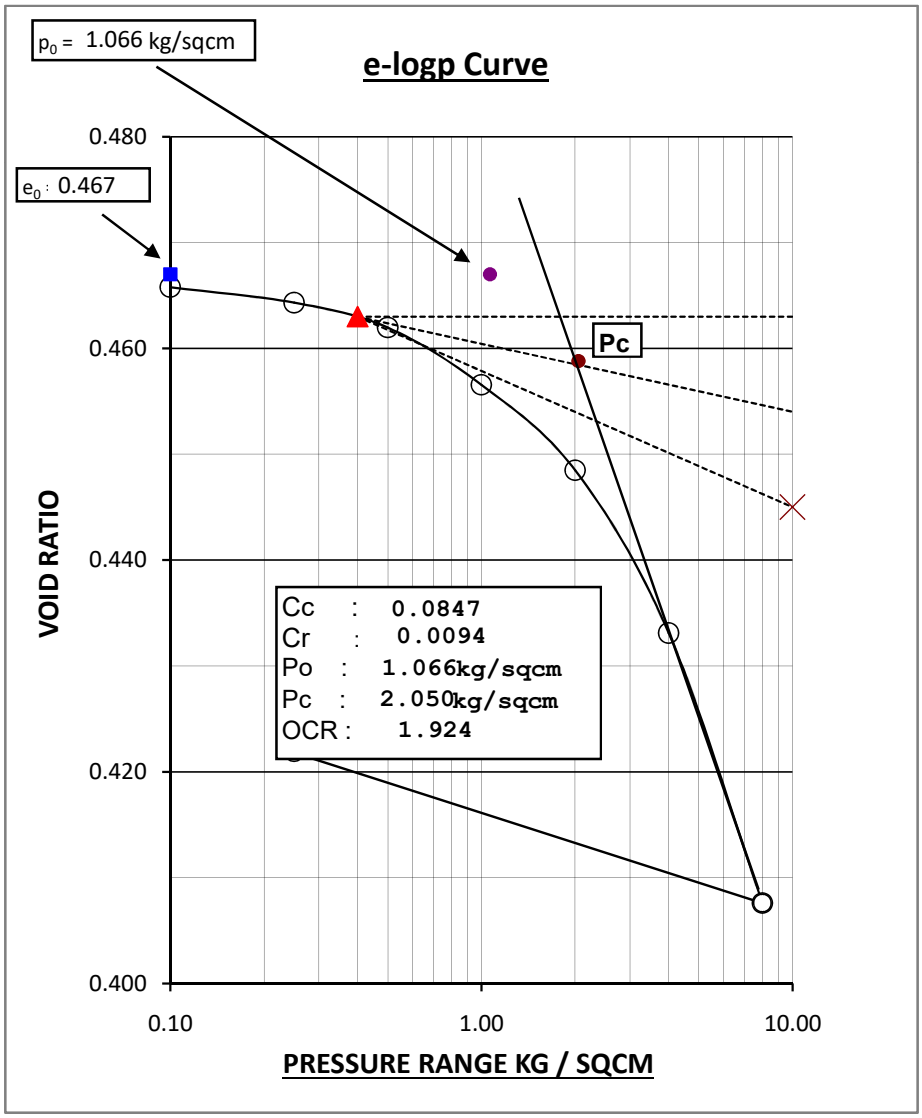
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	44	0.669	0.0440				
0.10 - 0.25	103	0.652	0.0690	29.70	0.0485	169.3	4.812
0.25 - 0.50	169	0.624	0.0687	35.60	0.0442	360.1	2.139
0.50 - 1.00	179	0.594	0.0370	21.89	0.0289	443.9	1.611
1.00 - 2.00	222	0.556	0.0234	29.73	0.0164	418.2	1.564
2.00 - 4.00	287	0.508	0.0155	36.53	0.0098	322.9	1.797
4.00 - 8.00	334	0.452	0.0093	40.77	0.0055	228.2	2.176
8.00 - 0.25	103	0.469	0.0015				



CONSOLIDATION TEST RESULTS

Sample Number:IBH-04/UDS-05 Depth :14.6-15.05 meters
Description :Brownish grey clayey silt with sand mixture.
Water content:Initial=18.1% Final =17.2% Initial Void Ratio =0.467

P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	8	0.466	0.0080				
0.10 - 0.25	10	0.464	0.0067	20.00	0.0053	182.1	4.642
0.25 - 0.50	16	0.462	0.0064	12.50	0.0056	399.4	2.105
0.50 - 1.00	37	0.457	0.0074	27.03	0.0054	267.4	3.111
1.00 - 2.00	55	0.448	0.0055	45.45	0.0030	169.3	4.822
2.00 - 4.00	105	0.433	0.0053	56.19	0.0023	163.4	4.837
4.00 - 8.00	174	0.408	0.0044	56.90	0.0019	240.0	3.105
8.00 - 0.25	97	0.422	0.0013				

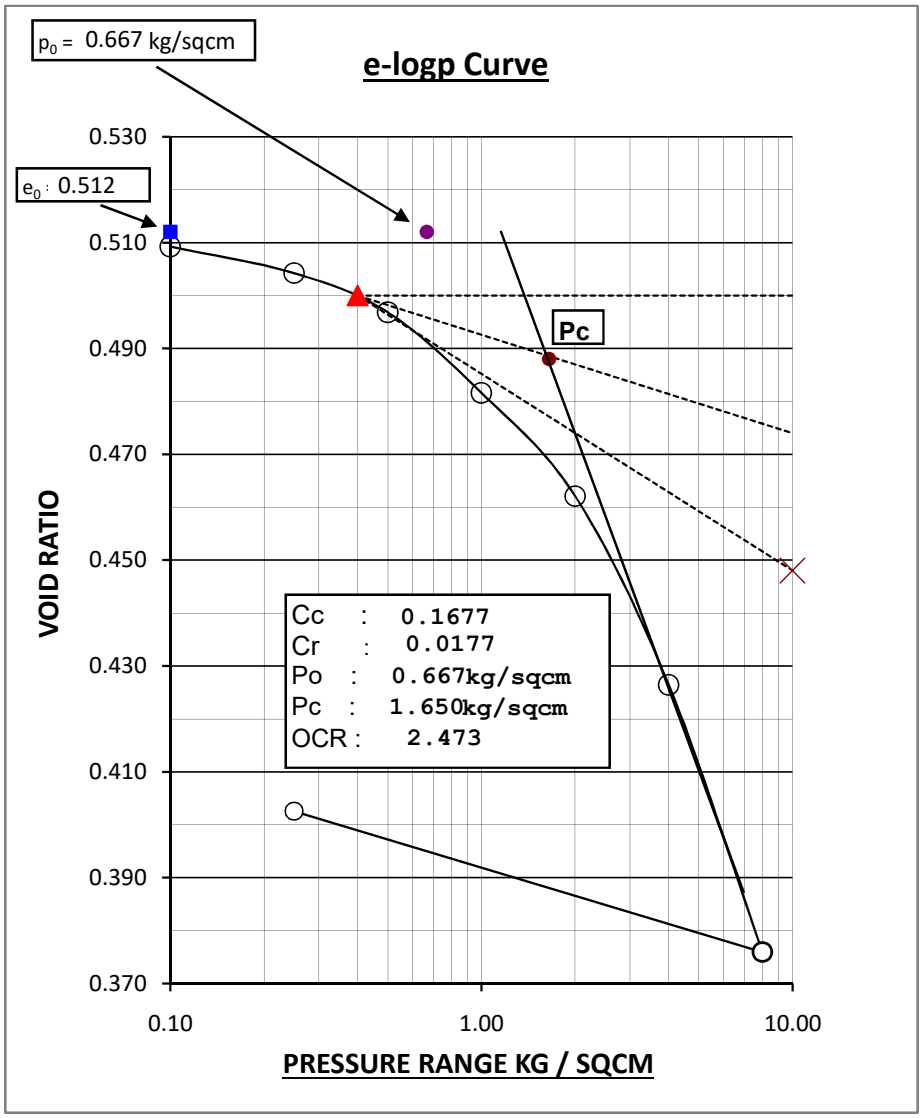


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CONSOLIDATION TEST RESULTS

Sample Number:IBH-05/UDS-03 Depth :7.5-7.95 meters
Description :Brownish grey clayey silt with traces of kankars.
Water content:Initial=18.2% Final =16.2% Initial Void Ratio =0.512

P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	20	0.509	0.0200				
0.10 - 0.25	33	0.504	0.0220	51.52	0.0107	242.4	3.453
0.25 - 0.50	49	0.497	0.0197	40.82	0.0117	104.5	7.875
0.50 - 1.00	101	0.482	0.0204	59.41	0.0083	218.9	3.647
1.00 - 2.00	129	0.462	0.0132	56.59	0.0057	298.4	2.550
2.00 - 4.00	236	0.426	0.0122	60.59	0.0048	290.4	2.422
4.00 - 8.00	334	0.376	0.0088	45.21	0.0048	171.4	3.607
8.00 - 0.25	176	0.403	0.0025				

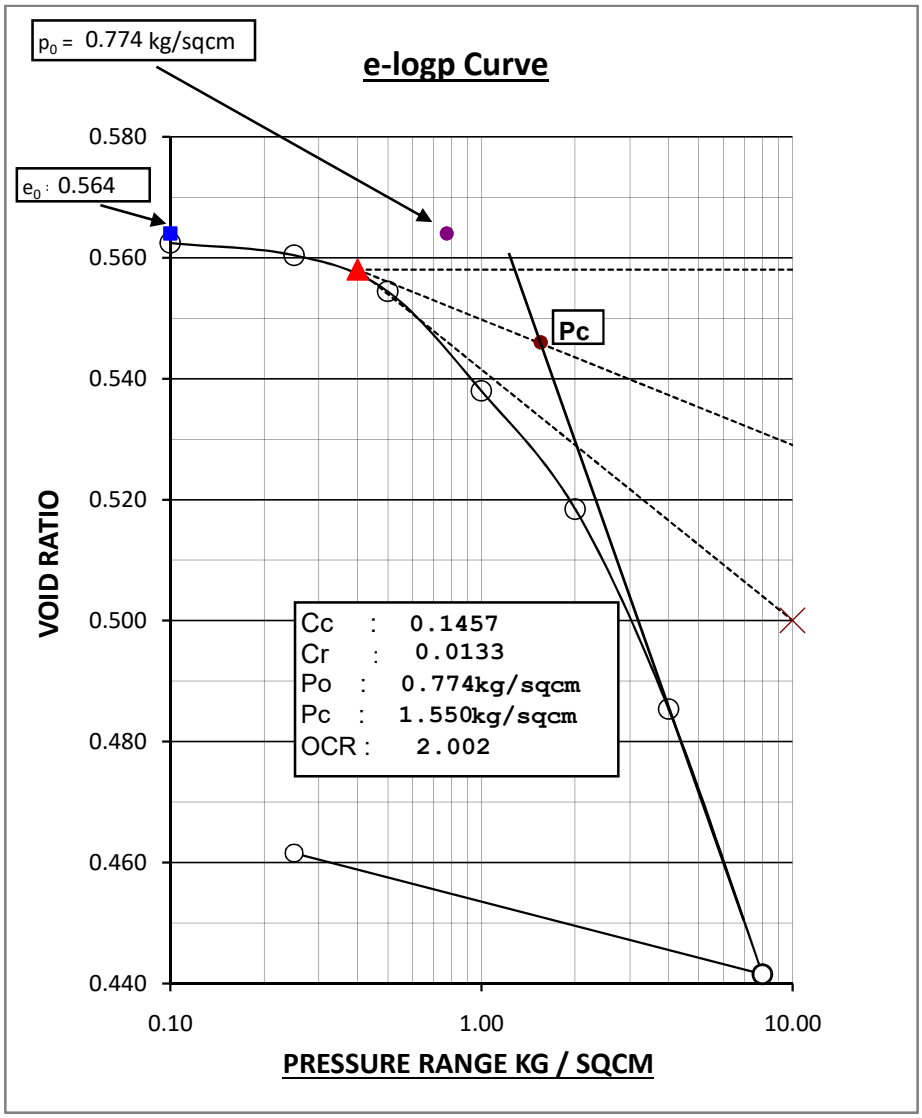


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CONSOLIDATION TEST RESULTS

Sample Number:IBH-06/UDS-03 Depth :8.5-8.95 meters
Description :Brownish grey clayey silty with traces of kankars.
Water content:Initial=22.3% Final =17.1% Initial Void Ratio =0.564

P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	7	0.562	0.0070				
0.10 - 0.25	13	0.560	0.0087	15.38	0.0074	169.0	4.974
0.25 - 0.50	38	0.554	0.0153	17.90	0.0125	120.0	6.934
0.50 - 1.00	105	0.538	0.0212	17.60	0.0174	72.6	11.132
1.00 - 2.00	125	0.518	0.0127	18.00	0.0104	112.5	6.849
2.00 - 4.00	211	0.485	0.0109	17.06	0.0090	122.4	5.859
4.00 - 8.00	280	0.442	0.0074	13.93	0.0064	131.0	4.906
8.00 - 0.25	128	0.462	0.0018				

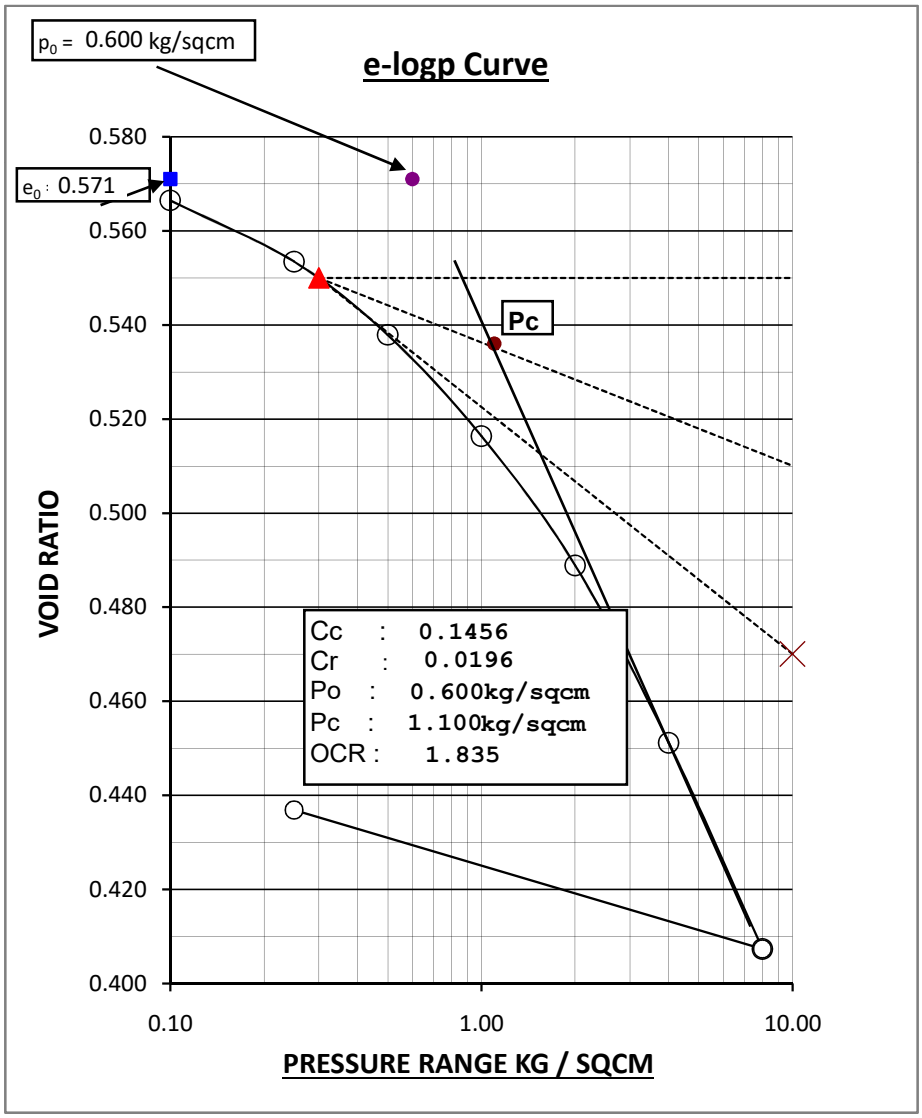


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CONSOLIDATION TEST RESULTS

Sample Number:IBH-07/UDS-02 Depth :5.5-5.95 meters
Description :Yellowish grey clayey silt with traces of sand mixture
Water content:Initial=22.7% Final =18.2% Initial Void Ratio =0.571

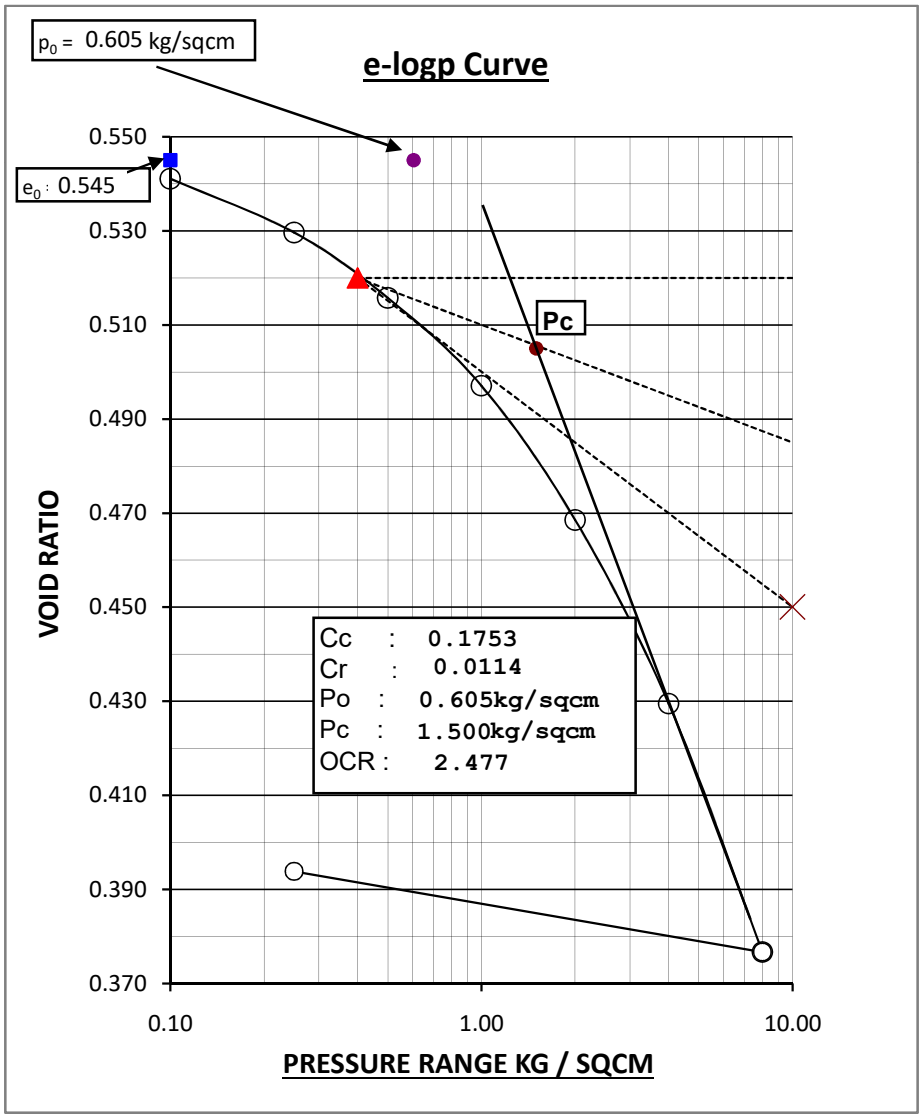
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	26	0.566	0.0260				
0.10 - 0.25	83	0.553	0.0555	18.07	0.0455	665.3	1.240
0.25 - 0.50	99	0.538	0.0400	17.10	0.0332	563.4	1.411
0.50 - 1.00	137	0.516	0.0280	12.41	0.0245	633.8	1.194
1.00 - 2.00	175	0.489	0.0181	19.43	0.0146	685.5	1.032
2.00 - 4.00	240	0.451	0.0127	20.42	0.0101	926.7	0.695
4.00 - 8.00	279	0.407	0.0076	20.79	0.0060	501.1	1.137
8.00 - 0.25	188	0.437	0.0027				



CONSOLIDATION TEST RESULTS

Sample Number:IBH-08/UDS-02 Depth :5.5-5.95 meters
Description :Brownish grey clayey silt with traces of kankar.
Water content:Initial=22% Final =18.9% Initial Void Ratio =0.545

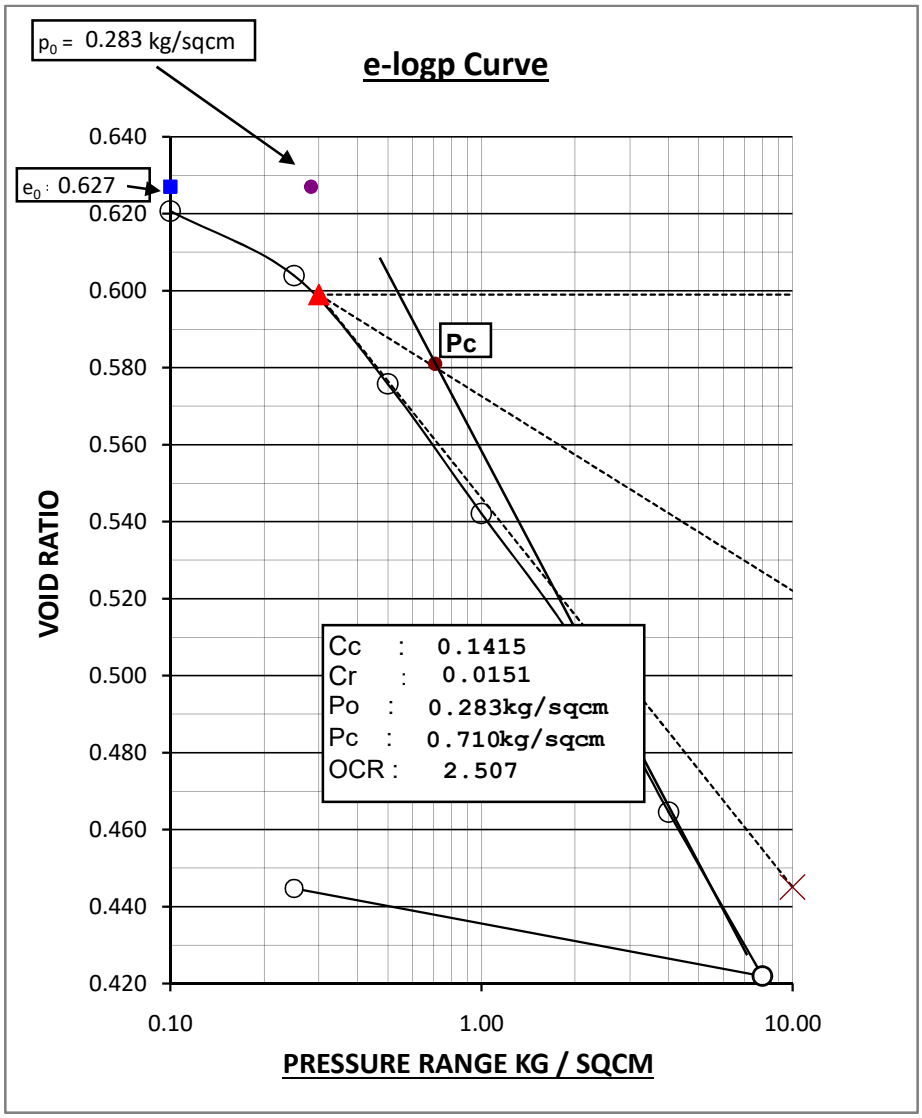
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	24	0.541	0.0240				
0.10 - 0.25	74	0.530	0.0494	48.65	0.0254	262.1	3.164
0.25 - 0.50	90	0.516	0.0363	30.00	0.0254	306.5	2.616
0.50 - 1.00	121	0.497	0.0246	39.67	0.0149	124.4	6.168
1.00 - 2.00	185	0.469	0.0191	36.76	0.0121	269.7	2.666
2.00 - 4.00	253	0.429	0.0133	45.61	0.0072	107.7	6.053
4.00 - 8.00	342	0.377	0.0092	27.67	0.0067	228.2	2.483
8.00 - 0.25	111	0.394	0.0016				



CONSOLIDATION TEST RESULTS

Sample Number:IBH-09/UDS-01 Depth :2.5-2.95 meters
Description :Brownish grey clayey silt.
Water content:Initial=24.5% Final =18.5% Initial Void Ratio =0.627

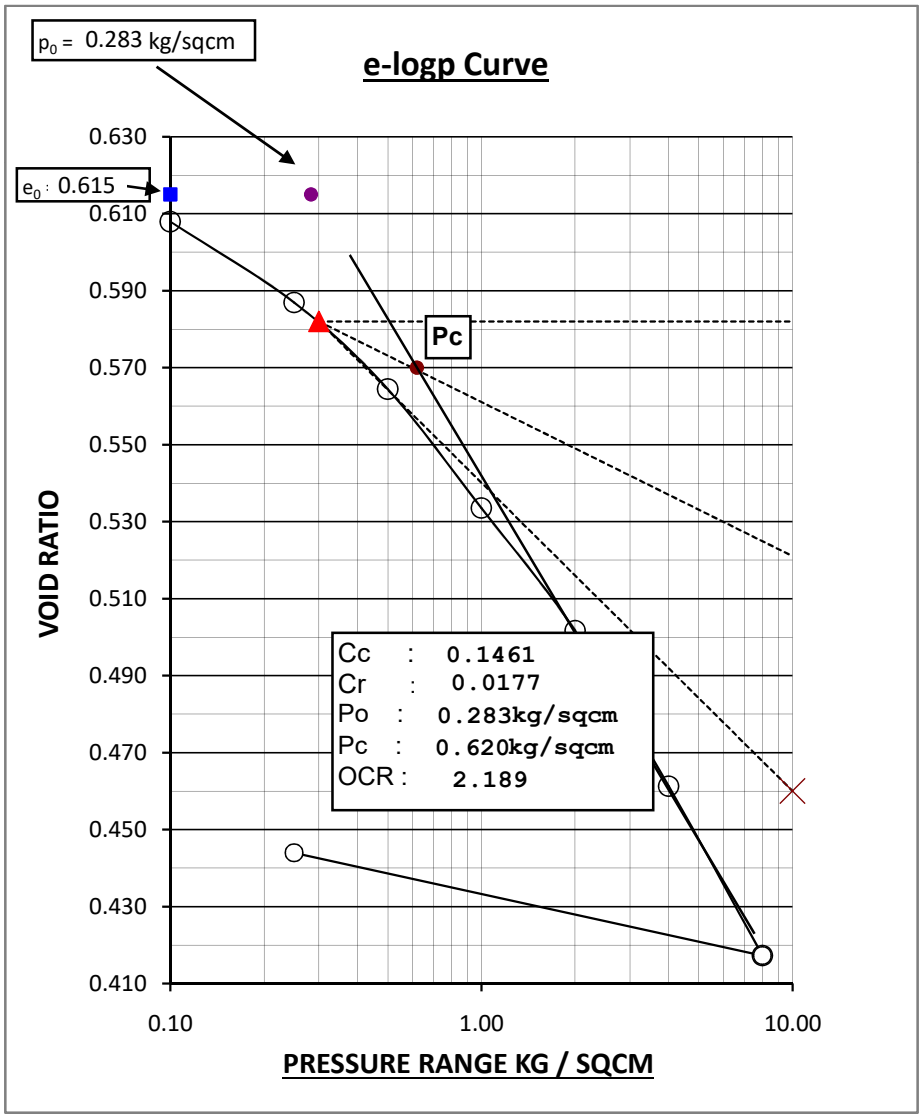
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	37	0.621	0.0370				
0.10 - 0.25	103	0.604	0.0689	21.90	0.0538	440.6	1.858
0.25 - 0.50	173	0.576	0.0702	16.18	0.0588	252.8	3.059
0.50 - 1.00	207	0.542	0.0427	23.67	0.0326	282.5	2.523
1.00 - 2.00	207	0.508	0.0218	15.46	0.0185	645.5	1.007
2.00 - 4.00	270	0.465	0.0146	18.89	0.0118	756.2	0.768
4.00 - 8.00	262	0.422	0.0073	28.24	0.0052	875.5	0.581
8.00 - 0.25	140	0.445	0.0021				



CONSOLIDATION TEST RESULTS

Sample Number:IBH-10/UDS-01 Depth :2.5-2.95 meters
Description :Brownish grey, clayey silt with silt stone.
Water content:Initial=25% Final =18.4% Initial Void Ratio =0.615

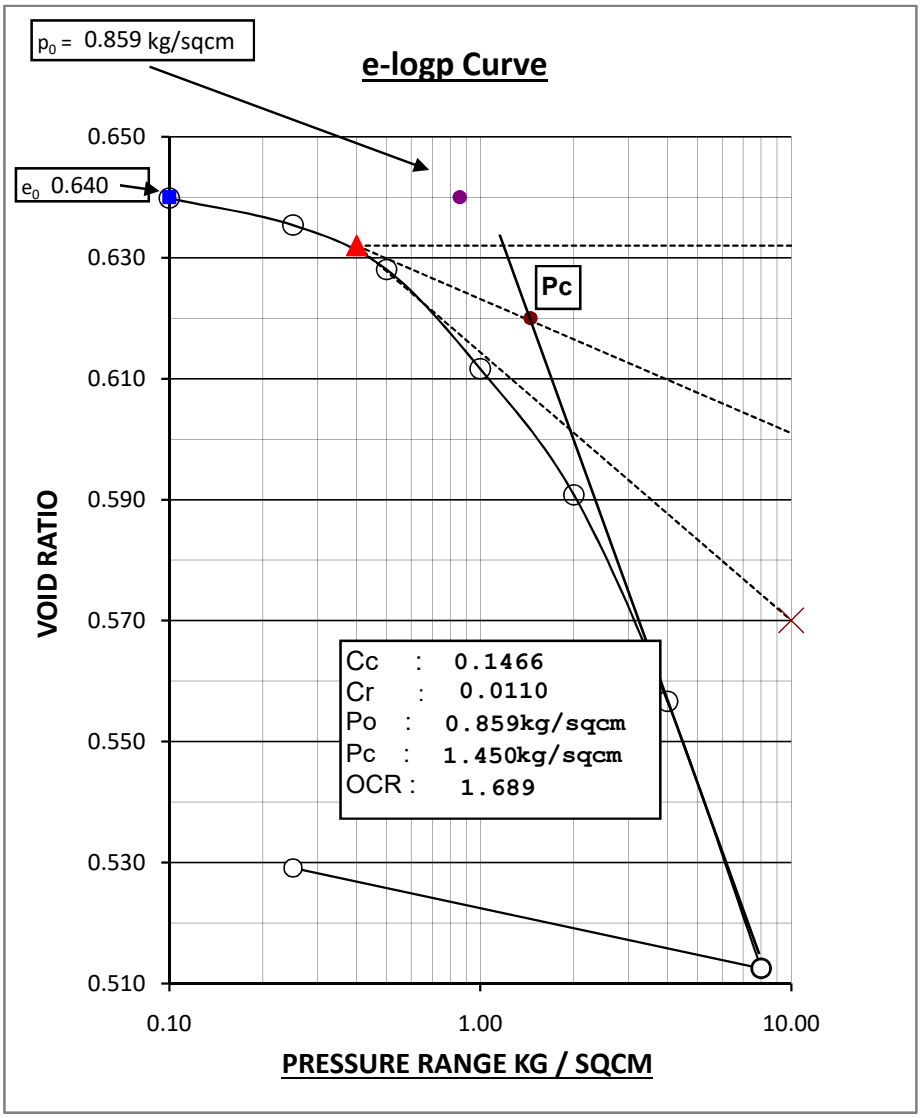
P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	47	0.608	0.0470				
0.10 - 0.25	130	0.587	0.0872	29.40	0.0615	166.0	4.873
0.25 - 0.50	139	0.564	0.0567	27.70	0.0410	280.1	2.731
0.50 - 1.00	191	0.534	0.0395	18.78	0.0321	257.3	2.770
1.00 - 2.00	197	0.502	0.0208	10.99	0.0185	114.3	5.721
2.00 - 4.00	250	0.461	0.0135	18.00	0.0110	430.9	1.366
4.00 - 8.00	272	0.417	0.0075	20.59	0.0060	104.5	4.949
8.00 - 0.25	165	0.444	0.0024				



CONSOLIDATION TEST RESULTS

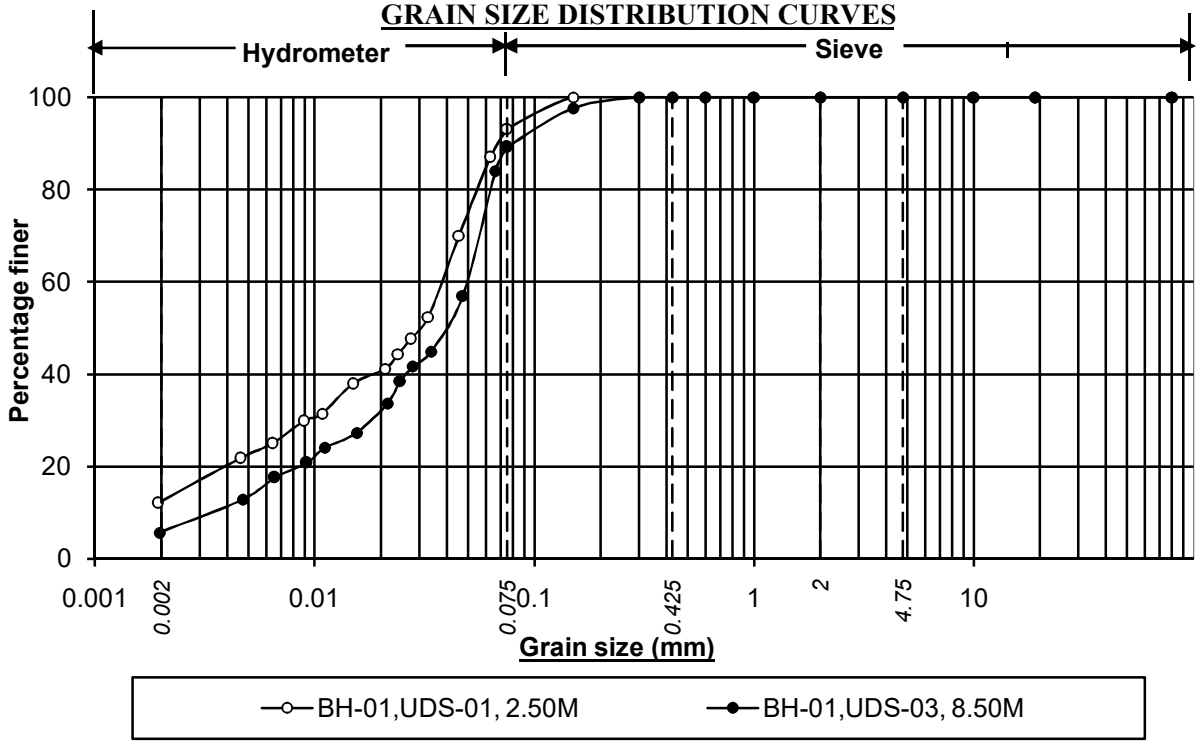
Sample Number:CHT-03/UDS-03 Depth :8.5-8.95 meters
Description :Brownish grey clayey silt.
Water content:Initial=23.6% Final =17.8% Initial Void Ratio =0.64

P1-P2 Kg/Sqcm	Dial Change	Void Ratio	Mv Sqcm/kg	Comprn %	Mvc sqcm/kg	T90 Sec	1000.Cv sqcm/sec
0.00 - 0.10	3	0.640	0.0030				
0.10 - 0.25	27	0.635	0.0180	11.11	0.0160	693.6	1.214
0.25 - 0.50	45	0.628	0.0181	12.20	0.0159	345.6	2.401
0.50 - 1.00	100	0.612	0.0202	10.00	0.0181	260.0	3.099
1.00 - 2.00	127	0.591	0.0129	15.50	0.0109	777.6	0.988
2.00 - 4.00	208	0.557	0.0107	14.42	0.0092	252.8	2.830
4.00 - 8.00	269	0.513	0.0071	14.50	0.0061	331.4	1.941
8.00 - 0.25	101	0.529	0.0014				

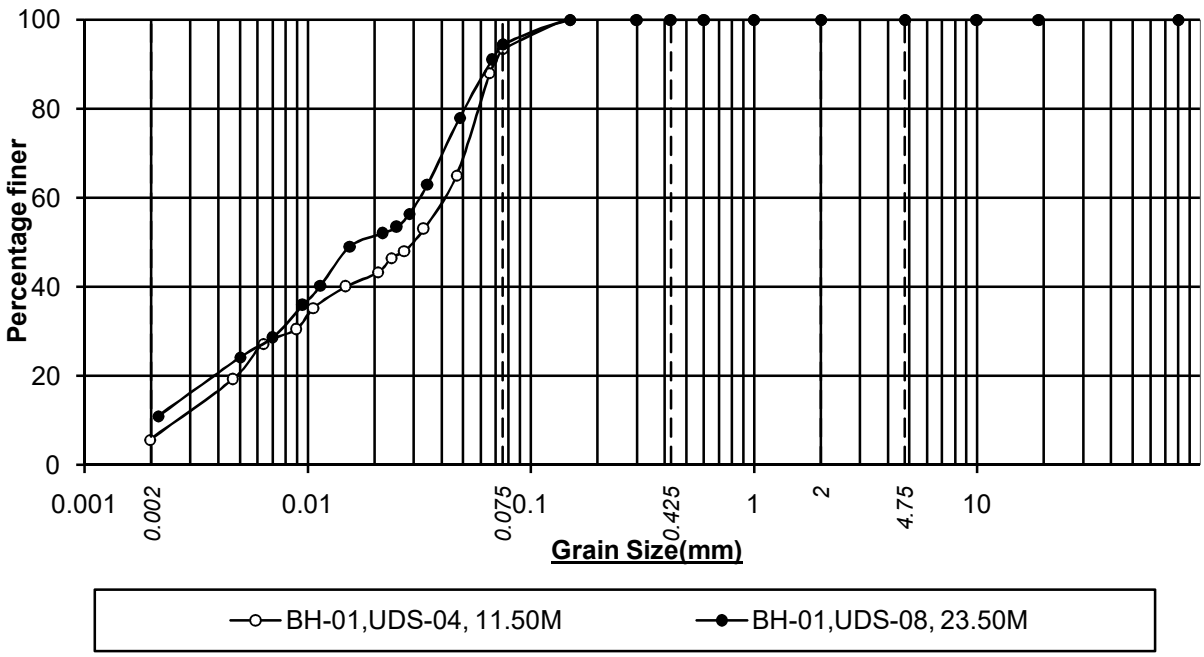


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GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-01,UDS-01, 2.50M	12.5	80.7	6.8	0.0	0.0	6.8		0.0
BH-01,UDS-03, 8.50M	5.7	83.5	10.8	0.0	0.0	10.8		0.0

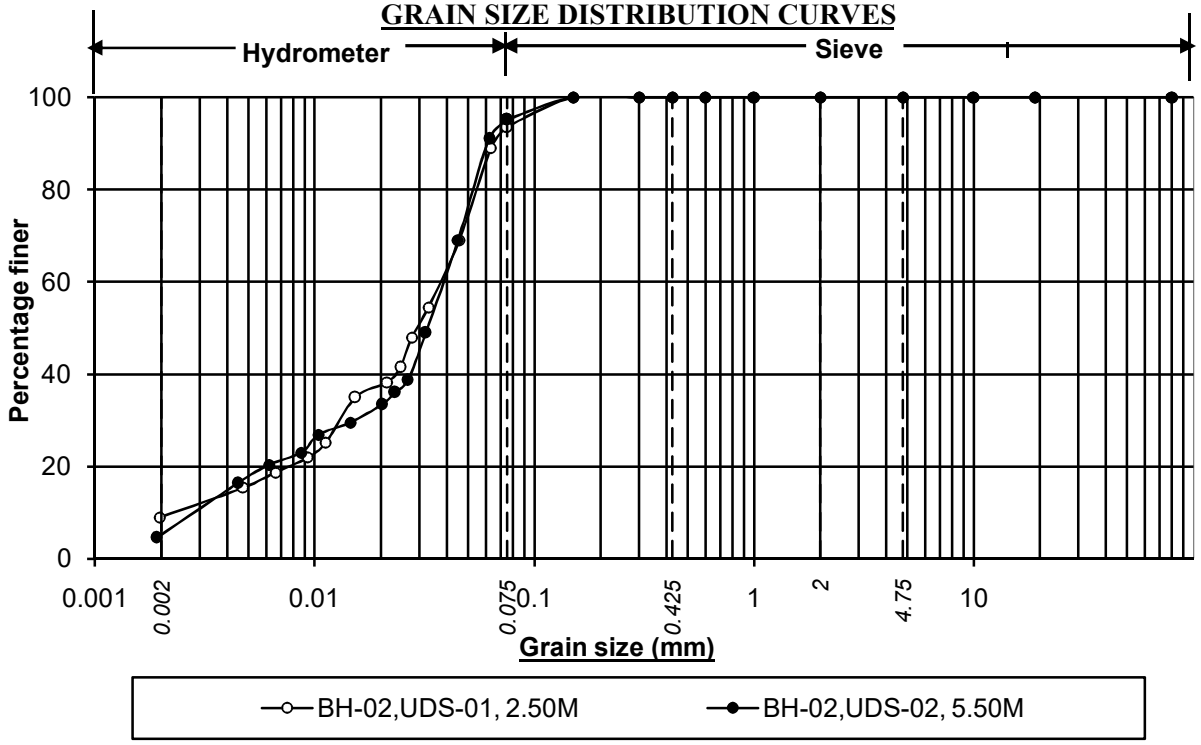


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-01,UDS-04, 11.50M	5.9	87.5	6.6	0.0	0.0	6.6		0.0
BH-01,UDS-08, 23.50M	9.9	84.6	5.5	0.0	0.0	5.5		0.0

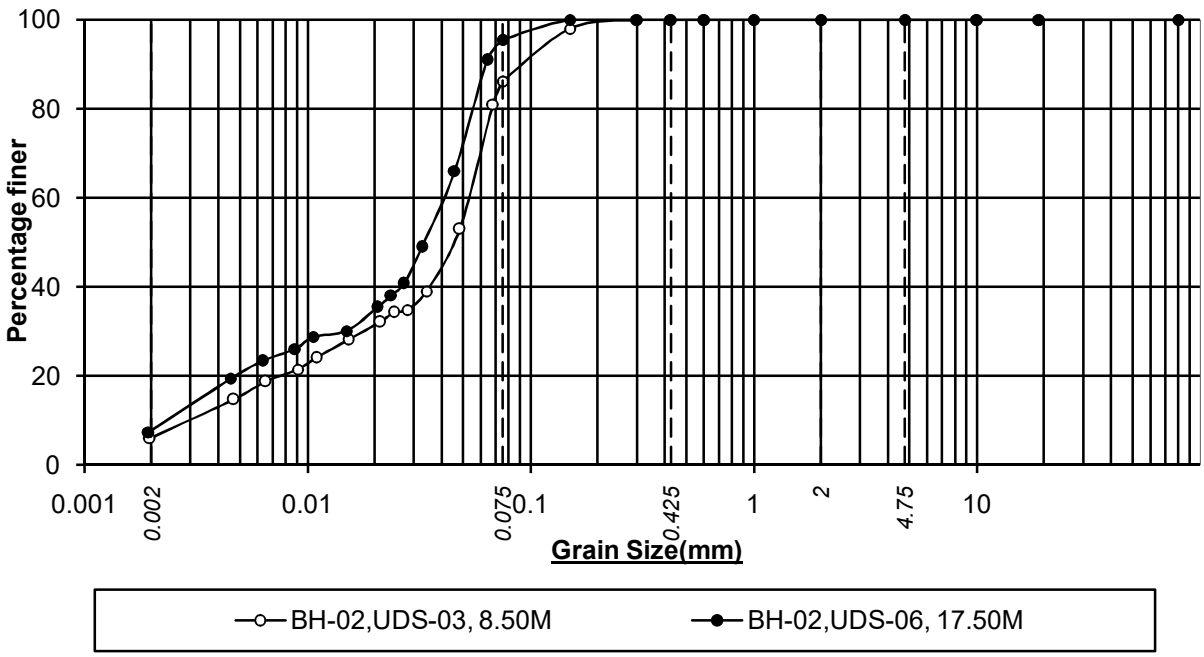
Project:- Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar | **Job No. 4388**

C. E. Testing Company Pvt. Ltd.

GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	<0.002	0.002-0.075	0.075-0.425	0.425-2.00	2.0-4.75	Total sand	Weighted mean dia (mm)	>4.75
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-02,UDS-01, 2.50M	9.0	84.6	6.4	0.0	0.0	6.4		0.0
BH-02,UDS-02, 5.50M	5.2	89.9	4.9	0.0	0.0	4.9		0.0

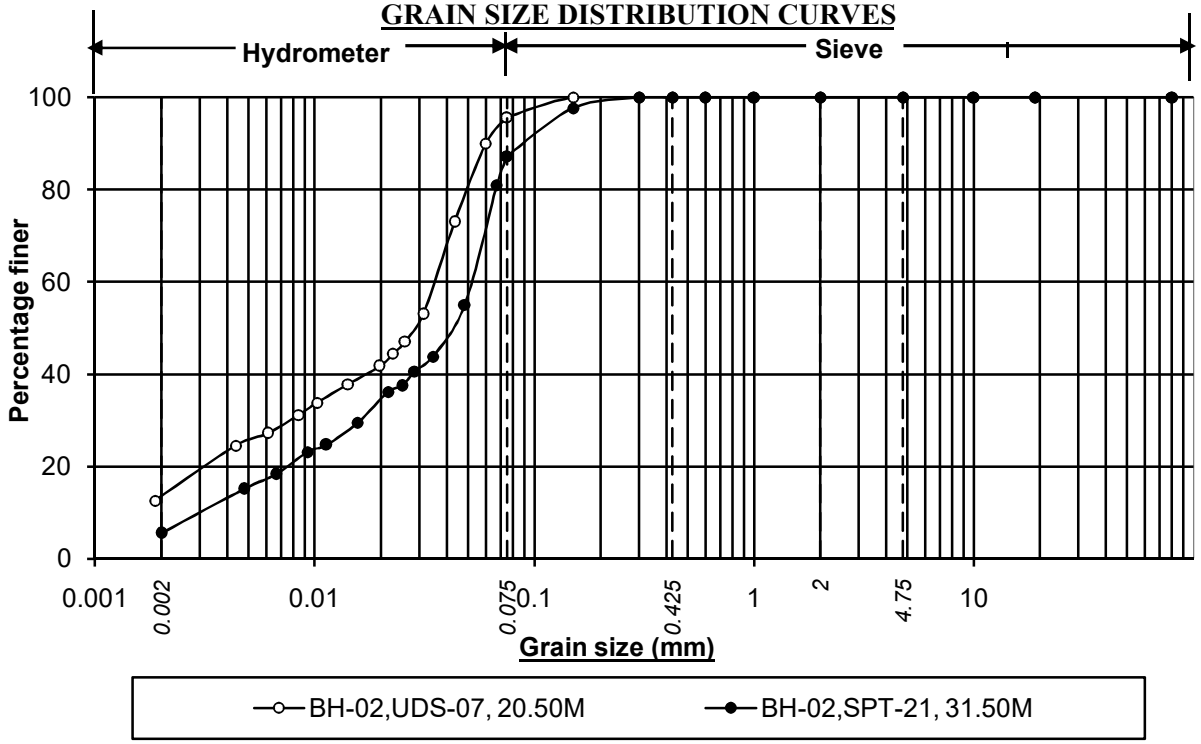


Grain size (mm)	<0.002	0.002-0.075	0.075-0.425	0.425-2.00	2.0-4.75	Total sand	Weighted mean dia (mm)	>4.75
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-02,UDS-03, 8.50M	6.2	80.0	13.8	0.0	0.0	13.8		0.0
BH-02,UDS-06, 17.50M	7.8	87.7	4.5	0.0	0.0	4.5		0.0

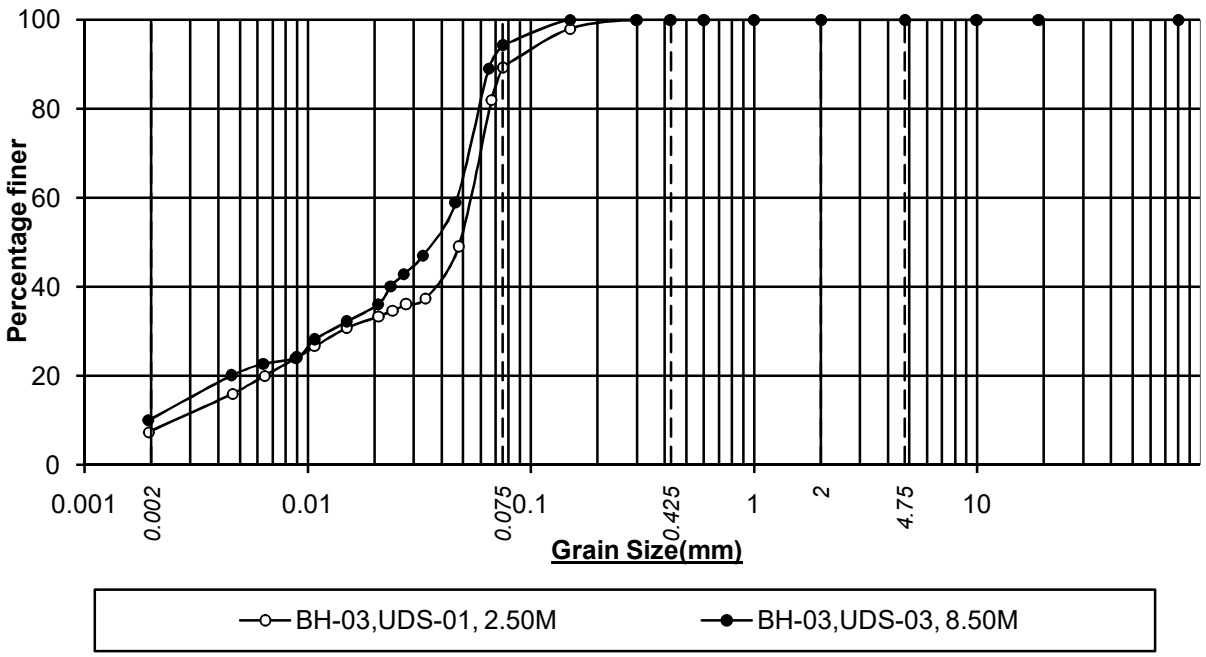
Project:- Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar | **Job No. 4388**

C. E. Testing Company Pvt. Ltd.

GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-02,UDS-07, 20.50M	13.5	82.2	4.3	0.0	0.0	4.3		0.0
BH-02,SPT-21, 31.50M	5.5	81.7	12.8	0.0	0.0	12.8		0.0

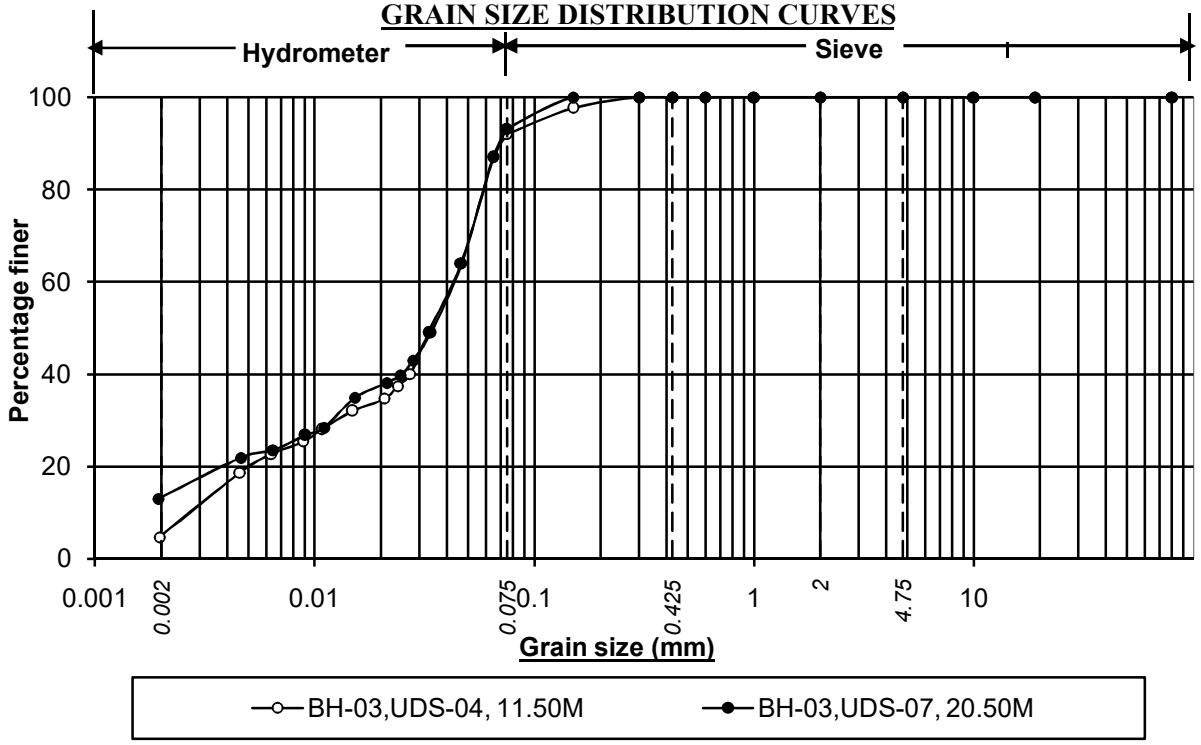


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-03,UDS-01, 2.50M	7.6	81.7	10.7	0.0	0.0	10.7		0.0
BH-03,UDS-03, 8.50M	10.4	83.9	5.7	0.0	0.0	5.7		0.0

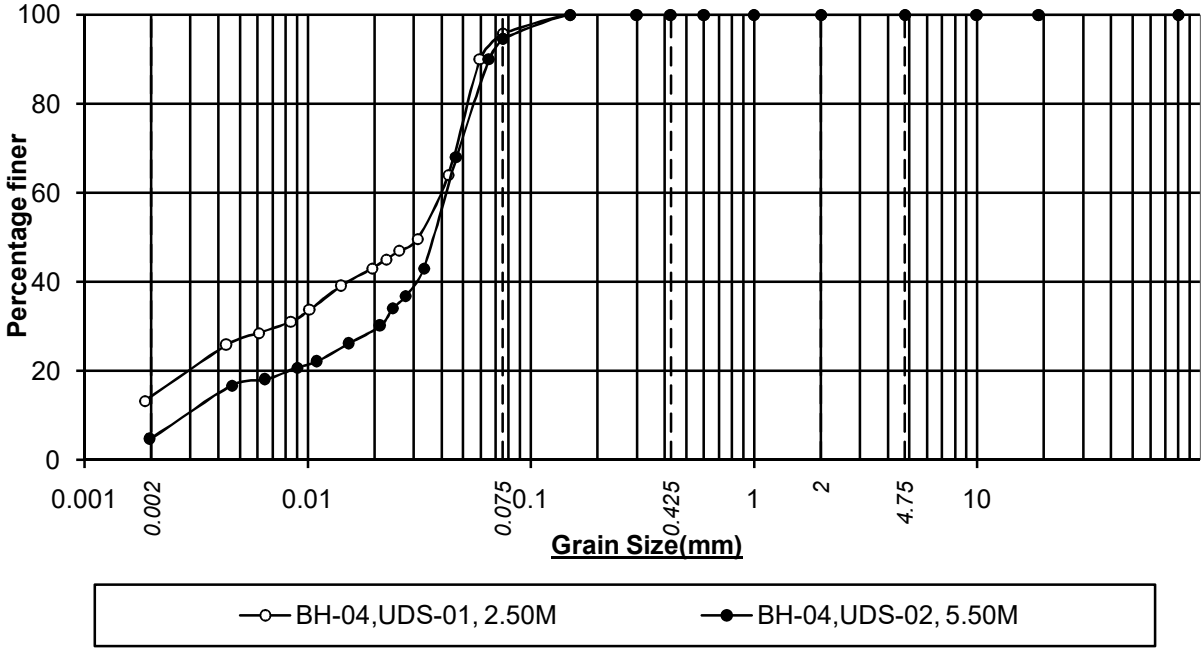
Project:- Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar | **Job No. 4388**

C. E. Testing Company Pvt. Ltd.

GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-03,UDS-04, 11.50M	4.9	87.1	8.0	0.0	0.0	8.0		0.0
BH-03,UDS-07, 20.50M	13.3	79.9	6.8	0.0	0.0	6.8		0.0

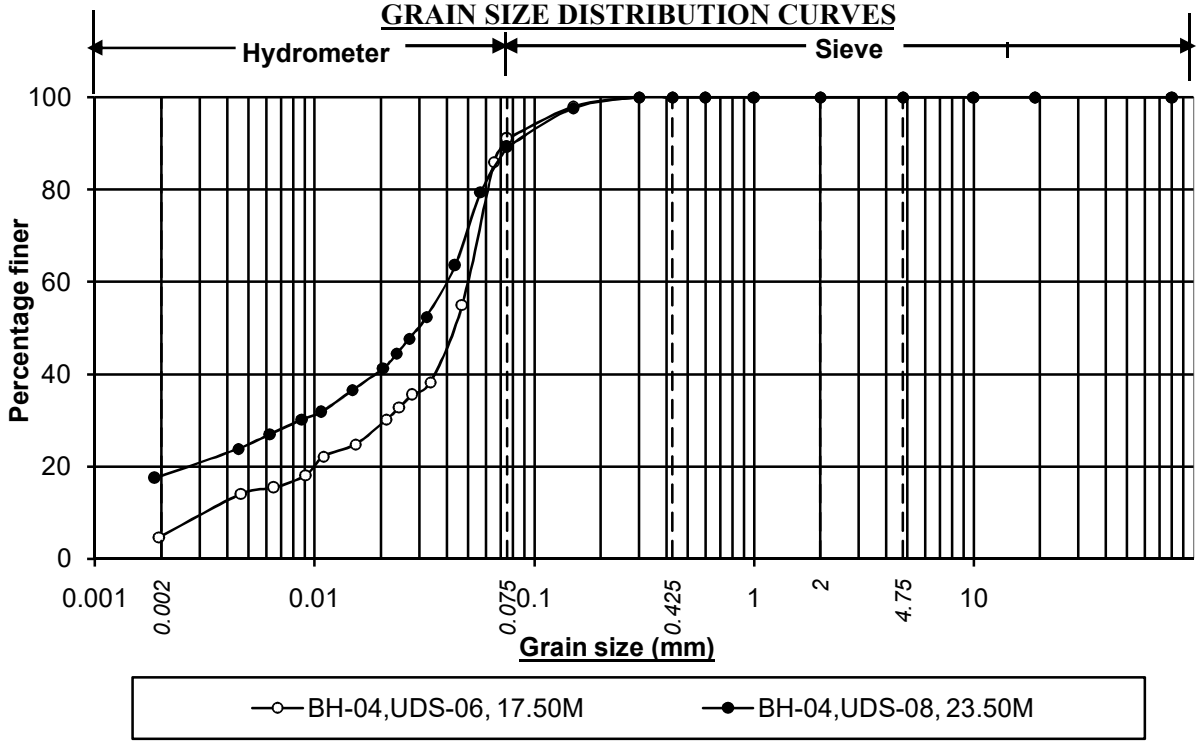


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-04,UDS-01, 2.50M	14.3	81.6	4.1	0.0	0.0	4.1		0.0
BH-04,UDS-02, 5.50M	5.0	89.7	5.3	0.0	0.0	5.3		0.0

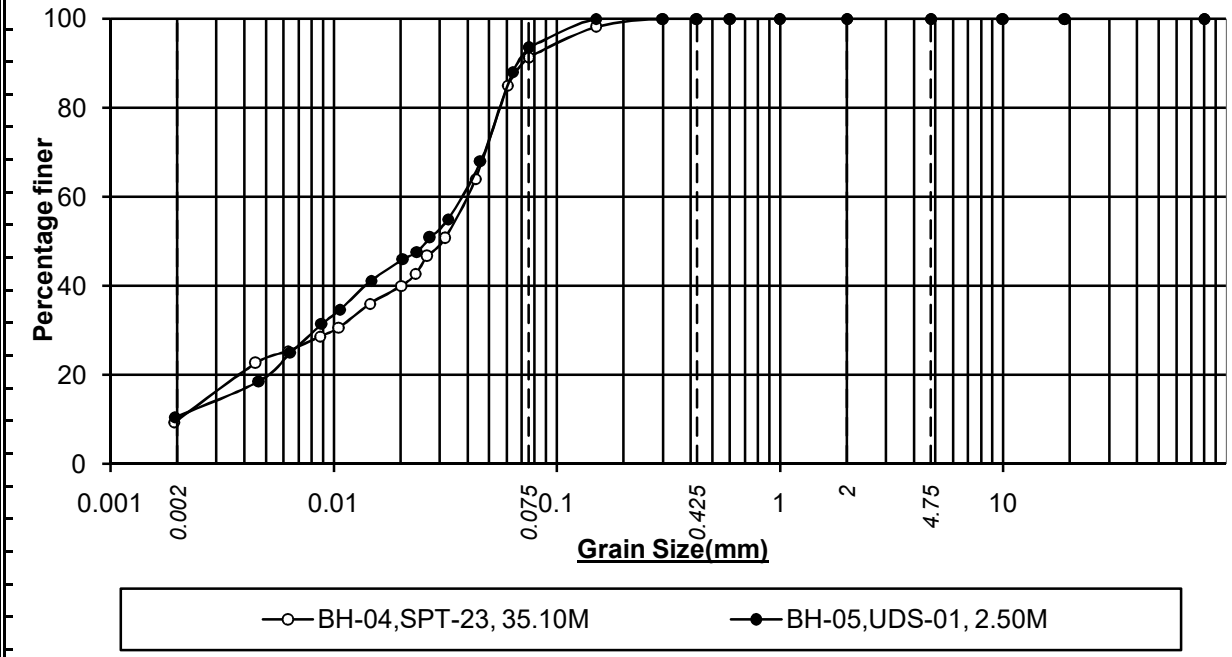
Project:- Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar | **Job No. 4388**

C. E. Testing Company Pvt. Ltd.

GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-04,UDS-06, 17.50M	4.9	86.1	9.0	0.0	0.0	9.0		0.0
BH-04,UDS-08, 23.50M	17.9	71.3	10.8	0.0	0.0	10.8		0.0

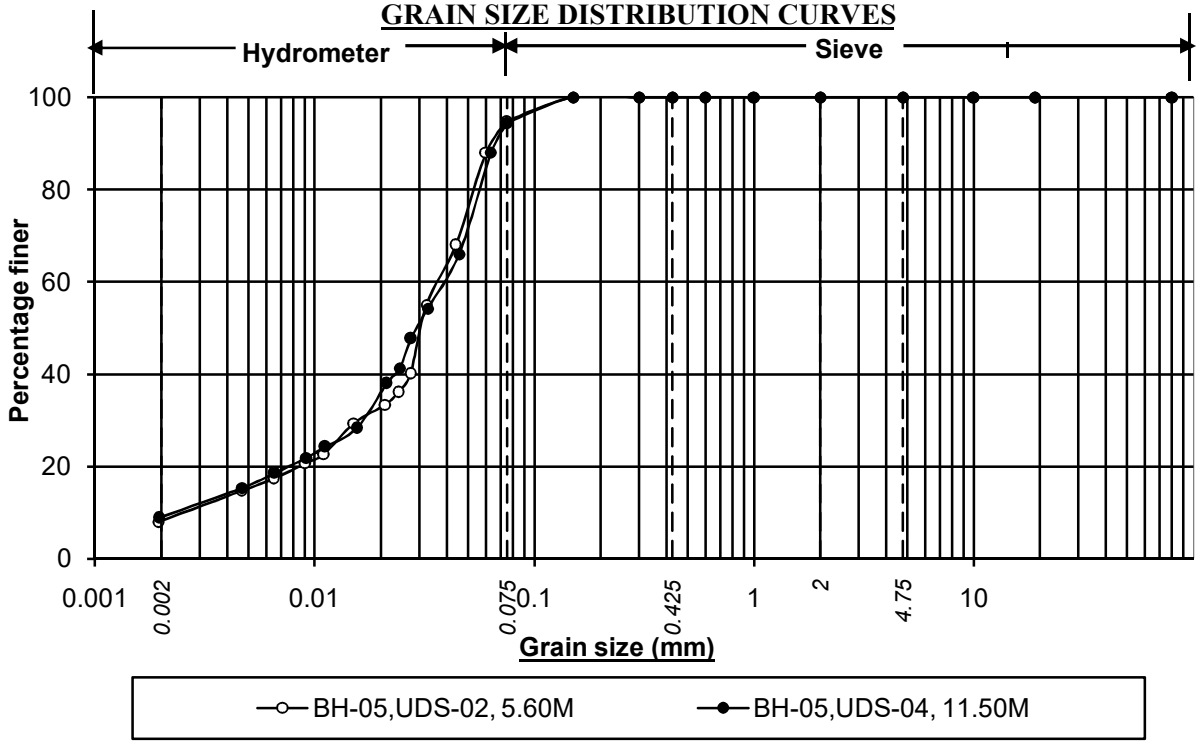


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-04,SPT-23, 35.10M	9.9	81.5	8.6	0.0	0.0	8.6		0.0
BH-05,UDS-01, 2.50M	10.8	82.8	6.4	0.0	0.0	6.4		0.0

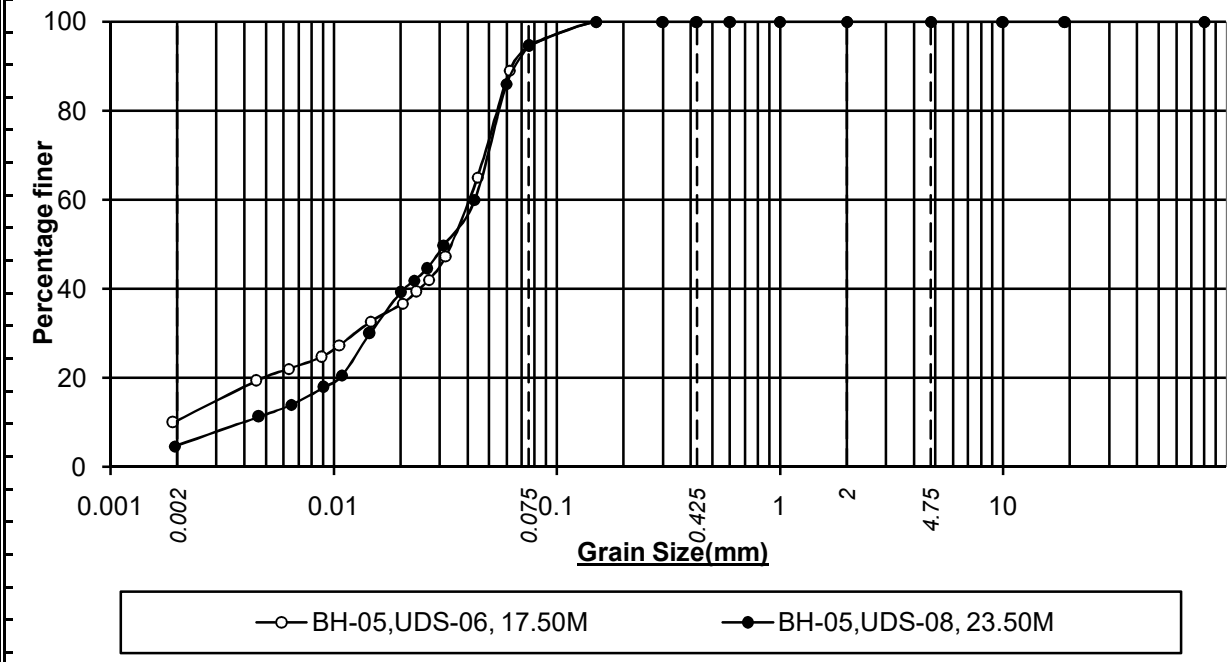
Project:- Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar | **Job No. 4388**

C. E. Testing Company Pvt. Ltd.

GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-05,UDS-02, 5.60M	8.2	86.6	5.2	0.0	0.0	5.2		0.0
BH-05,UDS-04, 11.50M	9.0	85.4	5.6	0.0	0.0	5.6		0.0

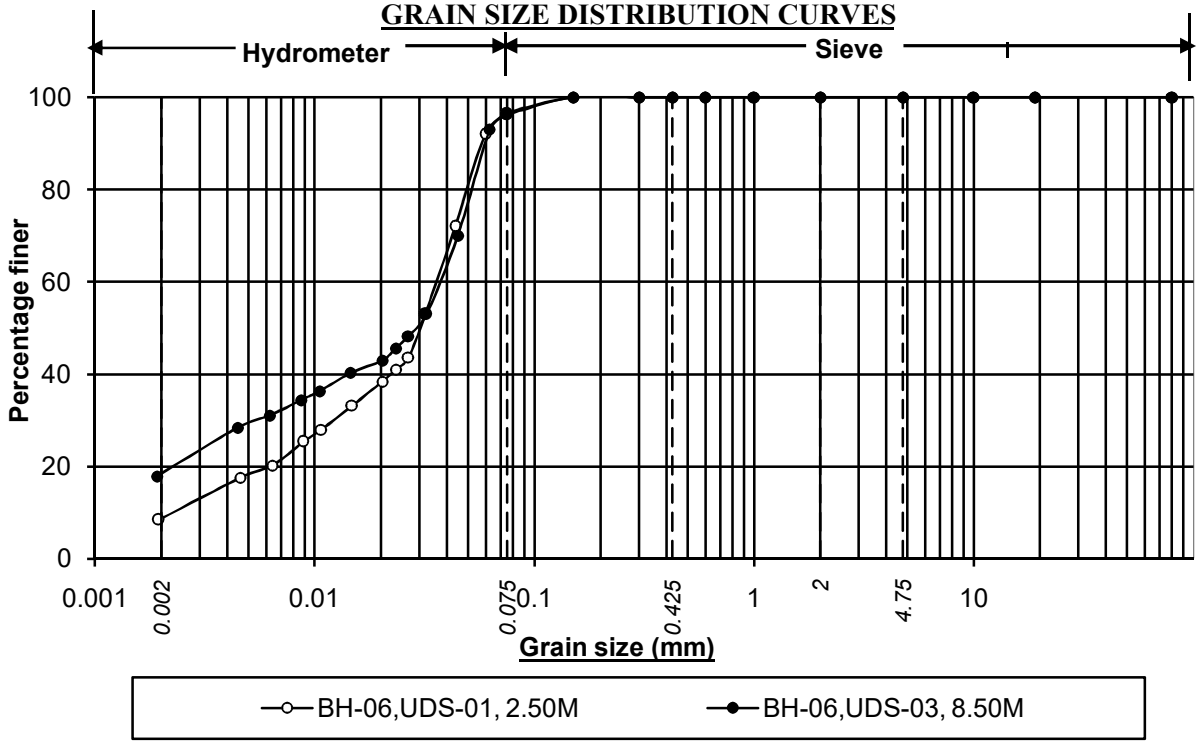


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-05,UDS-06, 17.50M	10.5	84.3	5.2	0.0	0.0	5.2		0.0
BH-05,UDS-08, 23.50M	4.9	89.8	5.3	0.0	0.0	5.3		0.0

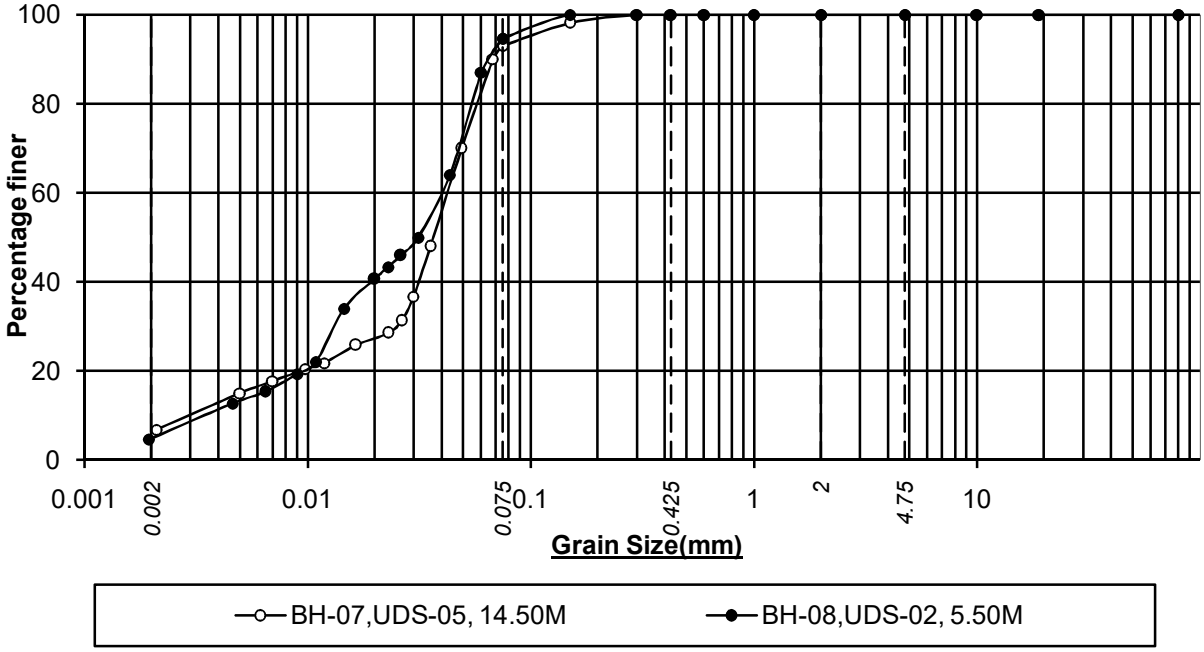
Project:- Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar | **Job No. 4388**

C. E. Testing Company Pvt. Ltd.

GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	<0.002	0.002-0.075	0.075-0.425	0.425-2.00	2.0-4.75	Total sand	Weighted mean dia (mm)	>4.75
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-06,UDS-01, 2.50M	8.7	87.9	3.4	0.0	0.0	3.4		0.0
BH-06,UDS-03, 8.50M	18.4	78.0	3.6	0.0	0.0	3.6		0.0

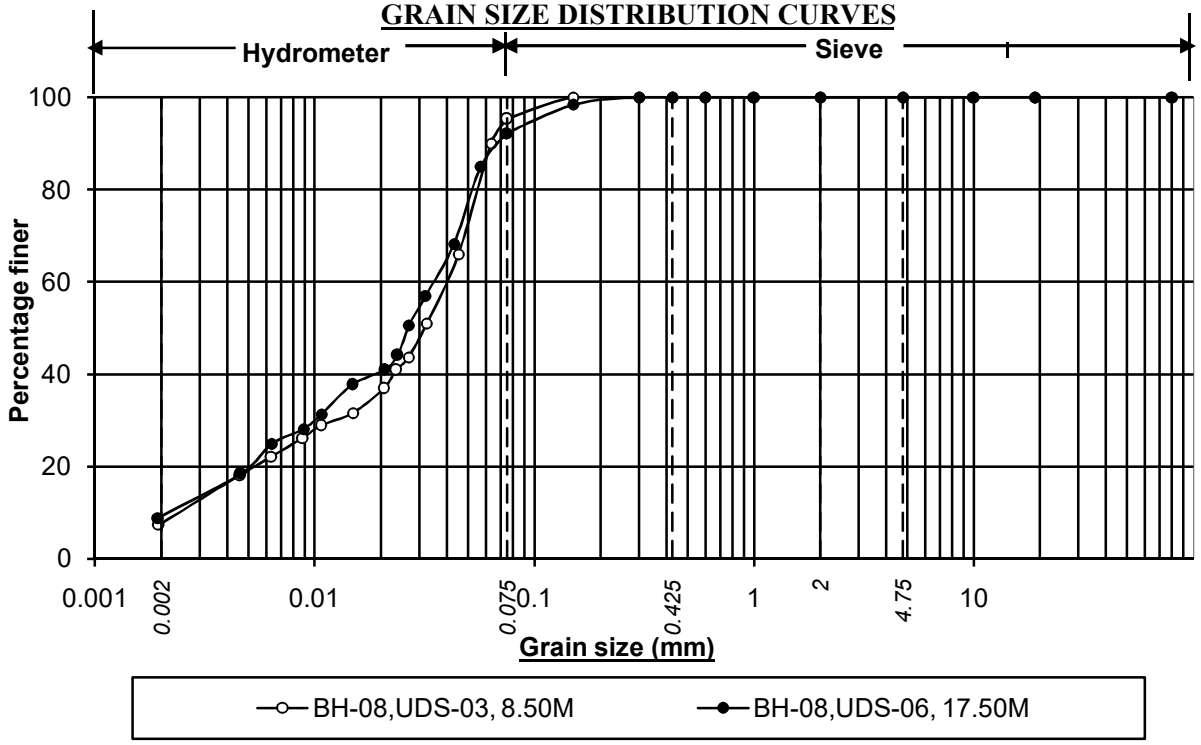


Grain size (mm)	<0.002	0.002-0.075	0.075-0.425	0.425-2.00	2.0-4.75	Total sand	Weighted mean dia (mm)	>4.75
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-07,UDS-05, 14.50M	6.3	86.7	7.0	0.0	0.0	7.0		0.0
BH-08,UDS-02, 5.50M	4.9	89.8	5.3	0.0	0.0	5.3		0.0

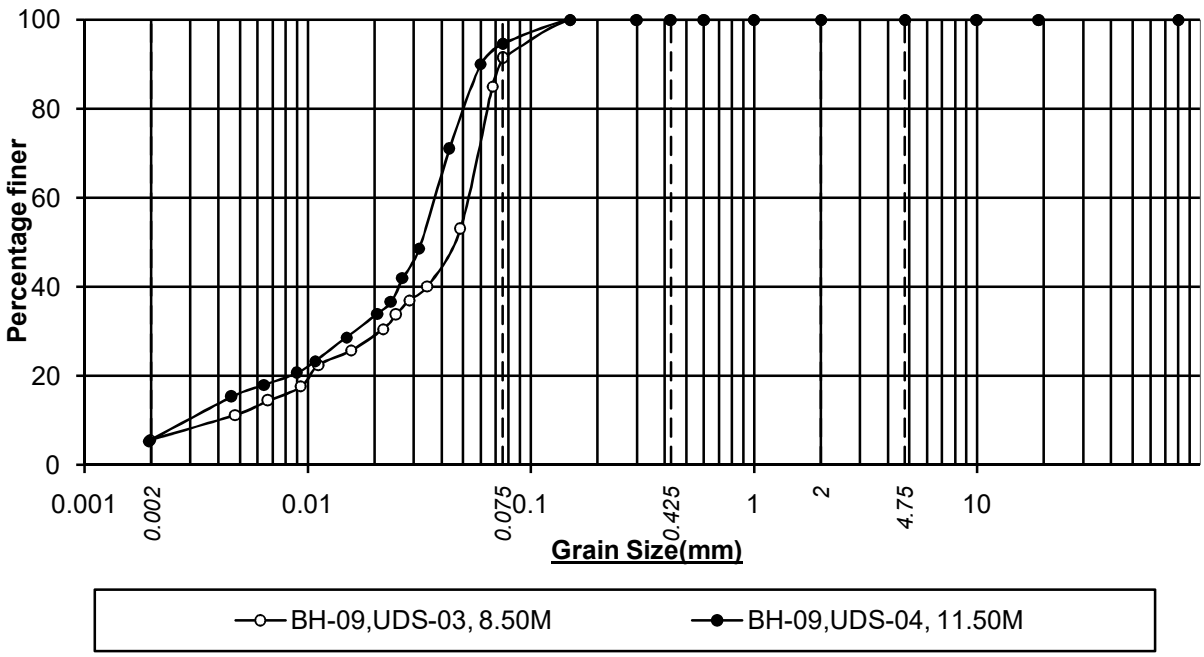
Project:- Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar | **Job No. 4388**

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GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-08,UDS-03, 8.50M	7.7	87.6	4.7	0.0	0.0	4.7		0.0
BH-08,UDS-06, 17.50M	9.2	83.0	7.8	0.0	0.0	7.8		0.0

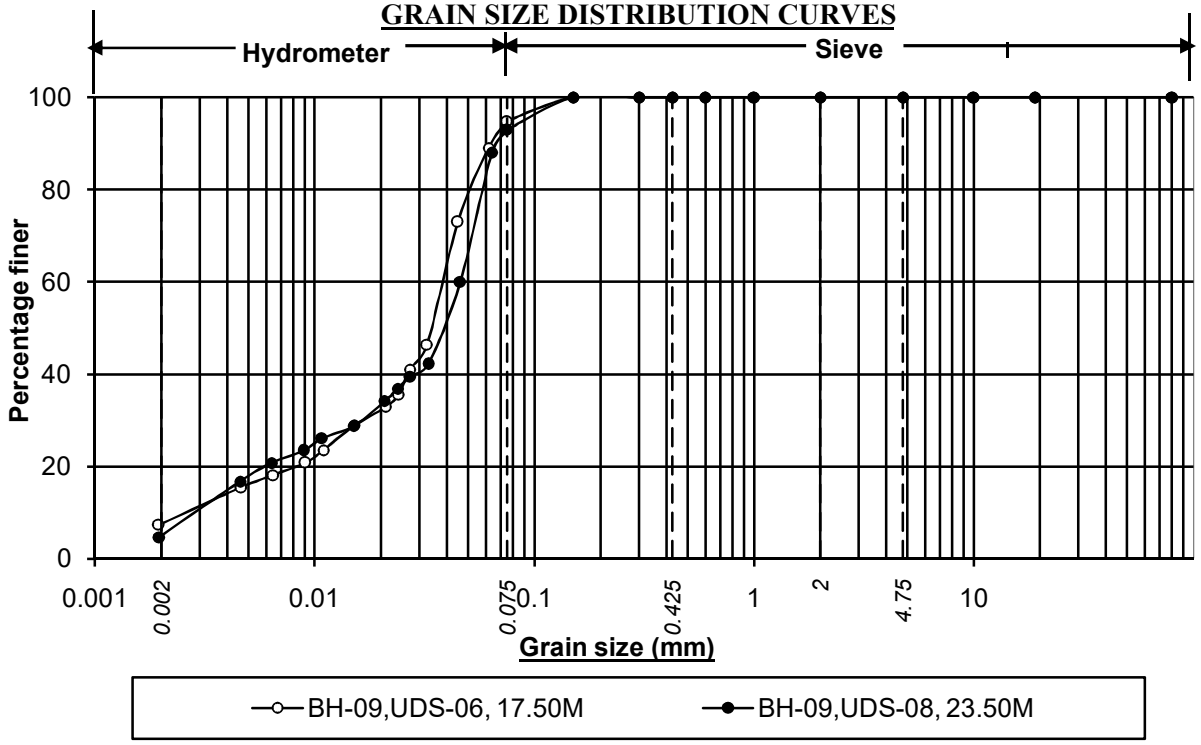


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-09,UDS-03, 8.50M	5.7	85.7	8.6	0.0	0.0	8.6		0.0
BH-09,UDS-04, 11.50M	5.7	89.0	5.3	0.0	0.0	5.3		0.0

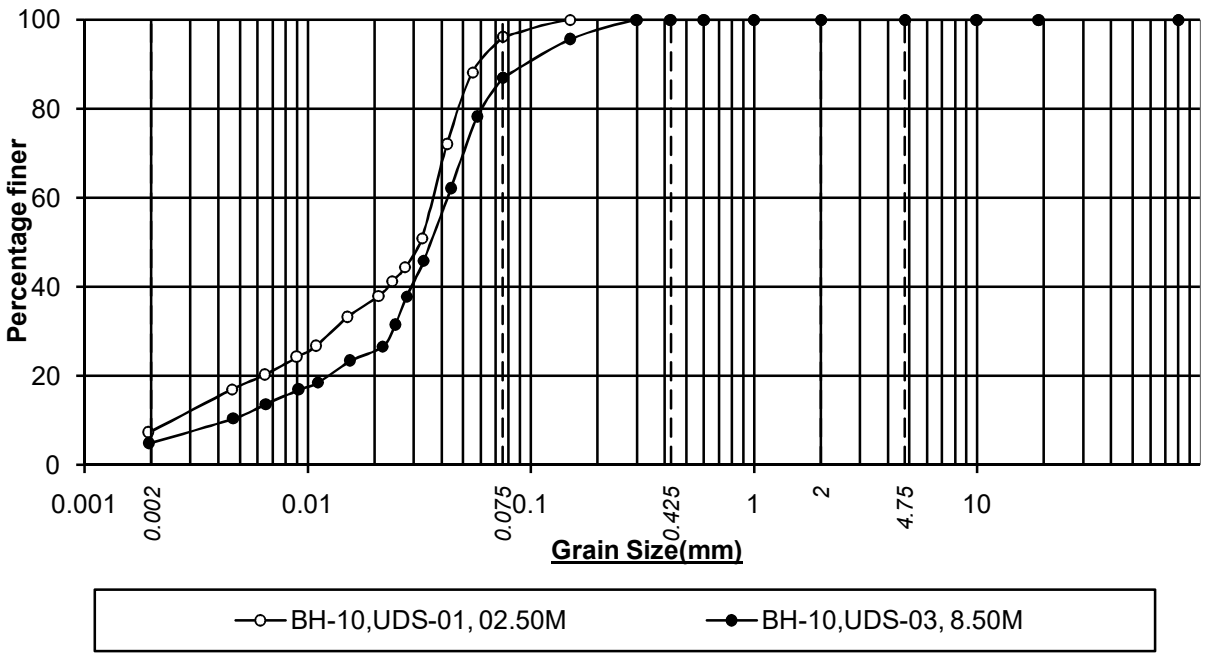
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GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-09,UDS-06, 17.50M	7.6	87.2	5.2	0.0	0.0	5.2		0.0
BH-09,UDS-08, 23.50M	4.9	88.1	7.0	0.0	0.0	7.0		0.0

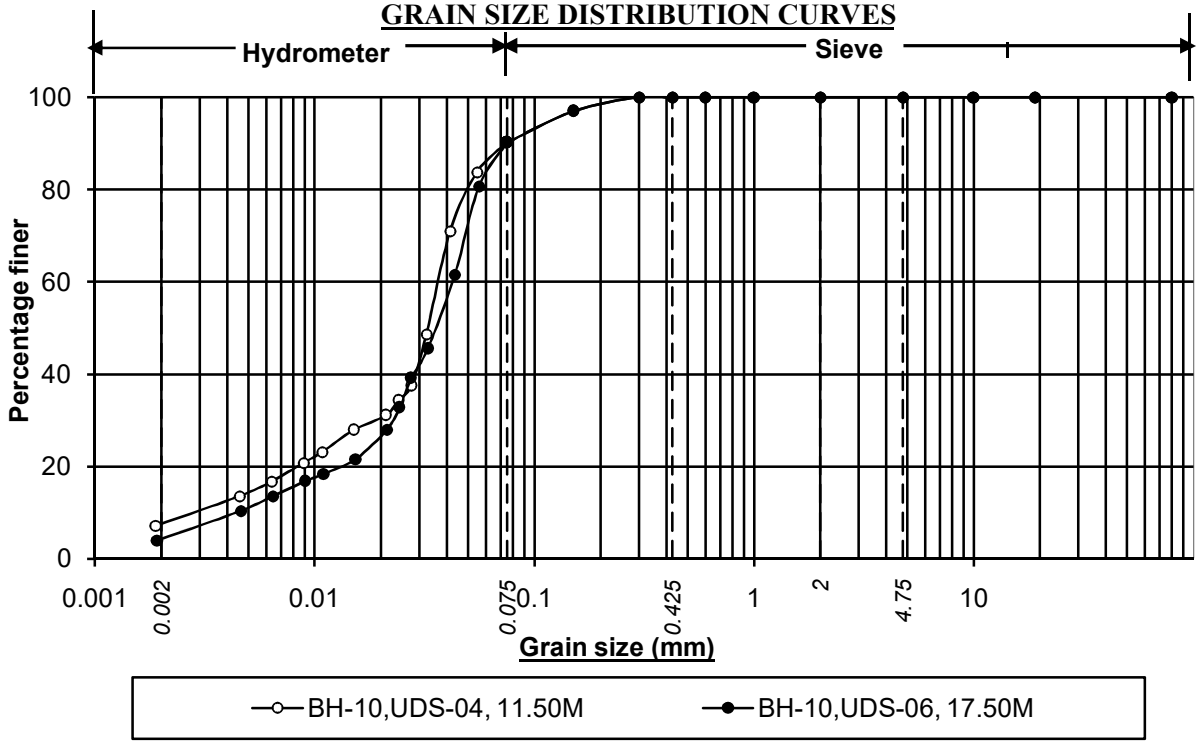


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-10,UDS-01, 02.50M	7.6	88.6	3.8	0.0	0.0	3.8		0.0
BH-10,UDS-03, 8.50M	5.0	82.0	13.0	0.0	0.0	13.0		0.0

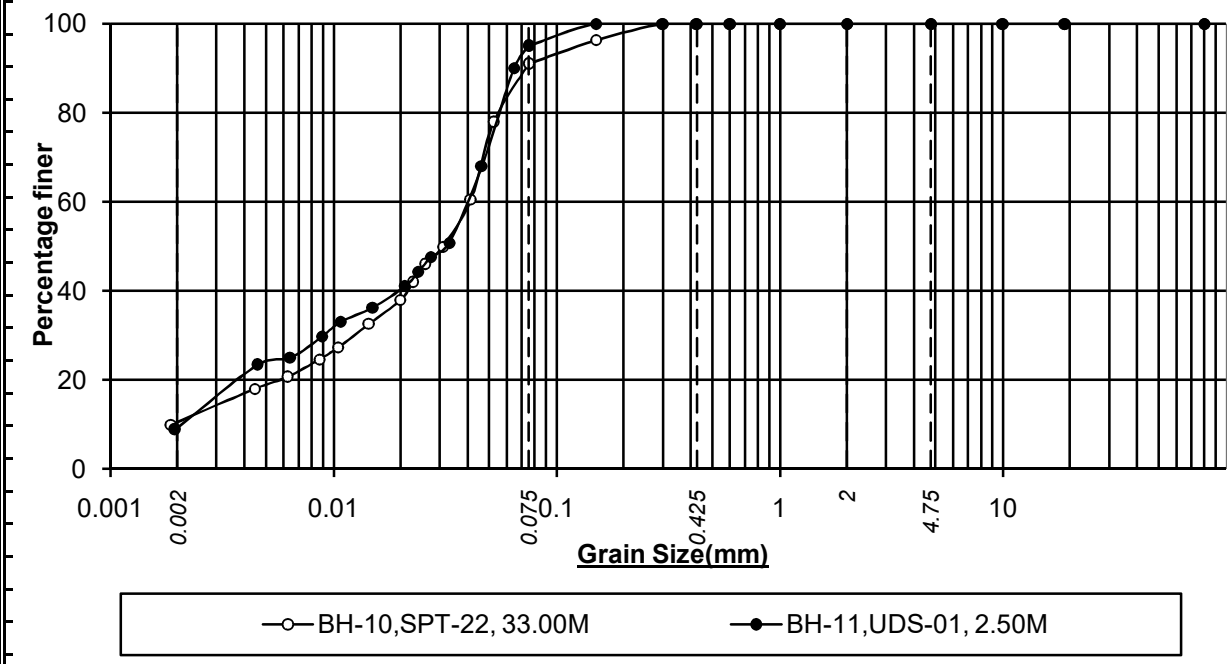
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GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	<0.002	0.002-0.075	0.075-0.425	0.425-2.00	2.0-4.75	Total sand	Weighted mean dia (mm)	>4.75
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-10,UDS-04, 11.50M	7.5	82.7	9.8	0.0	0.0	9.8		0.0
BH-10,UDS-06, 17.50M	4.3	85.9	9.8	0.0	0.0	9.8		0.0

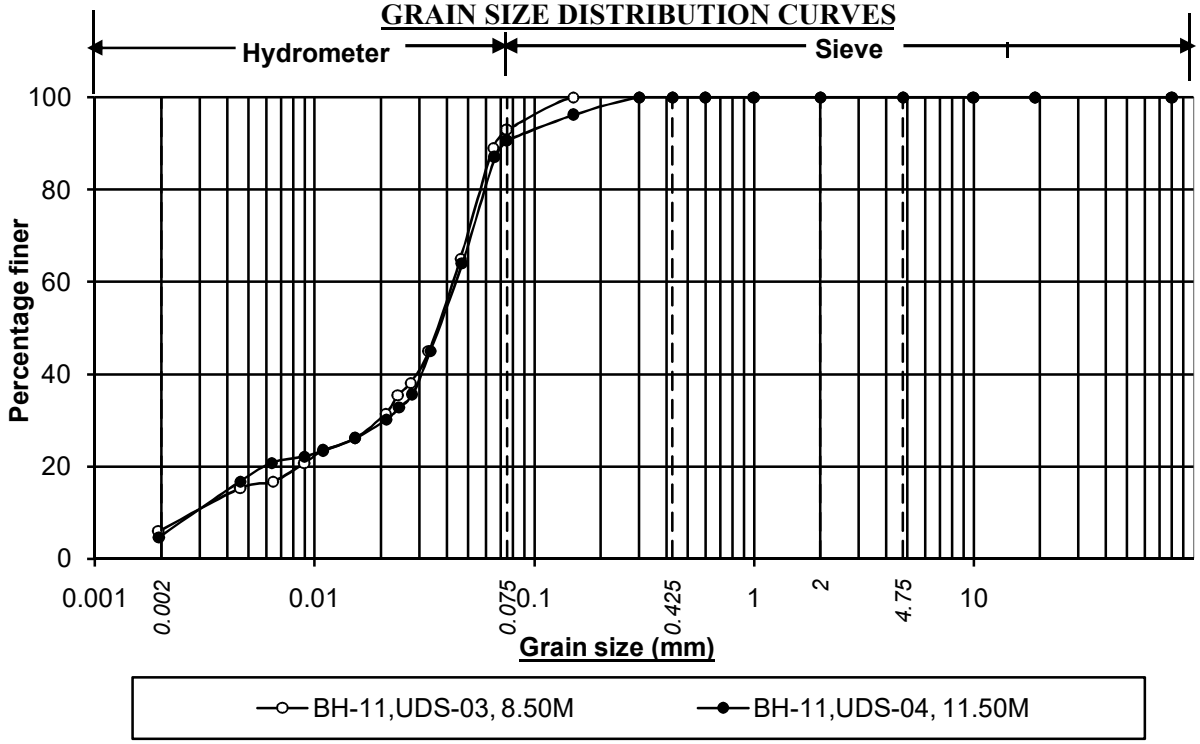


Grain size (mm)	<0.002	0.002-0.075	0.075-0.425	0.425-2.00	2.0-4.75	Total sand	Weighted mean dia (mm)	>4.75
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-10,SPT-22, 33.00M	10.6	80.4	9.0	0.0	0.0	9.0		0.0
BH-11,UDS-01, 2.50M	9.3	85.7	5.0	0.0	0.0	5.0		0.0

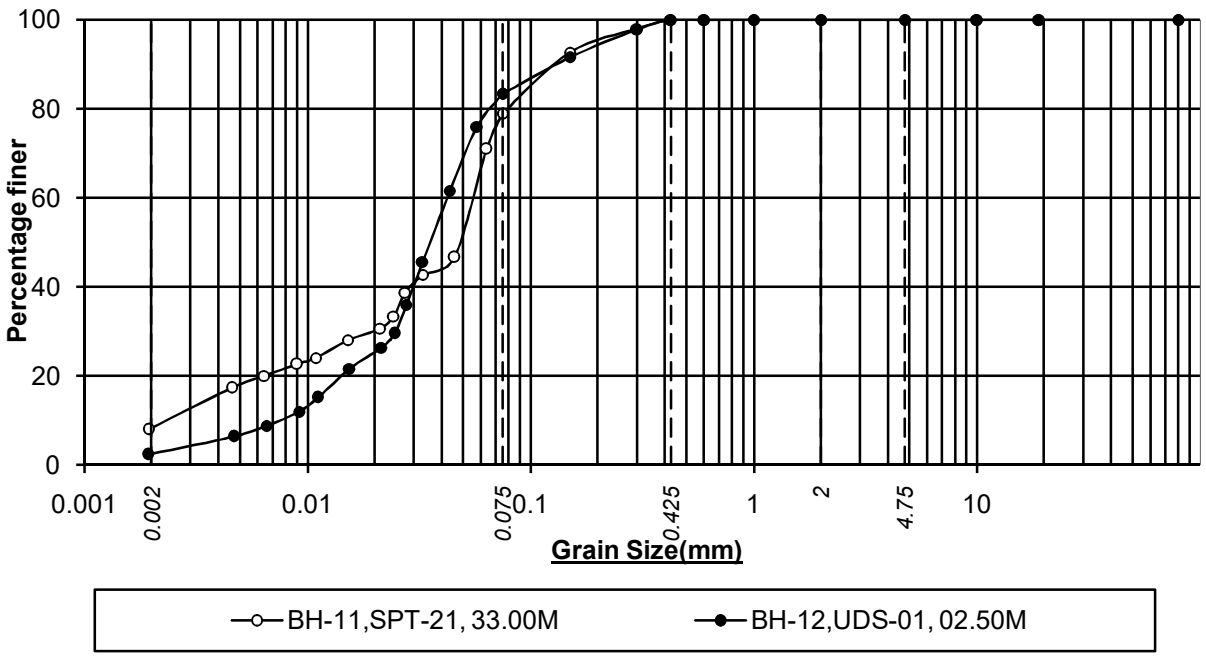
Project:- Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar | **Job No. 4388**

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GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-11,UDS-03, 8.50M	6.3	86.7	7.0	0.0	0.0	7.0		0.0
BH-11,UDS-04, 11.50M	4.9	85.7	9.4	0.0	0.0	9.4		0.0

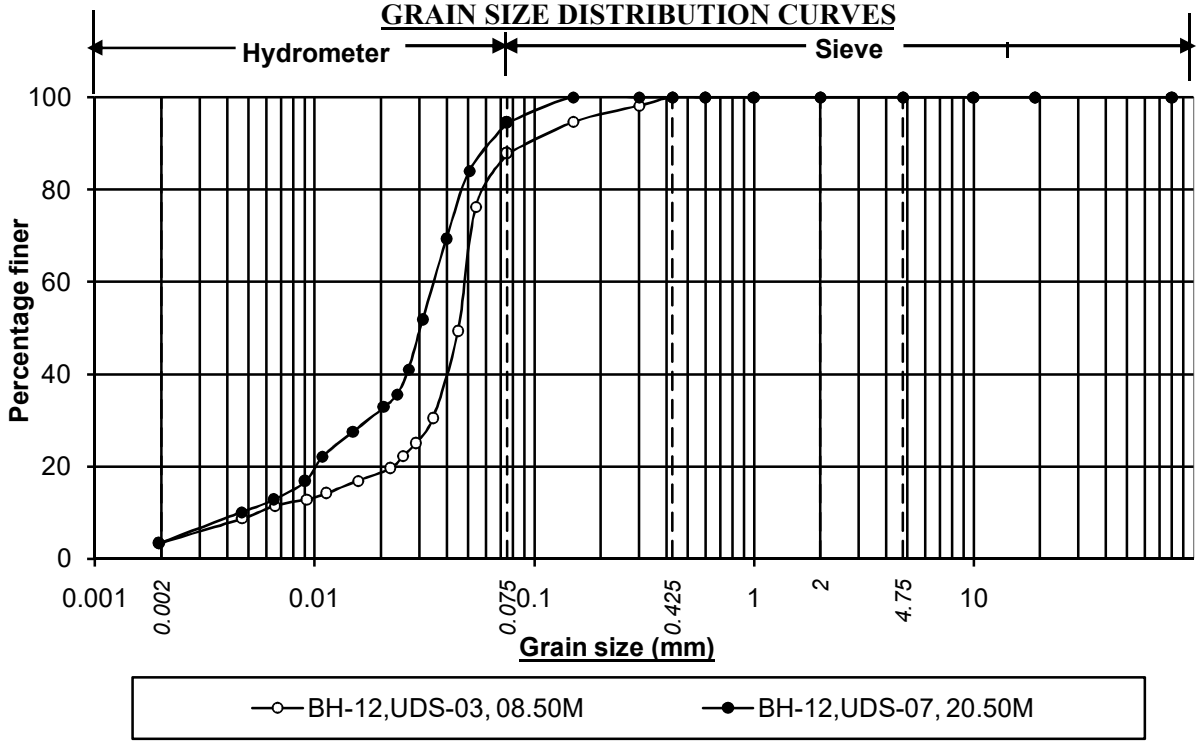


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-11,SPT-21, 33.00M	8.3	70.7	21.0	0.0	0.0	21.0		0.0
BH-12,UDS-01, 02.50M	2.5	80.9	16.6	0.0	0.0	16.6		0.0

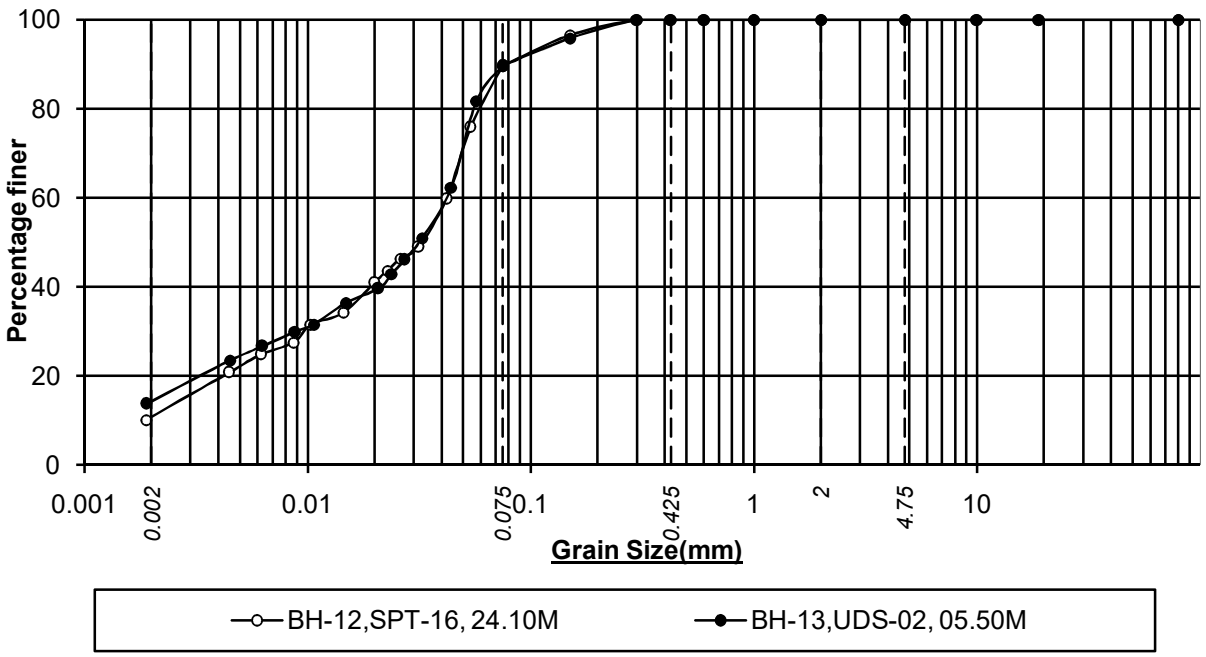
Project:- Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar | **Job No. 4388**

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GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-12,UDS-03, 08.50M	3.5	84.3	12.2	0.0	0.0	12.2		0.0
BH-12,UDS-07, 20.50M	3.6	90.9	5.5	0.0	0.0	5.5		0.0

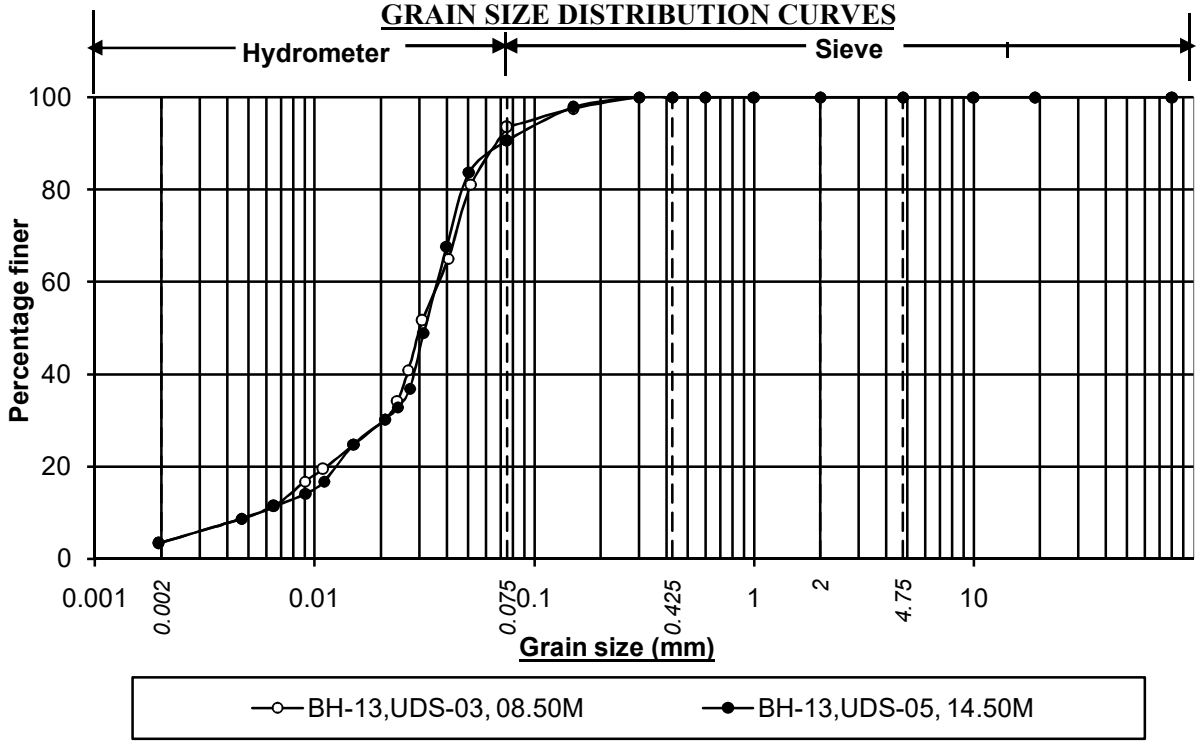


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-12,SPT-16, 24.10M	10.7	78.9	10.4	0.0	0.0	10.4		0.0
BH-13,UDS-02, 05.50M	14.3	75.3	10.4	0.0	0.0	10.4		0.0

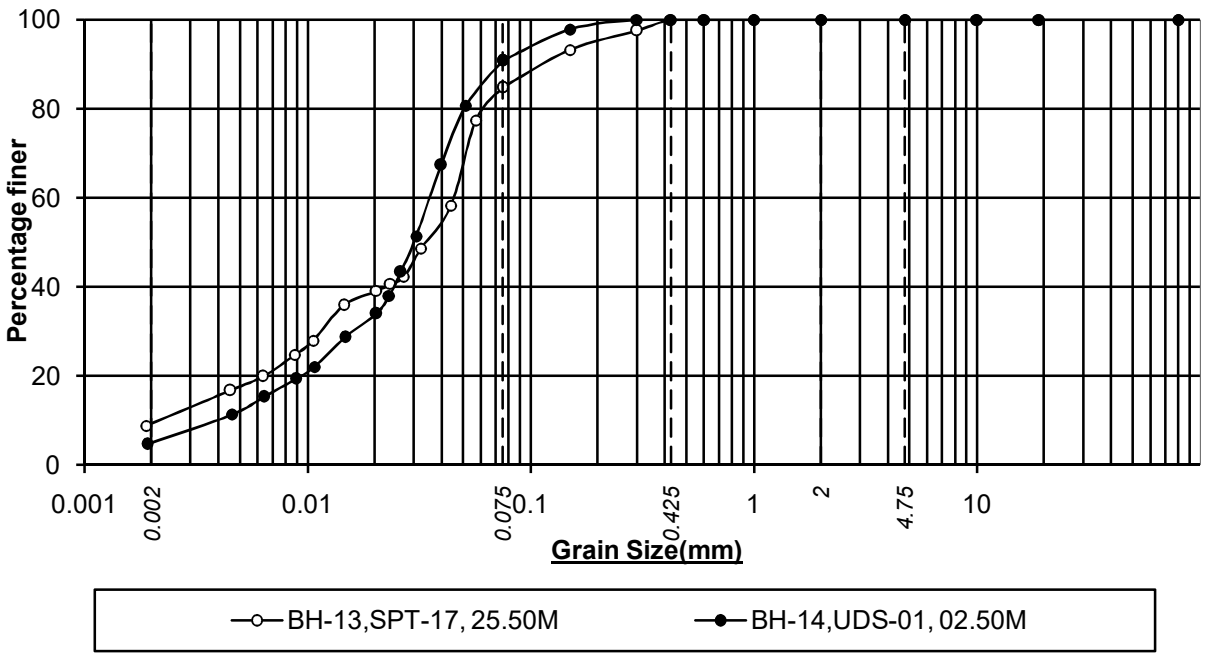
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GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	<0.002	0.002-0.075	0.075-0.425	0.425-2.00	2.0-4.75	Total sand	Weighted mean dia (mm)	>4.75
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-13,UDS-03, 08.50M	3.5	90.0	6.5	0.0	0.0	6.5		0.0
BH-13,UDS-05, 14.50M	3.5	87.1	9.4	0.0	0.0	9.4		0.0

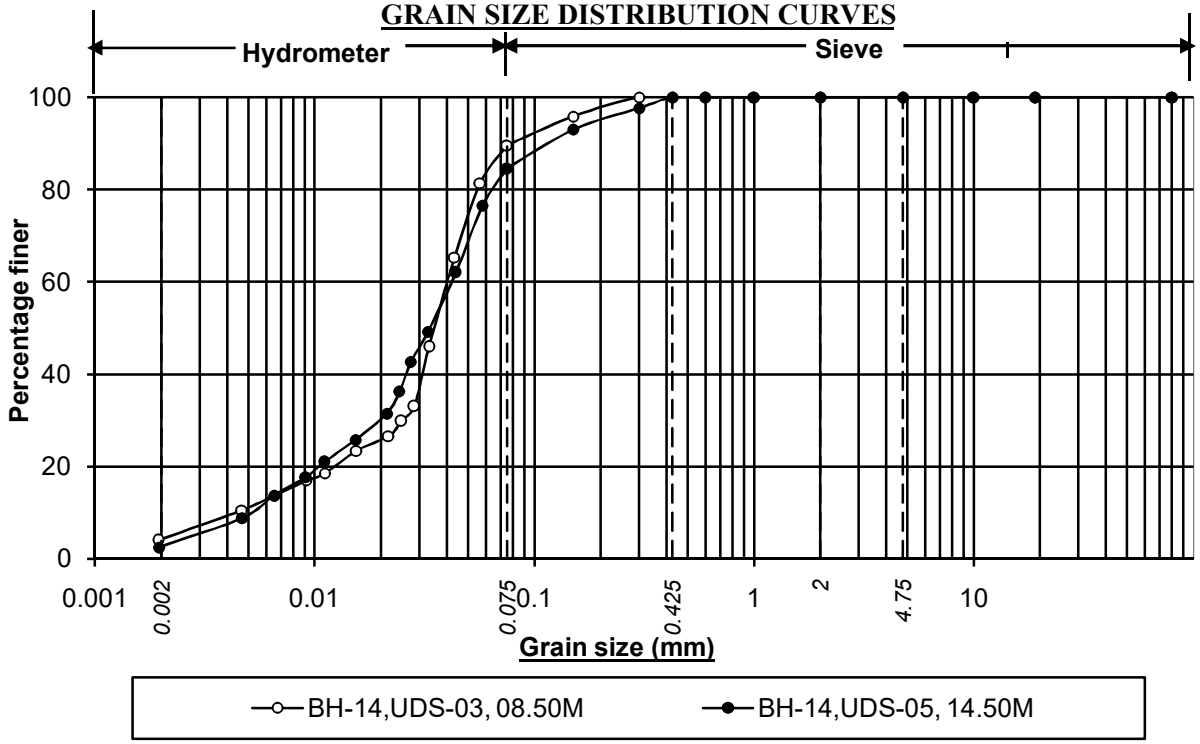


Grain size (mm)	<0.002	0.002-0.075	0.075-0.425	0.425-2.00	2.0-4.75	Total sand	Weighted mean dia (mm)	>4.75
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-13,SPT-17, 25.50M	9.3	75.5	15.2	0.0	0.0	15.2		0.0
BH-14,UDS-01, 02.50M	5.0	85.9	9.1	0.0	0.0	9.1		0.0

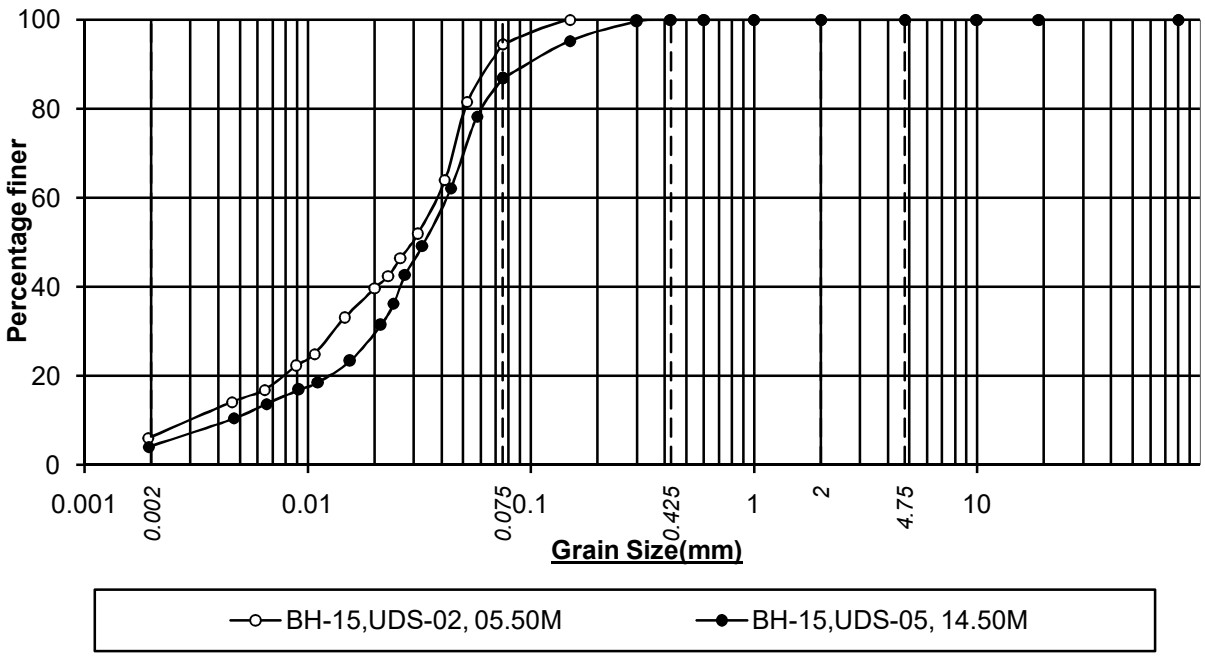
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GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-14,UDS-03, 08.50M	4.2	85.4	10.4	0.0	0.0	10.4		0.0
BH-14,UDS-05, 14.50M	2.6	82.0	15.4	0.0	0.0	15.4		0.0

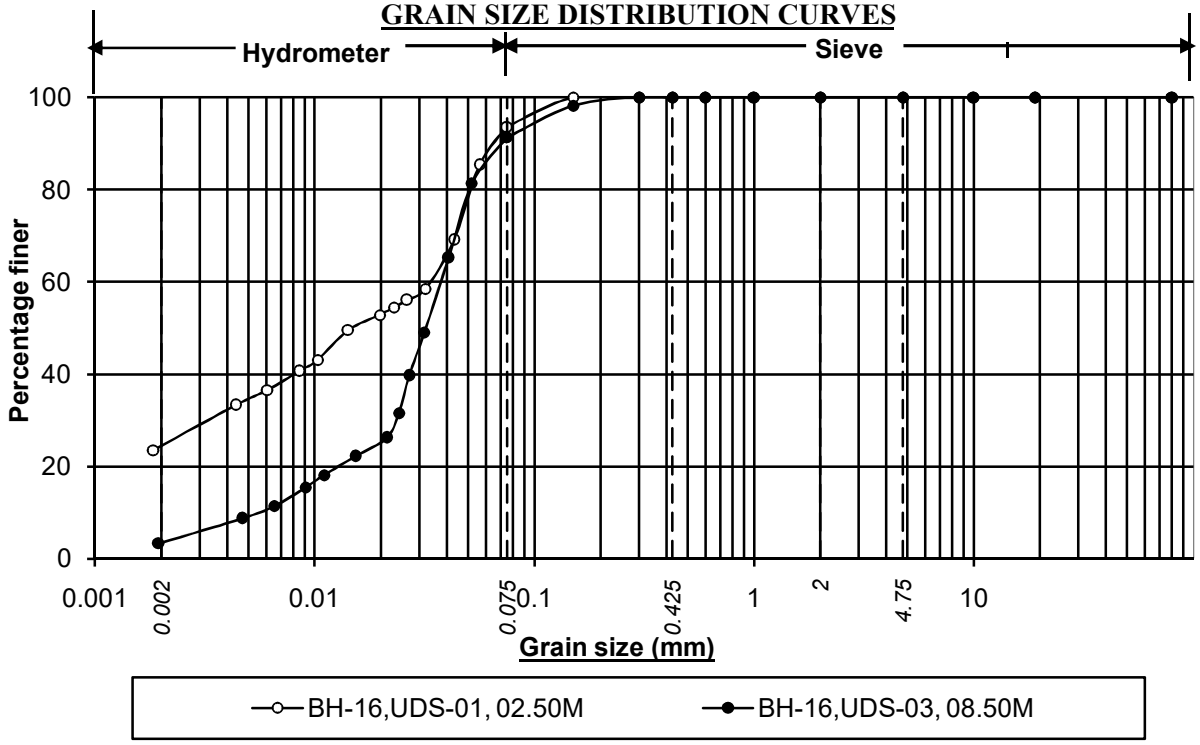


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-15,UDS-02, 05.50M	6.4	88.1	5.5	0.0	0.0	5.5		0.0
BH-15,UDS-05, 14.50M	4.2	82.6	13.2	0.0	0.0	13.2		0.0

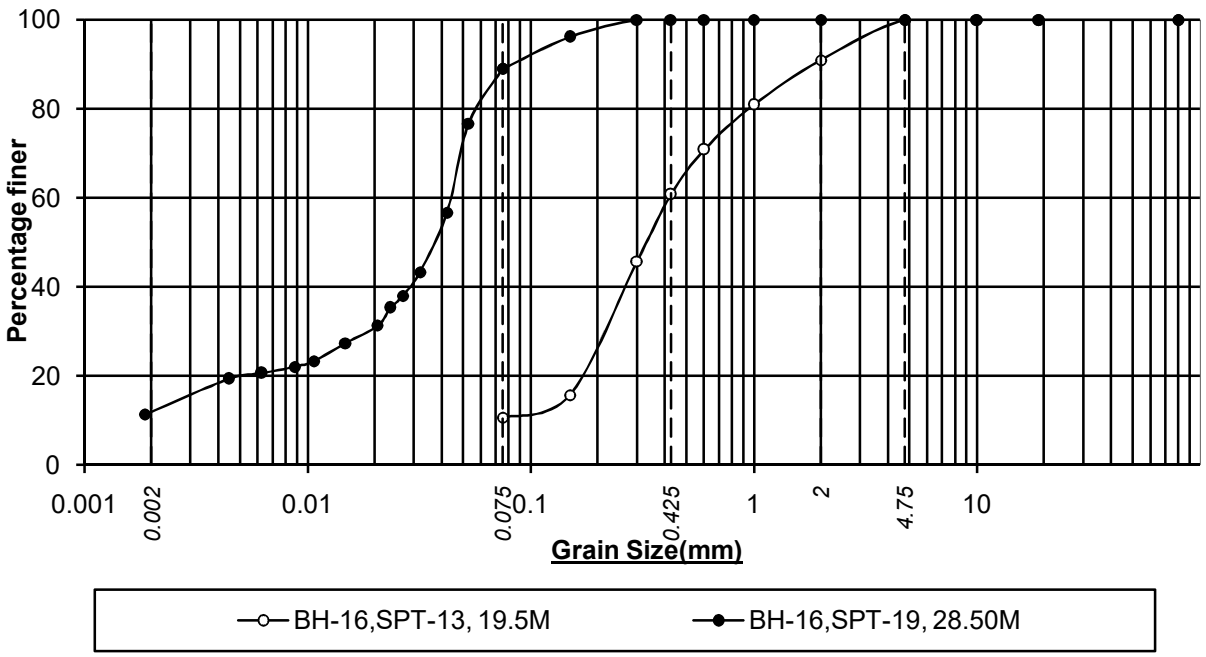
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GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-16,UDS-01, 02.50M	24.5	69.1	6.4	0.0	0.0	6.4		0.0
BH-16,UDS-03, 08.50M	3.5	87.8	8.7	0.0	0.0	8.7		0.0

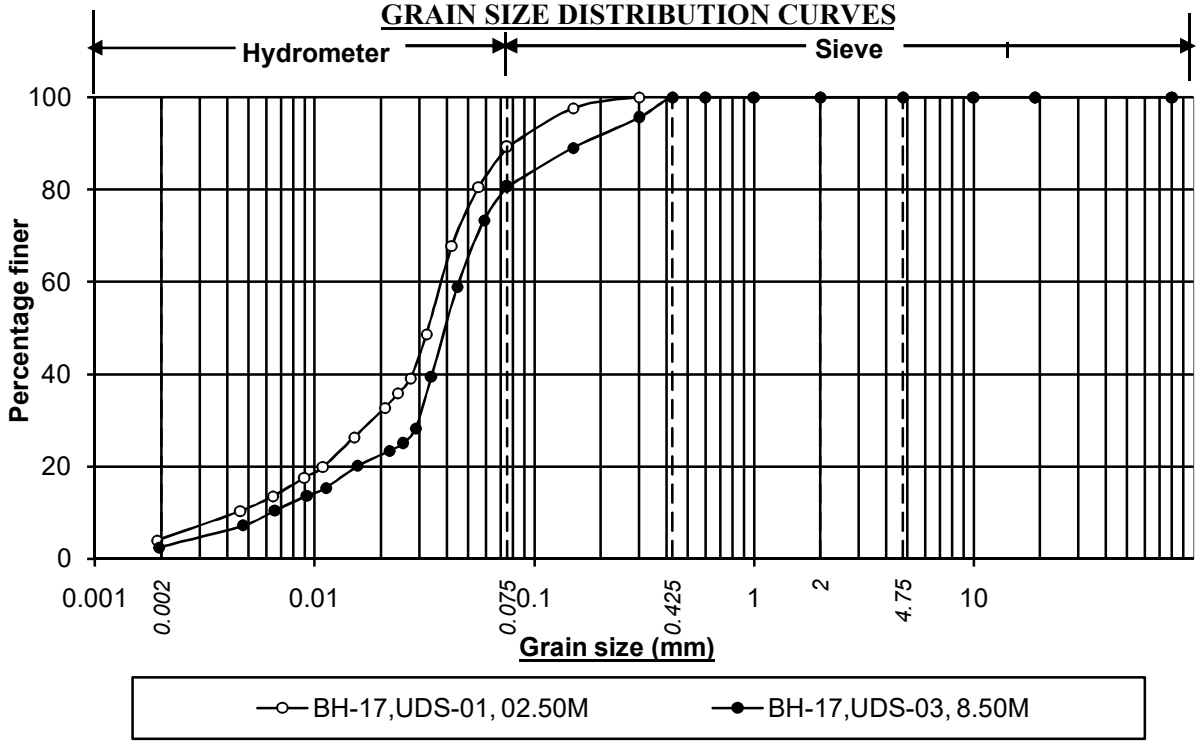


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-16,SPT-13, 19.5M		10.7	50.1	30.2	9.0	89.3	0.721	0.0
BH-16,SPT-19, 28.50M	12.0	77.0	11.0	0.0	0.0	11.0		0.0

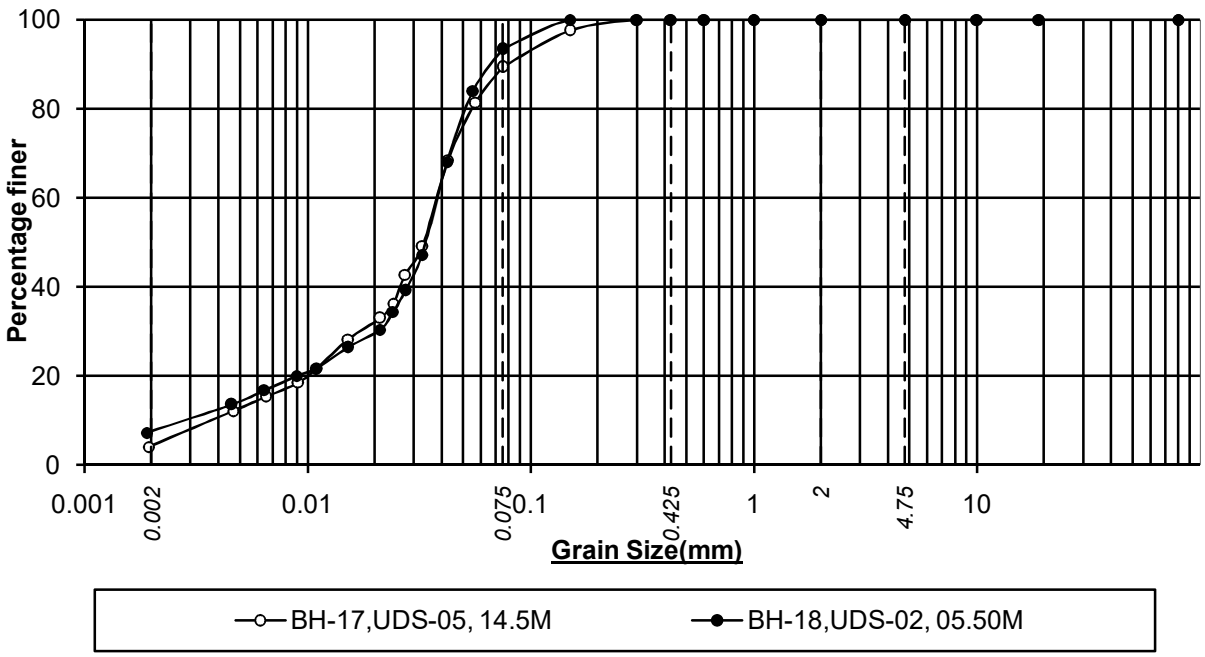
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GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-17,UDS-01, 02.50M	4.3	84.9	10.8	0.0	0.0	10.8		0.0
BH-17,UDS-03, 8.50M	2.5	78.1	19.4	0.0	0.0	19.4		0.0

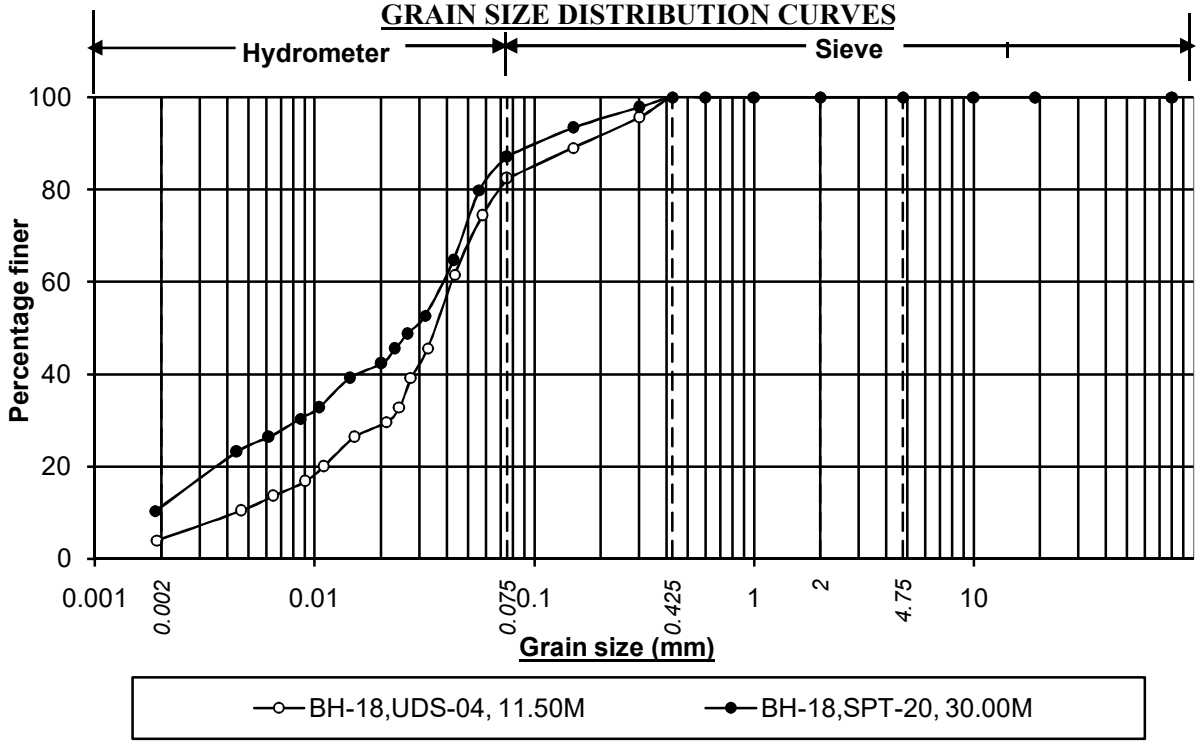


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-17,UDS-05, 14.5M	4.3	85.1	10.6	0.0	0.0	10.6		0.0
BH-18,UDS-02, 05.50M	7.5	85.9	6.6	0.0	0.0	6.6		0.0

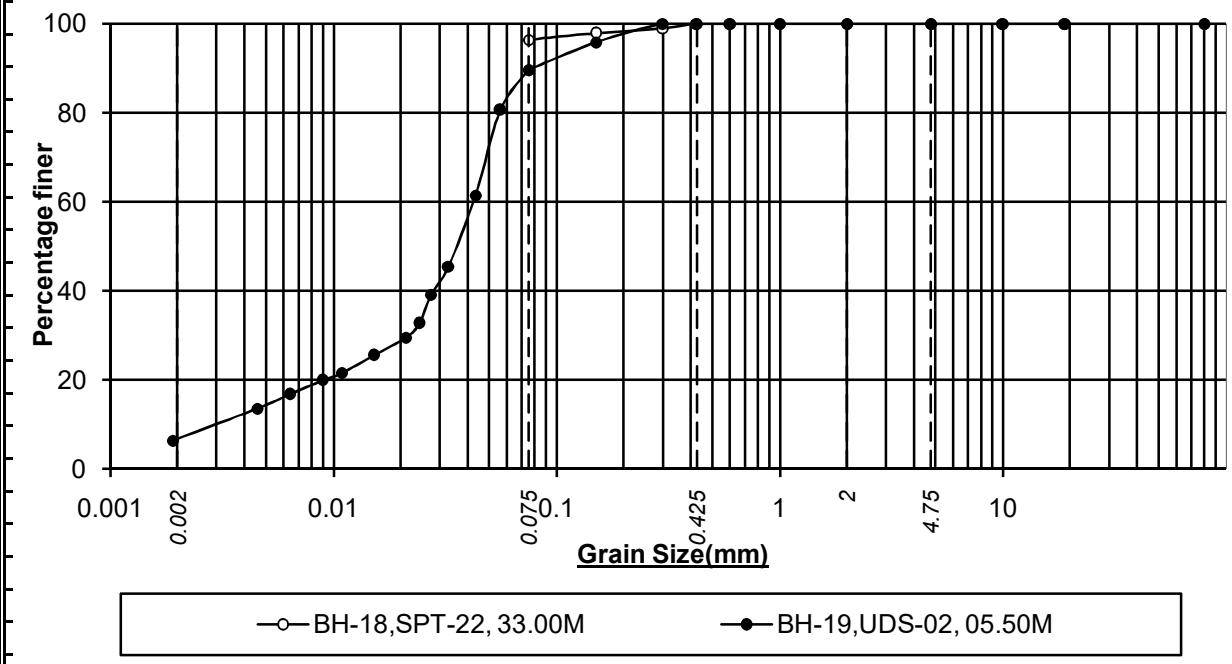
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GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-18,UDS-04, 11.50M	4.3	78.1	17.6	0.0	0.0	17.6		0.0
BH-18,SPT-20, 30.00M	11.3	75.9	12.8	0.0	0.0	12.8		0.0

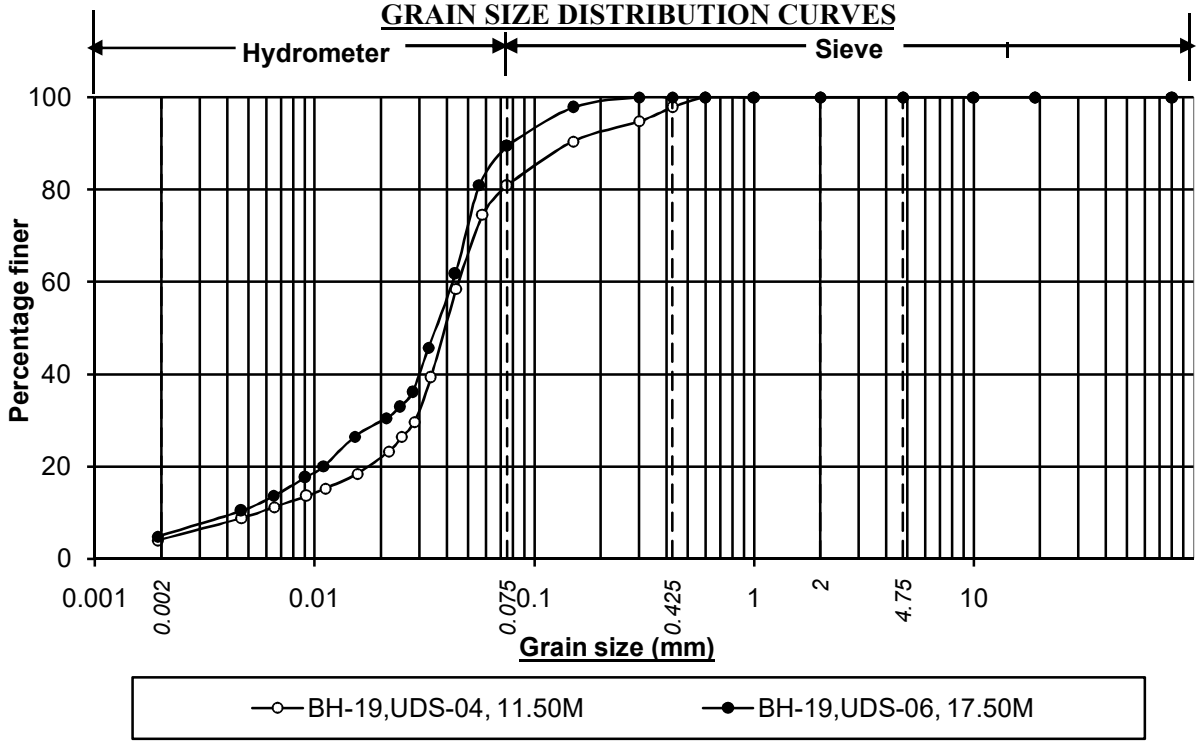


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-18,SPT-22, 33.00M		96.4	3.6	0.0	0.0	3.6		0.0
BH-19,UDS-02, 05.50M	6.8	82.8	10.4	0.0	0.0	10.4		0.0

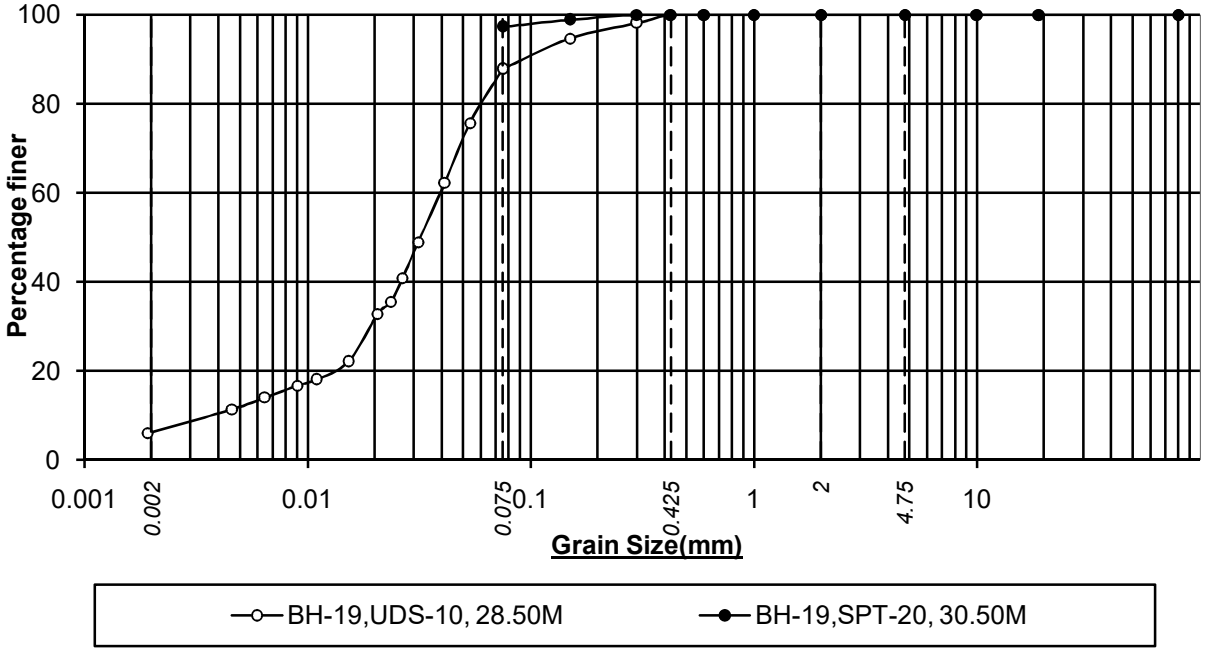
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GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	<0.002	0.002-0.075	0.075-0.425	0.425-2.00	2.0-4.75	Total sand	Weighted mean dia (mm)	>4.75
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-19,UDS-04, 11.50M	4.2	76.8	16.8	2.2	0.0	19.0		0.0
BH-19,UDS-06, 17.50M	5.0	84.6	10.4	0.0	0.0	10.4		0.0

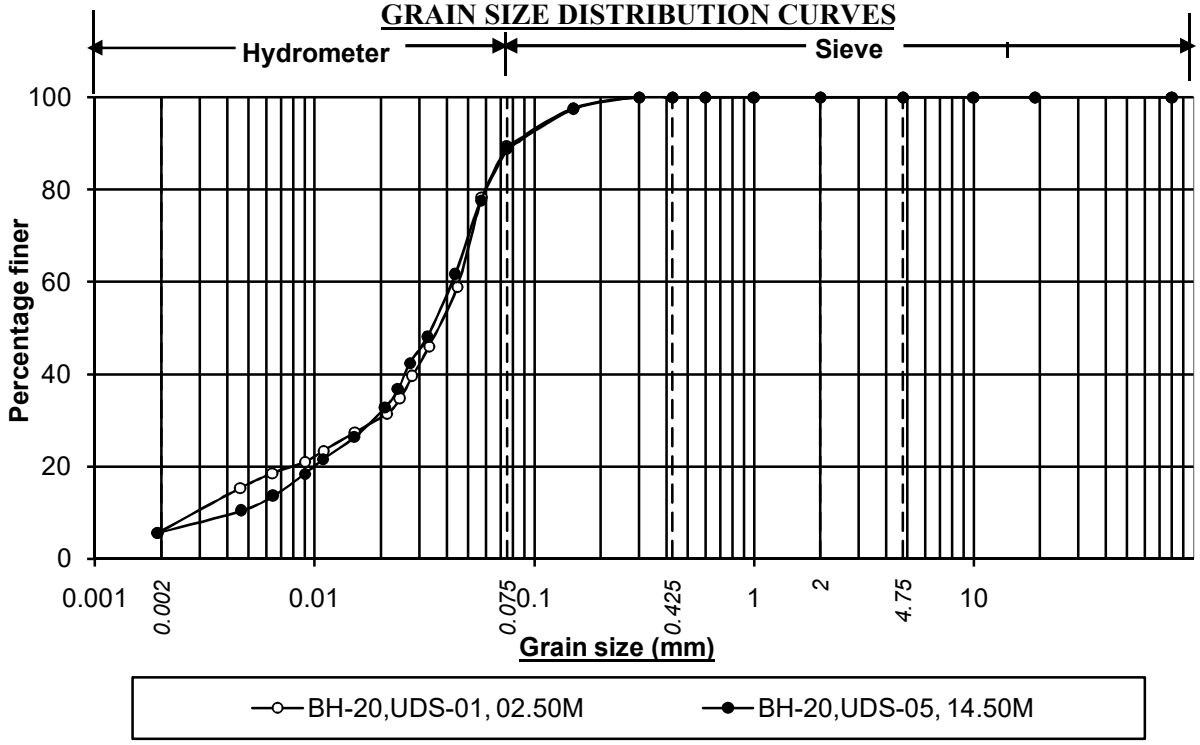


Grain size (mm)	<0.002	0.002-0.075	0.075-0.425	0.425-2.00	2.0-4.75	Total sand	Weighted mean dia (mm)	>4.75
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-19,UDS-10, 28.50M	6.3	81.6	12.1	0.0	0.0	12.1		0.0
BH-19,SPT-20, 30.50M		97.3	2.7	0.0	0.0	2.7		0.0

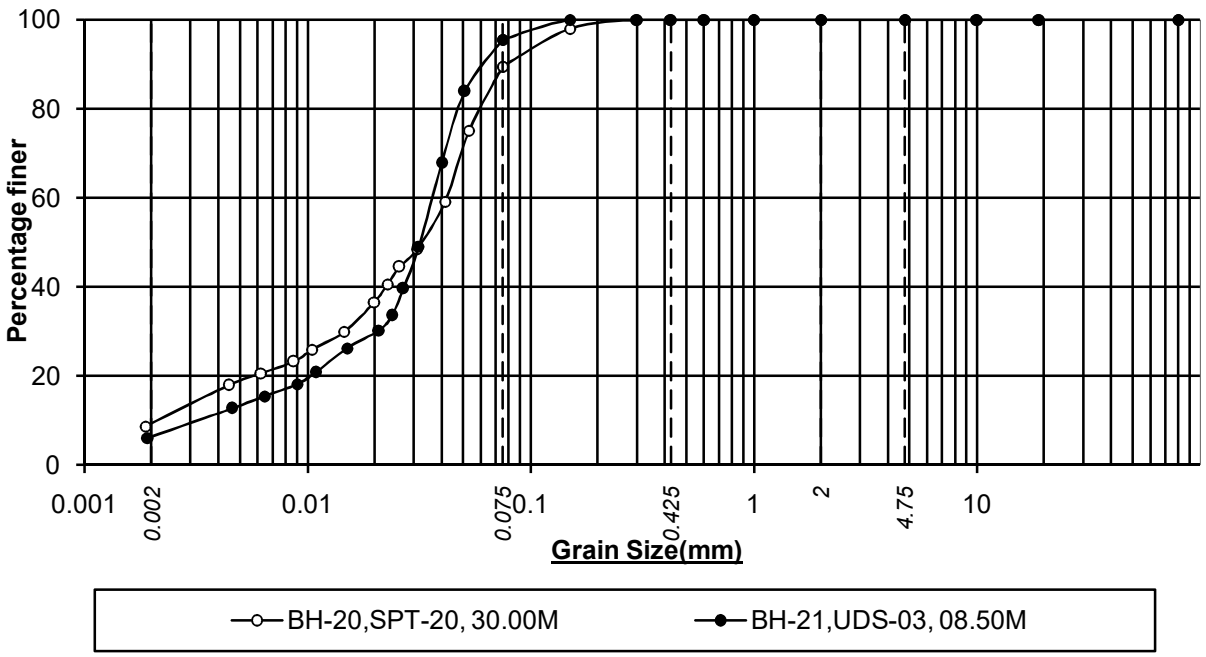
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GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-20,UDS-01, 02.50M	6.0	83.4	10.6	0.0	0.0	10.6		0.0
BH-20,UDS-05, 14.50M	5.8	83.0	11.2	0.0	0.0	11.2		0.0

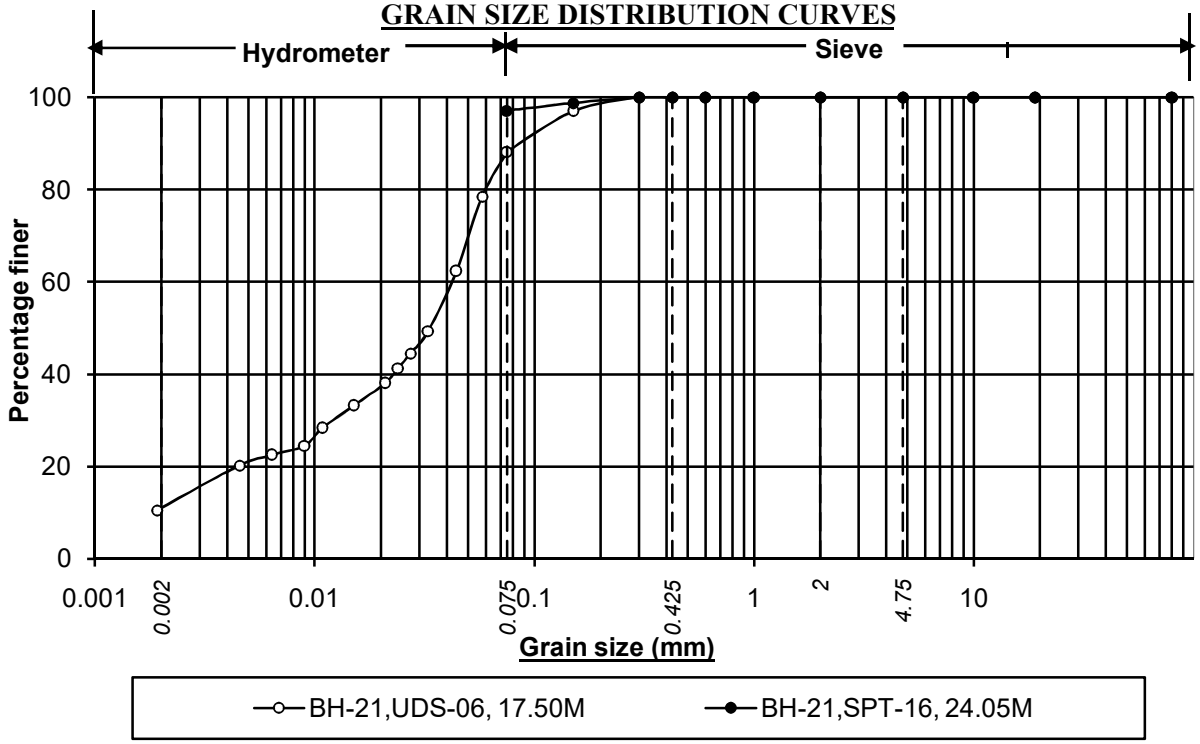


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-20,SPT-20, 30.00M	9.3	80.2	10.5	0.0	0.0	10.5		0.0
BH-21,UDS-03, 08.50M	6.3	89.2	4.5	0.0	0.0	4.5		0.0

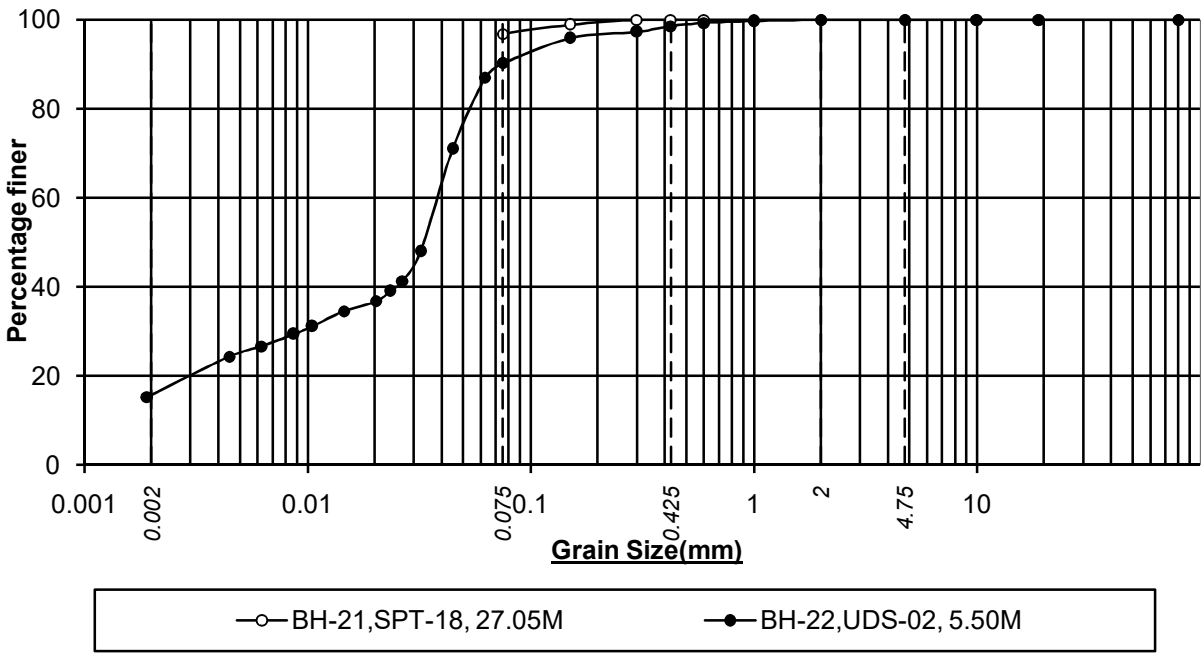
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Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-21,UDS-06, 17.50M	11.0	77.2	11.8	0.0	0.0	11.8		0.0
BH-21,SPT-16, 24.05M		97.1	2.9	0.0	0.0	2.9		0.0

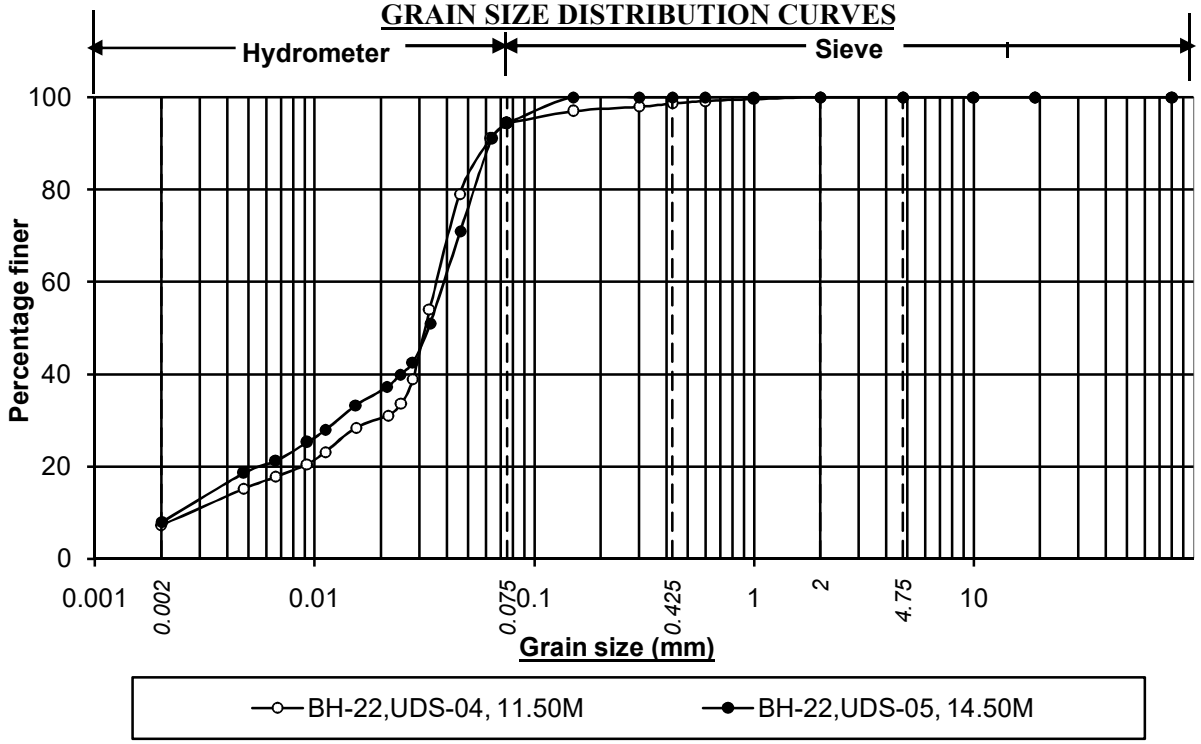


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-21,SPT-18, 27.05M		96.9	3.1	0.0	0.0	3.1		0.0
BH-22,UDS-02, 5.50M	15.7	74.5	8.4	1.4	0.0	9.8		0.0

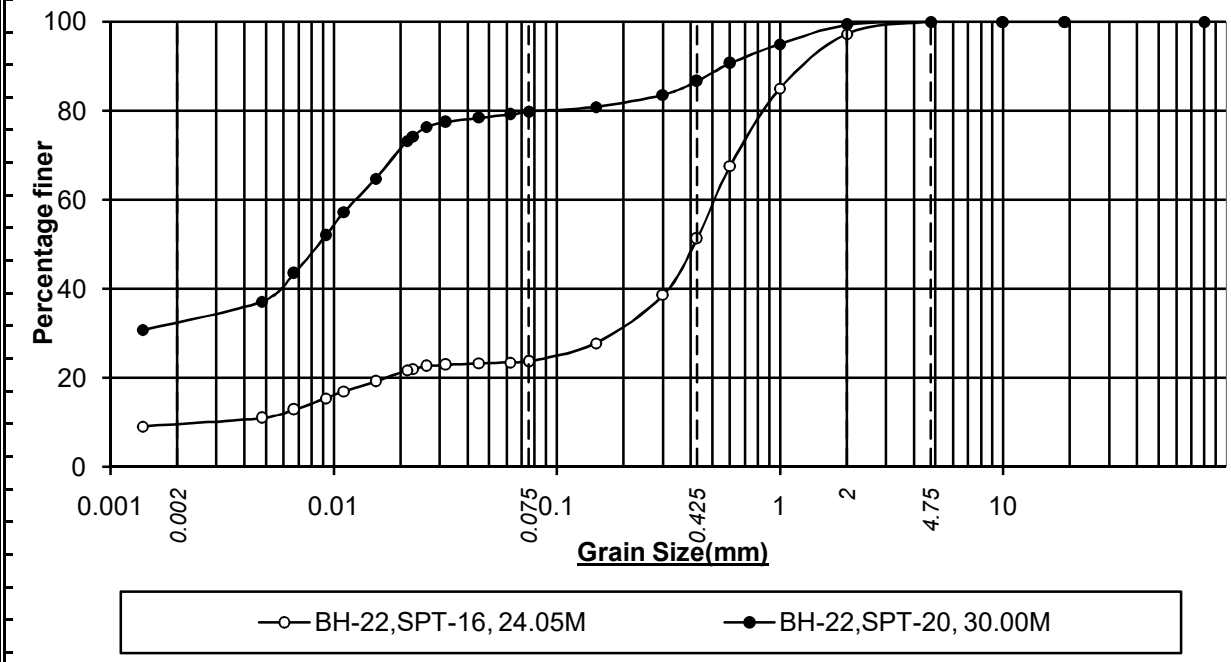
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GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-22,UDS-04, 11.50M	7.3	87.1	4.3	1.3	0.0	5.6		0.0
BH-22,UDS-05, 14.50M	7.8	86.6	5.6	0.0	0.0	5.6		0.0

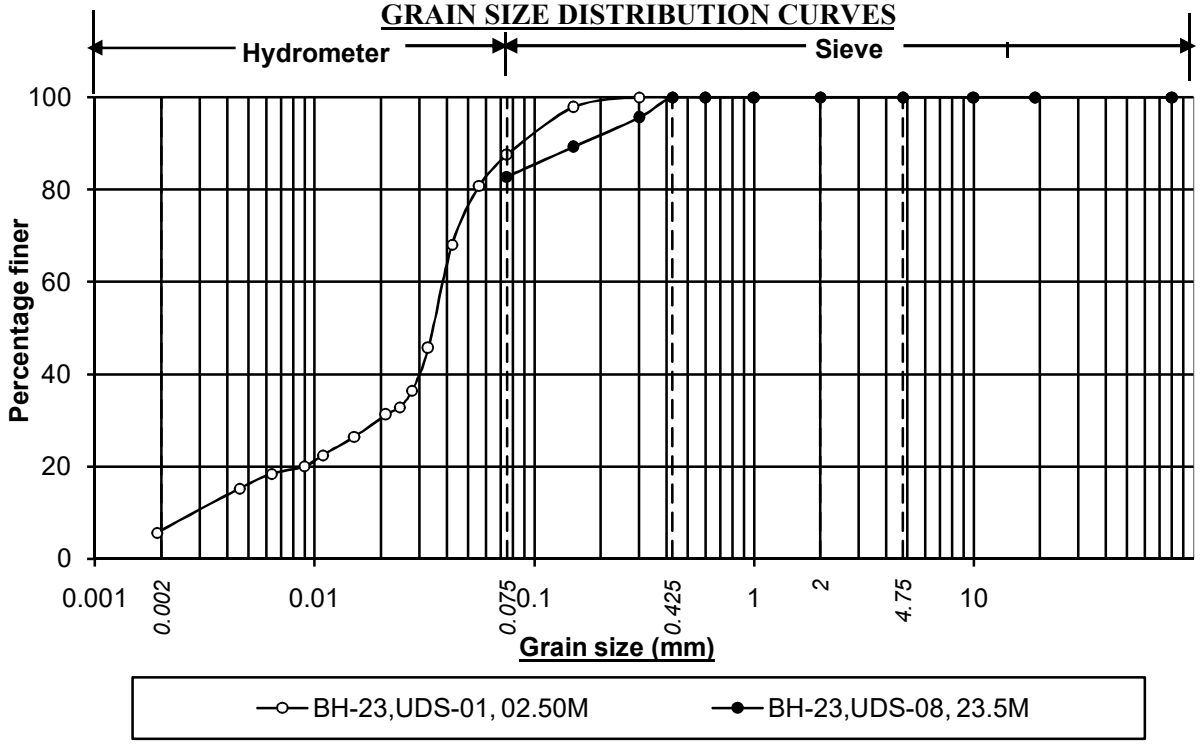


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-22,SPT-16, 24.05M	9.7	14.0	27.6	46.0	2.7	76.3	0.585	0.0
BH-22,SPT-20, 30.00M	32.6	47.3	6.7	12.7	0.7	20.1		0.0

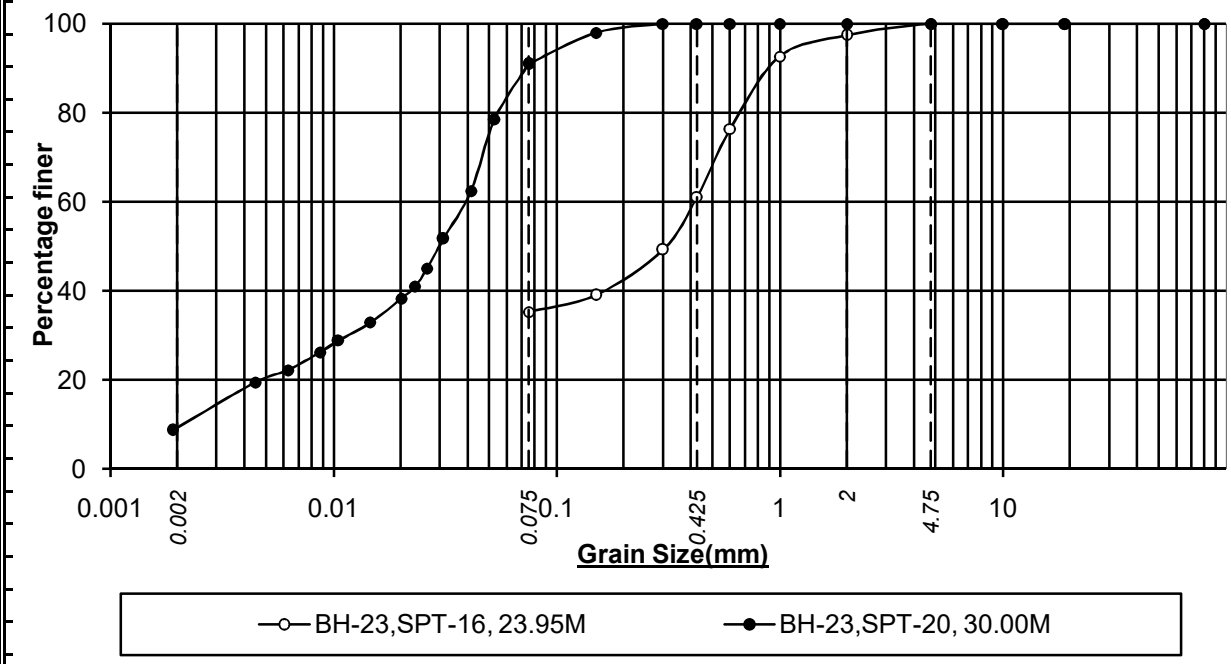
Project:- Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar | **Job No. 4388**

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GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-23,UDS-01, 02.50M	6.1	81.5	12.4	0.0	0.0	12.4		0.0
BH-23,UDS-08, 23.5M		82.8	17.2	0.0	0.0	17.2		0.0

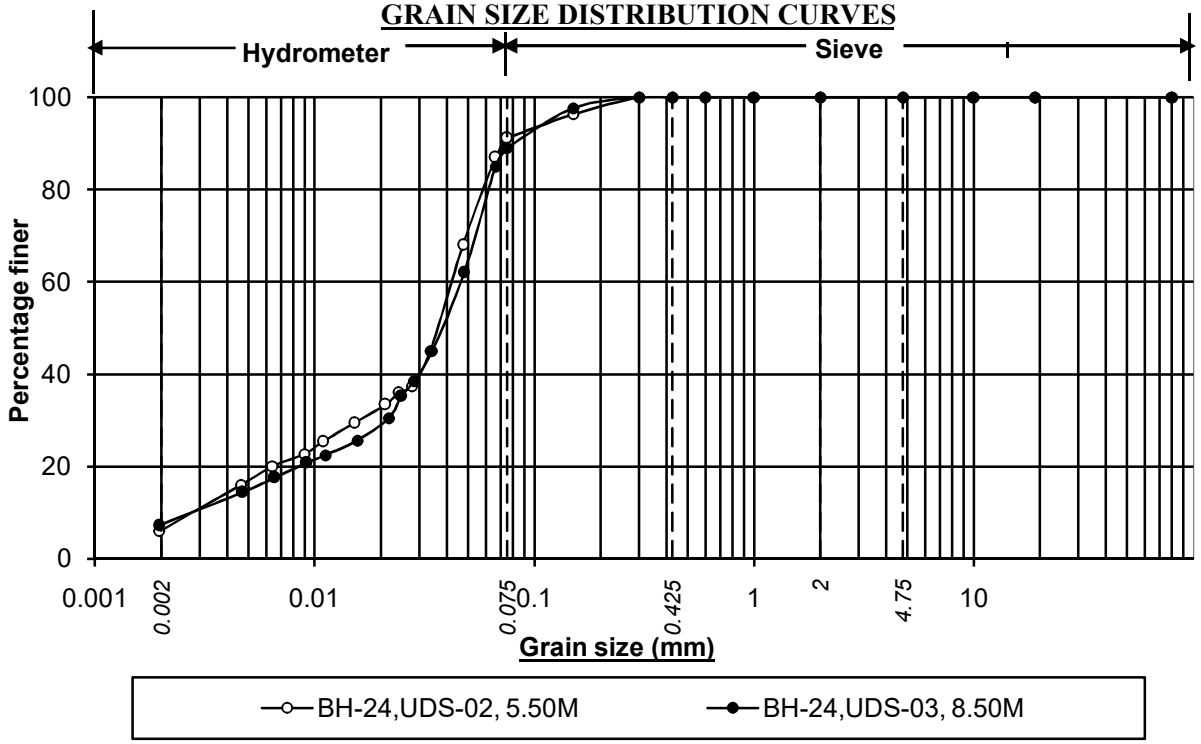


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-23,SPT-16, 23.95M		35.3	25.7	36.4	2.6	64.7		0.0
BH-23,SPT-20, 30.00M	9.3	81.7	9.0	0.0	0.0	9.0		0.0

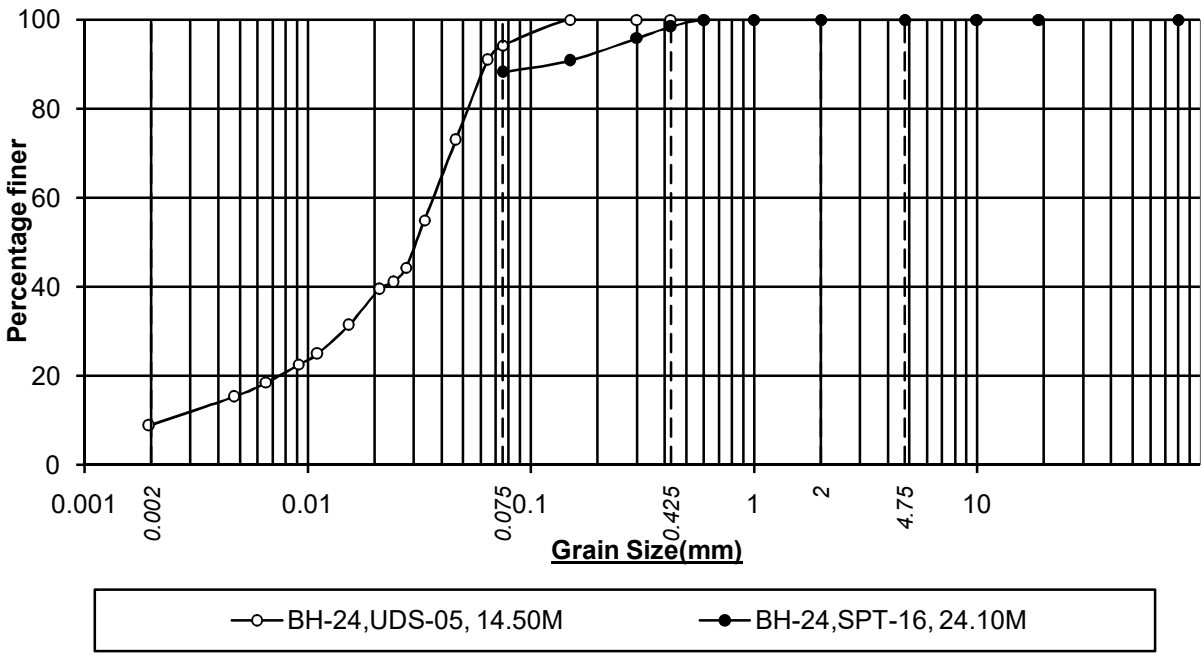
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GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-24,UDS-02, 5.50M	6.2	84.9	8.9	0.0	0.0	8.9		0.0
BH-24,UDS-03, 8.50M	7.4	81.6	11.0	0.0	0.0	11.0		0.0

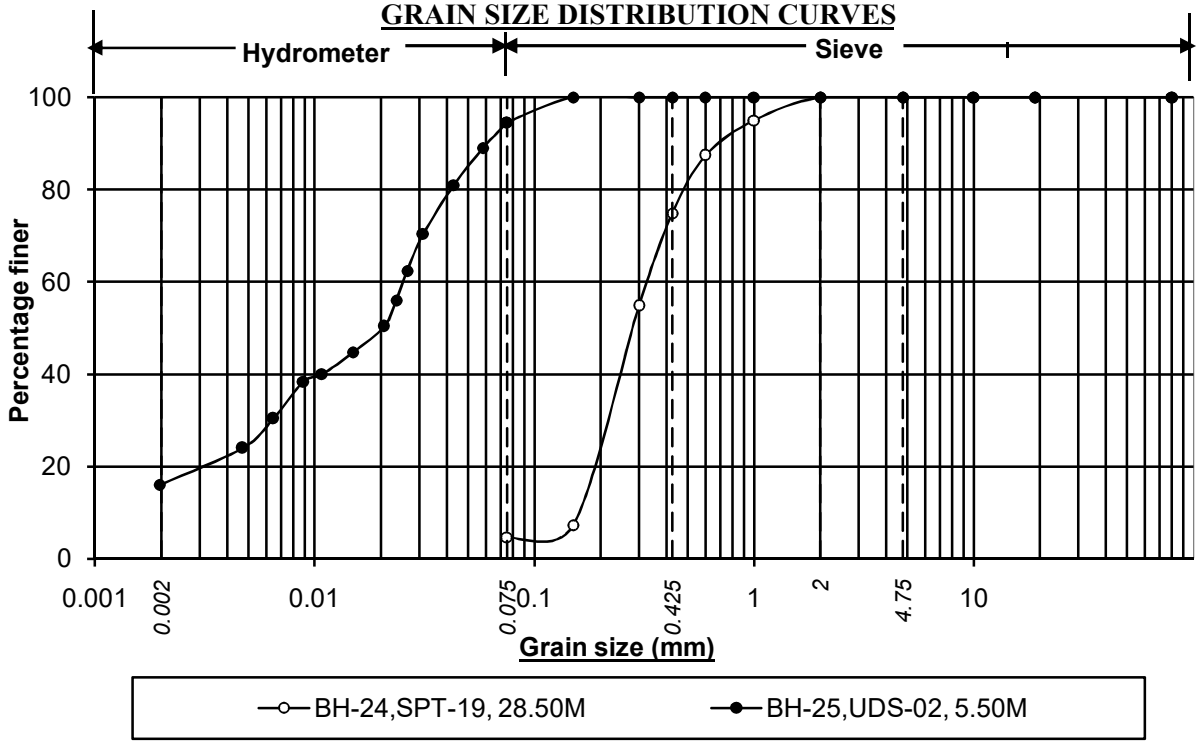


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-24,UDS-05, 14.50M	9.0	85.2	5.8	0.0	0.0	5.8		0.0
BH-24,SPT-16, 24.10M		88.3	10.2	1.5	0.0	11.7		0.0

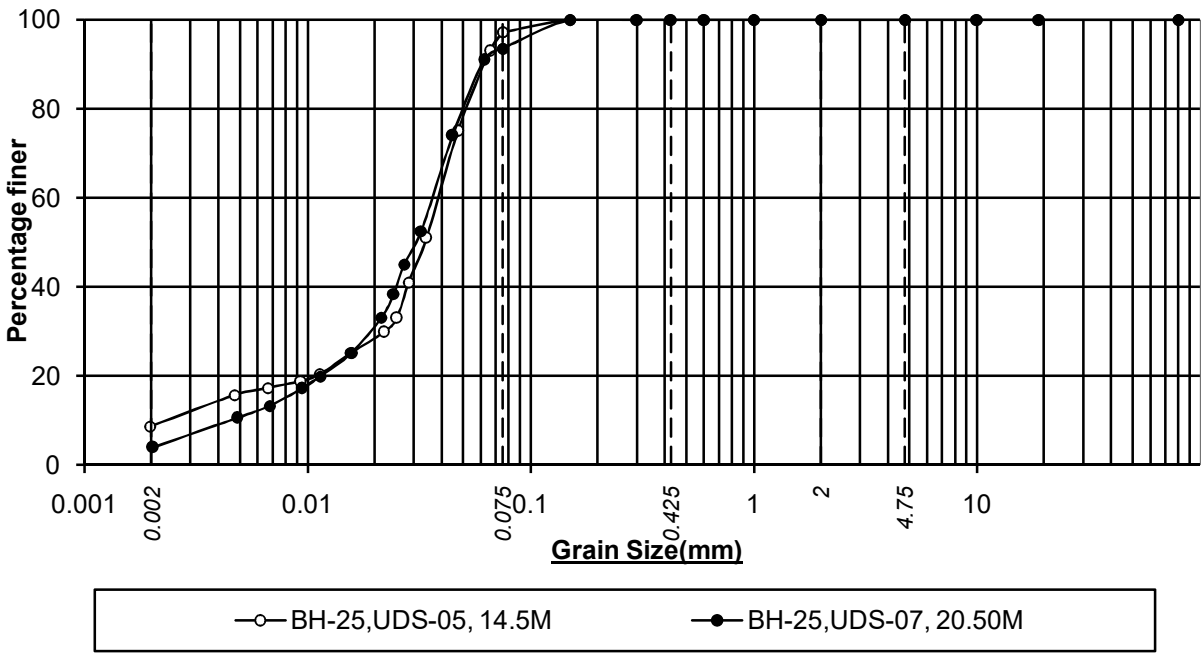
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GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	<0.002	0.002-0.075	0.075-0.425	0.425-2.00	2.0-4.75	Total sand	Weighted mean dia (mm)	>4.75
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-24,SPT-19, 28.50M		4.7	70.1	25.2	0.0	95.3		0.0
BH-25,UDS-02, 5.50M	16.1	78.5	5.4	0.0	0.0	5.4		0.0

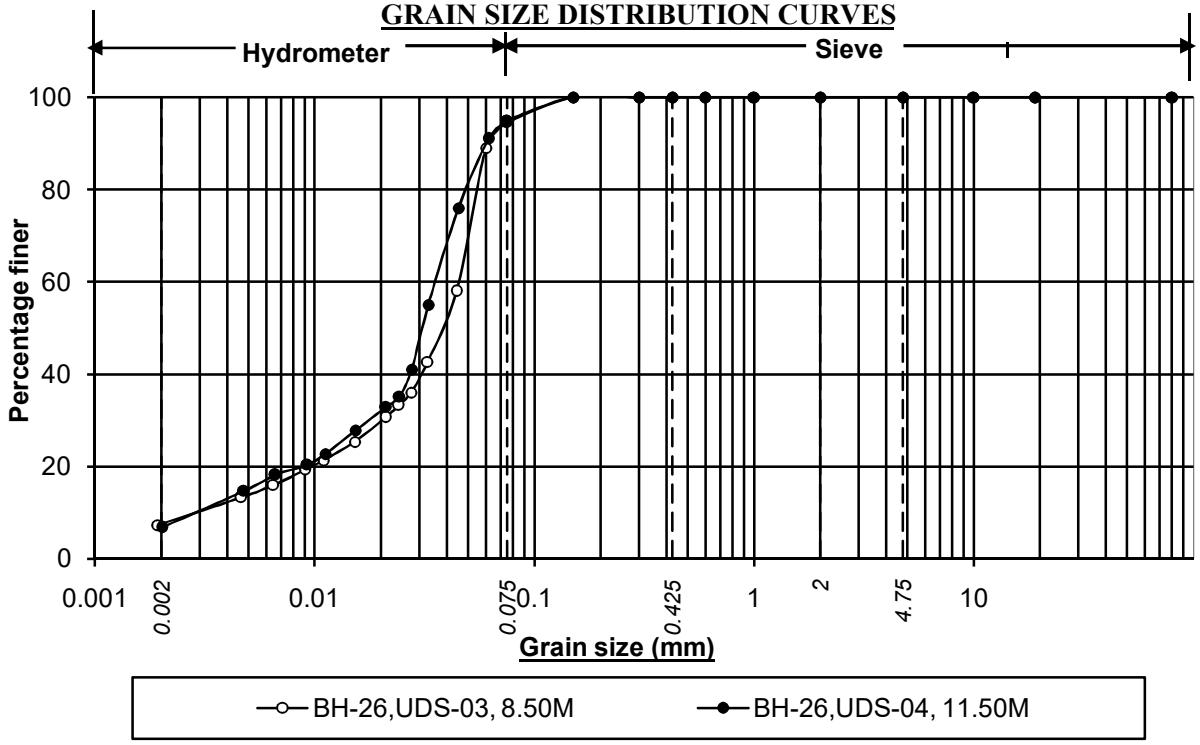


Grain size (mm)	<0.002	0.002-0.075	0.075-0.425	0.425-2.00	2.0-4.75	Total sand	Weighted mean dia (mm)	>4.75
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-25,UDS-05, 14.5M	8.8	88.4	2.8	0.0	0.0	2.8		0.0
BH-25,UDS-07, 20.50M	3.9	89.6	6.5	0.0	0.0	6.5		0.0

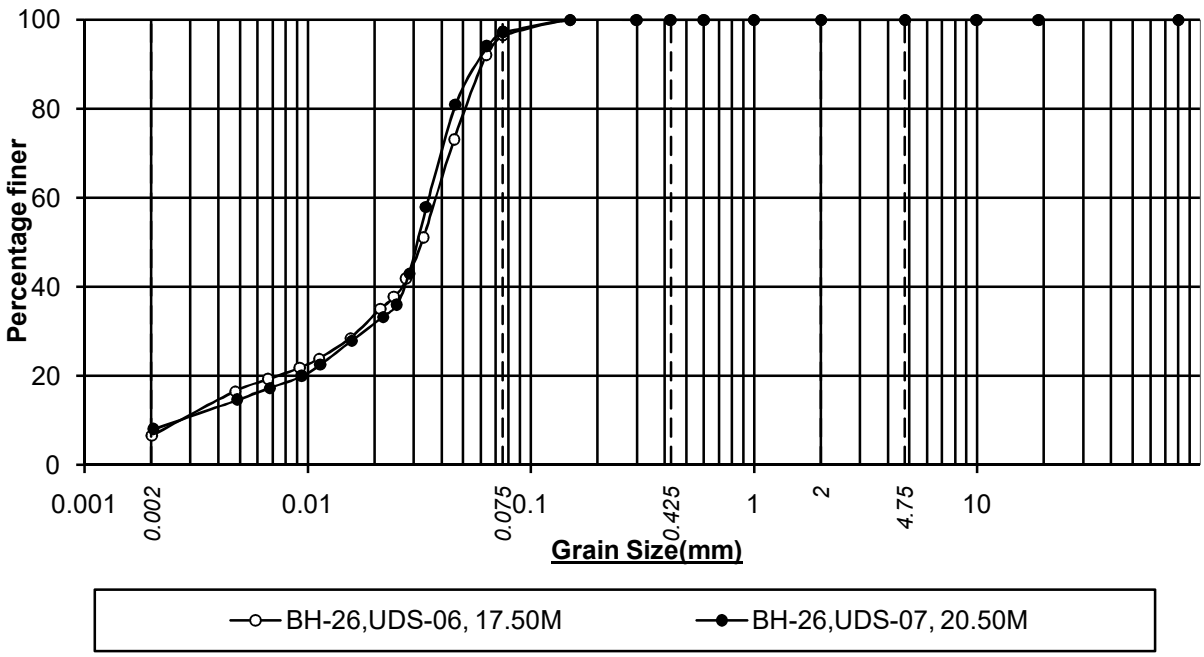
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GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-26,UDS-03, 8.50M	7.5	87.1	5.4	0.0	0.0	5.4		0.0
BH-26,UDS-04, 11.50M	6.7	88.3	5.0	0.0	0.0	5.0		0.0

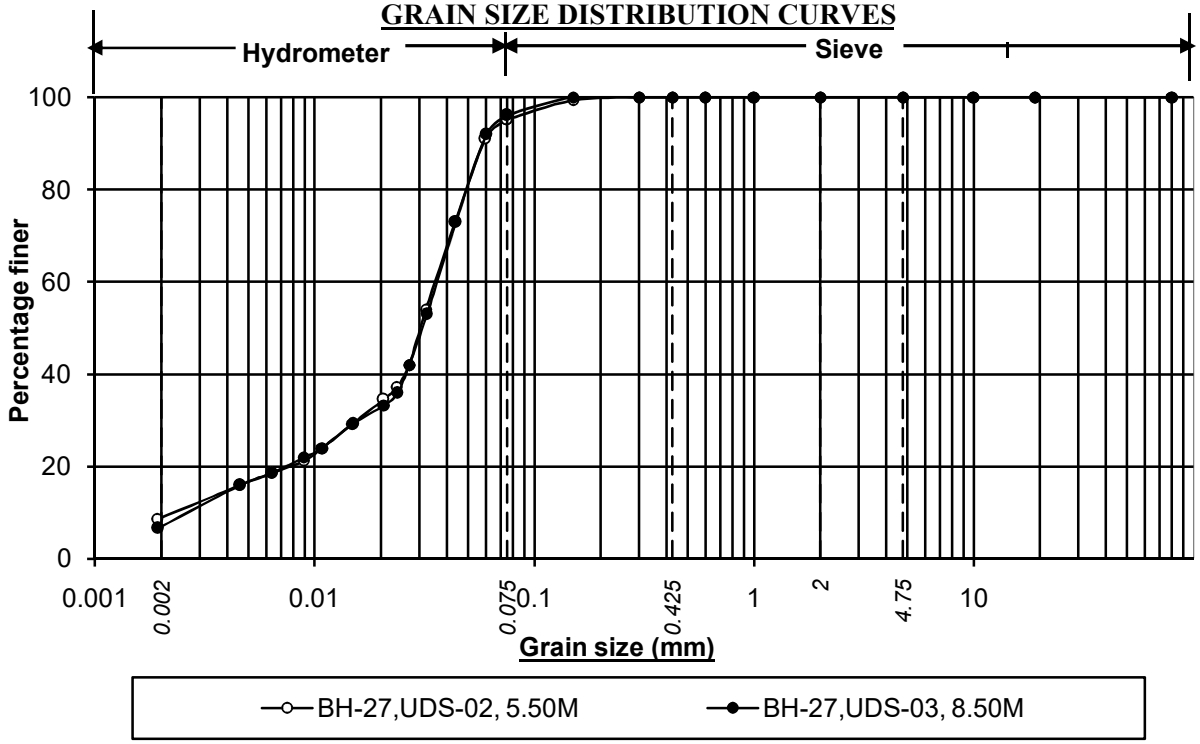


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-26,UDS-06, 17.50M	6.5	90.0	3.5	0.0	0.0	3.5		0.0
BH-26,UDS-07, 20.50M	7.9	89.3	2.8	0.0	0.0	2.8		0.0

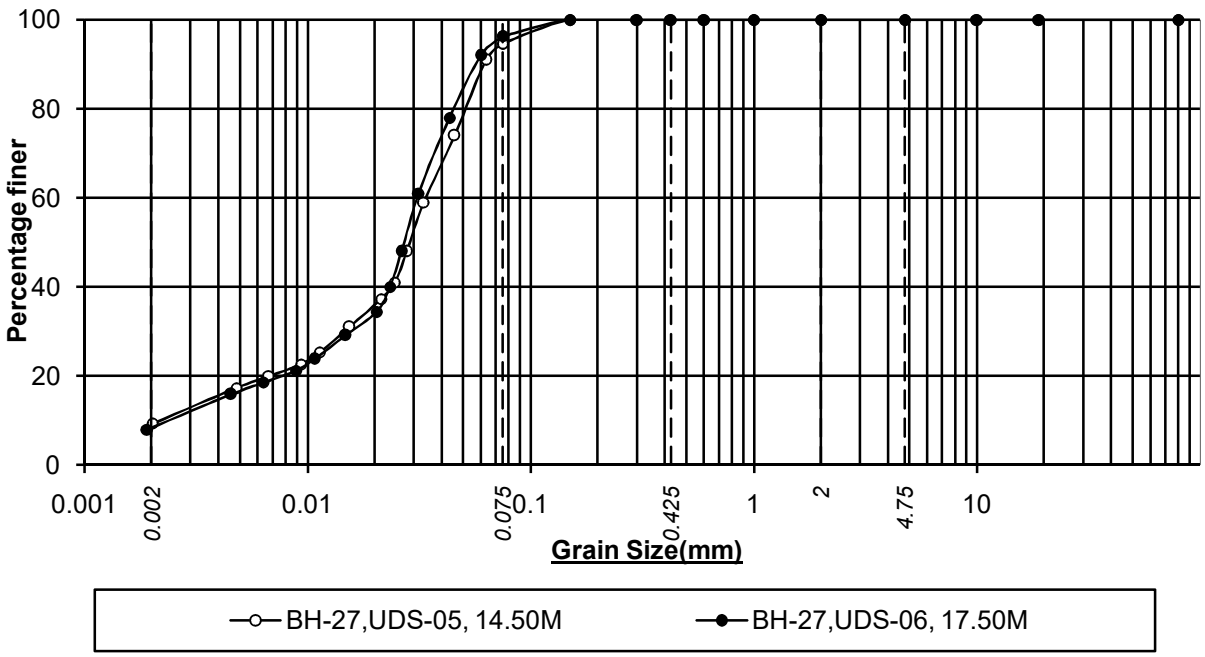
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GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-27,UDS-02, 5.50M	9.0	86.2	4.8	0.0	0.0	4.8		0.0
BH-27,UDS-03, 8.50M	7.0	89.2	3.8	0.0	0.0	3.8		0.0

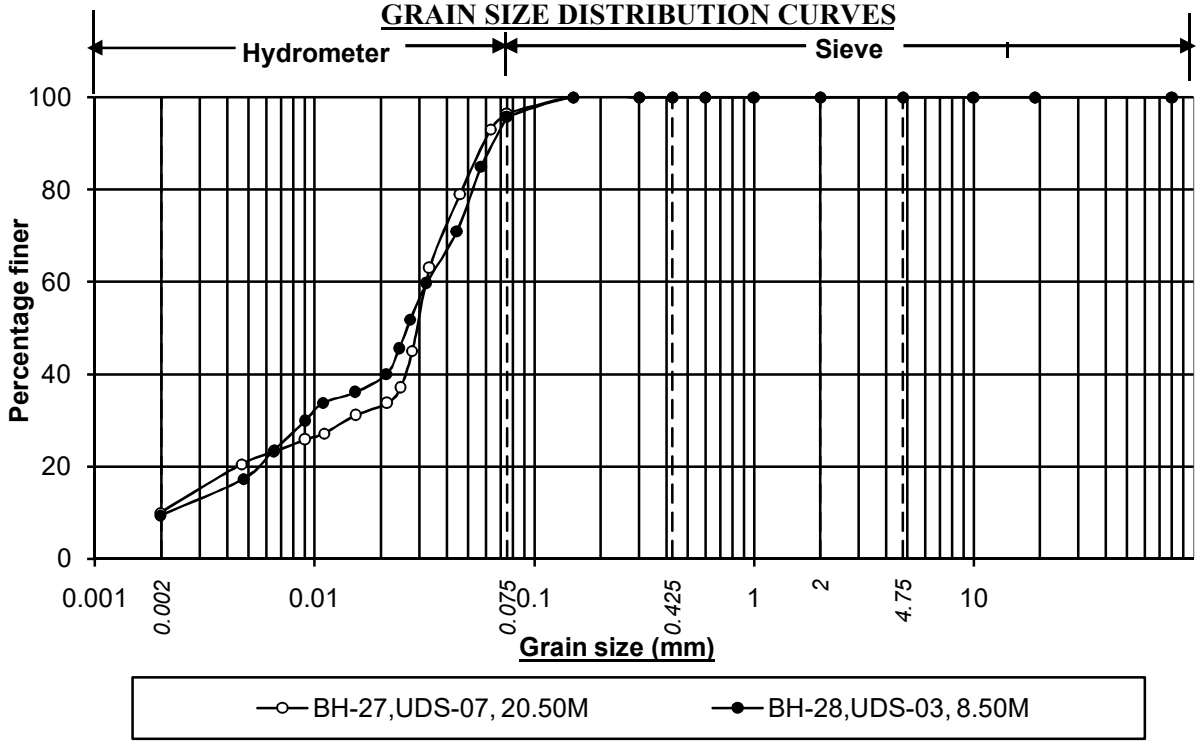


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-27,UDS-05, 14.50M	9.2	85.5	5.3	0.0	0.0	5.3		0.0
BH-27,UDS-06, 17.50M	8.3	88.0	3.7	0.0	0.0	3.7		0.0

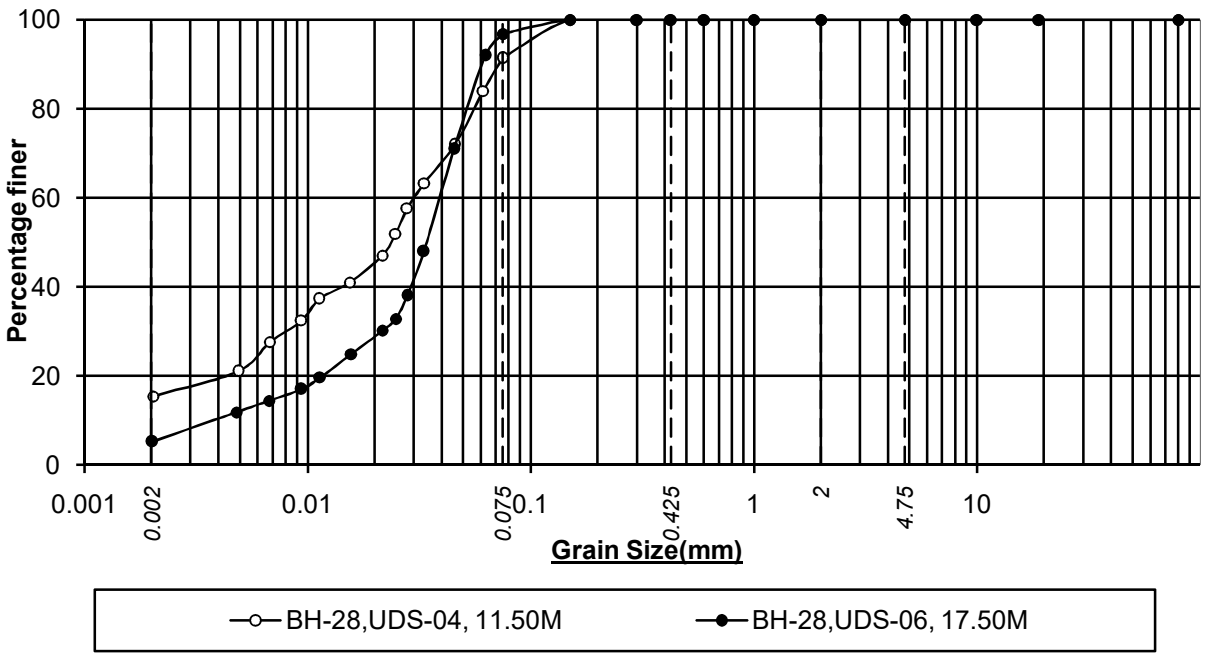
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GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-27,UDS-07, 20.50M	10.0	86.5	3.5	0.0	0.0	3.5		0.0
BH-28,UDS-03, 8.50M	9.5	86.3	4.2	0.0	0.0	4.2		0.0

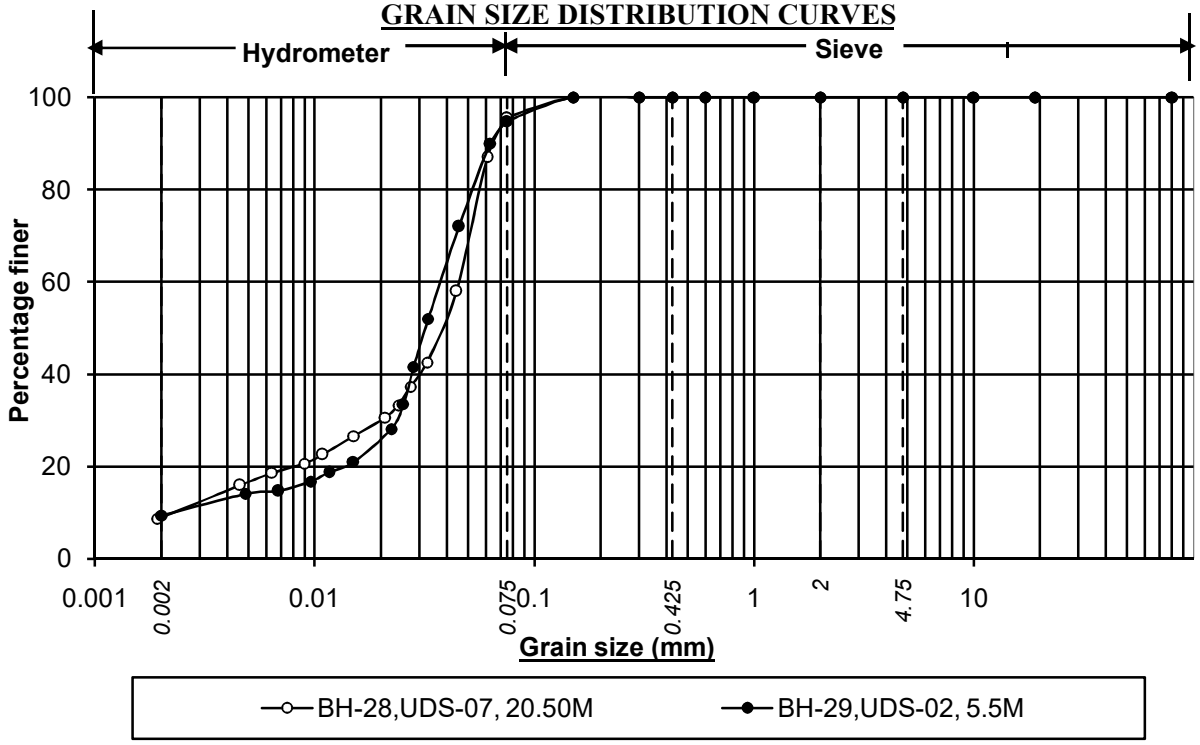


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-28,UDS-04, 11.50M	15.3	76.1	8.6	0.0	0.0	8.6		0.0
BH-28,UDS-06, 17.50M	5.2	91.7	3.1	0.0	0.0	3.1		0.0

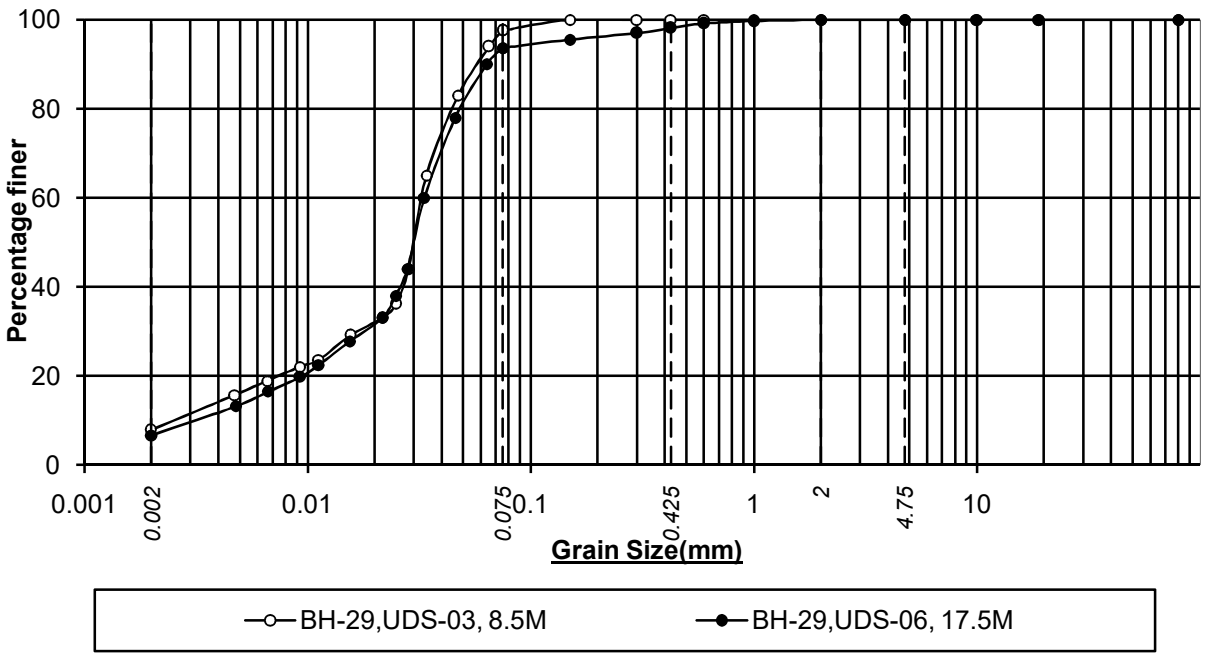
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GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-28,UDS-07, 20.50M	9.0	86.7	4.3	0.0	0.0	4.3		0.0
BH-29,UDS-02, 5.5M	9.3	85.5	5.2	0.0	0.0	5.2		0.0

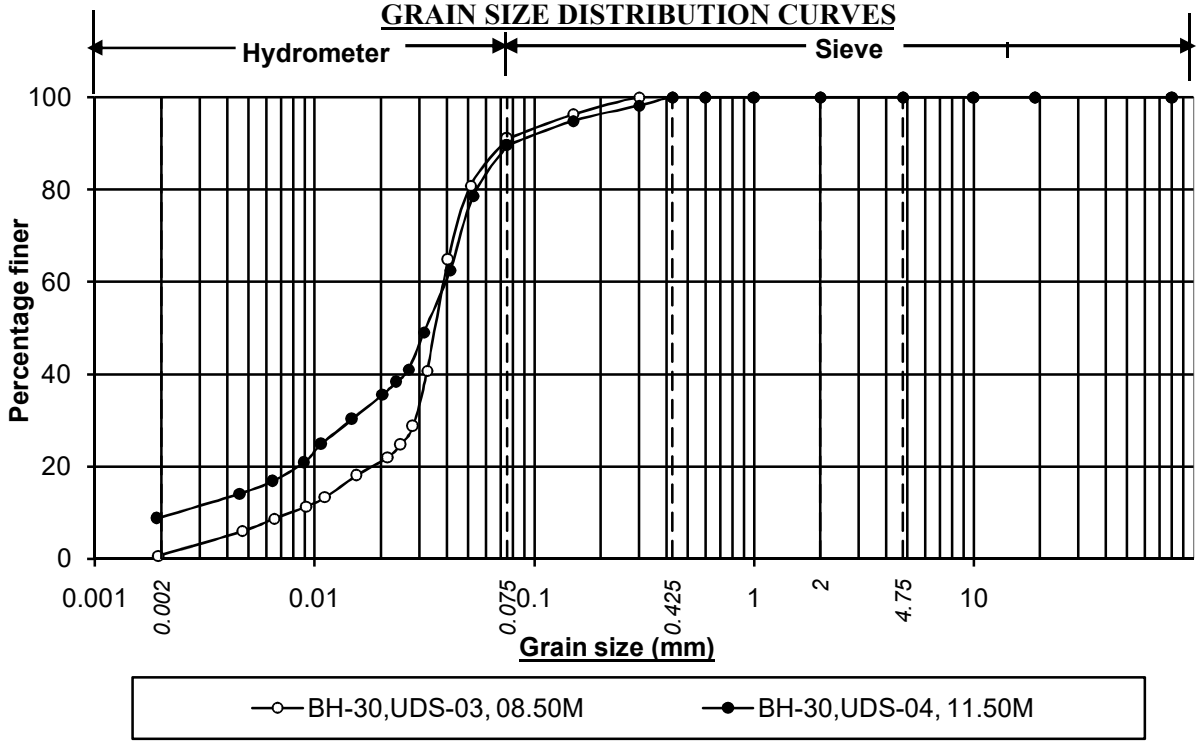


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-29,UDS-03, 8.5M	8.0	89.6	2.4	0.0	0.0	2.4		0.0
BH-29,UDS-06, 17.5M	6.6	87.1	4.5	1.8	0.0	6.3		0.0

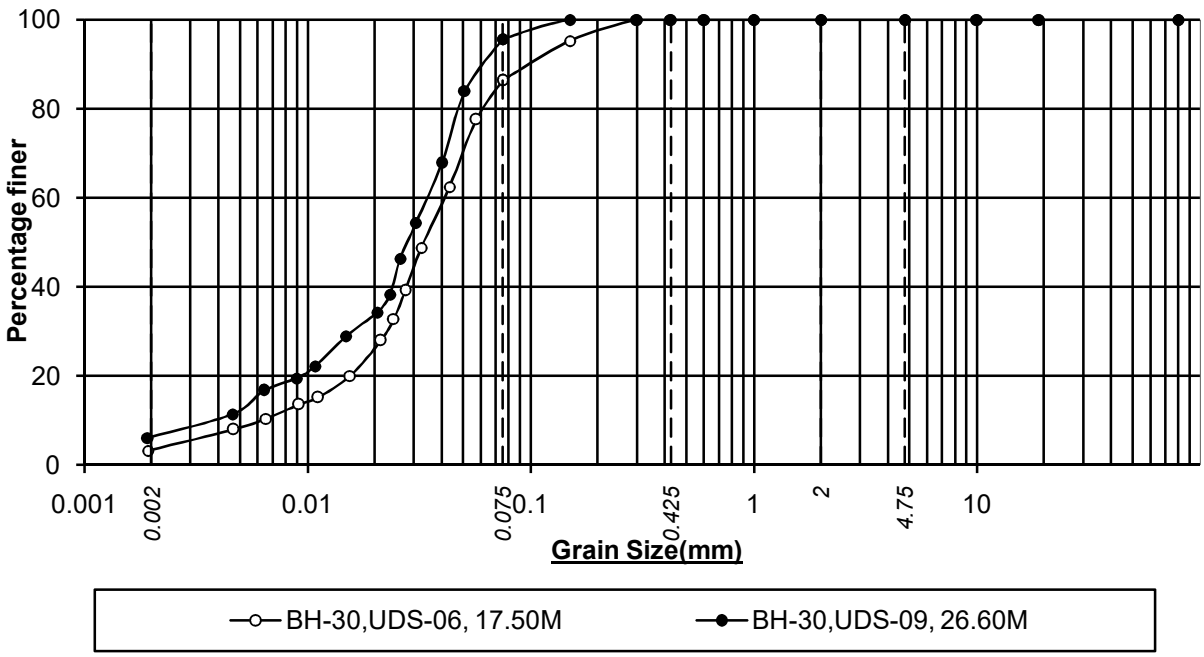
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Grain size (mm)	<0.002	0.002-0.075	0.075-0.425	0.425-2.00	2.0-4.75	Total sand	Weighted mean dia (mm)	>4.75
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-30,UDS-03, 08.50M	0.8	90.2	9.0	0.0	0.0	9.0		0.0
BH-30,UDS-04, 11.50M	9.0	80.6	10.4	0.0	0.0	10.4		0.0

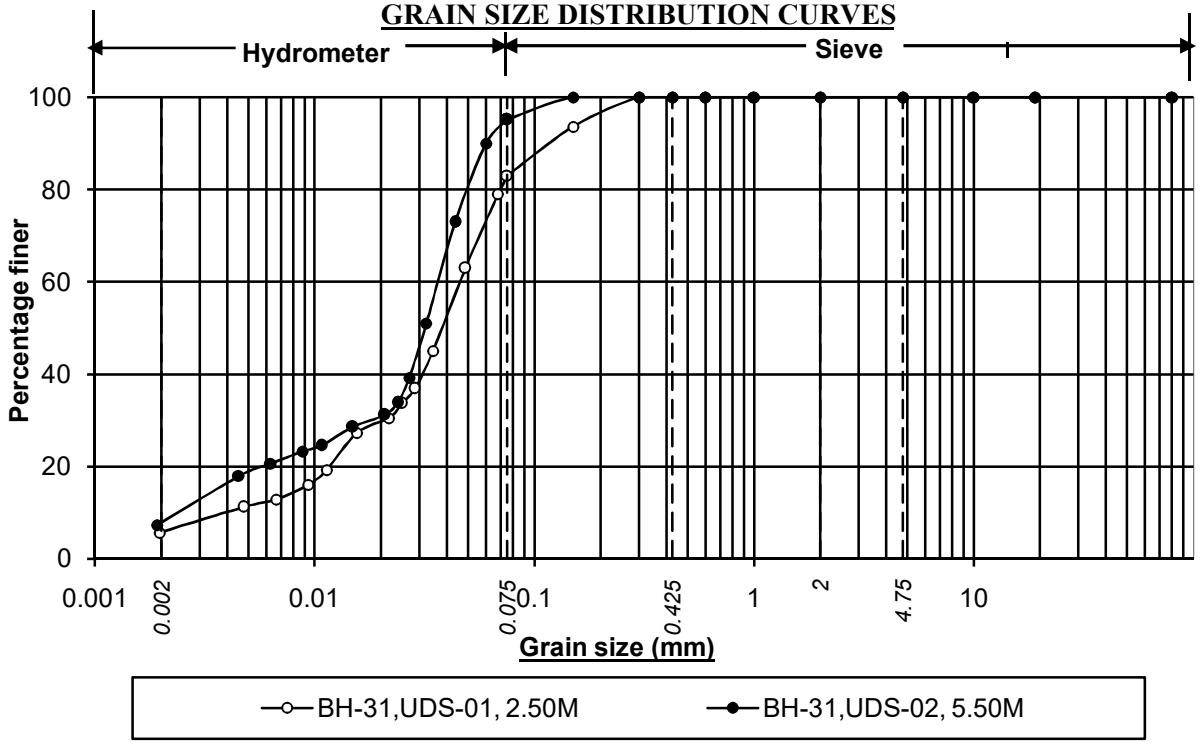


Grain size (mm)	<0.002	0.002-0.075	0.075-0.425	0.425-2.00	2.0-4.75	Total sand	Weighted mean dia (mm)	>4.75
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-30,UDS-06, 17.50M	3.4	83.0	13.6	0.0	0.0	13.6		0.0
BH-30,UDS-09, 26.60M	6.3	89.4	4.3	0.0	0.0	4.3		0.0

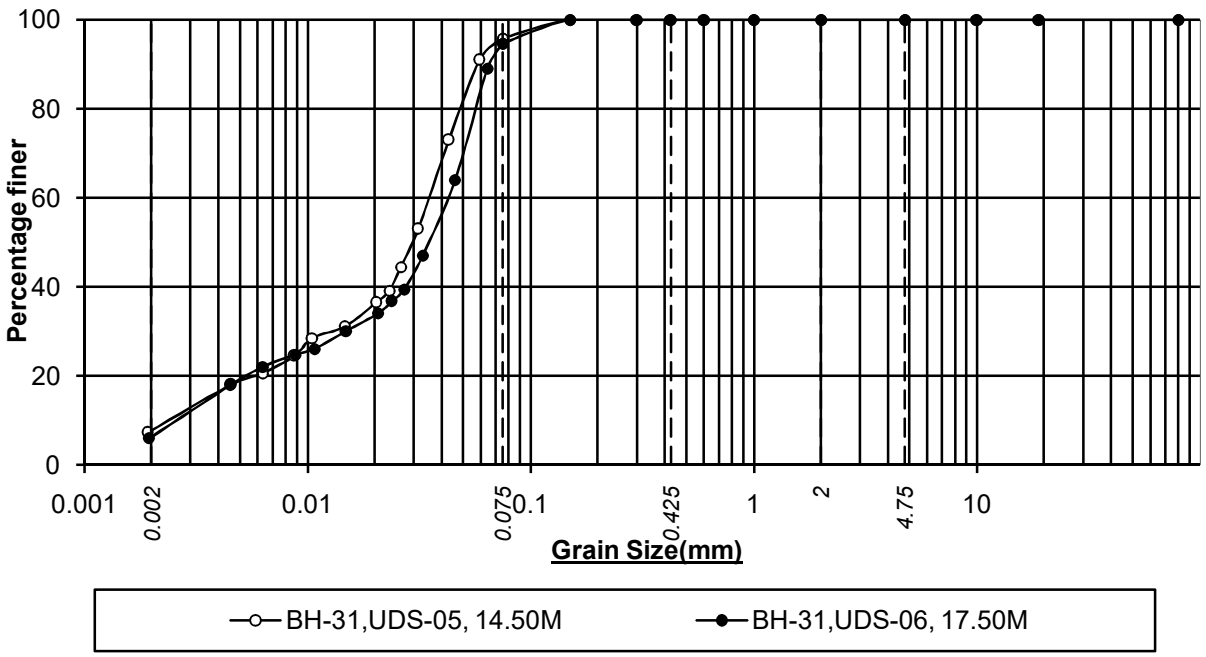
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GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-31,UDS-01, 2.50M	5.7	77.3	17.0	0.0	0.0	17.0		0.0
BH-31,UDS-02, 5.50M	7.8	87.4	4.8	0.0	0.0	4.8		0.0

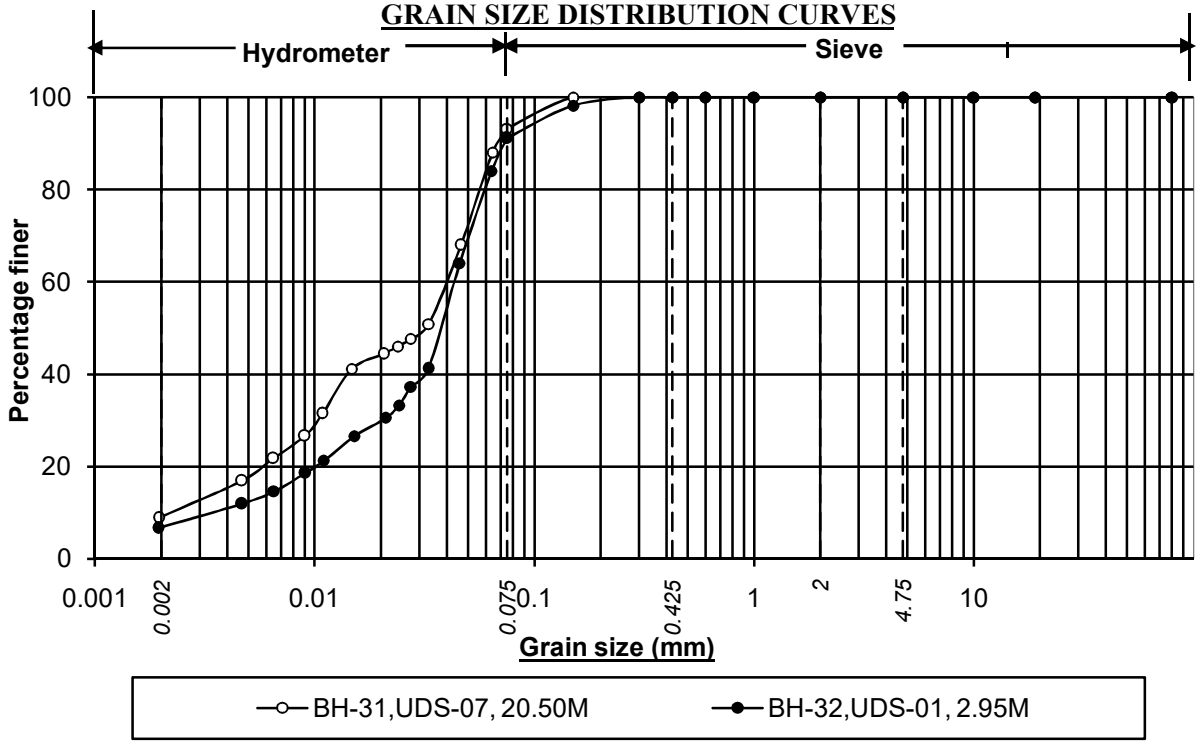


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-31,UDS-05, 14.50M	7.8	88.0	4.2	0.0	0.0	4.2		0.0
BH-31,UDS-06, 17.50M	6.4	88.3	5.3	0.0	0.0	5.3		0.0

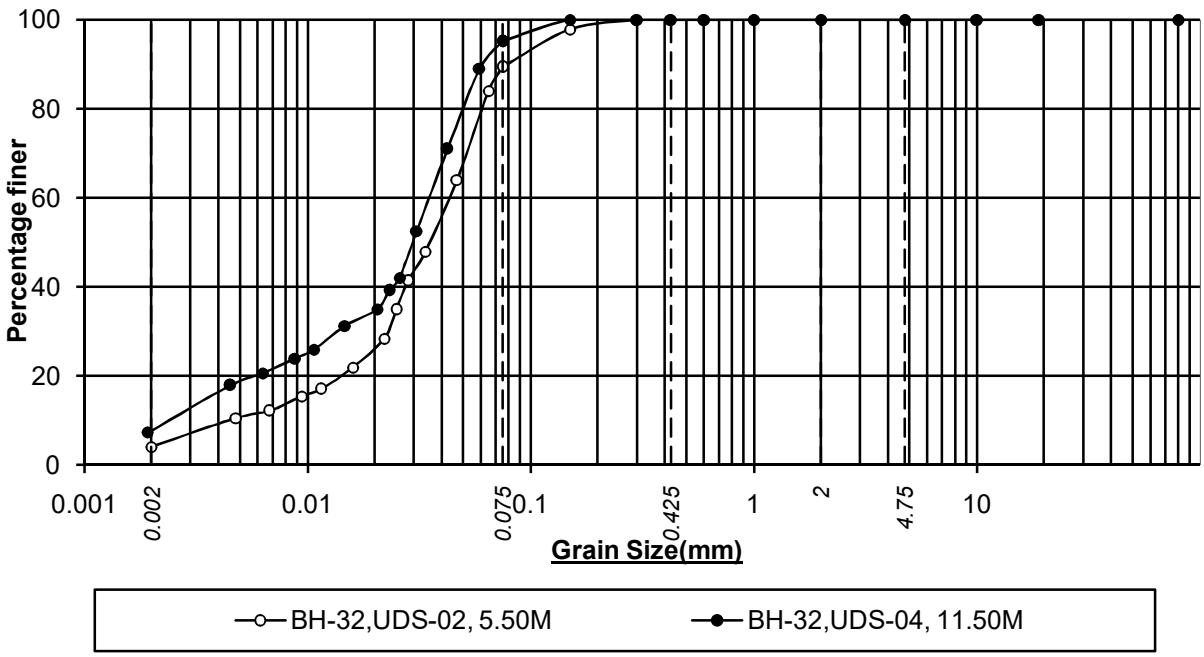
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Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	Total sand	Weighted mean dia (mm)	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-31,UDS-07, 20.50M	9.1	84.1	6.8	0.0	0.0	6.8		0.0
BH-32,UDS-01, 2.95M	6.8	84.4	8.8	0.0	0.0	8.8		0.0

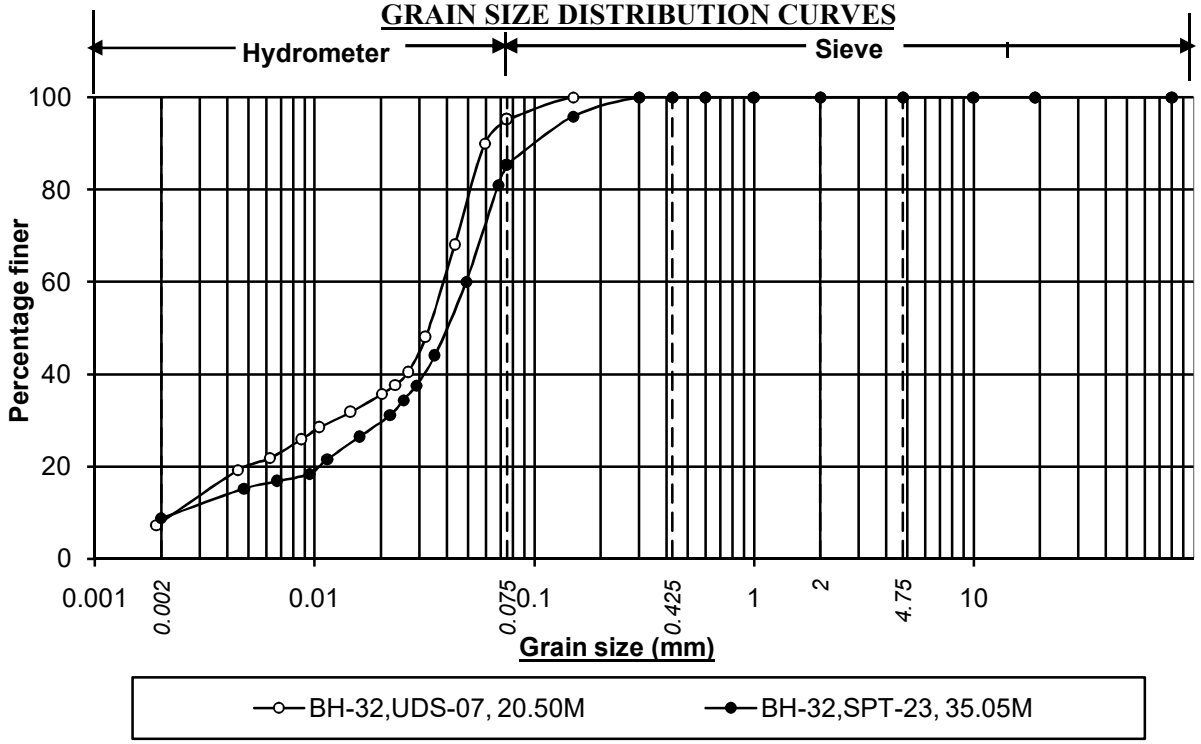


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	Total sand	Weighted mean dia (mm)	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-32,UDS-02, 5.50M	4.1	85.3	10.6	0.0	0.0	10.6		0.0
BH-32,UDS-04, 11.50M	7.8	87.4	4.8	0.0	0.0	4.8		0.0

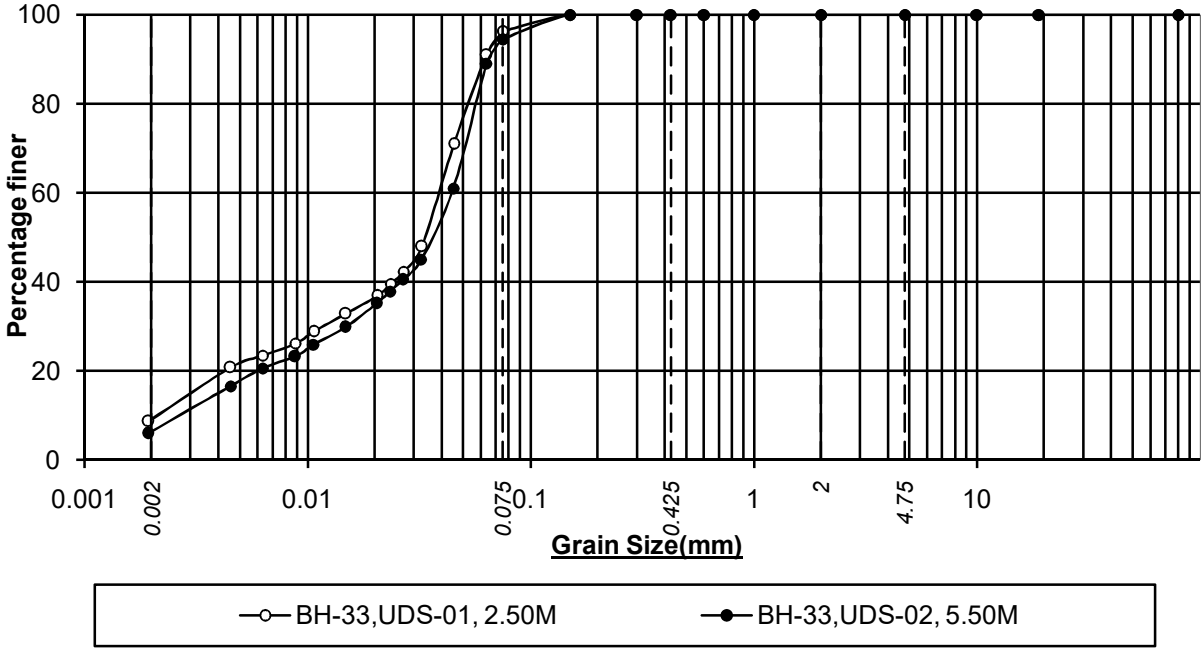
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Grain size (mm)	<0.002	0.002-0.075	0.075-0.425	0.425-2.00	2.0-4.75	Total sand	Weighted mean dia (mm)	>4.75
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-32,UDS-07, 20.50M	7.9	87.3	4.8	0.0	0.0	4.8		0.0
BH-32,SPT-23, 35.05M	8.8	76.6	14.6	0.0	0.0	14.6		0.0

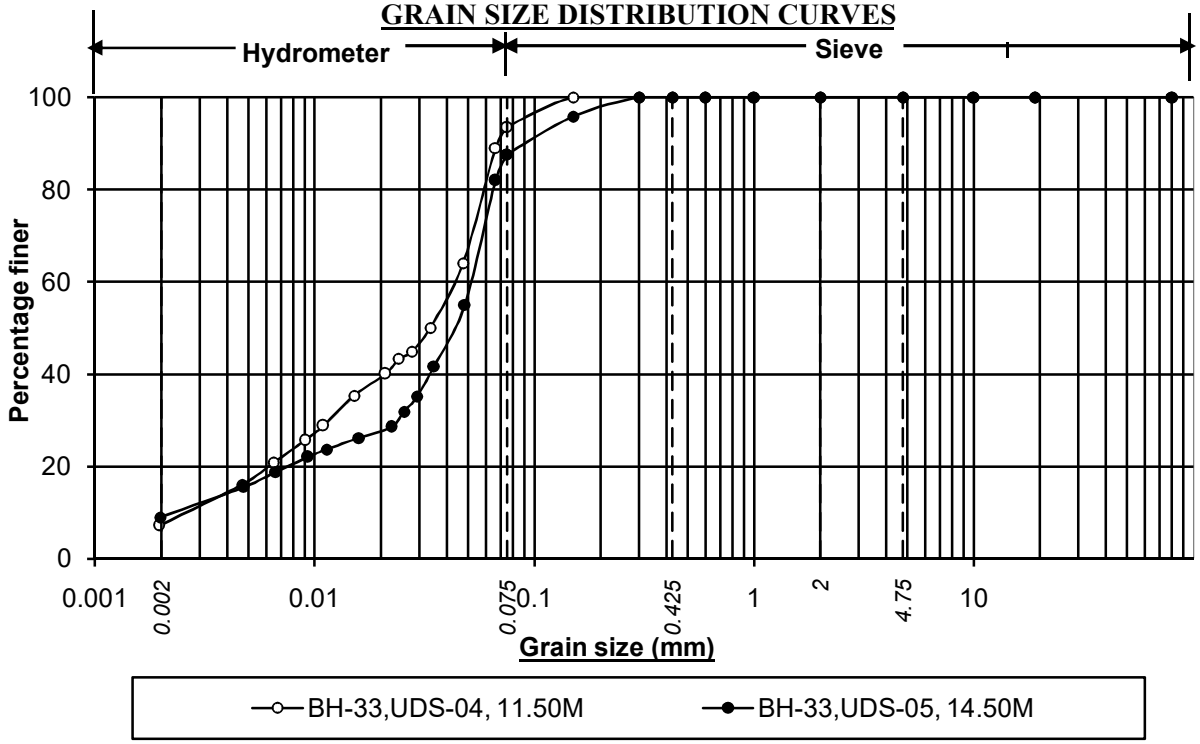


Grain size (mm)	<0.002	0.002-0.075	0.075-0.425	0.425-2.00	2.0-4.75	Total sand	Weighted mean dia (mm)	>4.75
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-33,UDS-01, 2.50M	9.2	87.2	3.6	0.0	0.0	3.6		0.0
BH-33,UDS-02, 5.50M	6.4	88.1	5.5	0.0	0.0	5.5		0.0

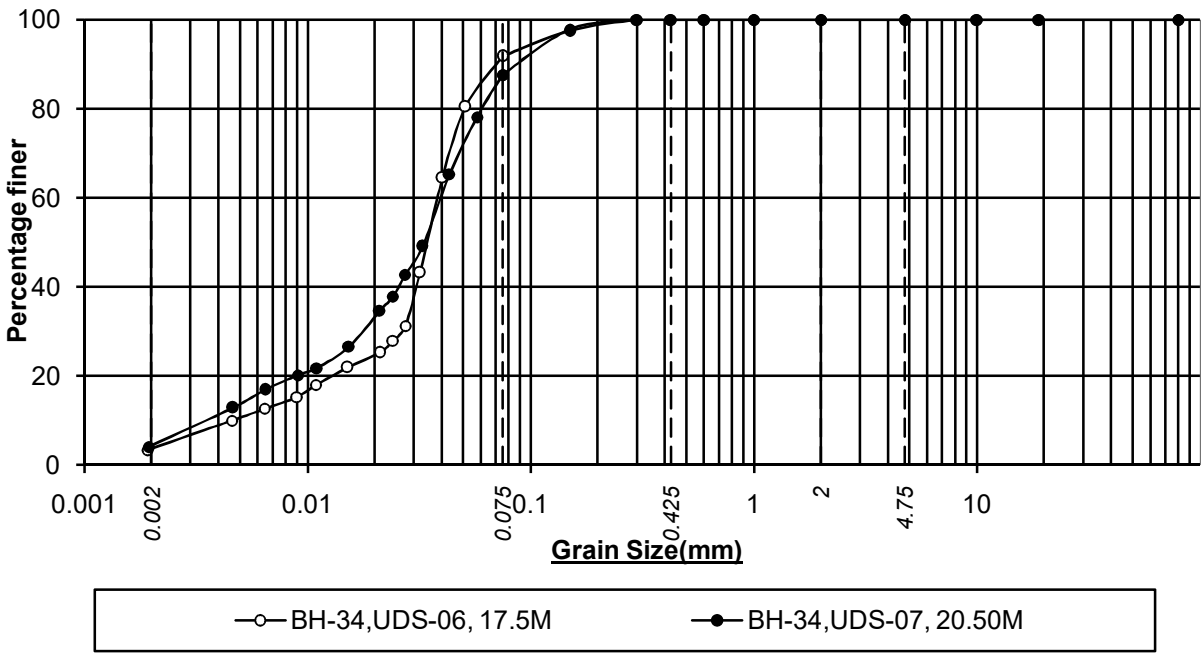
Project:- Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar | **Job No. 4388**

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GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	<0.002	0.002-0.075	0.075-0.425	0.425-2.00	2.0-4.75	Total sand	Weighted mean dia (mm)	>4.75
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-33,UDS-04, 11.50M	7.4	86.2	6.4	0.0	0.0	6.4		0.0
BH-33,UDS-05, 14.50M	9.0	78.6	12.4	0.0	0.0	12.4		0.0

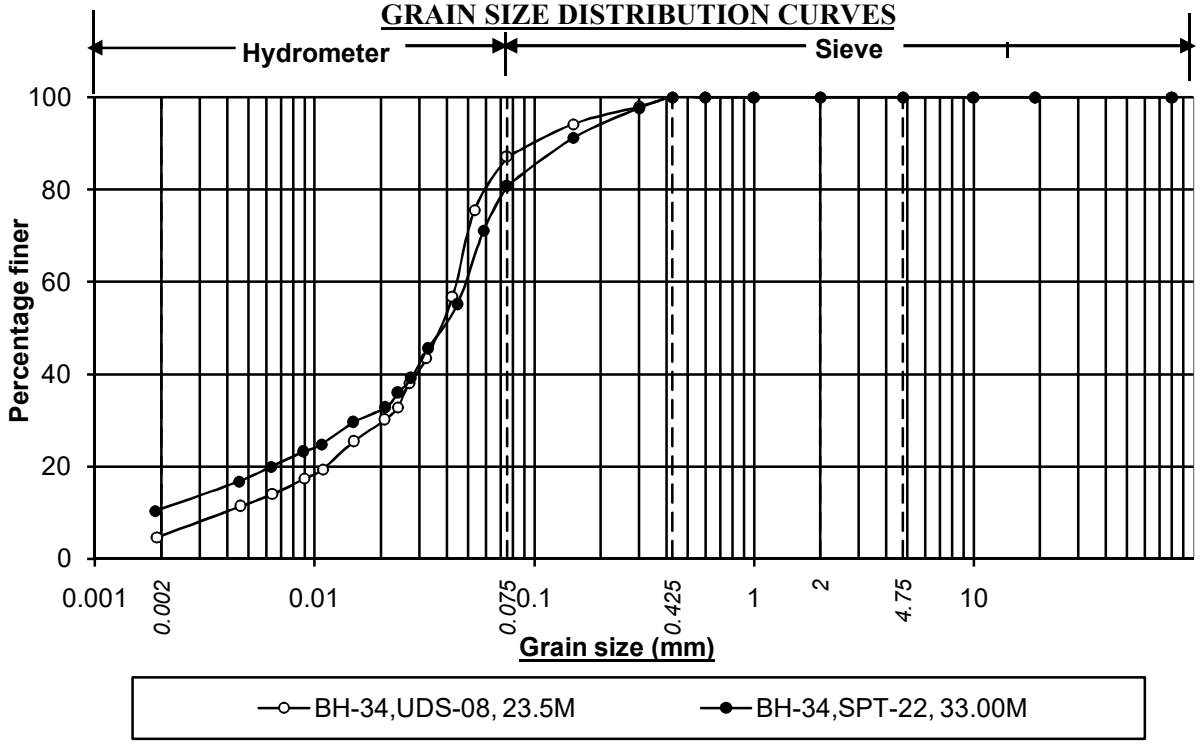


Grain size (mm)	<0.002	0.002-0.075	0.075-0.425	0.425-2.00	2.0-4.75	Total sand	Weighted mean dia (mm)	>4.75
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-34,UDS-06, 17.5M	3.6	88.2	8.2	0.0	0.0	8.2		0.0
BH-34,UDS-07, 20.50M	4.3	83.3	12.4	0.0	0.0	12.4		0.0

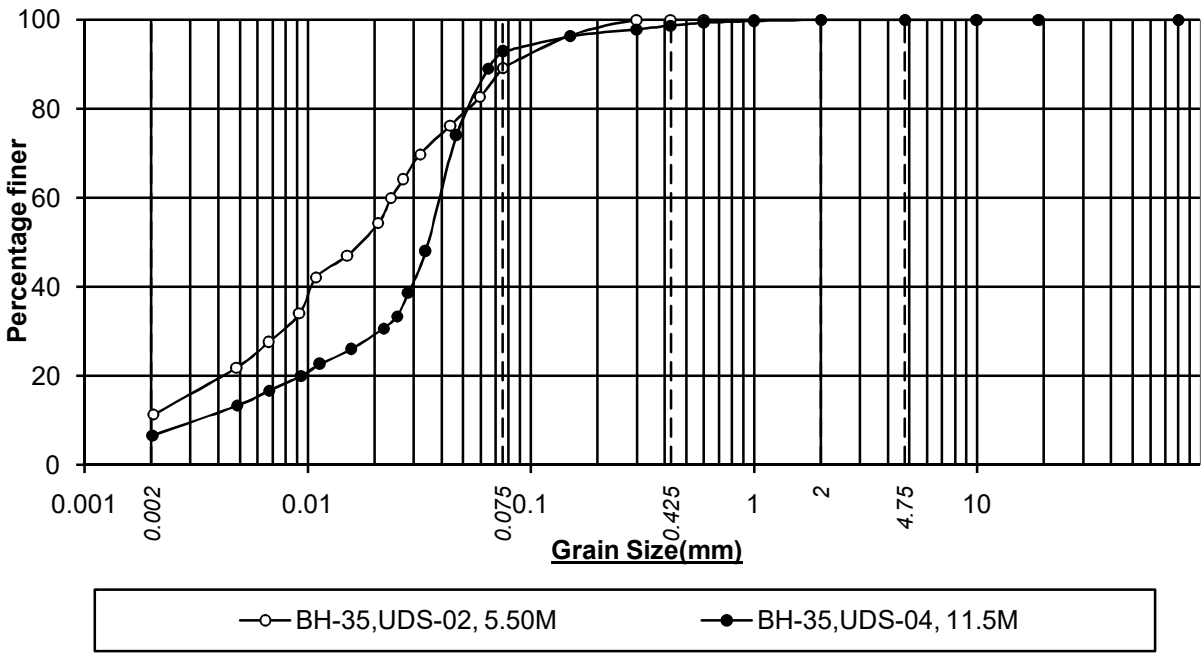
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GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-34,UDS-08, 23.5M	5.0	82.2	12.8	0.0	0.0	12.8		0.0
BH-34,SPT-22, 33.00M	10.8	70.0	19.2	0.0	0.0	19.2		0.0

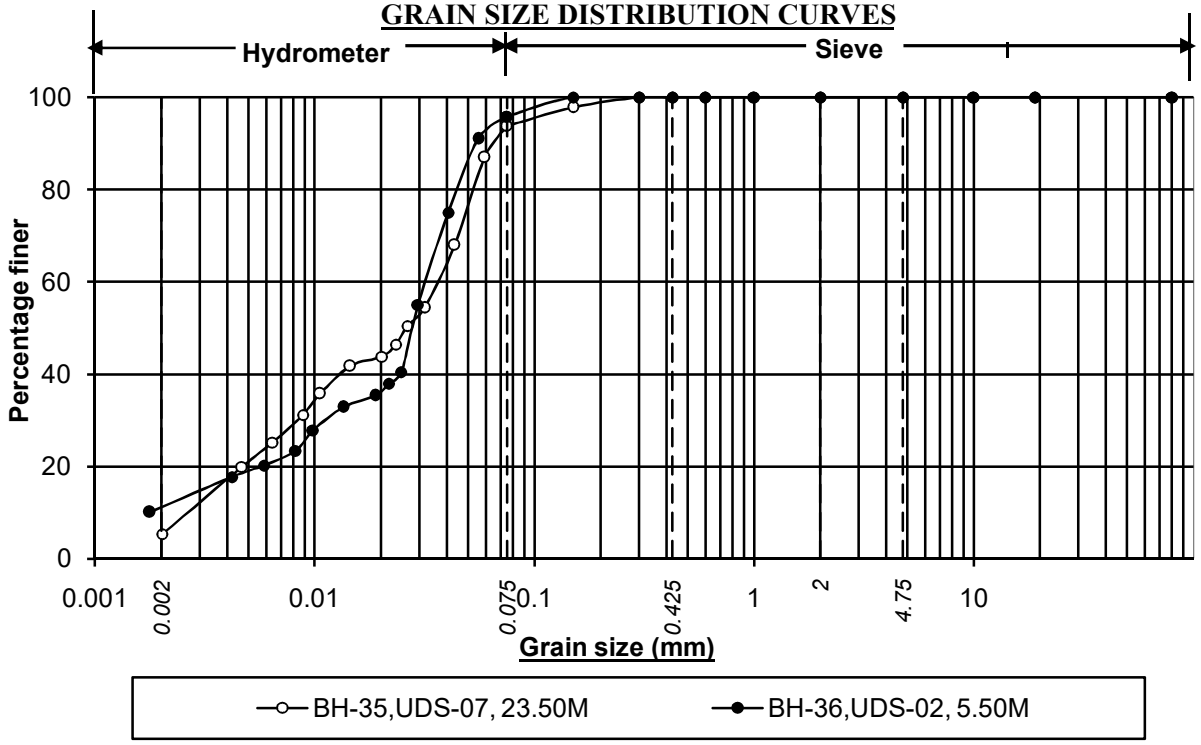


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-35,UDS-02, 5.50M	11.1	78.1	10.8	0.0	0.0	10.8		0.0
BH-35,UDS-04, 11.5M	6.6	86.3	5.8	1.3	0.0	7.1		0.0

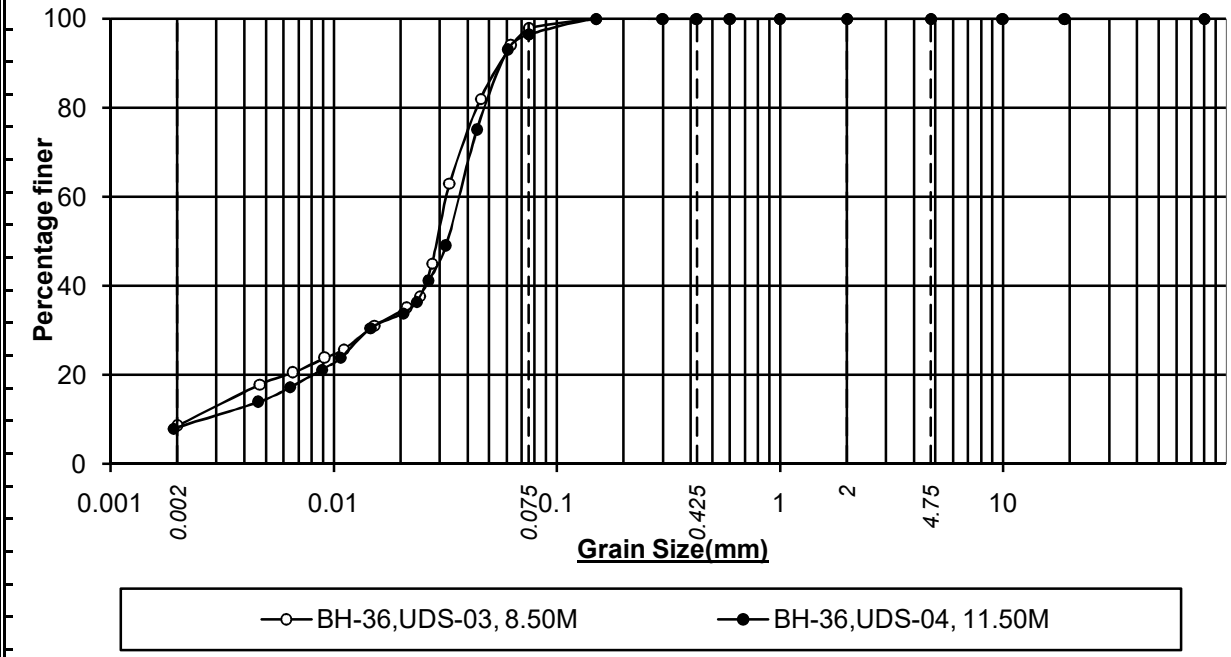
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GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-35,UDS-07, 23.50M	5.1	88.7	6.2	0.0	0.0	6.2		0.0
BH-36,UDS-02, 5.50M	11.2	84.7	4.1	0.0	0.0	4.1		0.0

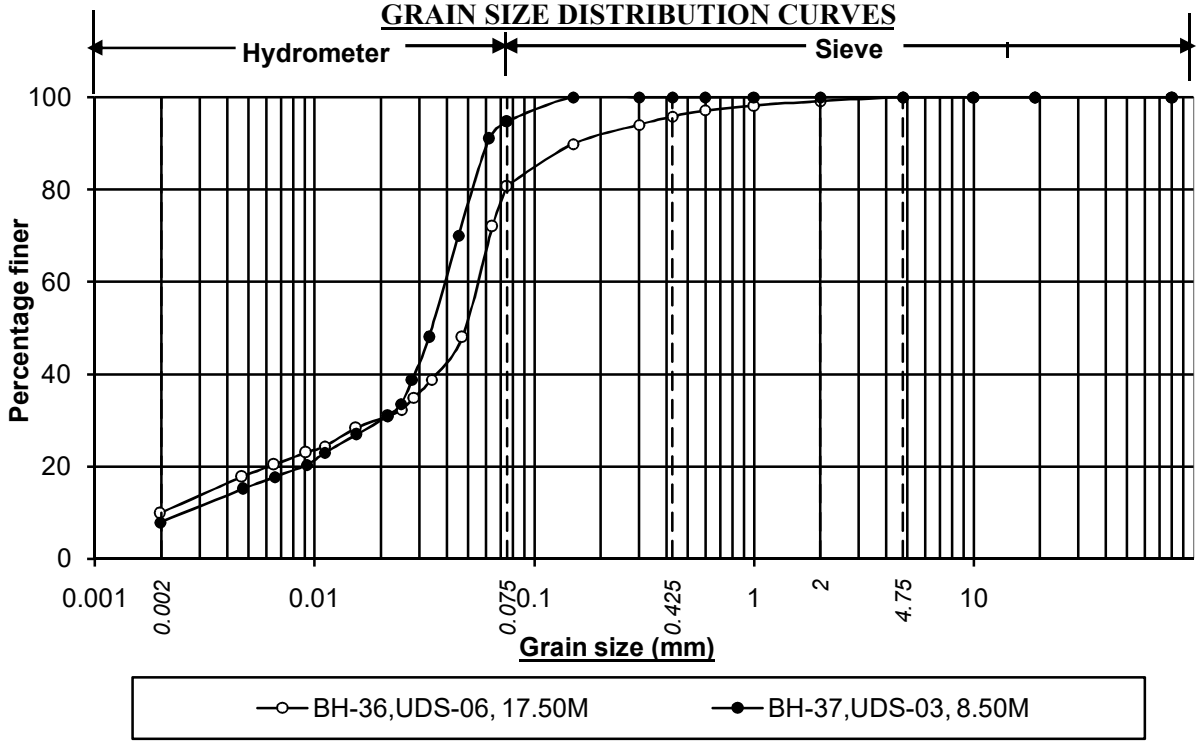


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-36,UDS-03, 8.50M	8.6	89.4	2.0	0.0	0.0	2.0		0.0
BH-36,UDS-04, 11.50M	8.2	88.3	3.5	0.0	0.0	3.5		0.0

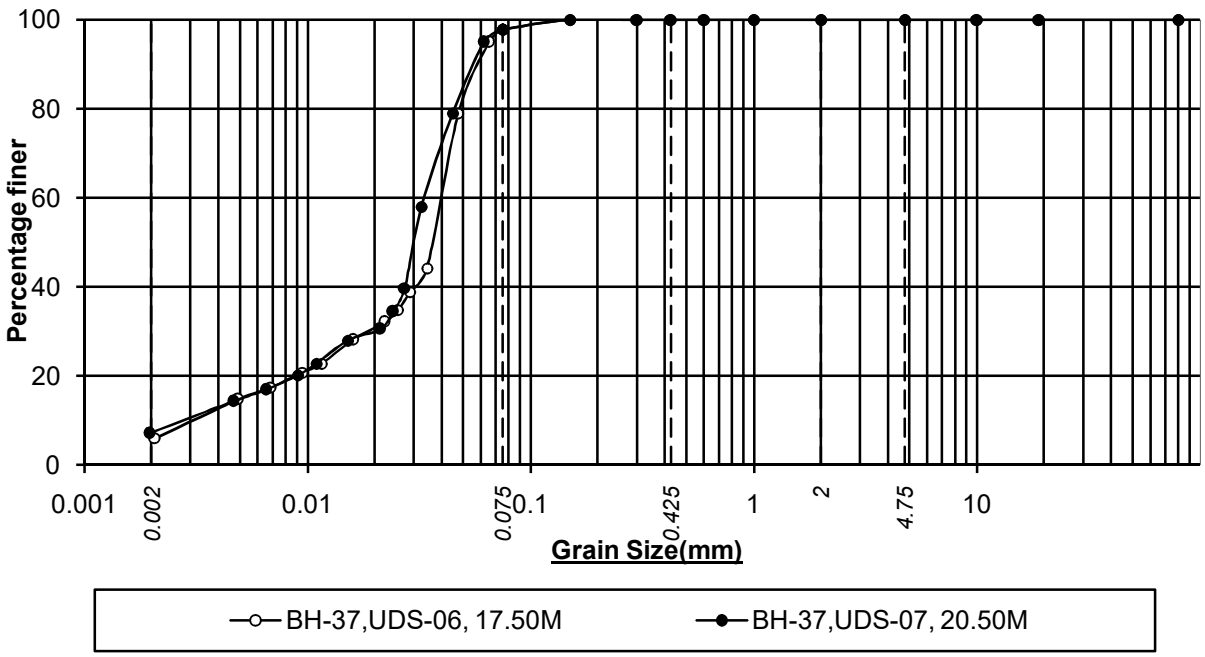
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GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-36,UDS-06, 17.50M	10.0	70.8	15.1	3.3	0.8	19.2		0.0
BH-37,UDS-03, 8.50M	8.0	86.9	5.1	0.0	0.0	5.1		0.0

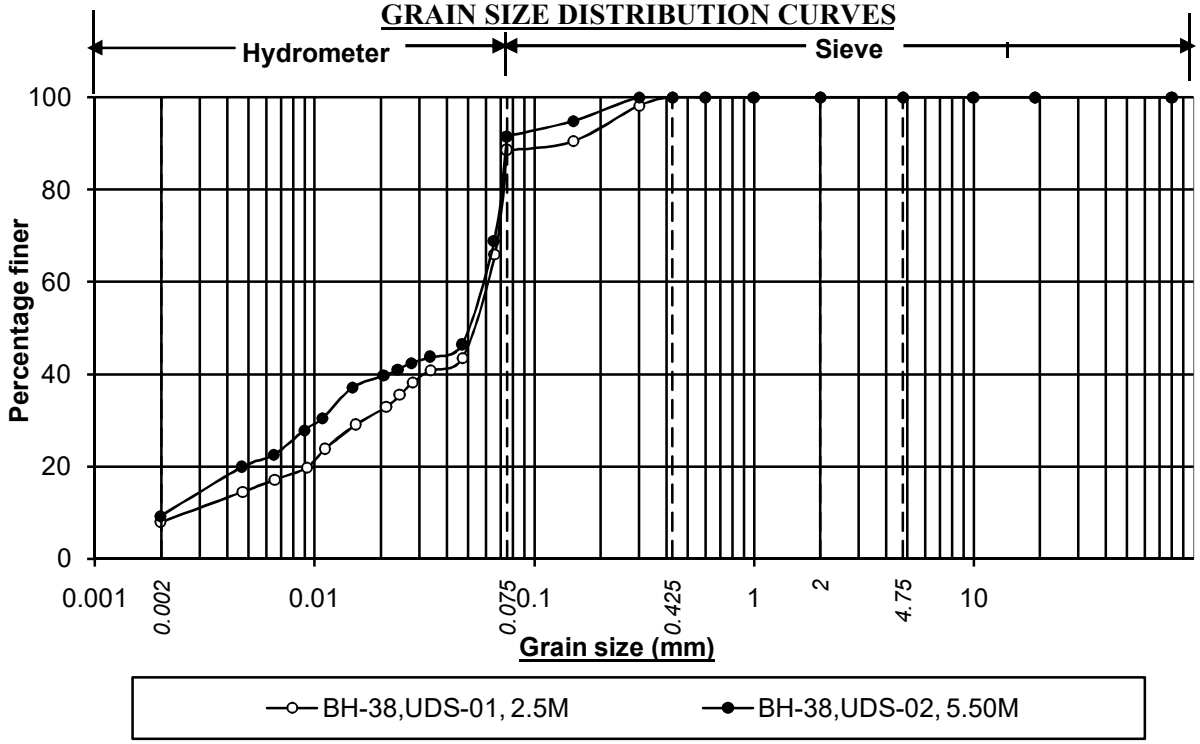


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-37,UDS-06, 17.50M	5.7	92.1	2.2	0.0	0.0	2.2		0.0
BH-37,UDS-07, 20.50M	7.3	90.5	2.2	0.0	0.0	2.2		0.0

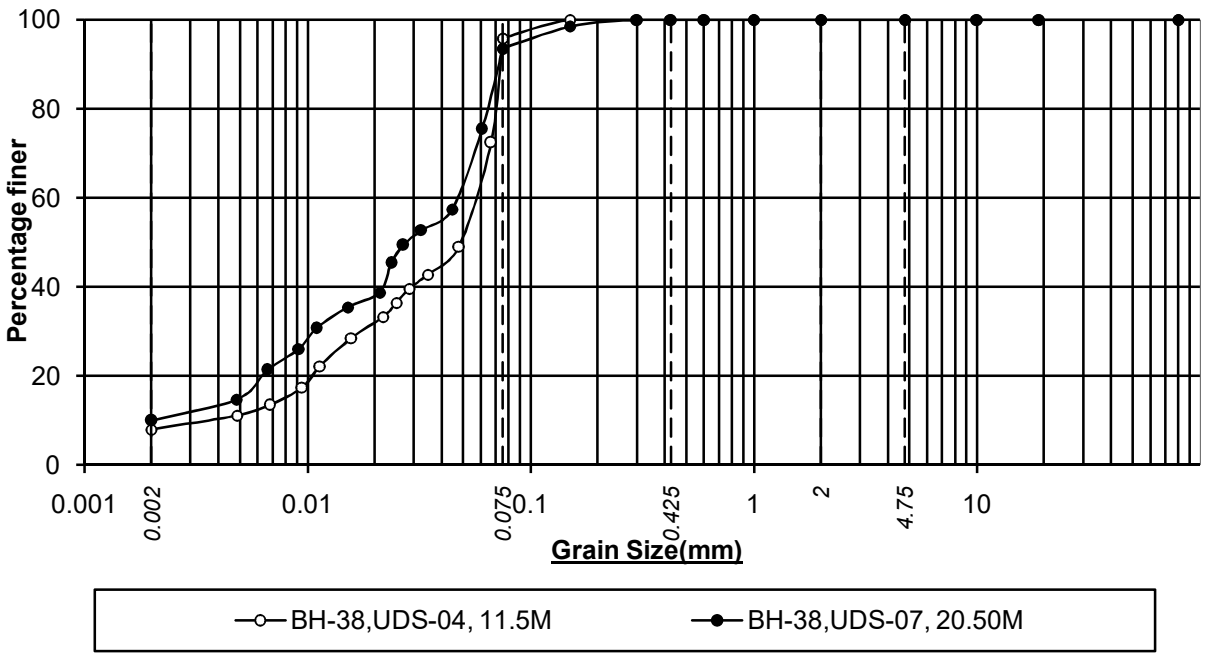
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GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-38,UDS-01, 2.5M	8.0	80.5	11.5	0.0	0.0	11.5		0.0
BH-38,UDS-02, 5.50M	9.4	82.1	8.5	0.0	0.0	8.5		0.0

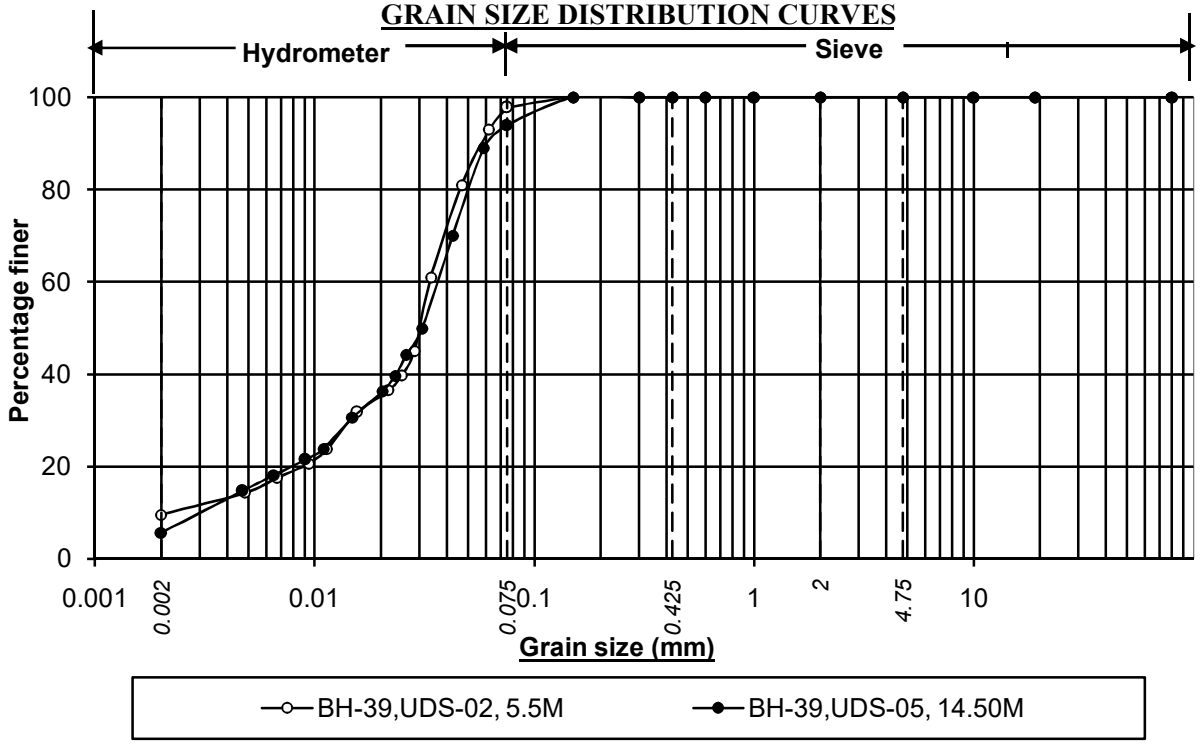


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-38,UDS-04, 11.5M	7.9	87.9	4.2	0.0	0.0	4.2		0.0
BH-38,UDS-07, 20.50M	10.0	83.5	6.5	0.0	0.0	6.5		0.0

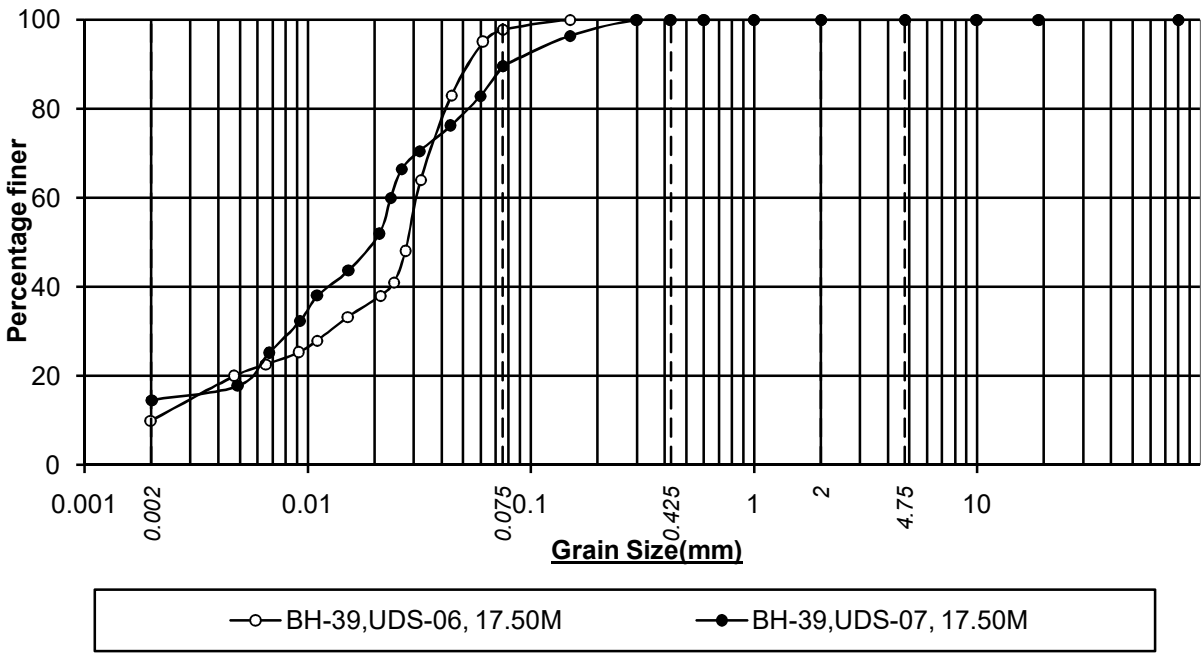
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GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	<0.002	0.002-0.075	0.075-0.425	0.425-2.00	2.0-4.75	Total sand	Weighted mean dia (mm)	>4.75
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-39,UDS-02, 5.5M	9.5	88.3	2.2	0.0	0.0	2.2		0.0
BH-39,UDS-05, 14.50M	5.7	88.3	6.0	0.0	0.0	6.0		0.0

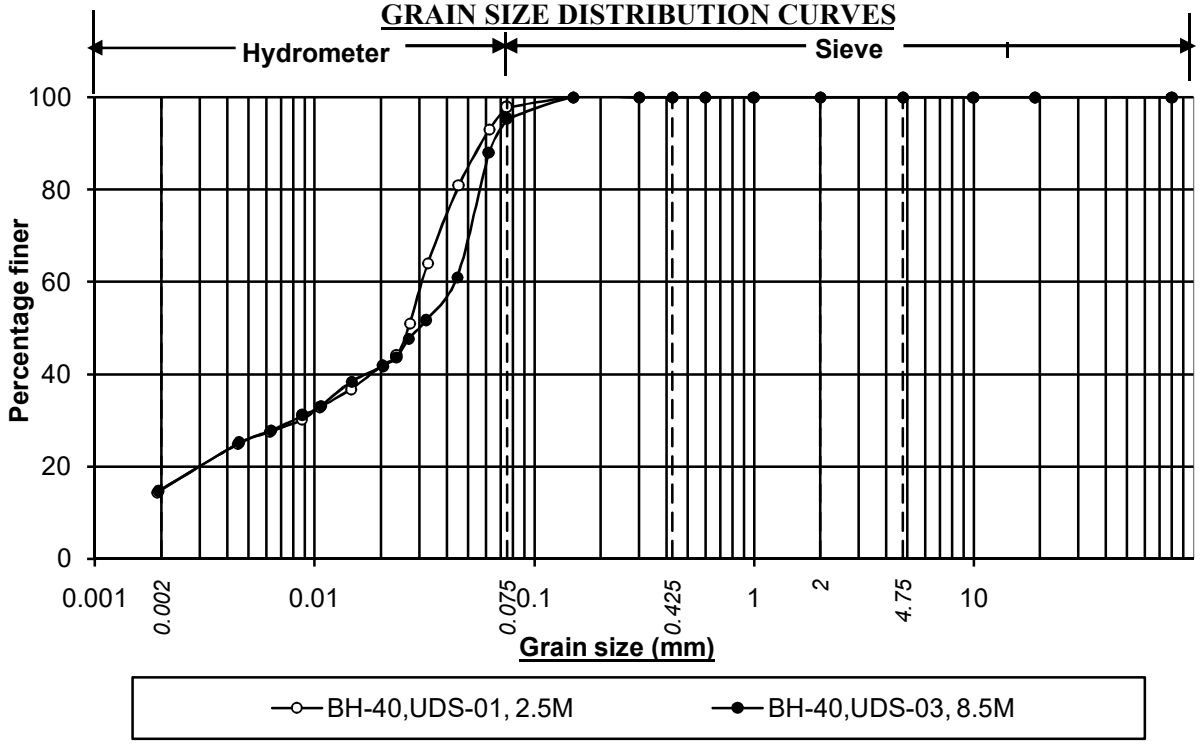


Grain size (mm)	<0.002	0.002-0.075	0.075-0.425	0.425-2.00	2.0-4.75	Total sand	Weighted mean dia (mm)	>4.75
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-39,UDS-06, 17.50M	10.0	87.8	2.2	0.0	0.0	2.2		0.0
BH-39,UDS-07, 17.50M	14.6	75.0	10.4	0.0	0.0	10.4		0.0

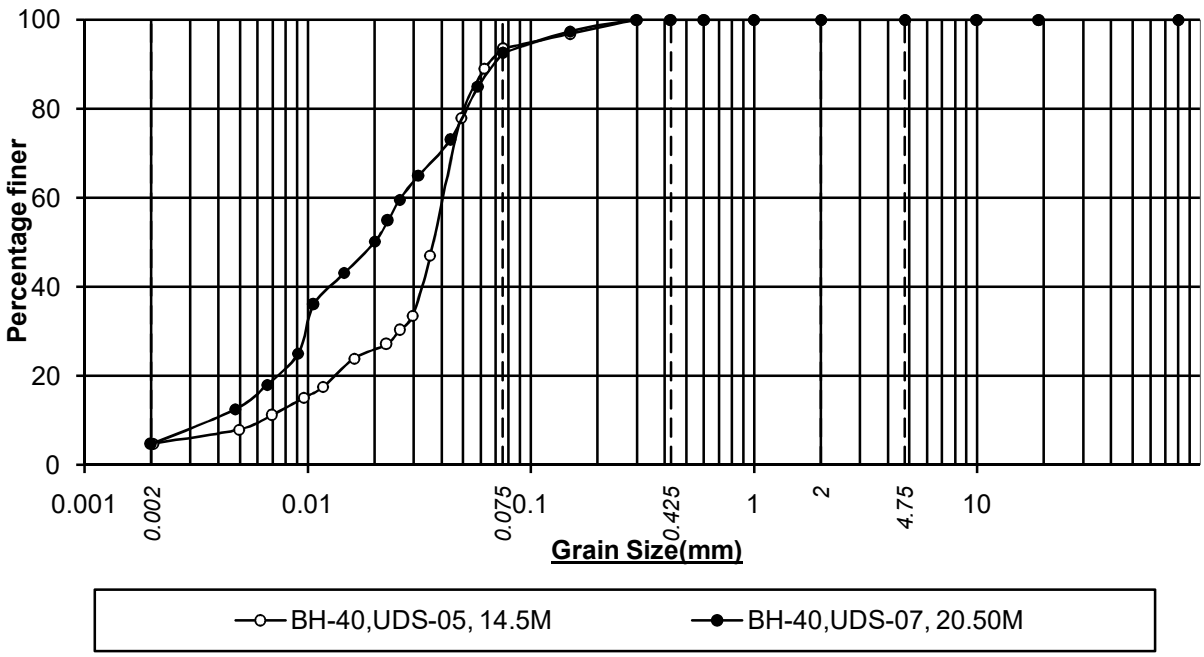
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GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-40,UDS-01, 2.5M	14.9	82.9	2.2	0.0	0.0	2.2		0.0
BH-40,UDS-03, 8.5M	14.9	80.4	4.7	0.0	0.0	4.7		0.0

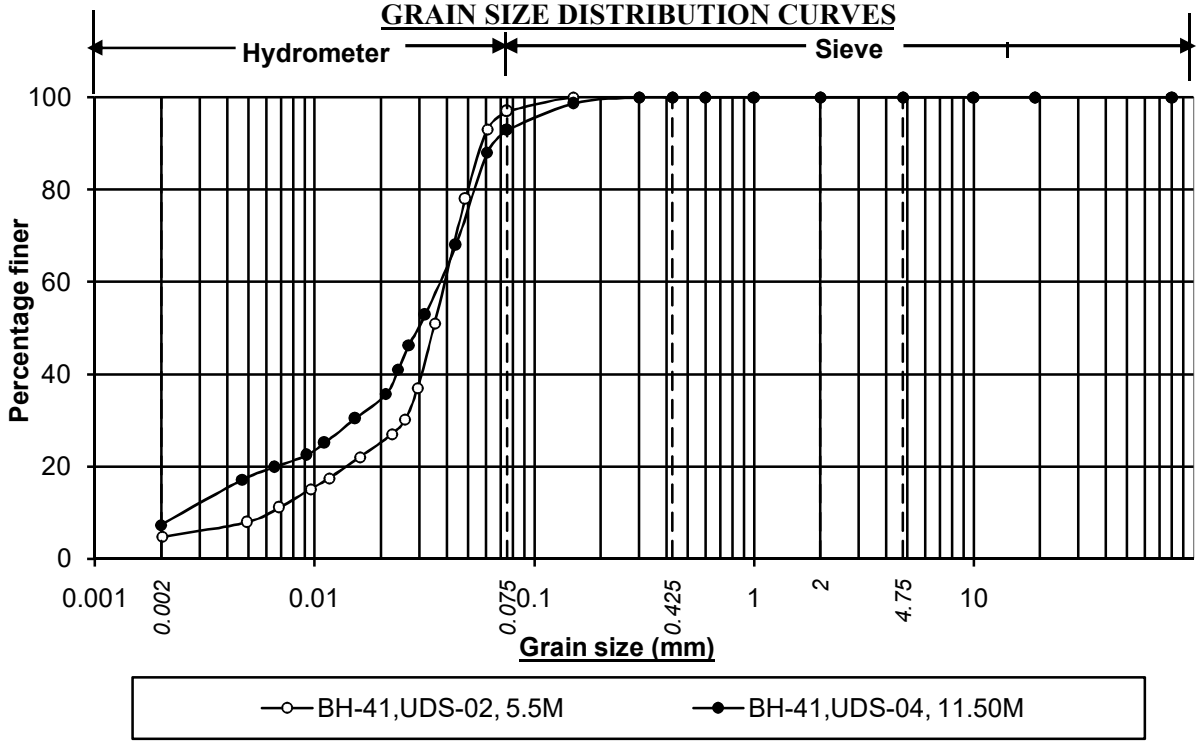


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-40,UDS-05, 14.5M	4.7	88.9	6.4	0.0	0.0	6.4		0.0
BH-40,UDS-07, 20.50M	4.7	87.9	7.4	0.0	0.0	7.4		0.0

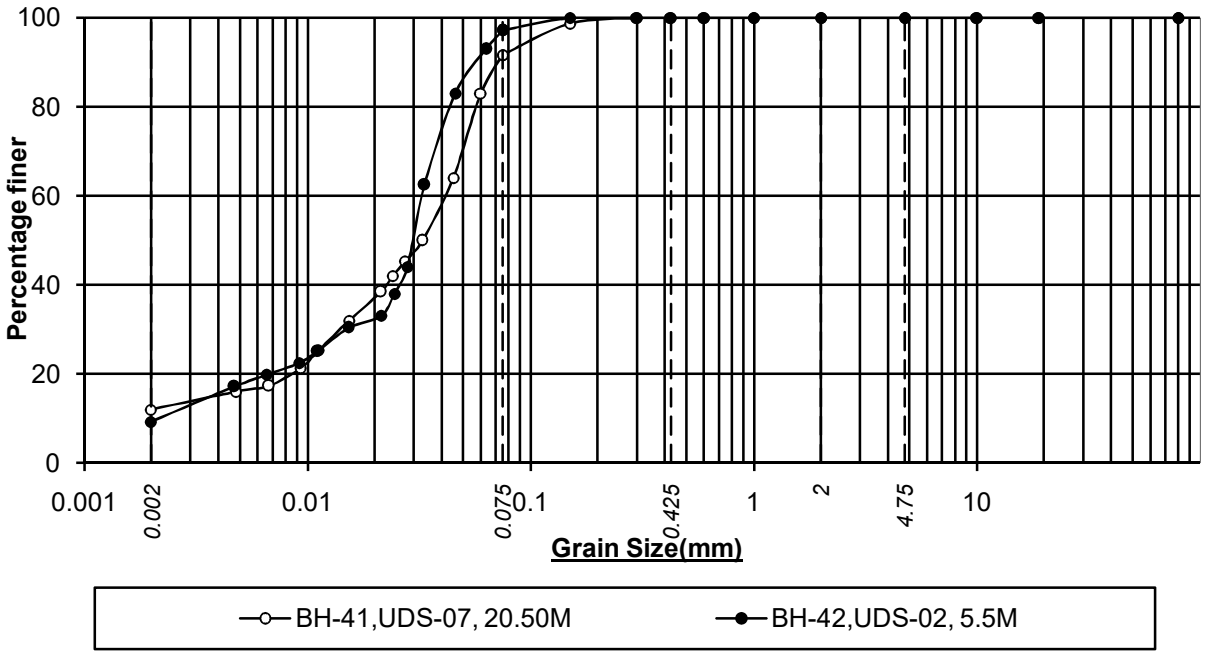
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Grain size (mm)	<0.002	0.002-0.075	0.075-0.425	0.425-2.00	2.0-4.75	Total sand	Weighted mean dia (mm)	>4.75
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-41,UDS-02, 5.5M	4.7	92.3	3.0	0.0	0.0	3.0		0.0
BH-41,UDS-04, 11.50M	7.3	85.7	7.0	0.0	0.0	7.0		0.0

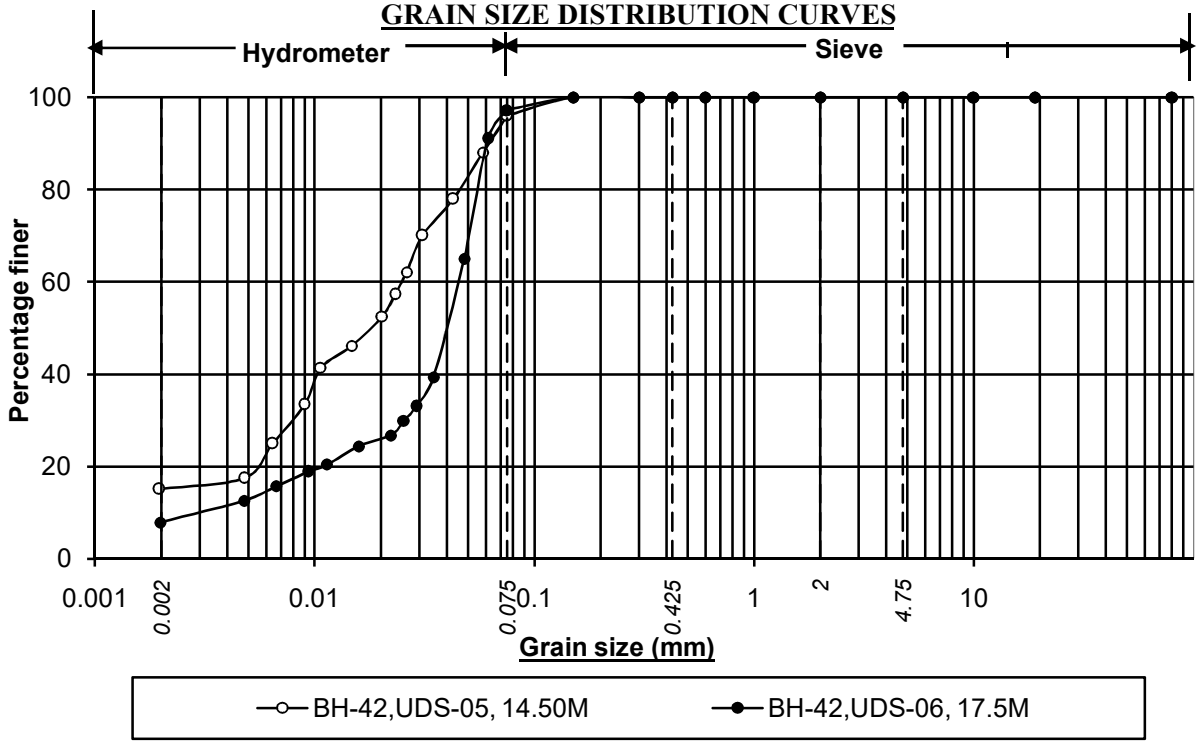


Grain size (mm)	<0.002	0.002-0.075	0.075-0.425	0.425-2.00	2.0-4.75	Total sand	Weighted mean dia (mm)	>4.75
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-41,UDS-07, 20.50M	12.0	79.6	8.4	0.0	0.0	8.4		0.0
BH-42,UDS-02, 5.5M	9.3	87.8	2.9	0.0	0.0	2.9		0.0

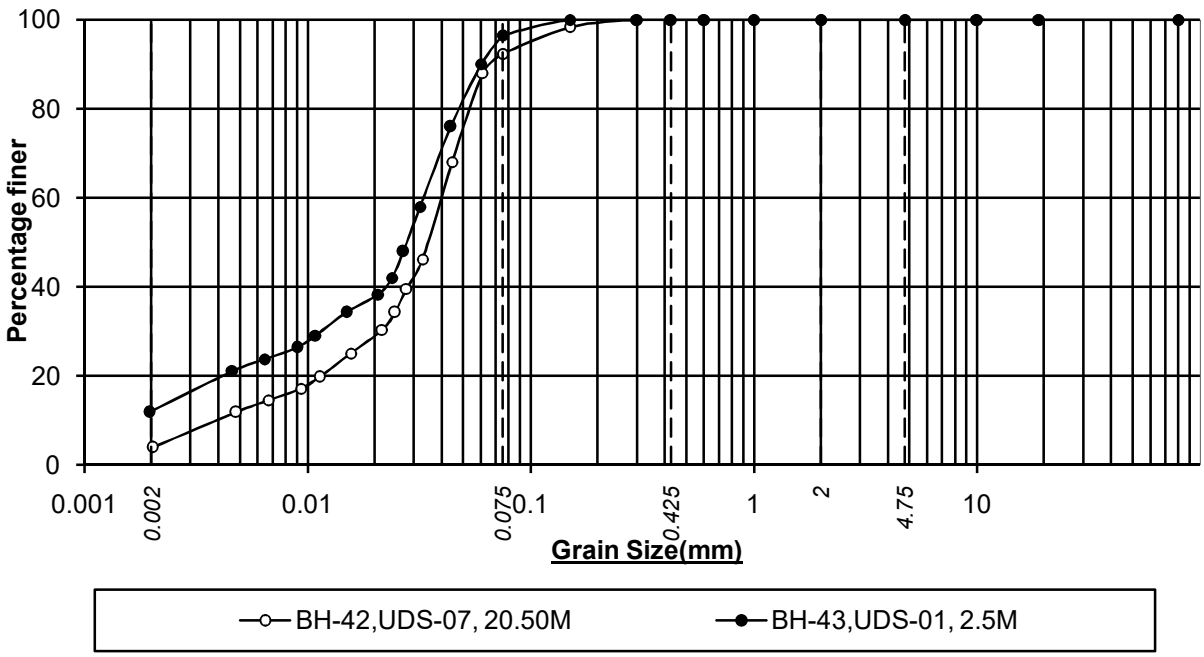
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Grain size (mm)	<0.002	0.002-0.075	0.075-0.425	0.425-2.00	2.0-4.75	Total sand	Weighted mean dia (mm)	>4.75
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-42,UDS-05, 14.50M	15.2	80.8	4.0	0.0	0.0	4.0		0.0
BH-42,UDS-06, 17.5M	7.9	89.3	2.8	0.0	0.0	2.8		0.0

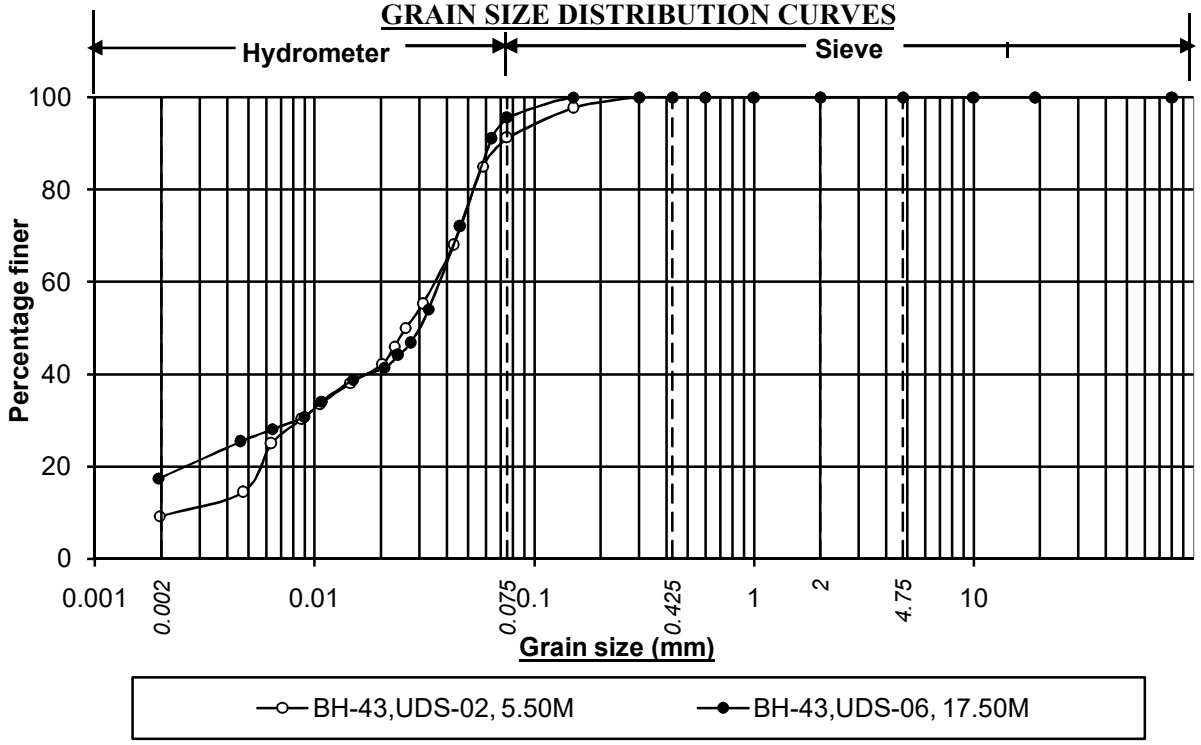


Grain size (mm)	<0.002	0.002-0.075	0.075-0.425	0.425-2.00	2.0-4.75	Total sand	Weighted mean dia (mm)	>4.75
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-42,UDS-07, 20.50M	3.9	88.5	7.6	0.0	0.0	7.6		0.0
BH-43,UDS-01, 2.5M	12.1	84.4	3.5	0.0	0.0	3.5		0.0

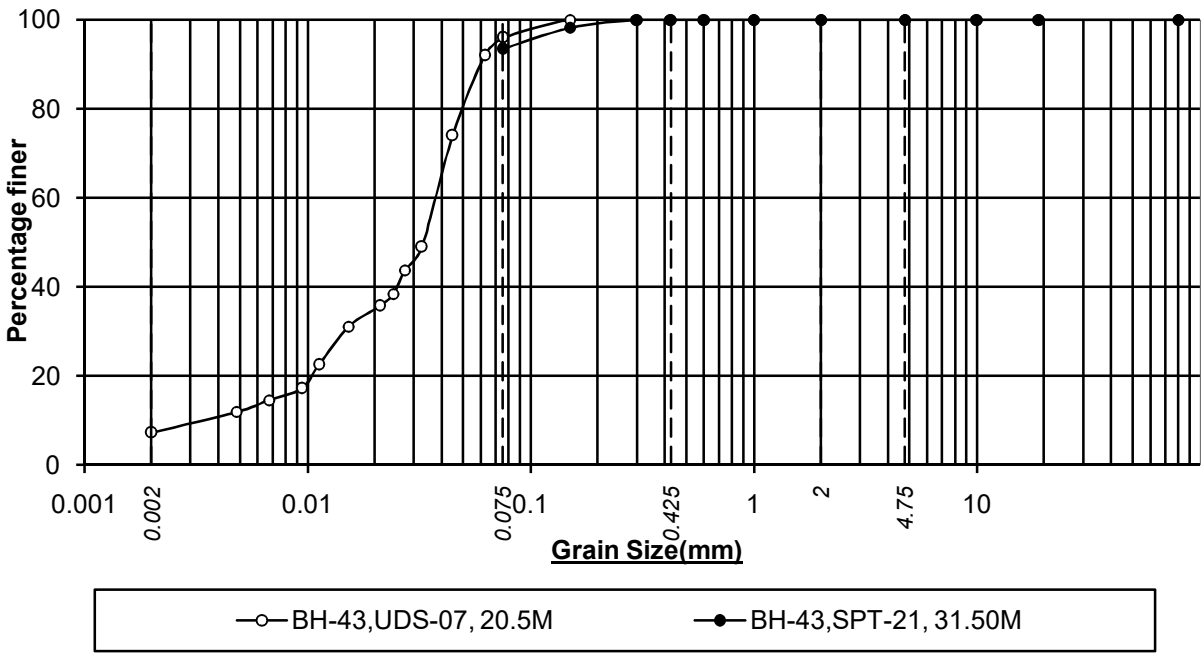
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Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-43,UDS-02, 5.50M	9.3	82.0	8.7	0.0	0.0	8.7		0.0
BH-43,UDS-06, 17.50M	17.6	78.0	4.4	0.0	0.0	4.4		0.0

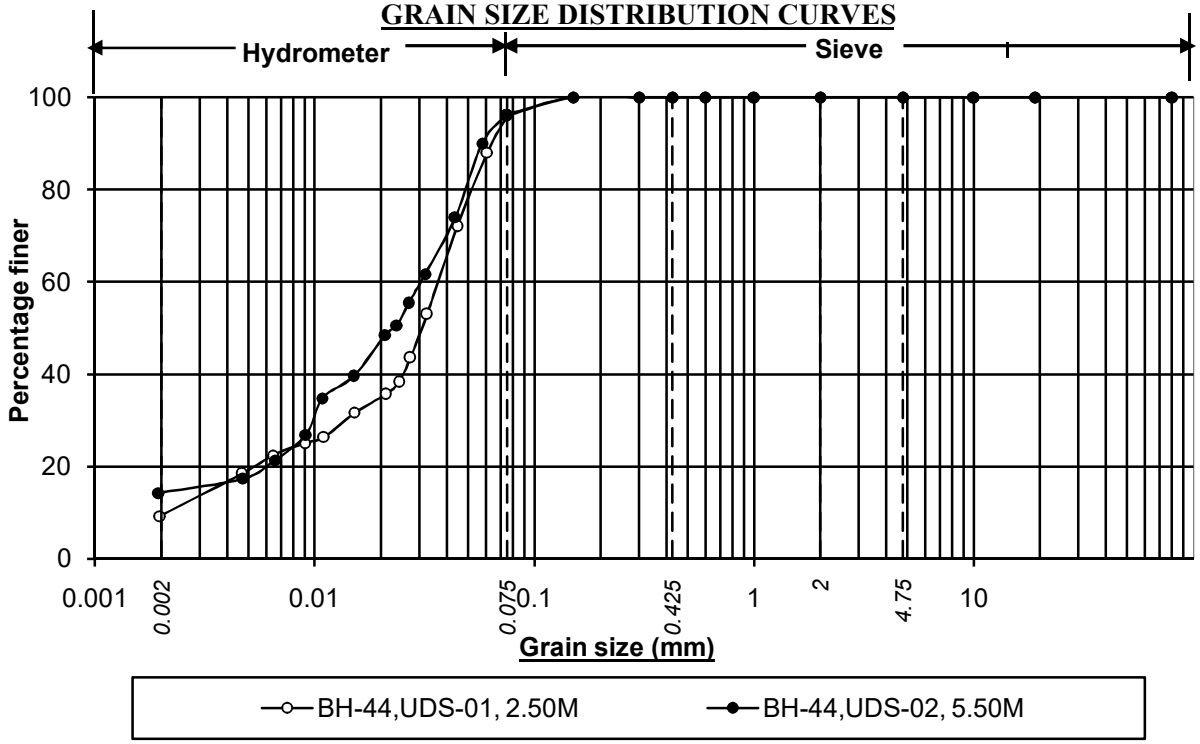


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-43,UDS-07, 20.5M	7.3	88.7	4.0	0.0	0.0	4.0		0.0
BH-43,SPT-21, 31.50M		93.4	6.6	0.0	0.0	6.6		0.0

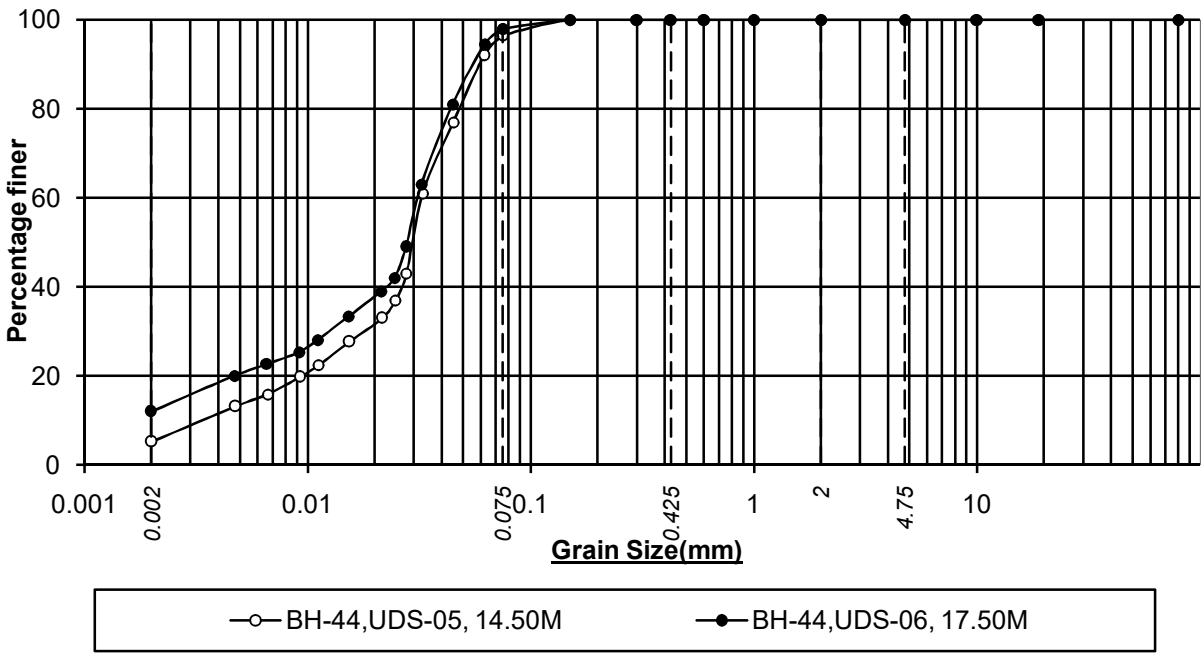
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Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-44,UDS-01, 2.50M	9.4	86.6	4.0	0.0	0.0	4.0		0.0
BH-44,UDS-02, 5.50M	14.3	81.9	3.8	0.0	0.0	3.8		0.0

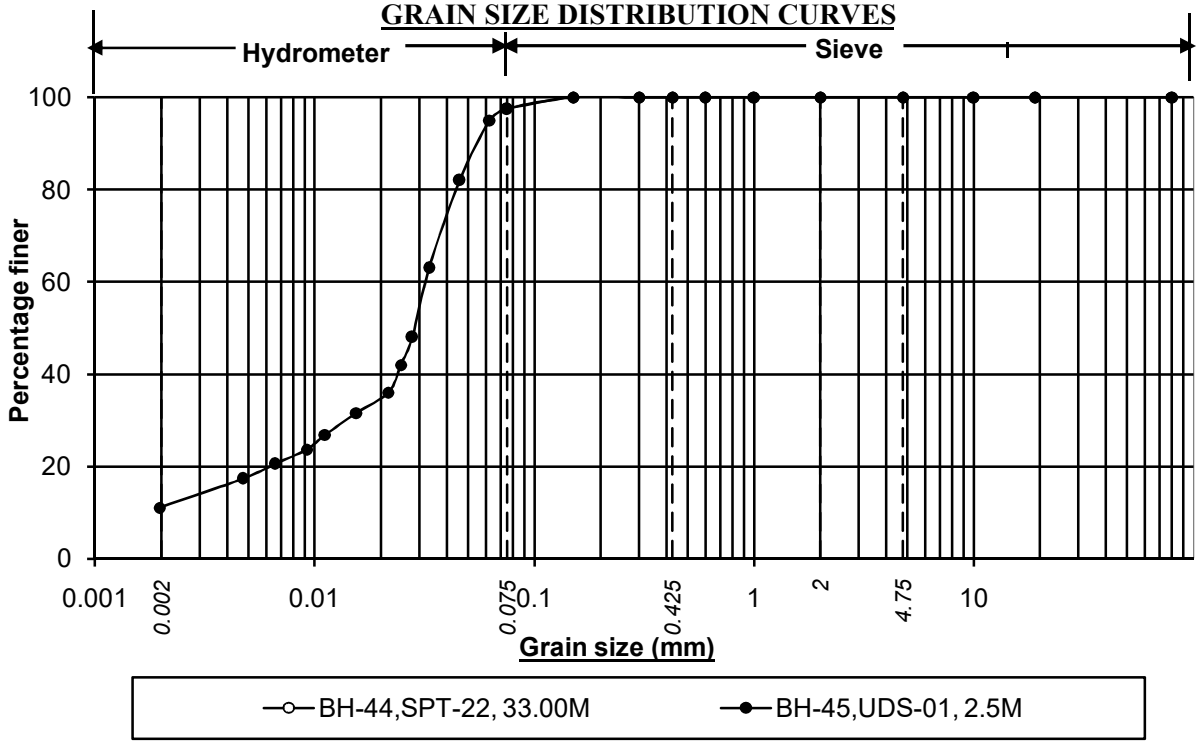


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-44,UDS-05, 14.50M	5.2	91.3	3.5	0.0	0.0	3.5		0.0
BH-44,UDS-06, 17.50M	12.1	85.9	2.0	0.0	0.0	2.0		0.0

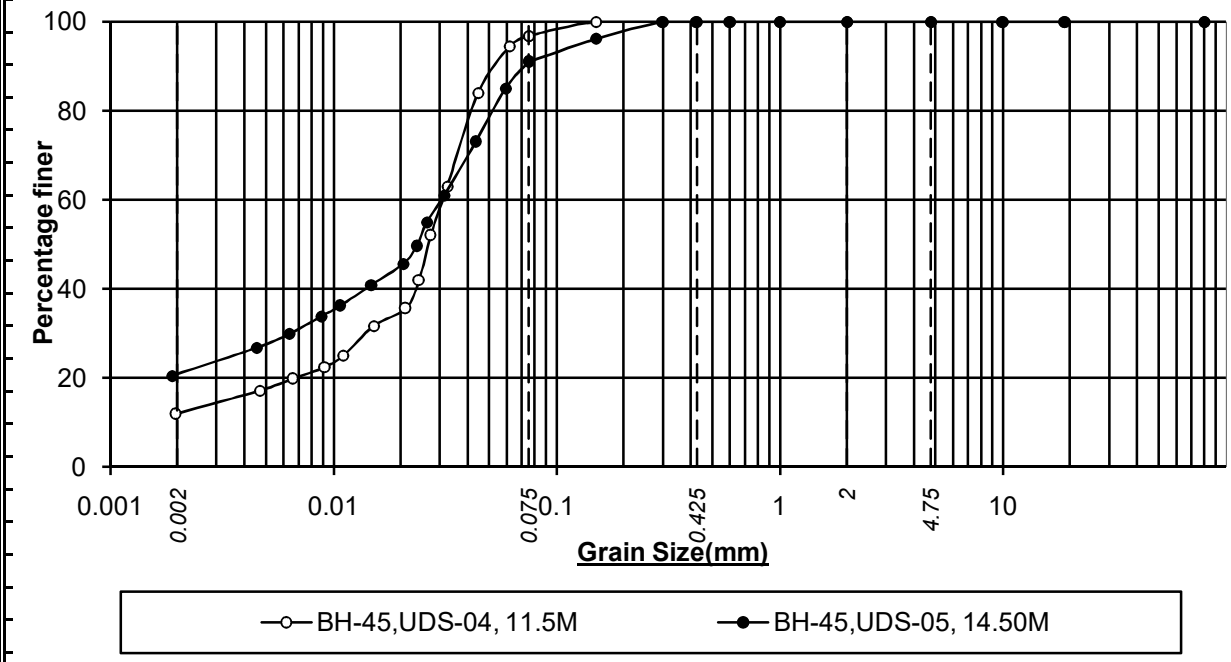
Project:- Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar | **Job No. 4388**

C. E. Testing Company Pvt. Ltd.

GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-44,SPT-22, 33.00M		97.5	2.5	0.0	0.0	2.5		0.0
BH-45,UDS-01, 2.5M	11.2	86.4	2.4	0.0	0.0	2.4		0.0

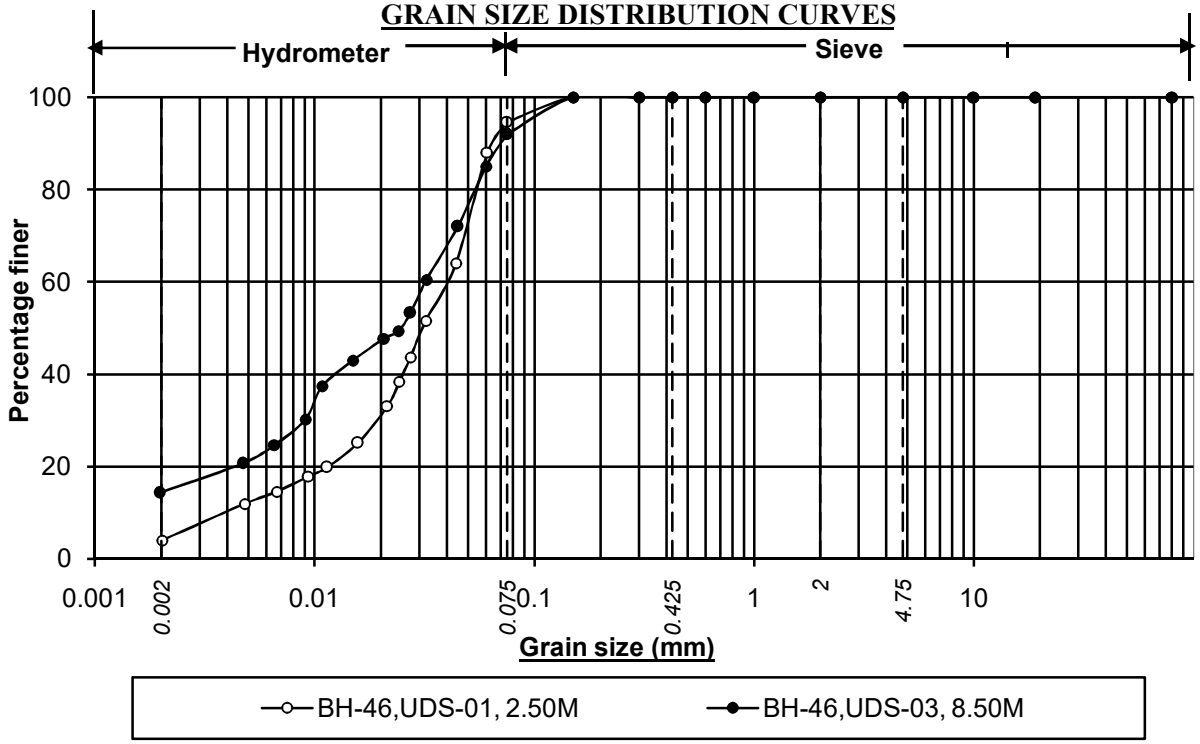


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-45,UDS-04, 11.5M	12.0	84.8	3.2	0.0	0.0	3.2		0.0
BH-45,UDS-05, 14.50M	20.8	70.2	9.0	0.0	0.0	9.0		0.0

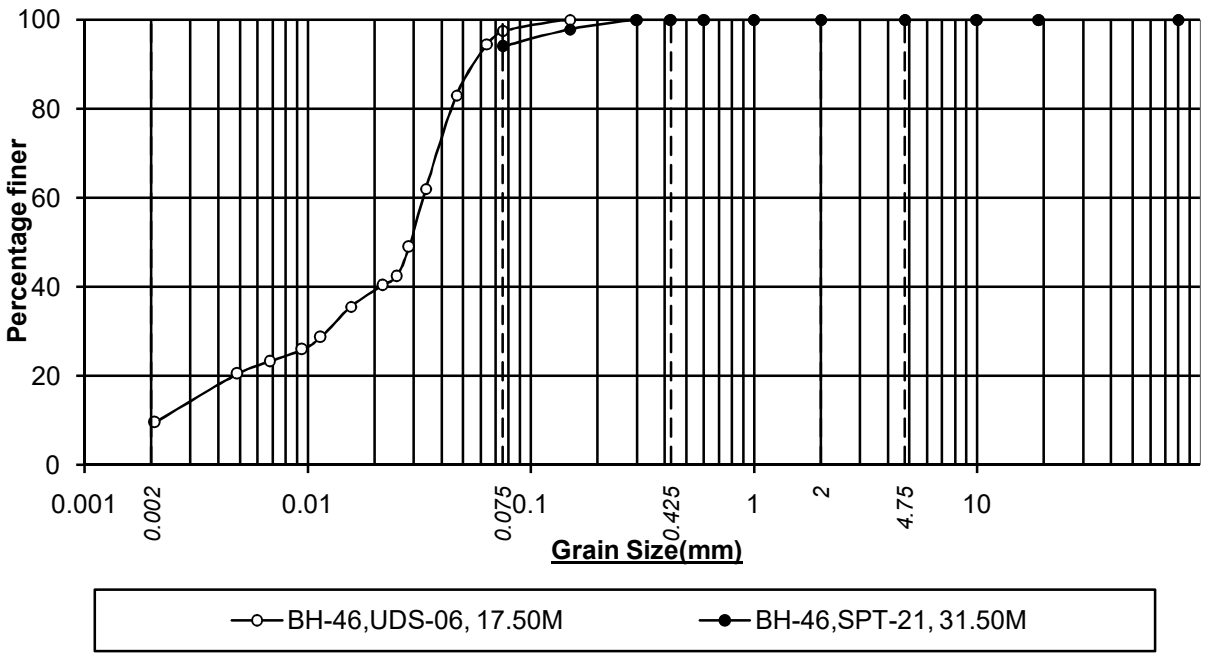
Project:- Geotech. Inv. Work for FGD System at Kahalgaon STPP, Bihar | **Job No. 4388**

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GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-46,UDS-01, 2.50M	3.8	90.8	5.4	0.0	0.0	5.4		0.0
BH-46,UDS-03, 8.50M	14.4	77.6	8.0	0.0	0.0	8.0		0.0

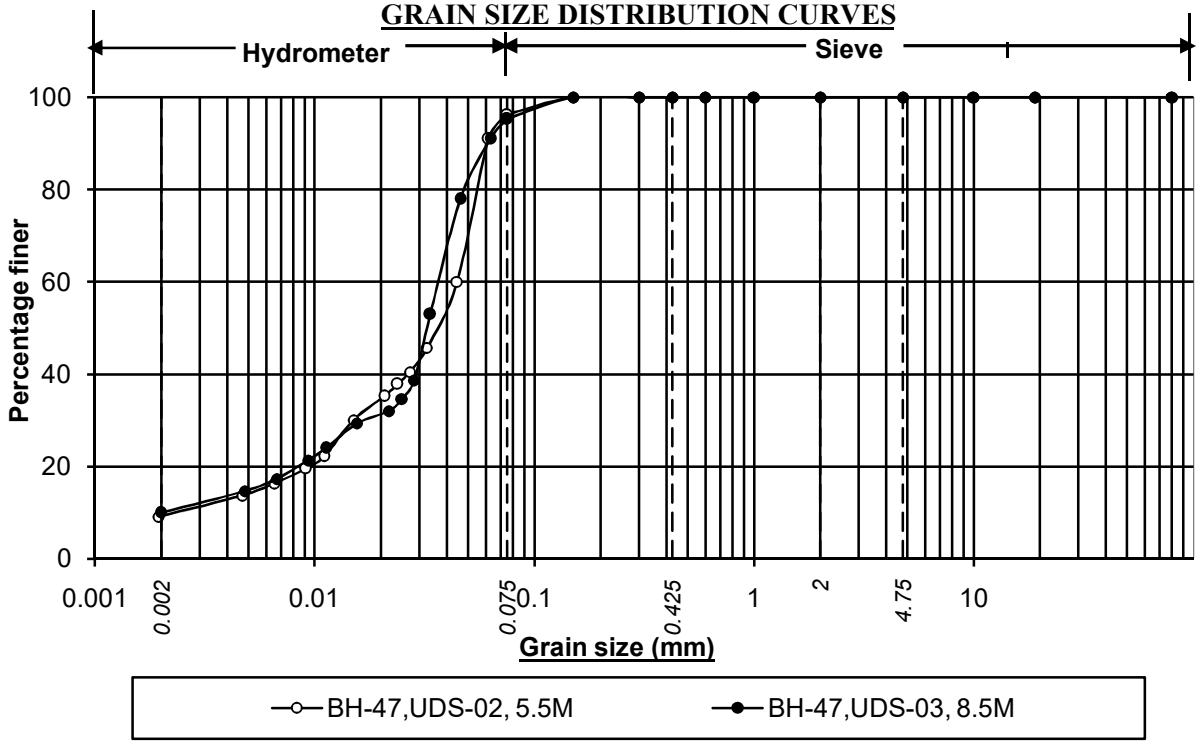


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-46,UDS-06, 17.50M	9.1	88.4	2.5	0.0	0.0	2.5		0.0
BH-46,SPT-21, 31.50M		94.0	6.0	0.0	0.0	6.0		0.0

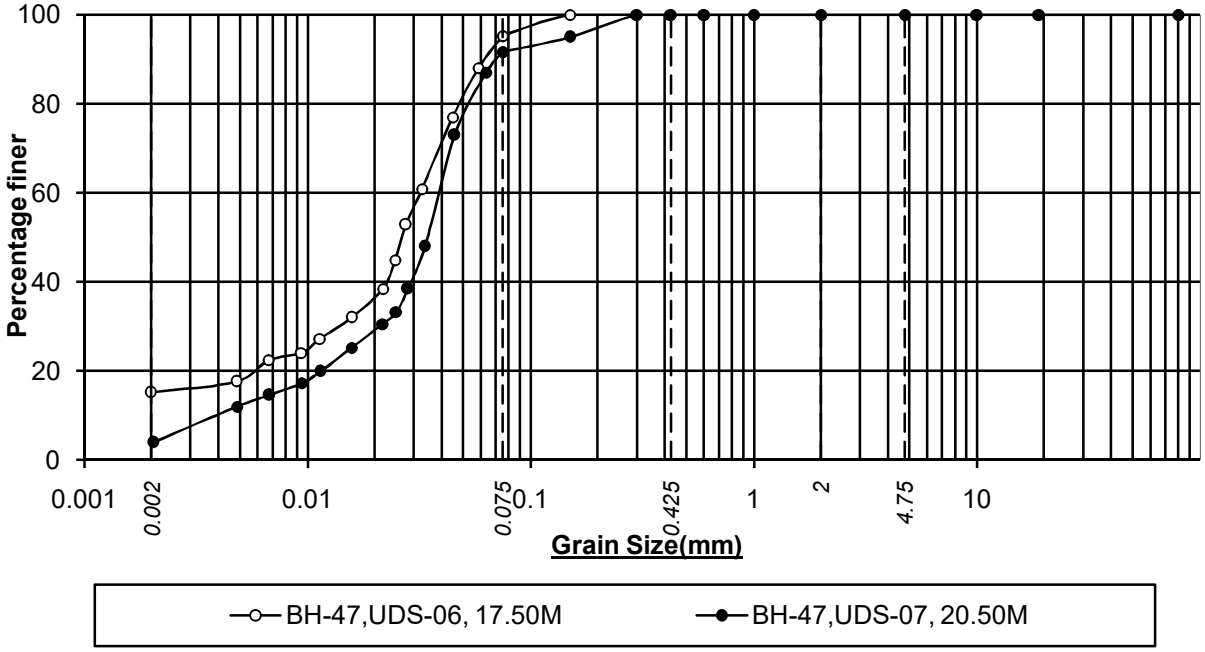
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GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-47,UDS-02, 5.5M	9.3	87.1	3.6	0.0	0.0	3.6		0.0
BH-47,UDS-03, 8.5M	10.0	85.3	4.7	0.0	0.0	4.7		0.0

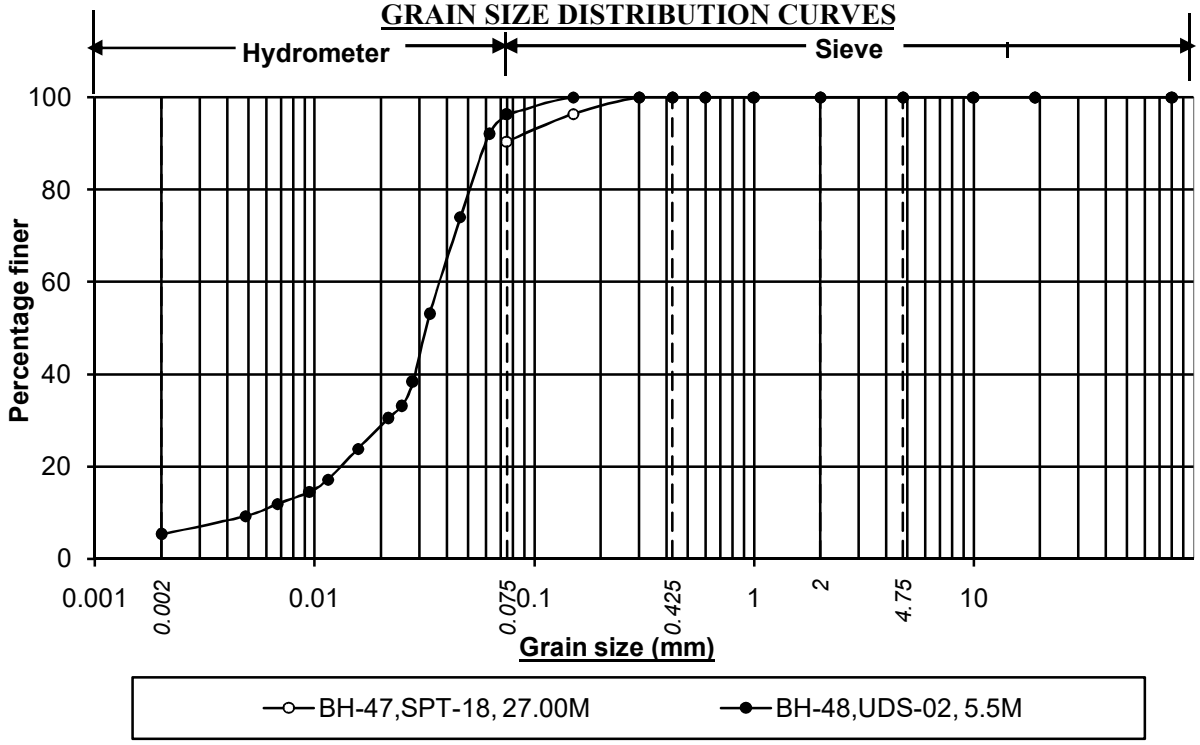


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-47,UDS-06, 17.50M	15.2	80.0	4.8	0.0	0.0	4.8		0.0
BH-47,UDS-07, 20.50M	3.8	87.8	8.4	0.0	0.0	8.4		0.0

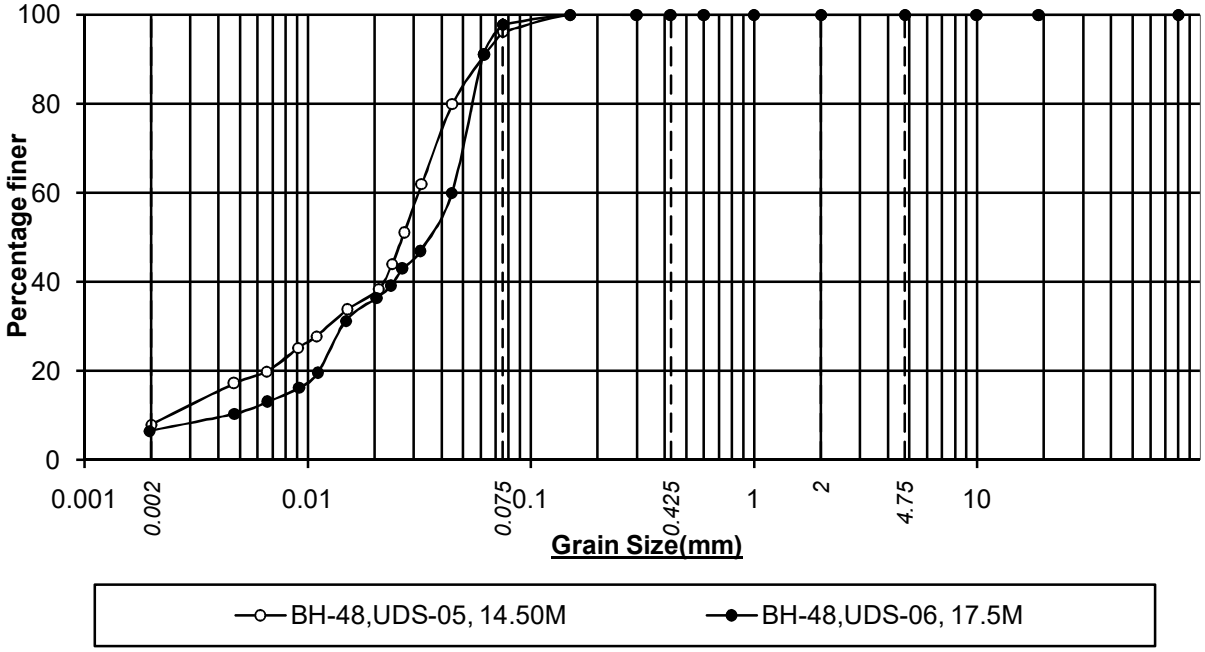
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GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-47,SPT-18, 27.00M		90.4	9.6	0.0	0.0	9.6		0.0
BH-48,UDS-02, 5.5M	5.3	91.1	3.6	0.0	0.0	3.6		0.0

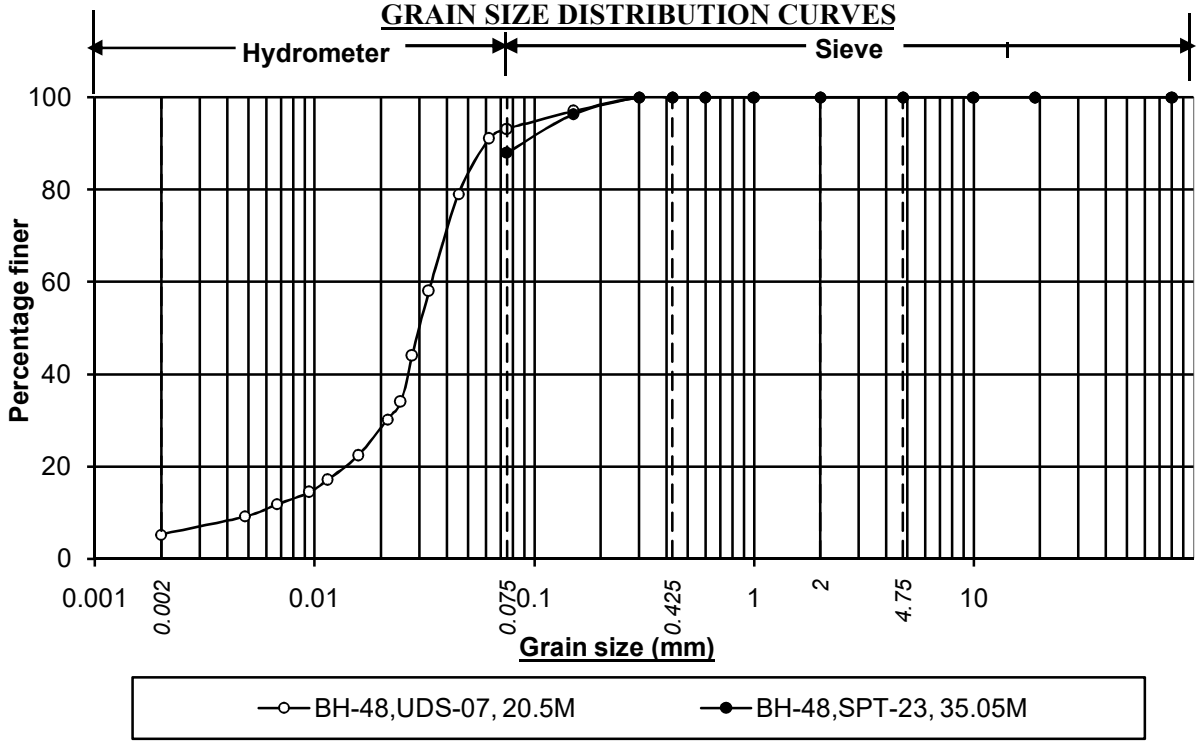


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-48,UDS-05, 14.50M	8.0	88.2	3.8	0.0	0.0	3.8		0.0
BH-48,UDS-06, 17.5M	6.6	91.2	2.2	0.0	0.0	2.2		0.0

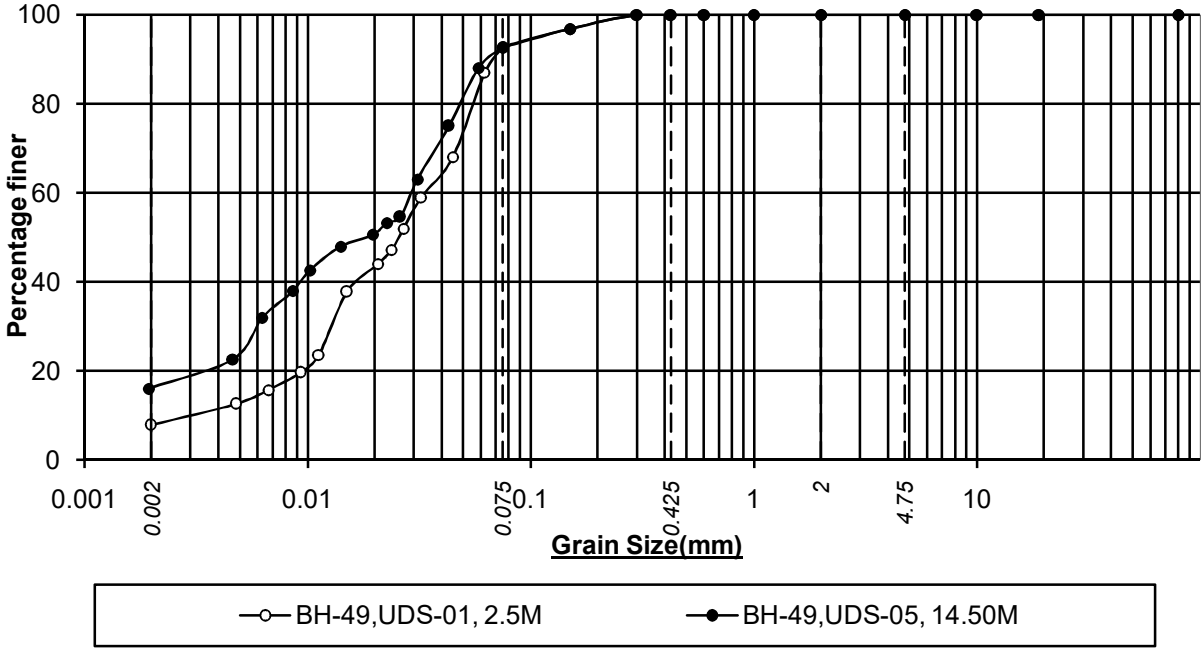
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GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-48,UDS-07, 20.5M	5.3	87.9	6.8	0.0	0.0	6.8		0.0
BH-48,SPT-23, 35.05M		88.0	12.0	0.0	0.0	12.0		0.0

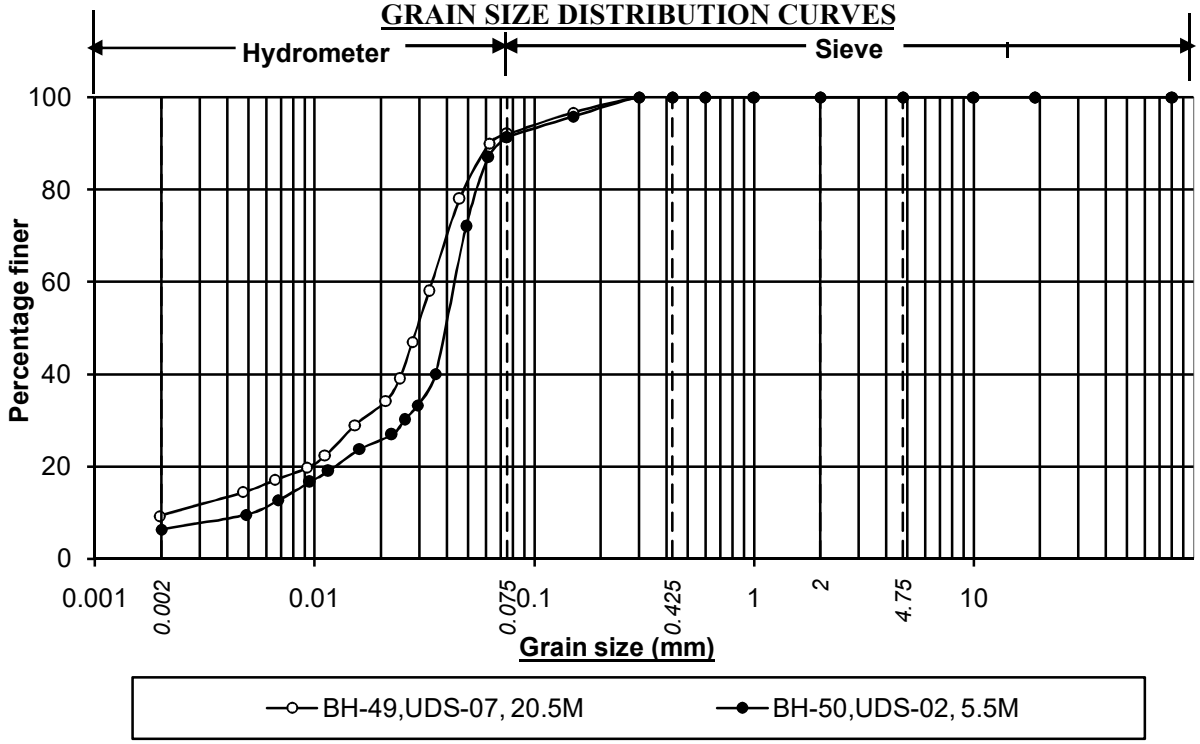


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-49,UDS-01, 2.5M	7.9	84.9	7.2	0.0	0.0	7.2		0.0
BH-49,UDS-05, 14.50M	16.2	76.5	7.3	0.0	0.0	7.3		0.0

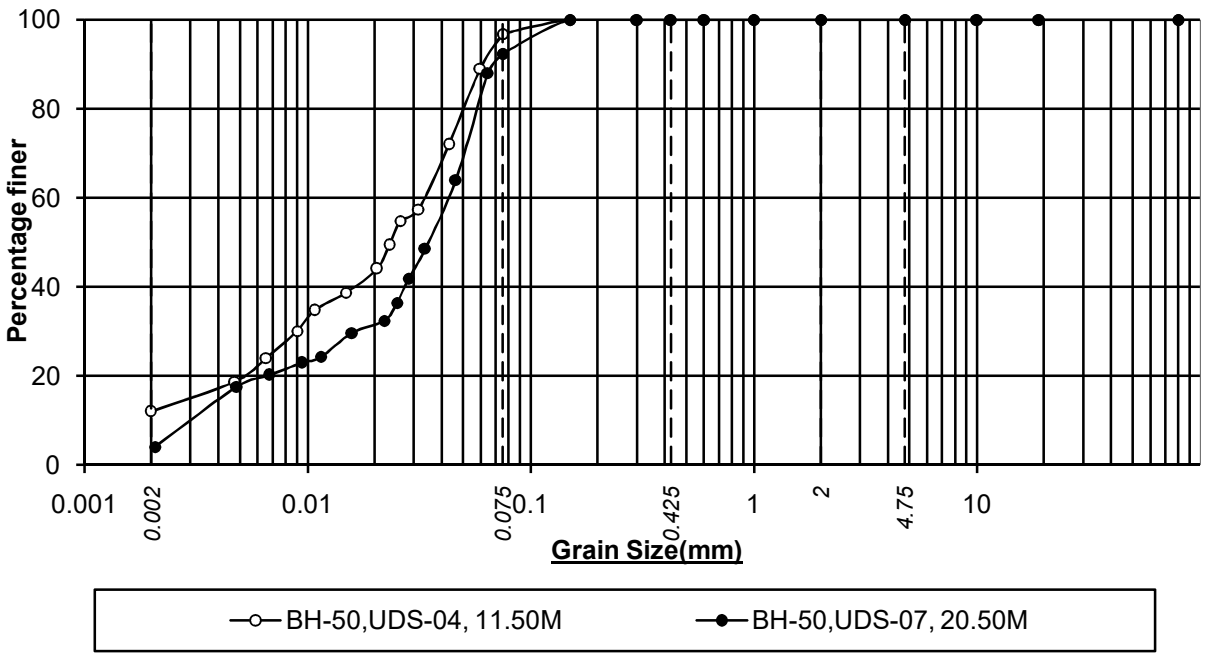
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GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-49,UDS-07, 20.5M	9.3	82.7	8.0	0.0	0.0	8.0		0.0
BH-50,UDS-02, 5.5M	6.3	85.1	8.6	0.0	0.0	8.6		0.0

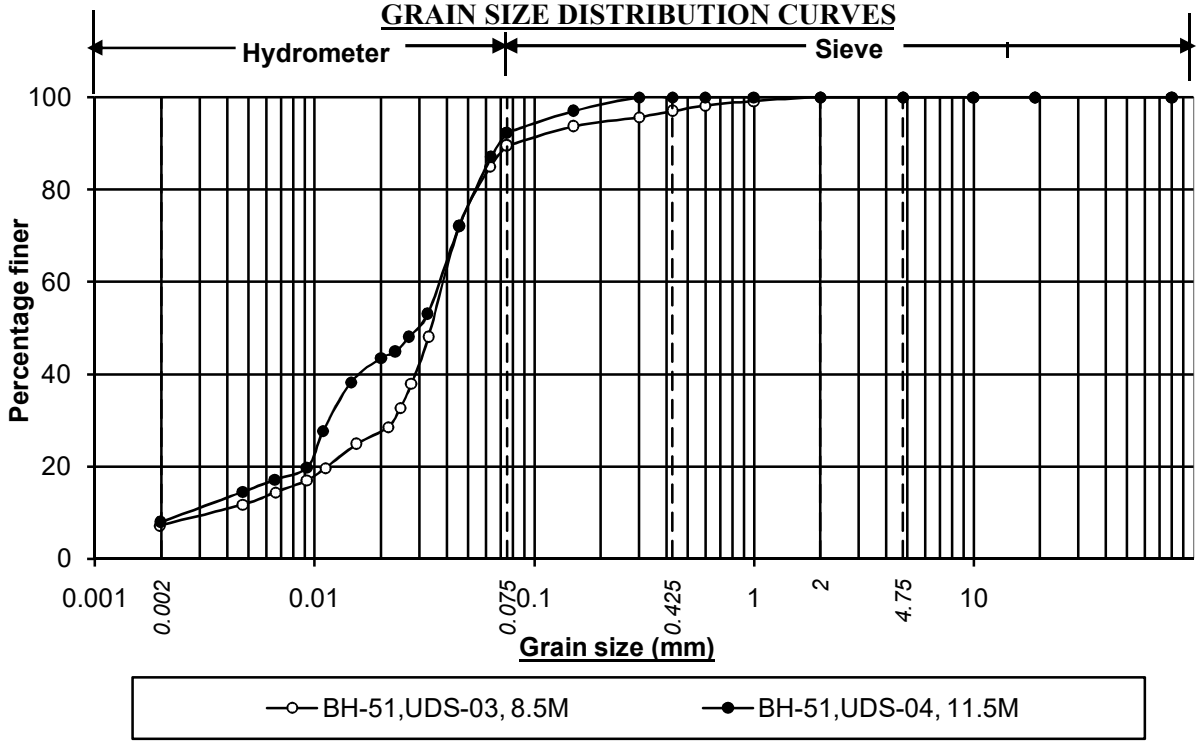


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-50,UDS-04, 11.50M	12.1	84.8	3.1	0.0	0.0	3.1		0.0
BH-50,UDS-07, 20.50M	3.4	88.9	7.7	0.0	0.0	7.7		0.0

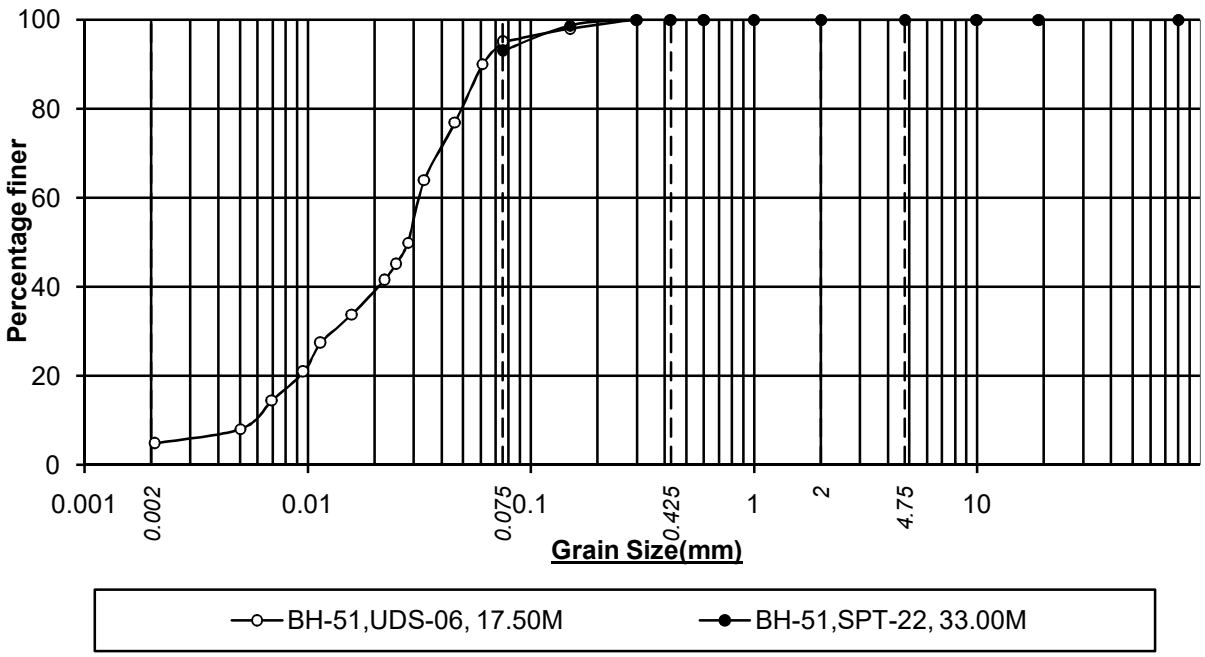
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GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-51,UDS-03, 8.5M	7.3	82.2	7.5	3.0	0.0	10.5		0.0
BH-51,UDS-04, 11.5M	8.0	84.4	7.6	0.0	0.0	7.6		0.0

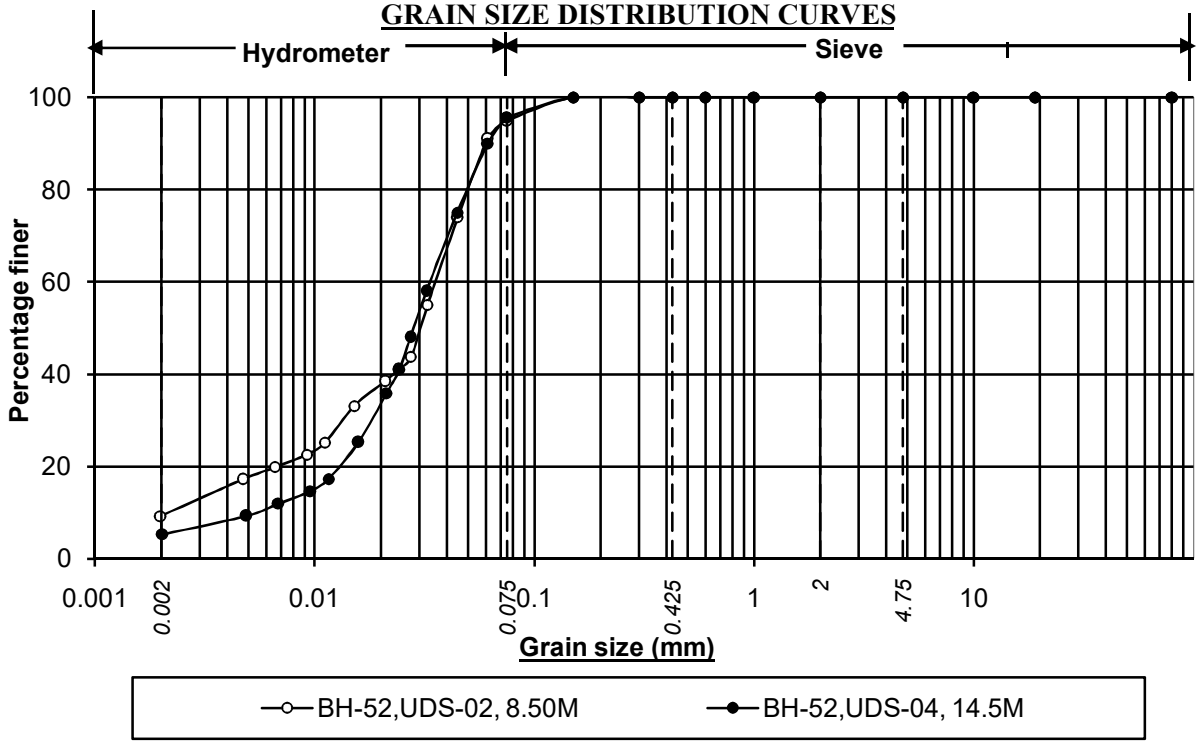


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-51,UDS-06, 17.50M	4.7	90.3	5.0	0.0	0.0	5.0		0.0
BH-51,SPT-22, 33.00M		93.0	7.0	0.0	0.0	7.0		0.0

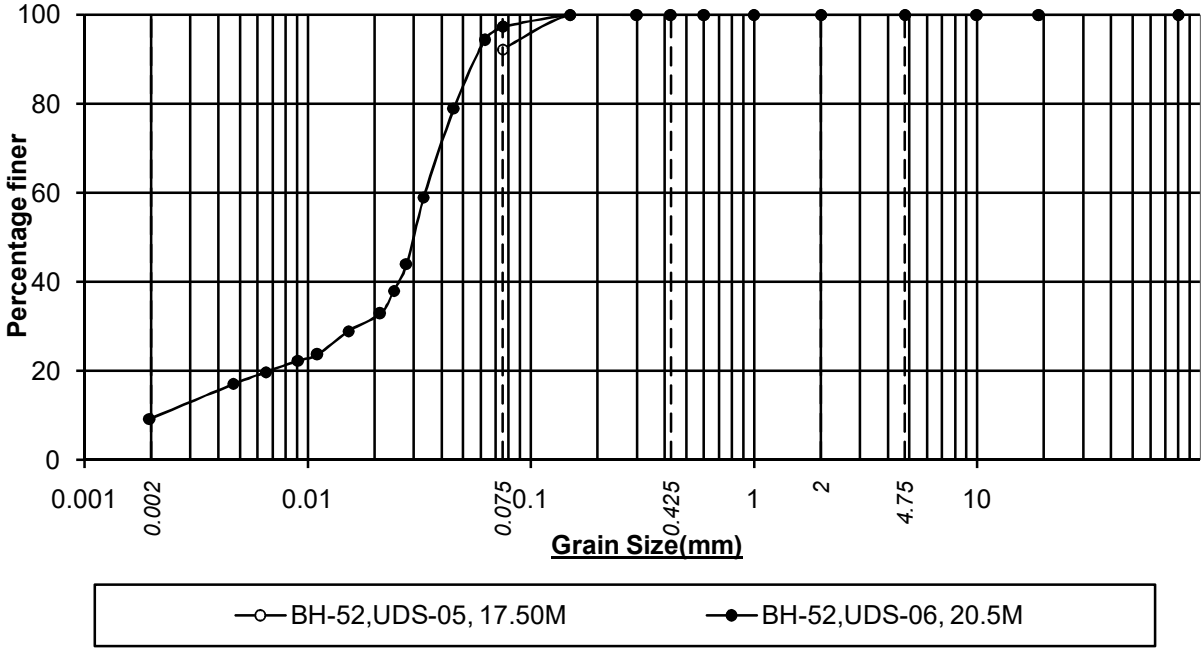
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GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-52,UDS-02, 8.50M	9.3	85.7	5.0	0.0	0.0	5.0		0.0
BH-52,UDS-04, 14.5M	5.3	90.4	4.3	0.0	0.0	4.3		0.0

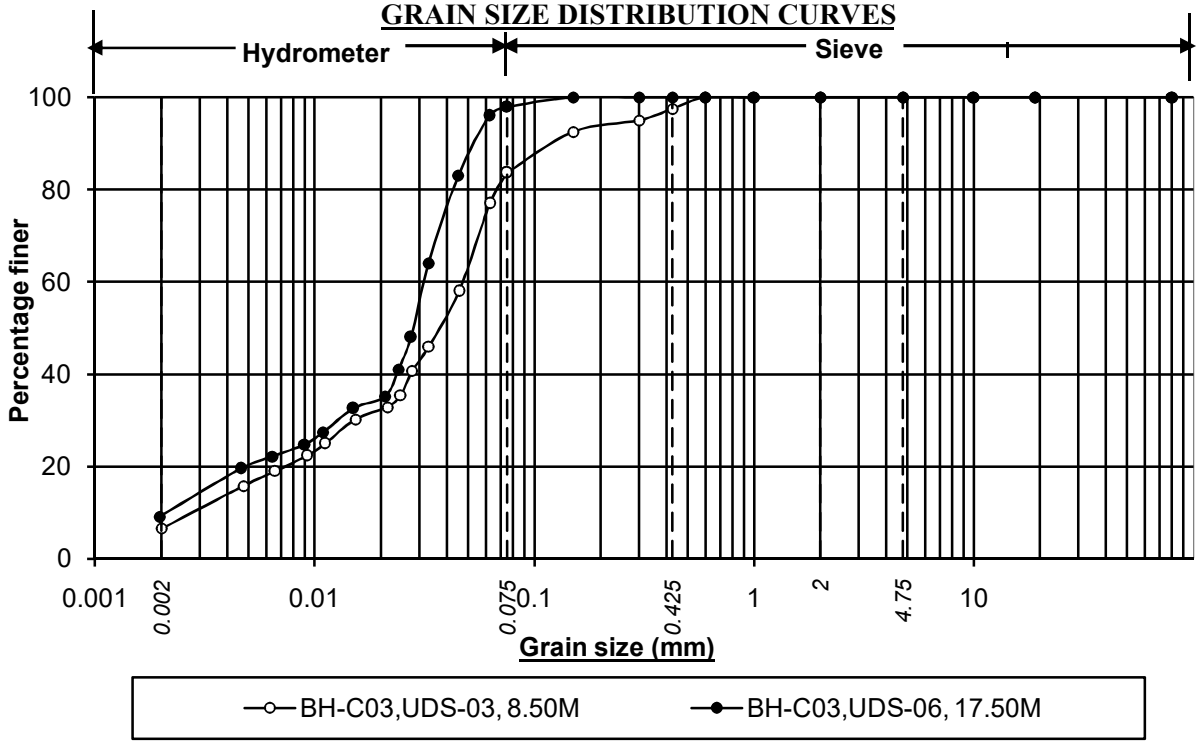


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
BH-52,UDS-05, 17.50M		92.2	7.8	0.0	0.0	7.8		0.0
BH-52,UDS-06, 20.5M	9.4	88.0	2.6	0.0	0.0	2.6		0.0

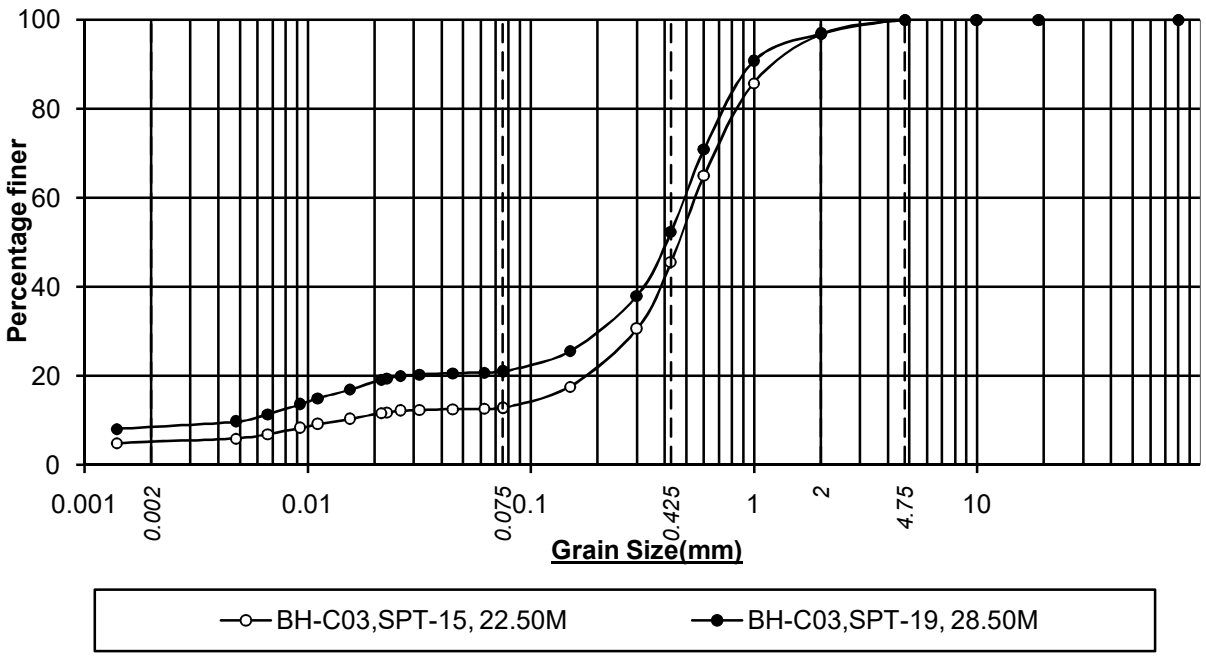
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GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	Total sand	Weighted mean dia (mm)	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
CHT03,UDS-03, 8.50M	6.5	77.2	13.8	2.5	0.0	16.3		0.0
CHT03,UDS-06, 17.50M	9.3	88.7	2.0	0.0	0.0	2.0		0.0

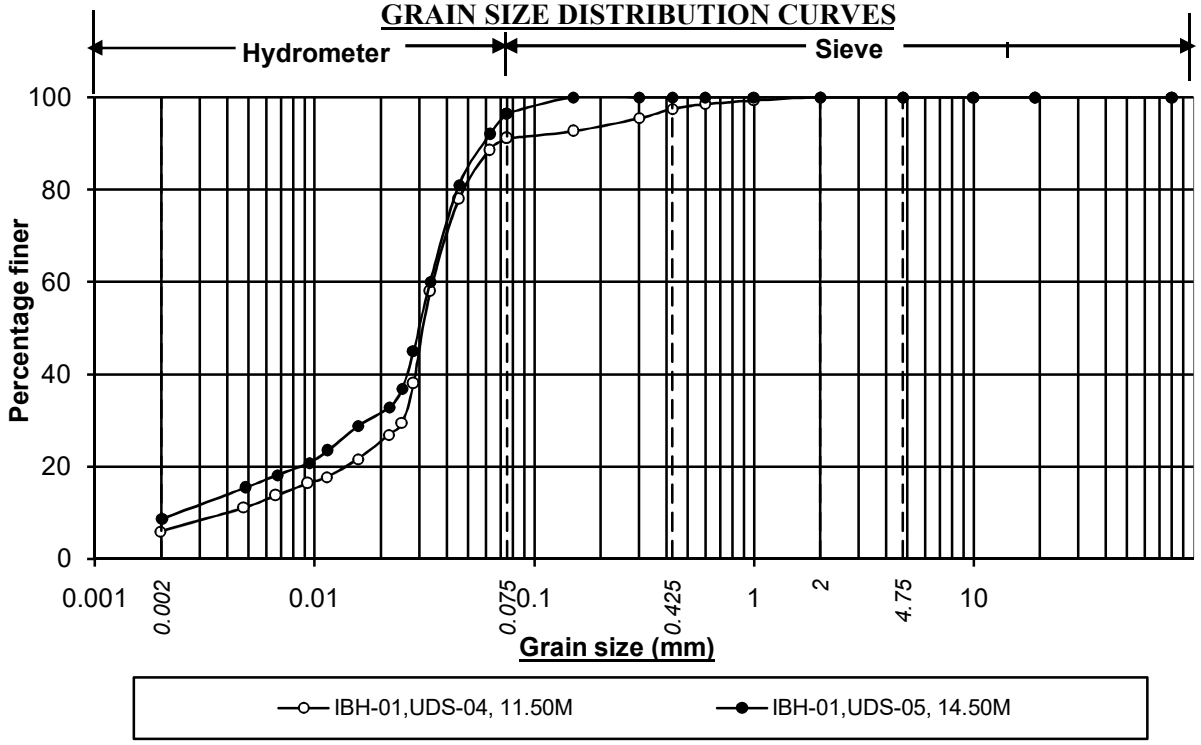


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	Total sand	Weighted mean dia (mm)	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
CHT03,SPT-15, 22.50M	5.2	7.5	32.9	51.2	3.2	87.3		0.0
CHT03,SPT-19, 28.50M	8.5	12.4	31.4	44.6	3.1	79.1		0.0

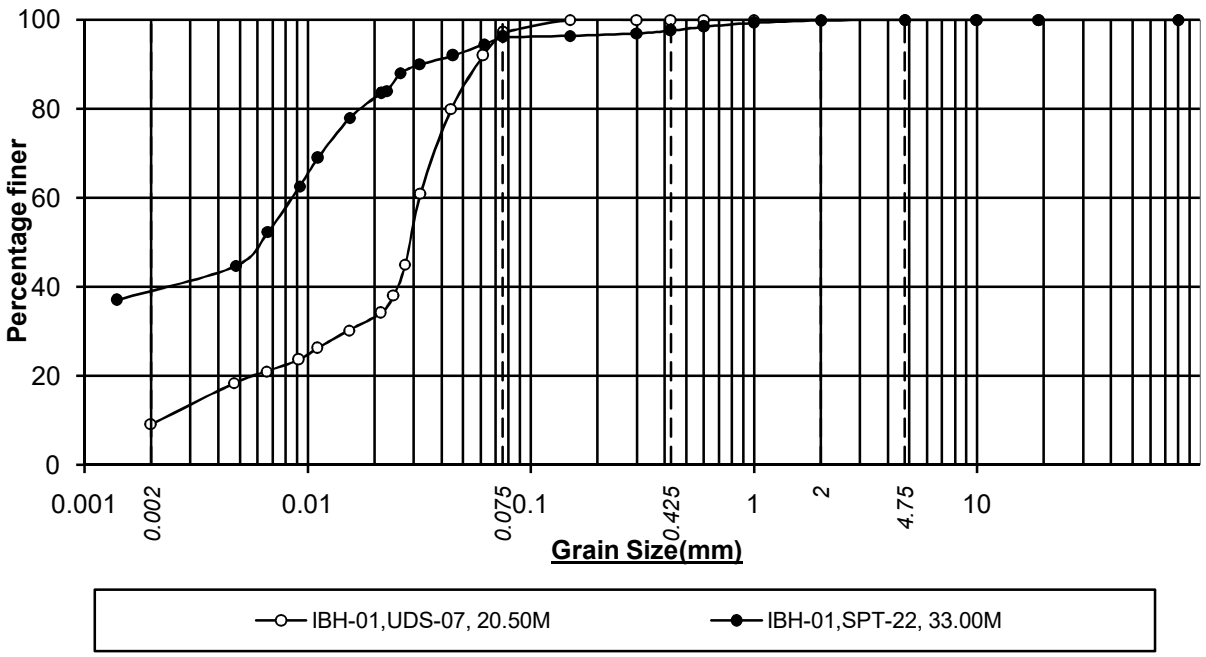
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GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
IBH-01,UDS-04, 11.50M	5.9	85.2	6.4	2.5	0.0	8.9		0.0
IBH-01,UDS-05, 14.50M	8.6	87.9	3.5	0.0	0.0	3.5		0.0

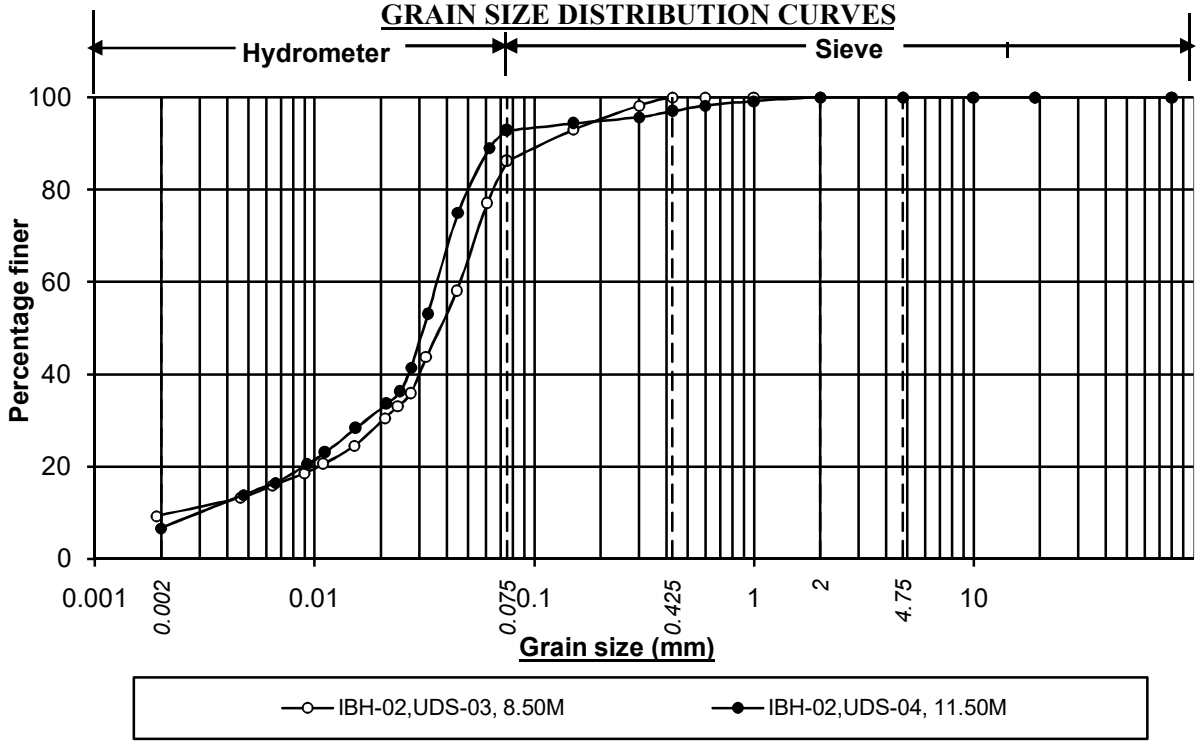


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
IBH-01,UDS-07, 20.50M	9.3	87.9	2.8	0.0	0.0	2.8		0.0
IBH-01,SPT-22, 33.00M	39.3	56.9	1.4	2.3	0.1	3.8		0.0

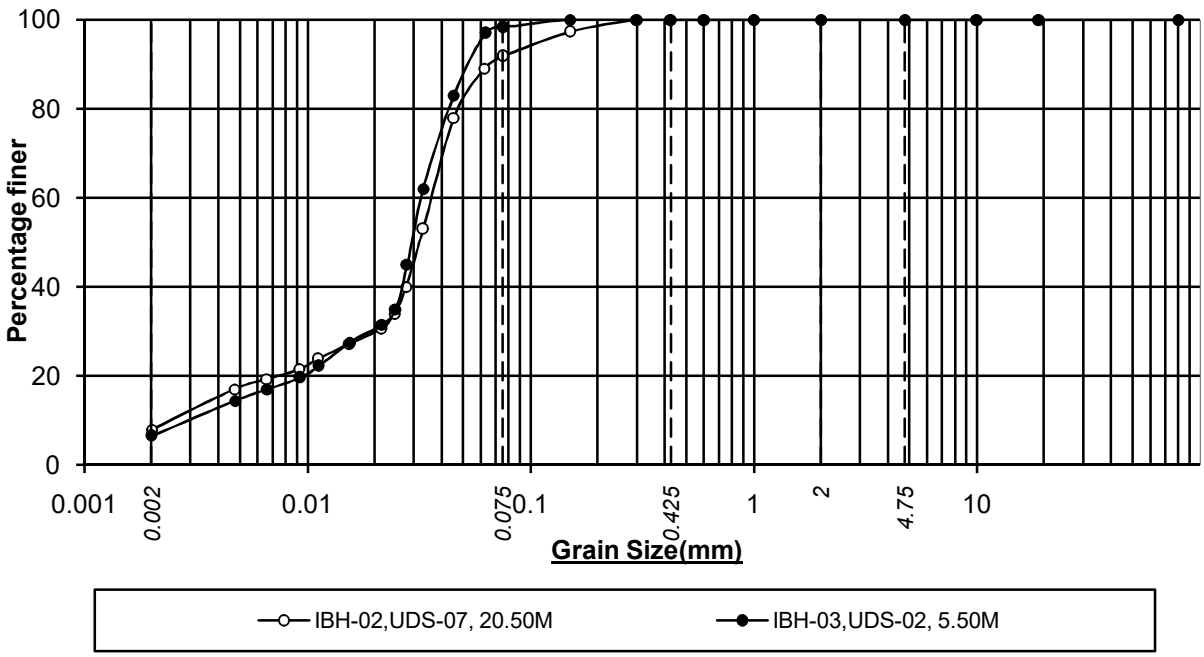
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GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
IBH-02,UDS-03, 8.50M	9.5	76.7	13.8	0.0	0.0	13.8		0.0
IBH-02,UDS-04, 11.50M	6.6	86.2	4.2	3.0	0.0	7.2		0.0

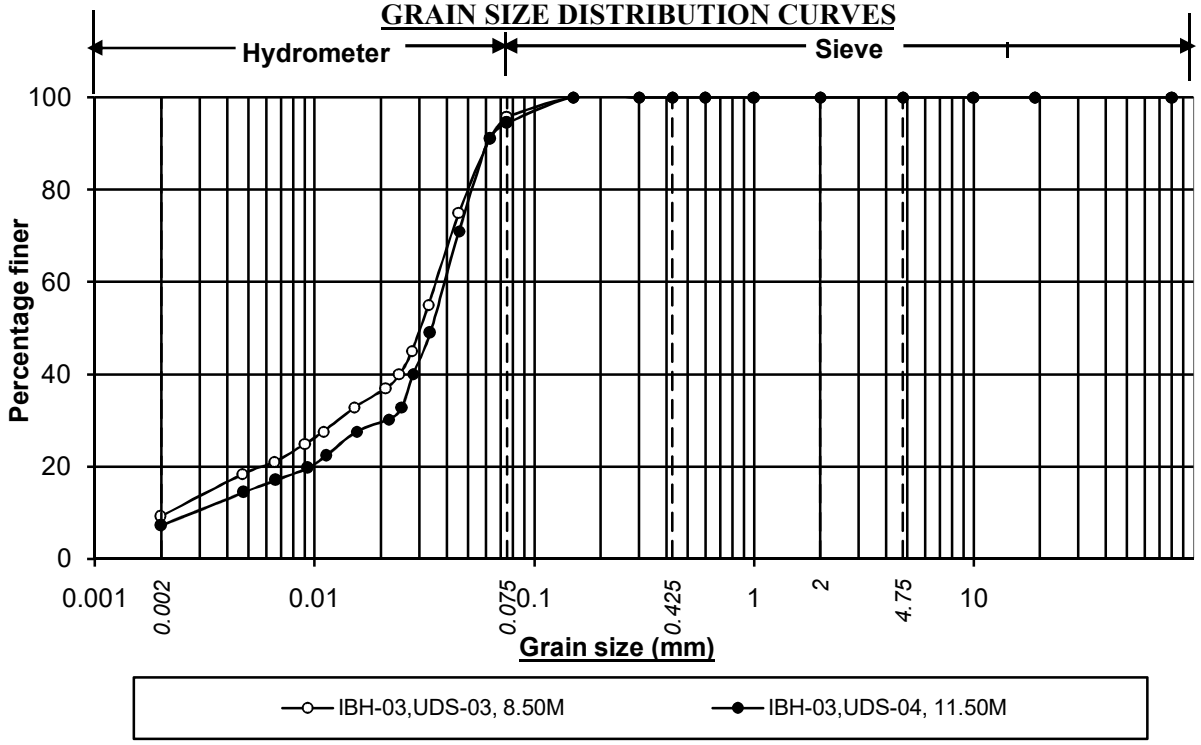


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
IBH-02,UDS-07, 20.50M	7.9	84.0	8.1	0.0	0.0	8.1		0.0
IBH-03,UDS-02, 5.50M	6.5	91.8	1.7	0.0	0.0	1.7		0.0

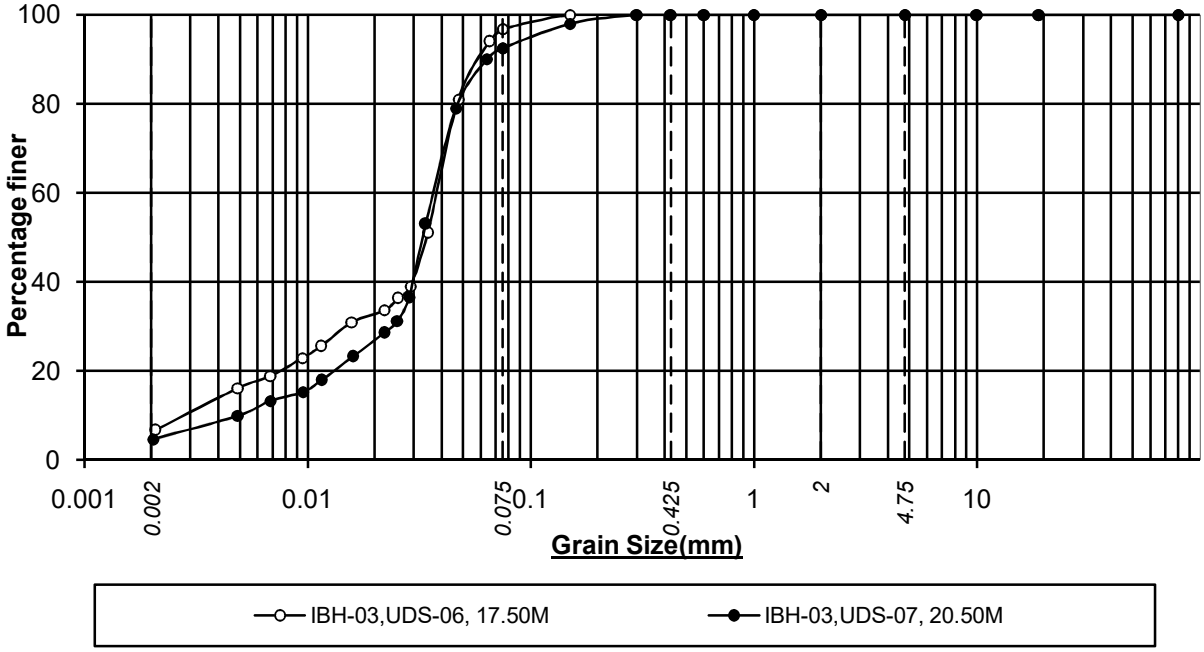
Project:- Geotech. Inv. Work for FGD System at Kahalgaon, Bihar. | **Job No. 4388**

C. E. Testing Company Pvt. Ltd.

GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	<0.002	0.002-0.075	0.075-0.425	0.425-2.00	2.0-4.75	Total sand	Weighted mean dia (mm)	>4.75
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
IBH-03,UDS-03, 8.50M	9.3	86.6	4.1	0.0	0.0	4.1		0.0
IBH-03,UDS-04, 11.50M	7.2	87.3	5.5	0.0	0.0	5.5		0.0

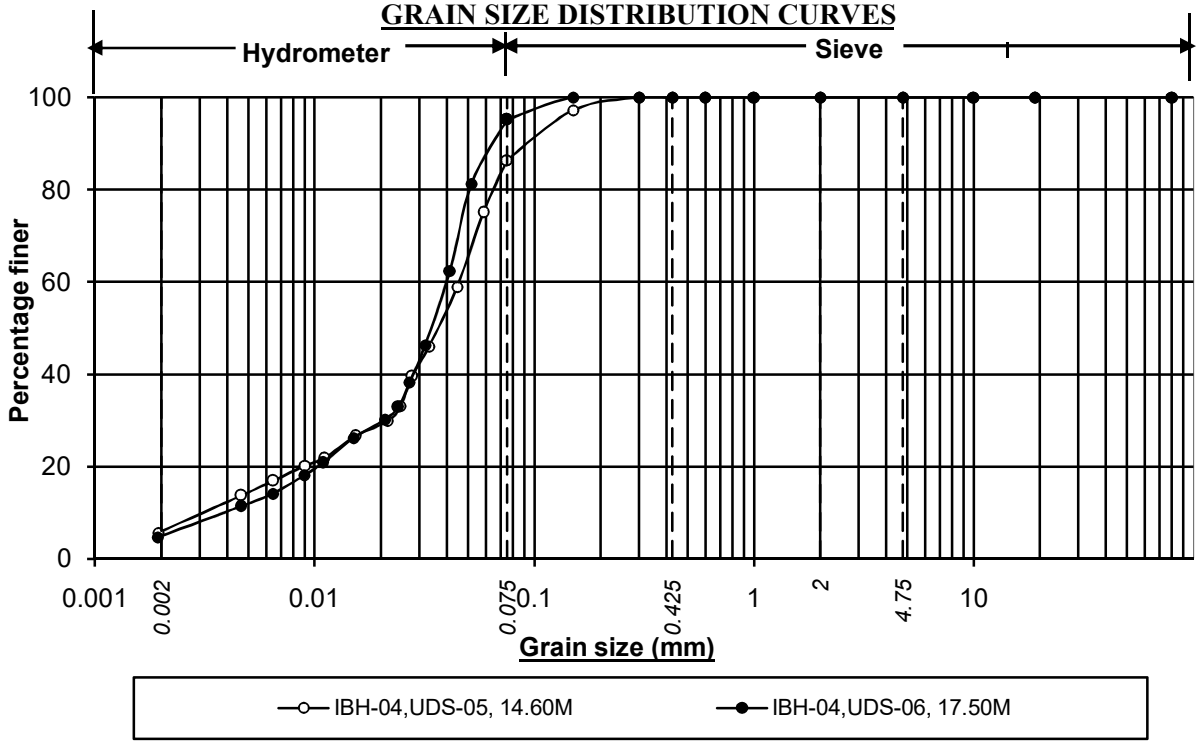


Grain size (mm)	<0.002	0.002-0.075	0.075-0.425	0.425-2.00	2.0-4.75	Total sand	Weighted mean dia (mm)	>4.75
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
IBH-03,UDS-06, 17.50M	6.3	90.5	3.2	0.0	0.0	3.2		0.0
IBH-03,UDS-07, 20.50M	4.5	88.0	7.5	0.0	0.0	7.5		0.0

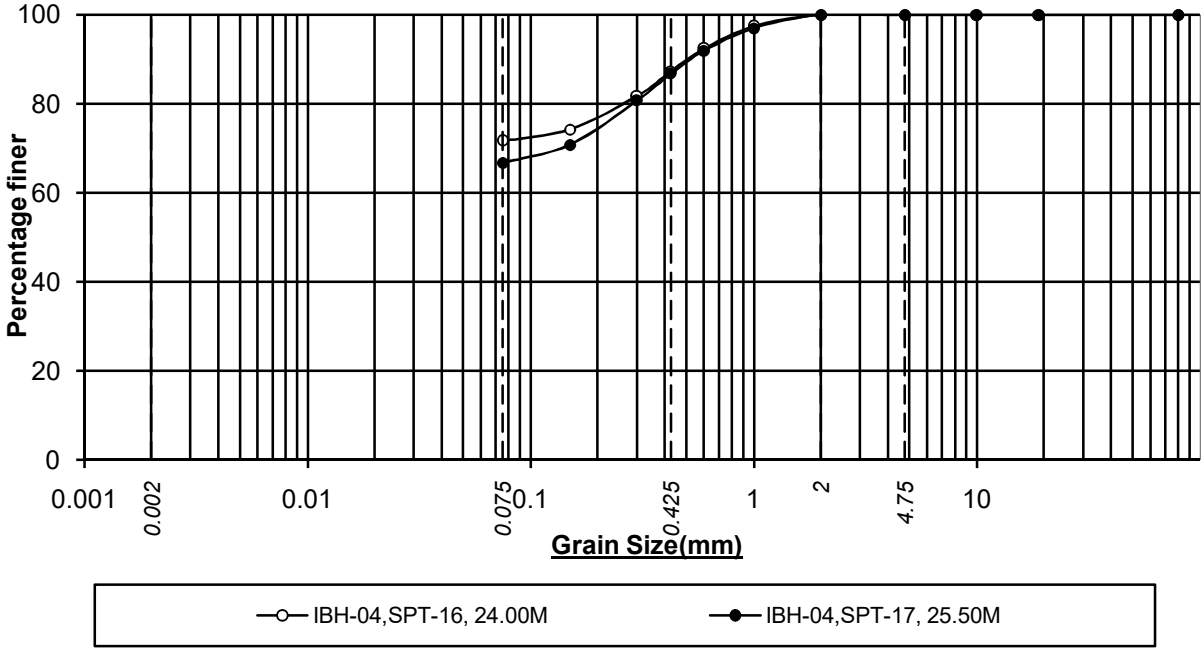
Project:- Geotech. Inv. Work for FGD System at Kahalgaon, Bihar. | **Job No. 4388**

C. E. Testing Company Pvt. Ltd.

GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	<0.002	0.002-0.075	0.075-0.425	0.425-2.00	2.0-4.75	Total sand	Weighted mean dia (mm)	>4.75
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
IBH-04,UDS-05, 14.60M	5.9	80.5	13.6	0.0	0.0	13.6		0.0
IBH-04,UDS-06, 17.50M	5.0	90.2	4.8	0.0	0.0	4.8		0.0

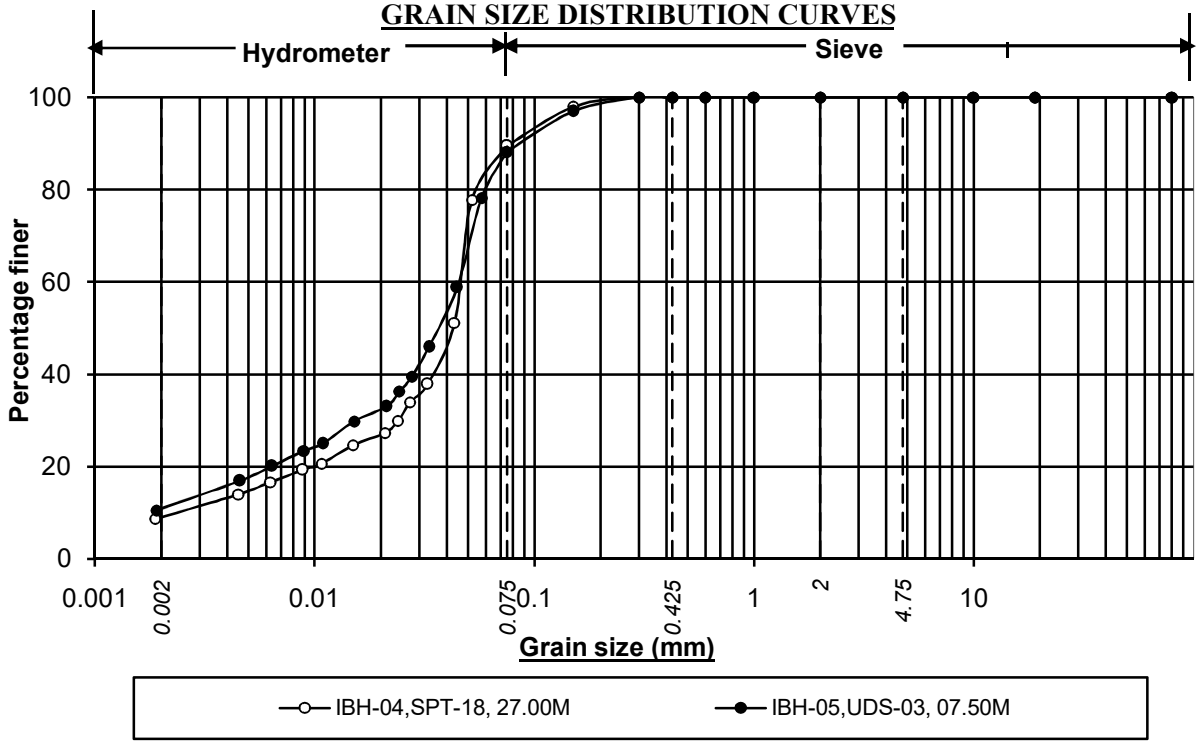


Grain size (mm)	<0.002	0.002-0.075	0.075-0.425	0.425-2.00	2.0-4.75	Total sand	Weighted mean dia (mm)	>4.75
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
IBH-04,SPT-16, 24.00M		71.7	15.6	12.7	0.0	28.3		0.0
IBH-04,SPT-17, 25.50M		66.8	20.0	13.2	0.0	33.2		0.0

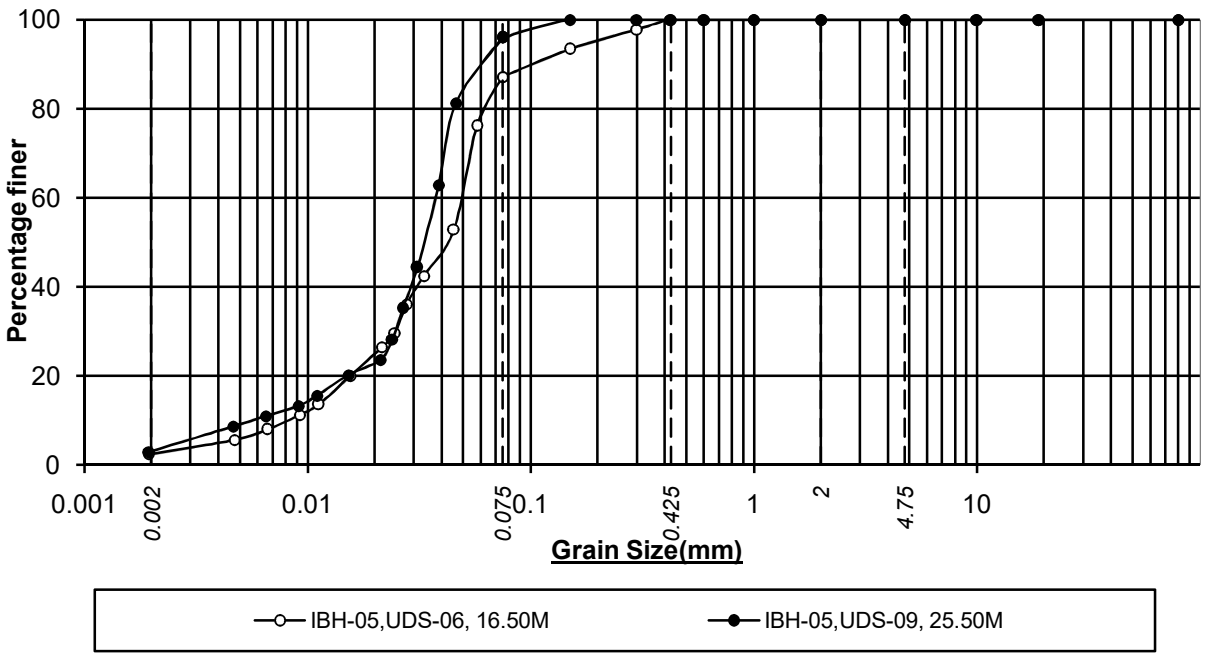
Project:- Geotech. Inv. Work for FGD System at Kahalgaon, Bihar. | **Job No. 4388**

C. E. Testing Company Pvt. Ltd.

GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
IBH-04,SPT-18, 27.00M	9.0	80.5	10.5	0.0	0.0	10.5		0.0
IBH-05,UDS-03, 07.50M	10.8	77.4	11.8	0.0	0.0	11.8		0.0

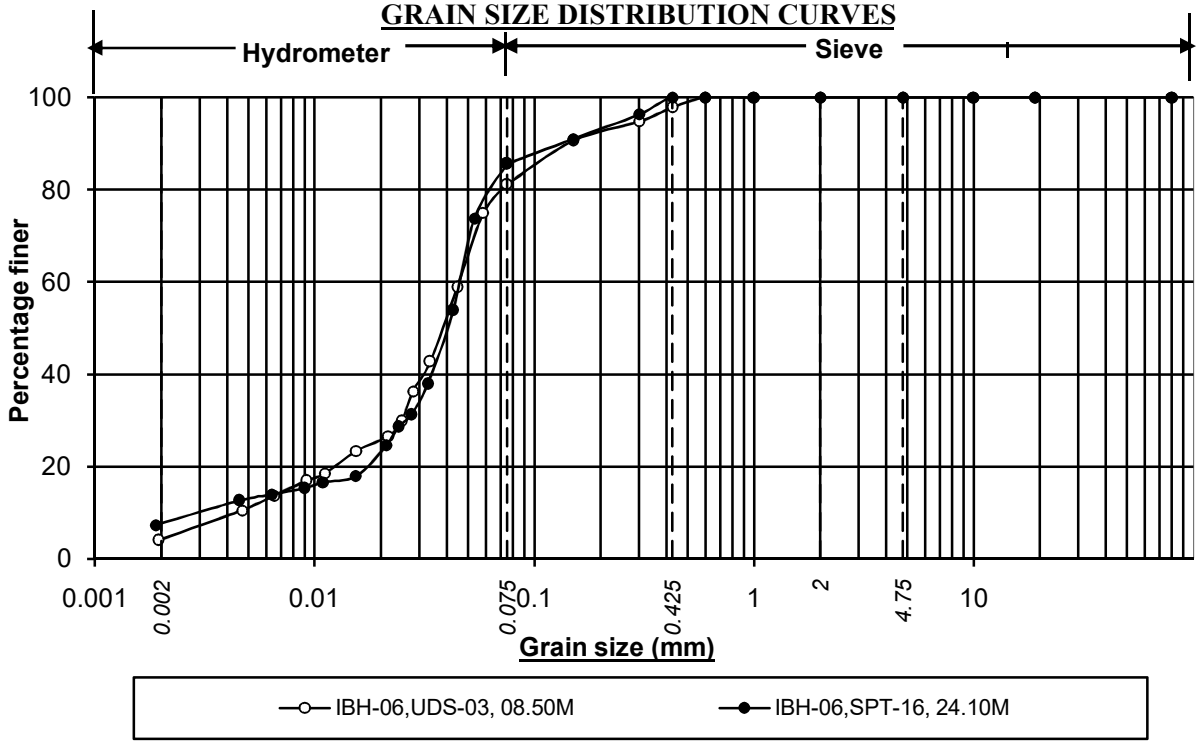


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
IBH-05,UDS-06, 16.50M	2.5	84.7	12.8	0.0	0.0	12.8		0.0
IBH-05,UDS-09, 25.50M	3.0	93.0	4.0	0.0	0.0	4.0		0.0

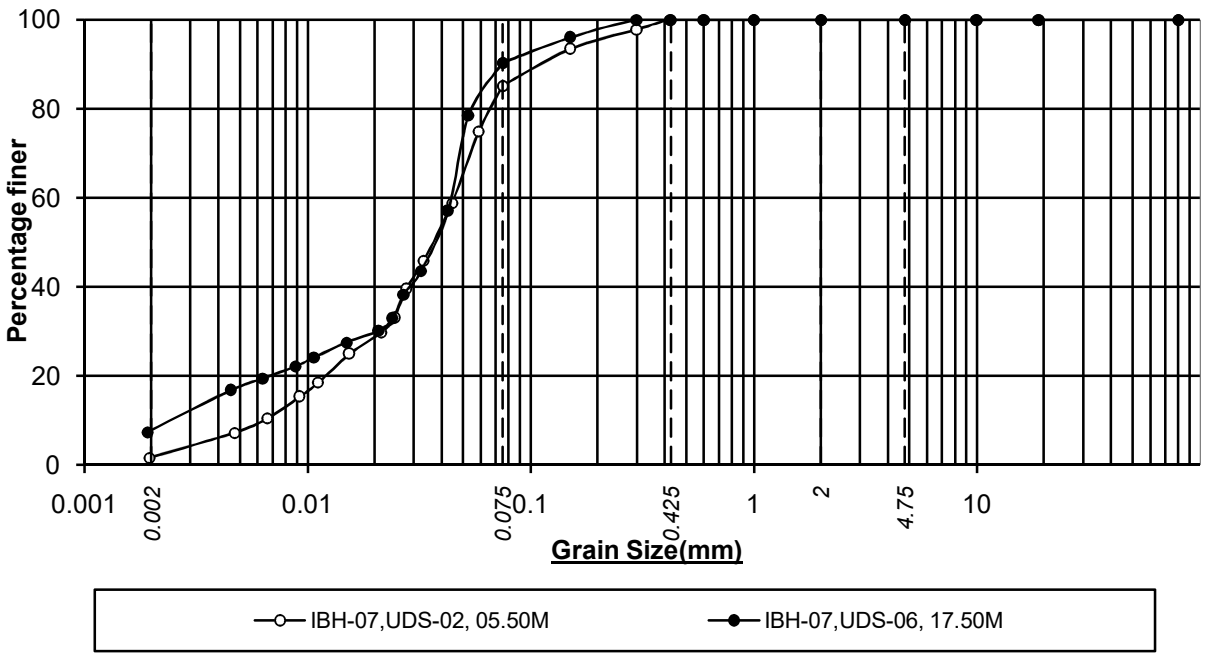
Project:- Geotech. Inv. Work for FGD System at Kahalgaon, Bihar. | **Job No. 4388**

C. E. Testing Company Pvt. Ltd.

GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
IBH-06,UDS-03, 08.50M	4.2	77.0	16.6	2.2	0.0	18.8		0.0
IBH-06,SPT-16, 24.10M	7.7	78.0	14.3	0.0	0.0	14.3		0.0

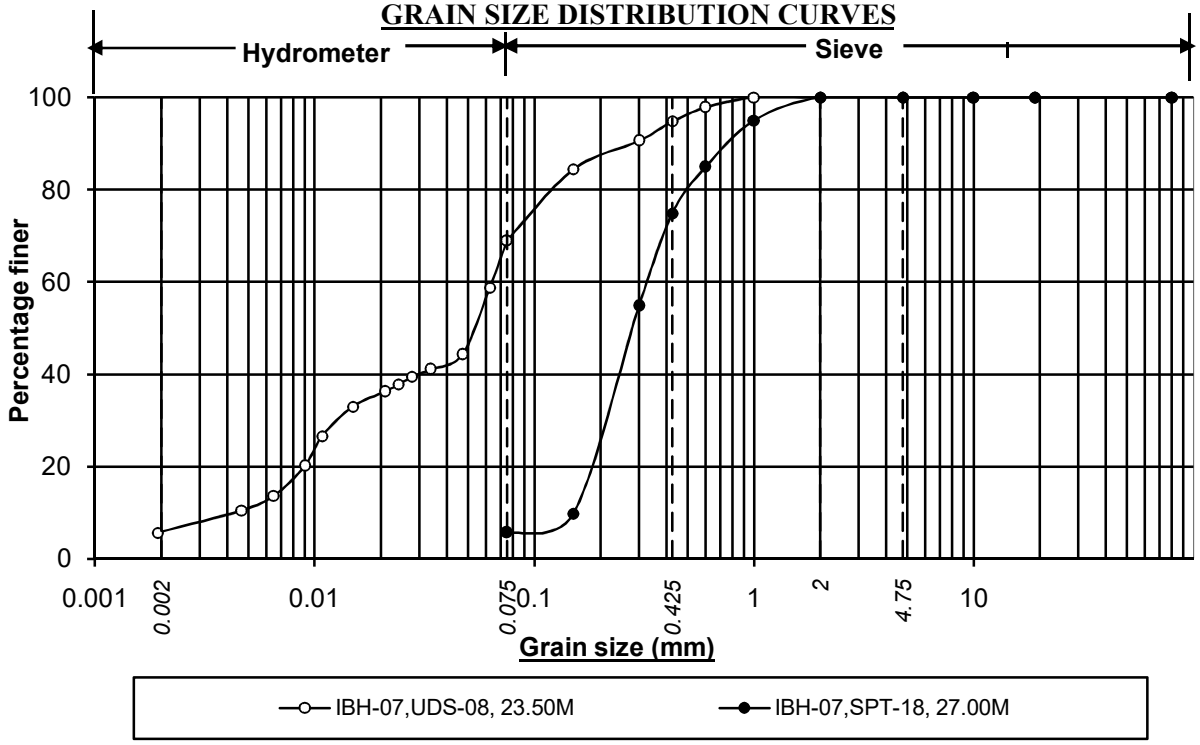


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
IBH-07,UDS-02, 05.50M	1.7	83.5	14.8	0.0	0.0	14.8		0.0
IBH-07,UDS-06, 17.50M	7.9	82.5	9.6	0.0	0.0	9.6		0.0

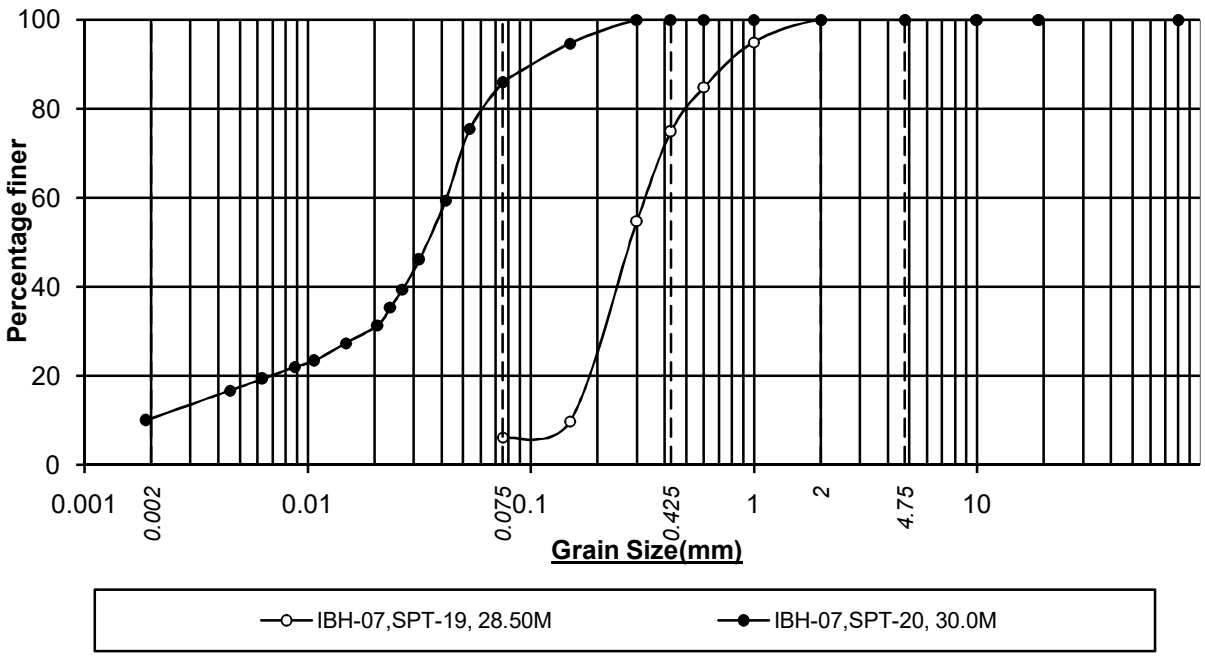
Project:- Geotech. Inv. Work for FGD System at Kahalgaon, Bihar. | **Job No. 4388**

C. E. Testing Company Pvt. Ltd.

GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
IBH-07,UDS-08, 23.50M	5.8	63.2	25.8	5.2	0.0	31.0		0.0
IBH-07,SPT-18, 27.00M		5.7	69.1	25.2	0.0	94.3		0.0

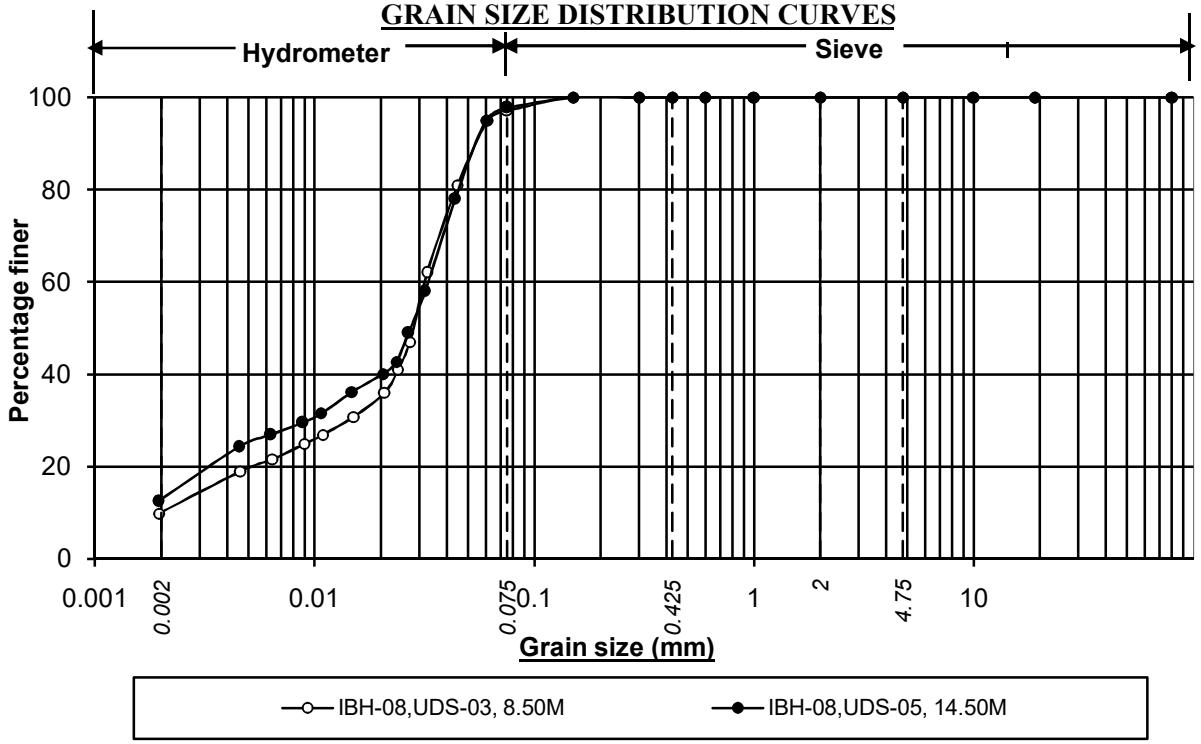


Grain size (mm)	*<0.002*	*0.002-0.075*	*0.075-0.425*	*0.425-2.00*	*2.0-4.75*	**Total sand**	**Weighted mean dia (mm)**	*>4.75*
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
IBH-07,SPT-19, 28.50M		6.2	68.6	25.2	0.0	93.8		0.0
IBH-07,SPT-20, 30.0M	10.5	75.5	14.0	0.0	0.0	14.0		0.0

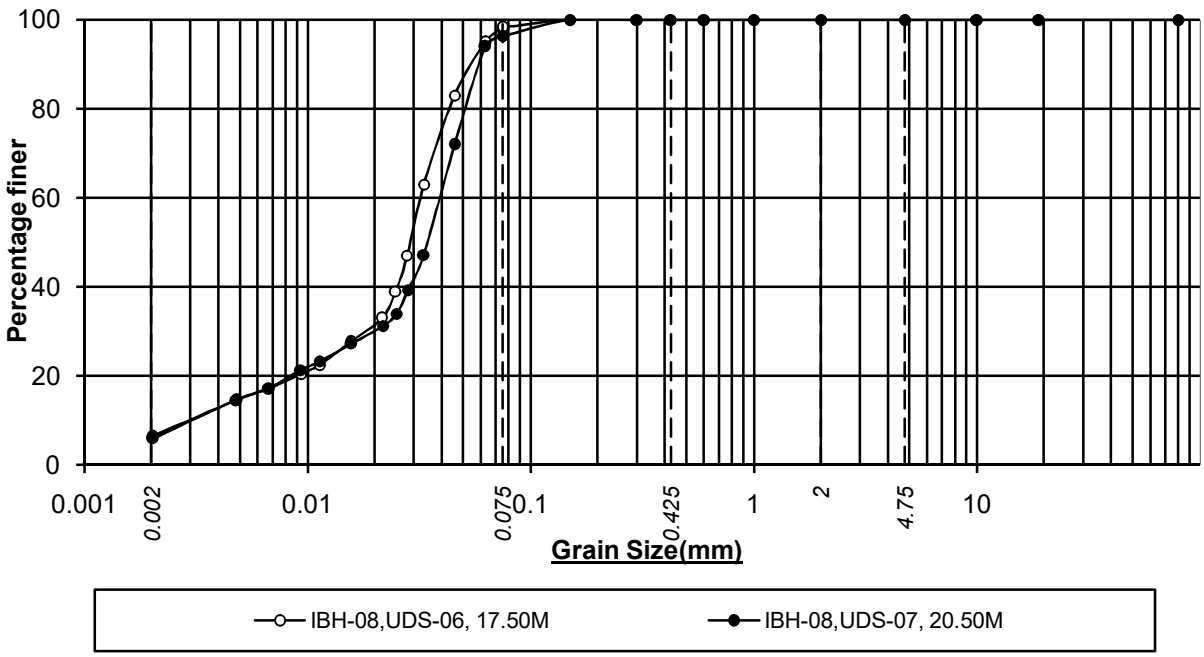
Project:- Geotech. Inv. Work for FGD System at Kahalgaon, Bihar. | **Job No. 4388**

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GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	<0.002	0.002-0.075	0.075-0.425	0.425-2.00	2.0-4.75	Total sand	Weighted mean dia (mm)	>4.75
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
IBH-08,UDS-03, 8.50M	10.1	87.1	2.8	0.0	0.0	2.8		0.0
IBH-08,UDS-05, 14.50M	12.9	85.0	2.1	0.0	0.0	2.1		0.0

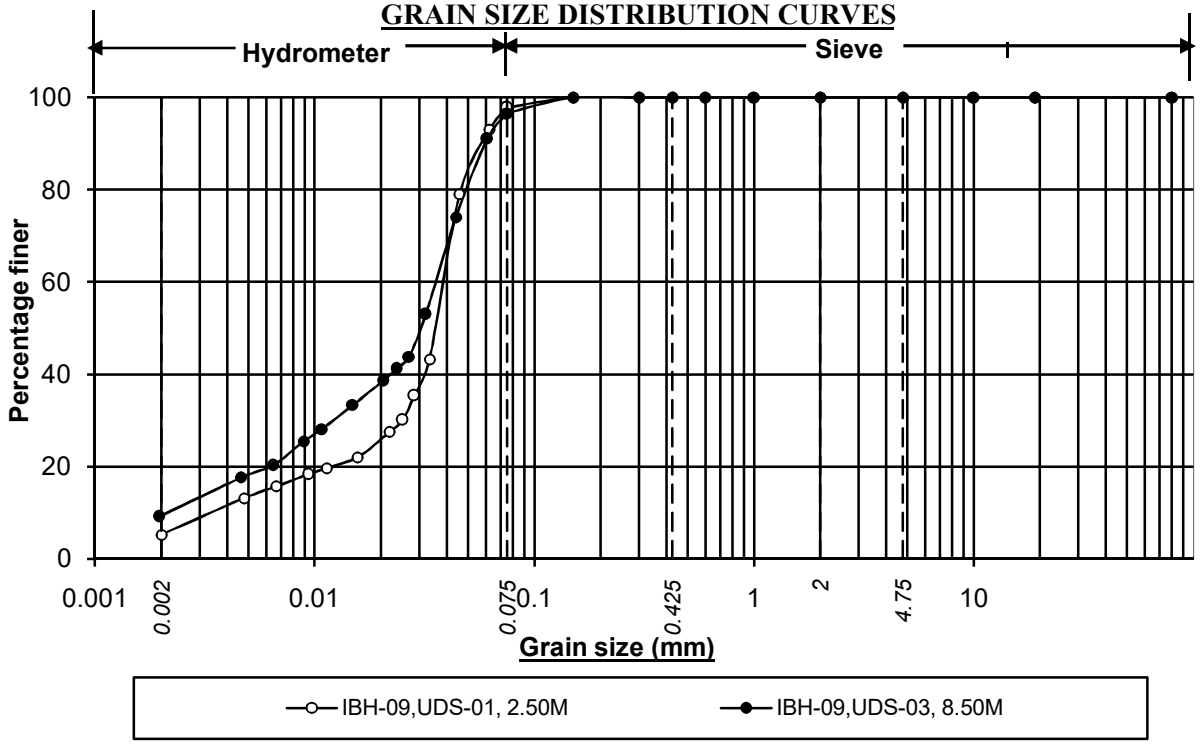


Grain size (mm)	<0.002	0.002-0.075	0.075-0.425	0.425-2.00	2.0-4.75	Total sand	Weighted mean dia (mm)	>4.75
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
IBH-08,UDS-06, 17.50M	6.5	91.8	1.7	0.0	0.0	1.7		0.0
IBH-08,UDS-07, 20.50M	5.8	90.5	3.7	0.0	0.0	3.7		0.0

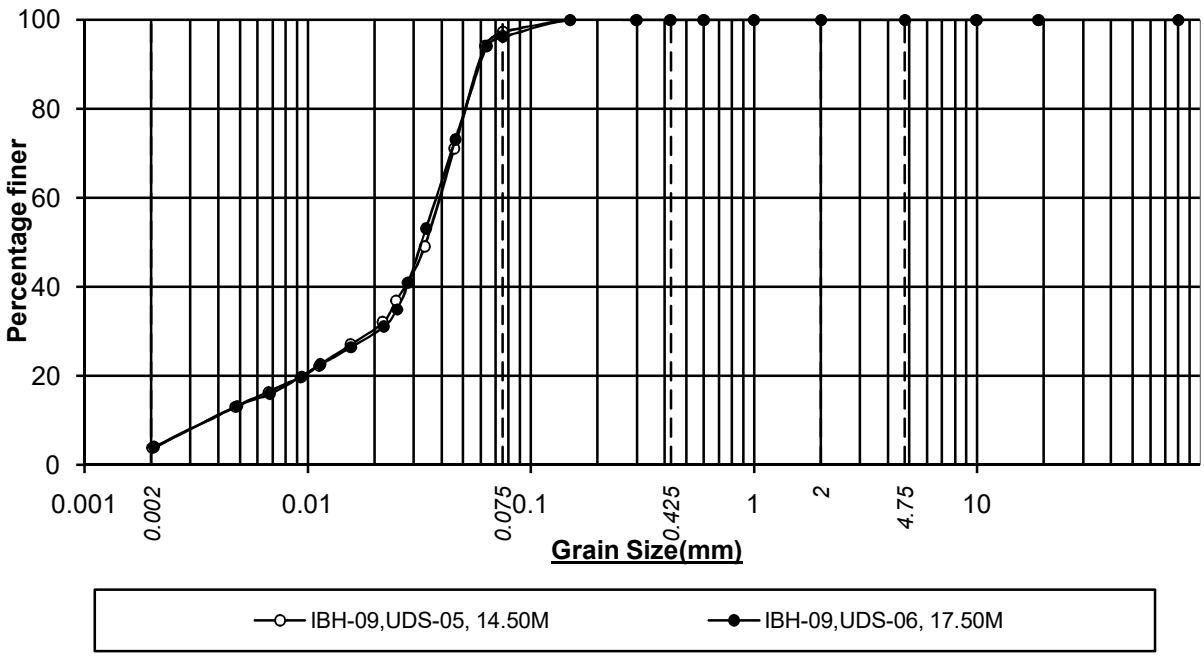
Project:- Geotech. Inv. Work for FGD System at Kahalgaon, Bihar. | **Job No. 4388**

C. E. Testing Company Pvt. Ltd.

GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	<0.002	0.002-0.075	0.075-0.425	0.425-2.00	2.0-4.75	Total sand	Weighted mean dia (mm)	>4.75
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
IBH-09,UDS-01, 2.50M	5.2	92.7	2.1	0.0	0.0	2.1		0.0
IBH-09,UDS-03, 8.50M	9.4	87.1	3.5	0.0	0.0	3.5		0.0

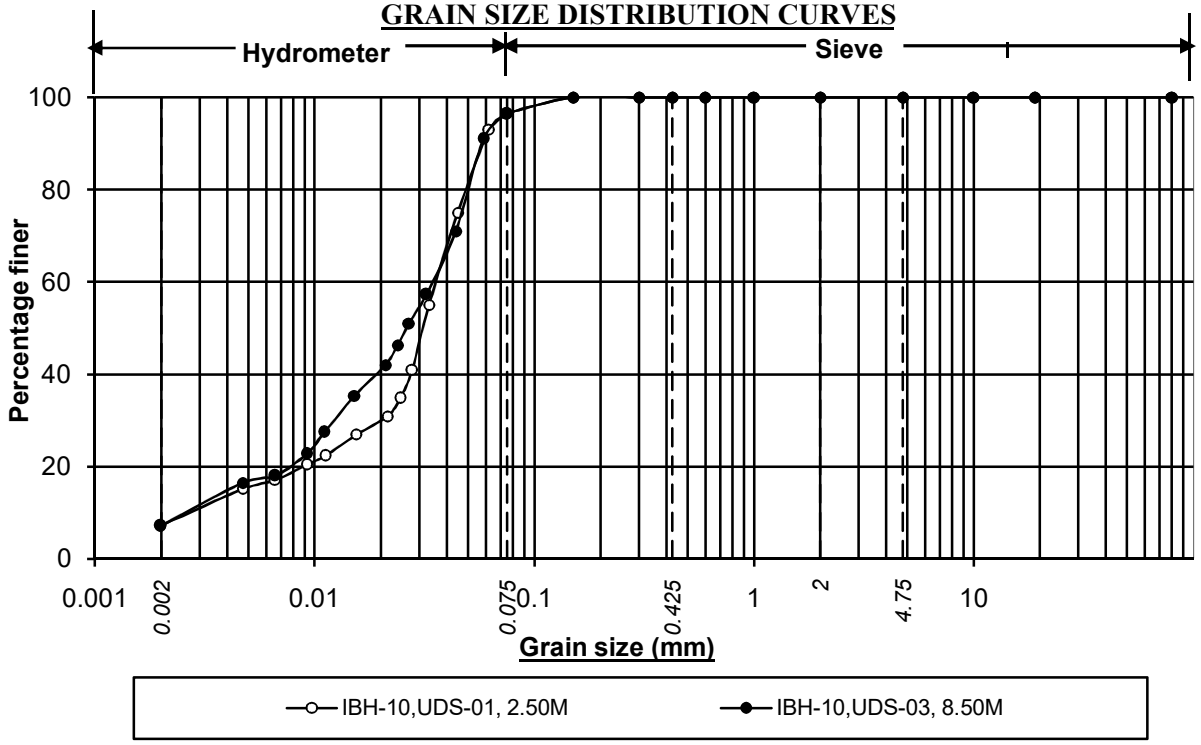


Grain size (mm)	<0.002	0.002-0.075	0.075-0.425	0.425-2.00	2.0-4.75	Total sand	Weighted mean dia (mm)	>4.75
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
IBH-09,UDS-05, 14.50M	3.8	93.6	2.6	0.0	0.0	2.6		0.0
IBH-09,UDS-06, 17.50M	3.7	92.5	3.8	0.0	0.0	3.8		0.0

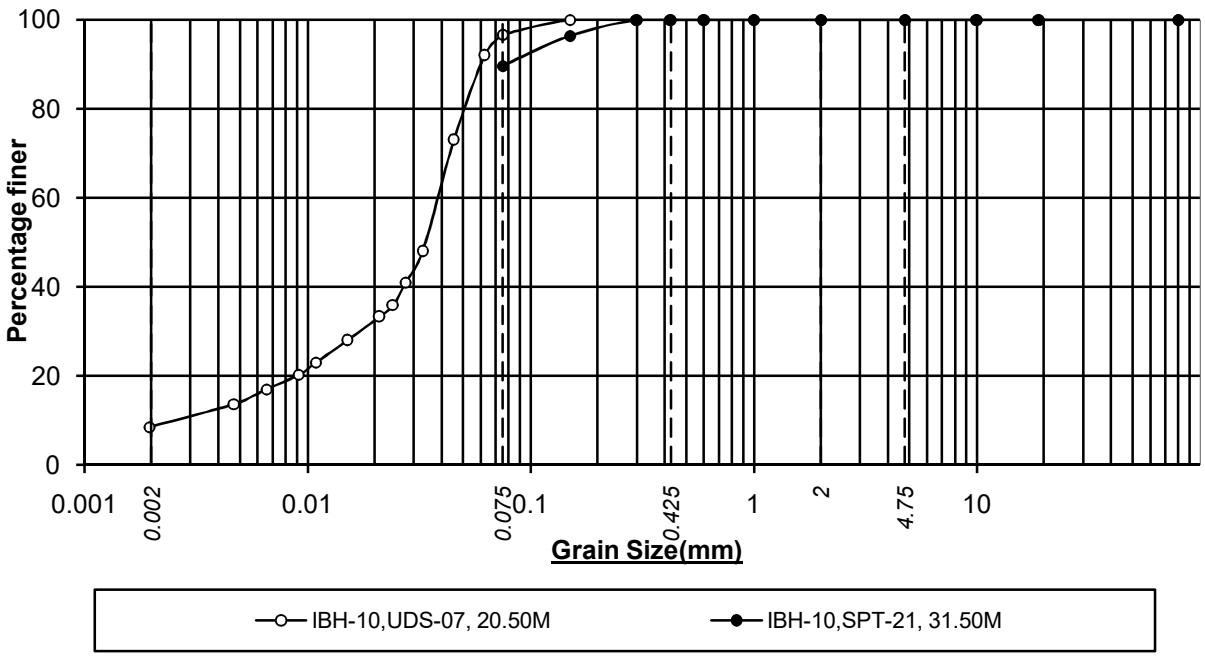
Project:- Geotech. Inv. Work for FGD System at Kahalgaon, Bihar. | **Job No. 4388**

C. E. Testing Company Pvt. Ltd.

GRAIN SIZE DISTRIBUTION CURVES



Grain size (mm)	<0.002	0.002-0.075	0.075-0.425	0.425-2.00	2.0-4.75	Total sand	Weighted mean dia (mm)	>4.75
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
IBH-10,UDS-01, 2.50M	7.3	89.2	3.5	0.0	0.0	3.5		0.0
IBH-10,UDS-03, 8.50M	7.1	89.5	3.4	0.0	0.0	3.4		0.0



Grain size (mm)	<0.002	0.002-0.075	0.075-0.425	0.425-2.00	2.0-4.75	Total sand	Weighted mean dia (mm)	>4.75
Sample No.	**Clay (%)**	**Silt (%)**	**Fine sand (%)**	**Medium sand (%)**	**Coarse sand (%)**			**Gravel (%)**
IBH-10,UDS-07, 20.50M	8.6	88.1	3.3	0.0	0.0	3.3		0.0
IBH-10,SPT-21, 31.50M		89.6	10.4	0.0	0.0	10.4		0.0

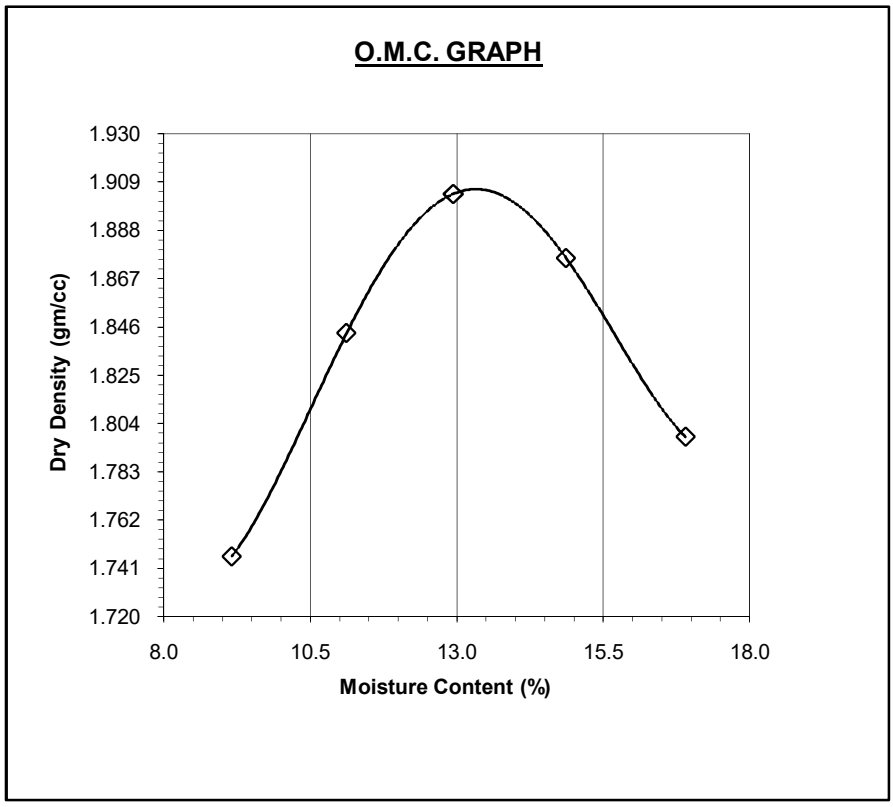
Project:- Geotech. Inv. Work for FGD System at Kahalgaon, Bihar. | **Job No. 4388**

PROCTOR TEST RESULTS.

TP-01 / DS04

Depth = 4.00M

Maximum Dry Density : 1.906 gm/cc
Optimum Moisture Content: 13.34 %

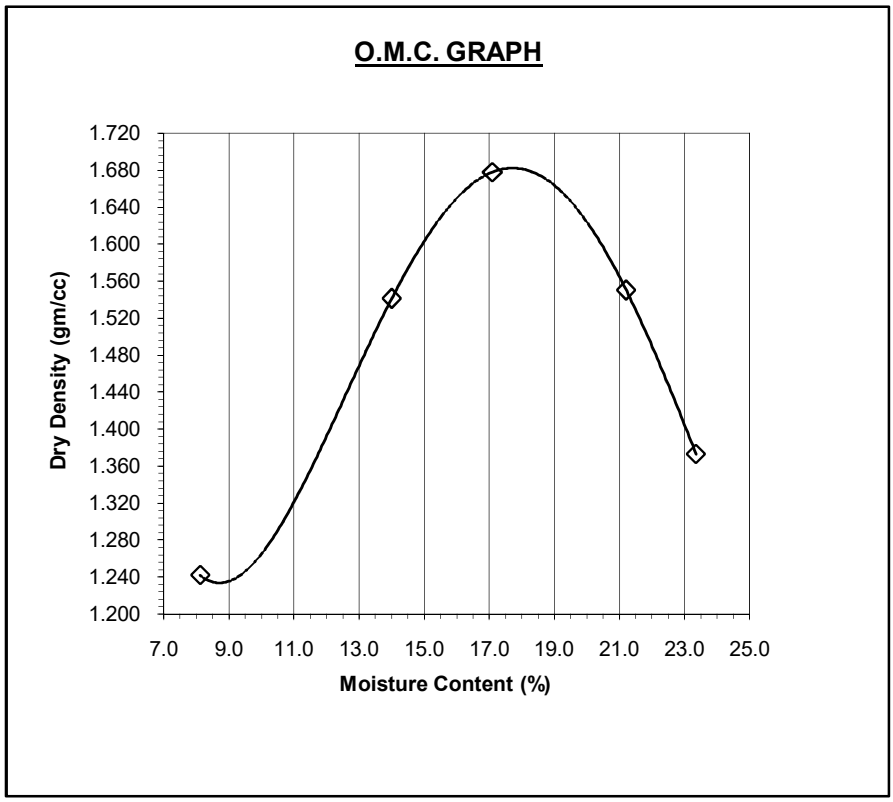


C.B.R. & PROCTOR TEST RESULTS.

TP02 / DS02

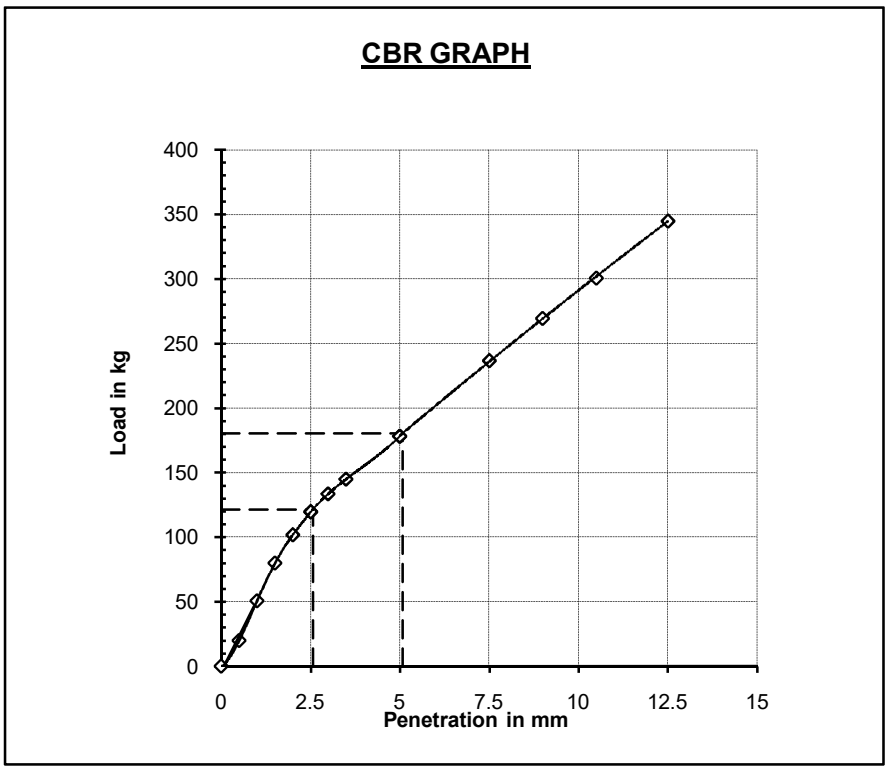
Depth = 2.00m

Maximum Dry Density : 1.680 gm/cc
Optimum Moisture Content: 17.70 %



TYPE :- SOAKED

Penetration (mm)	CBR (%)
2.5	8.86
5.0	8.78

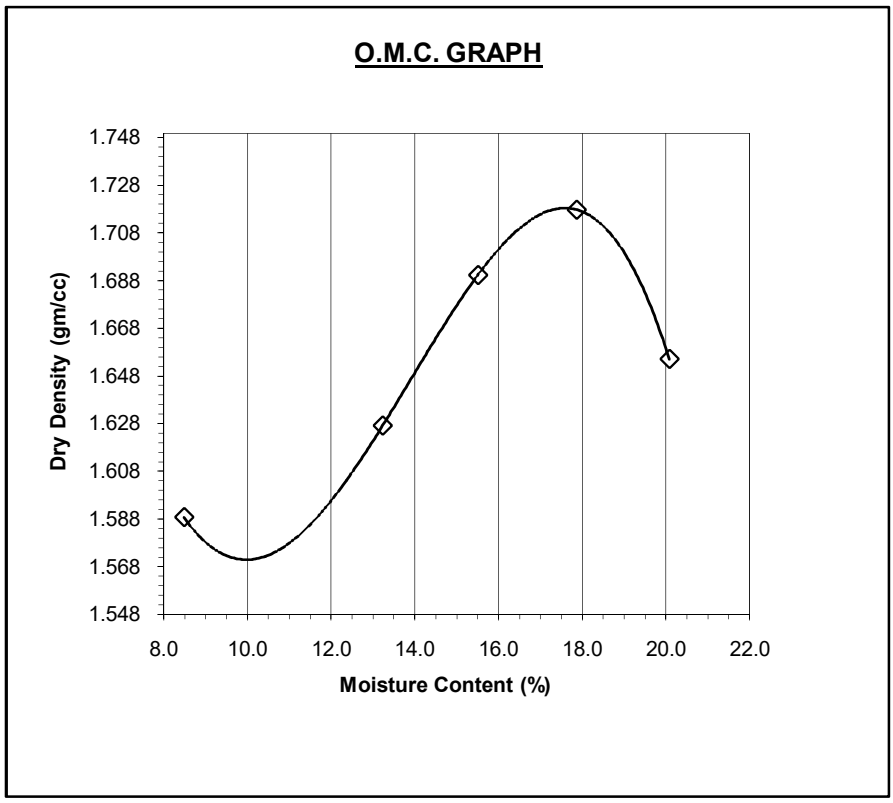


C.B.R. & PROCTOR TEST RESULTS.

TP03 / DS02

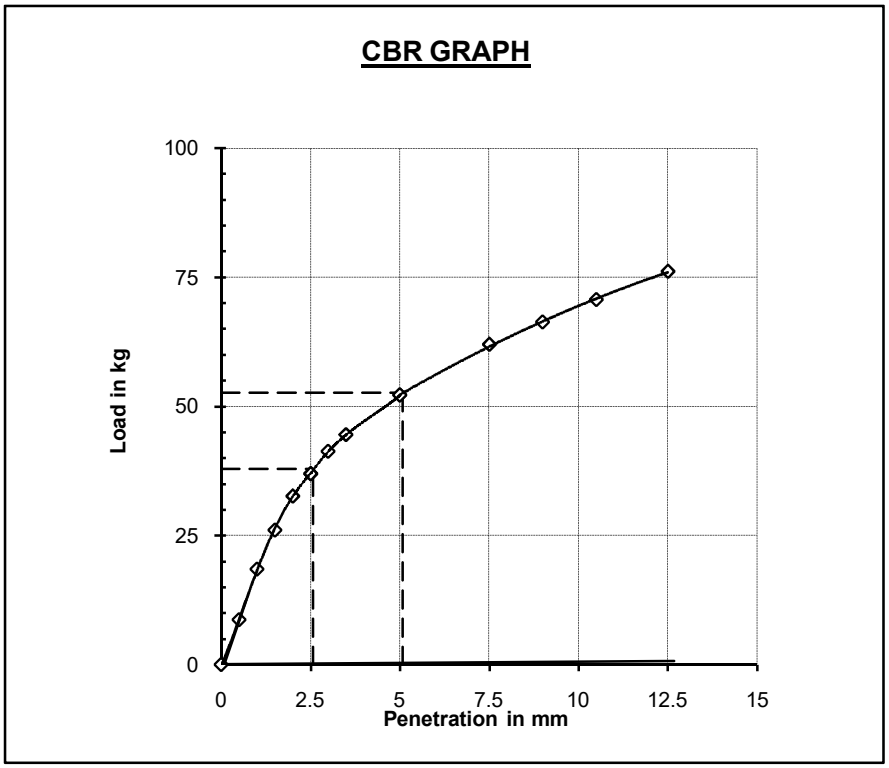
Depth = 2.00m

Maximum Dry Density : 1.718 gm/cc
Optimum Moisture Content: 17.50 %



TYPE :- SOAKED

Penetration (mm)	CBR (%)
2.5	2.77
5.0	2.56

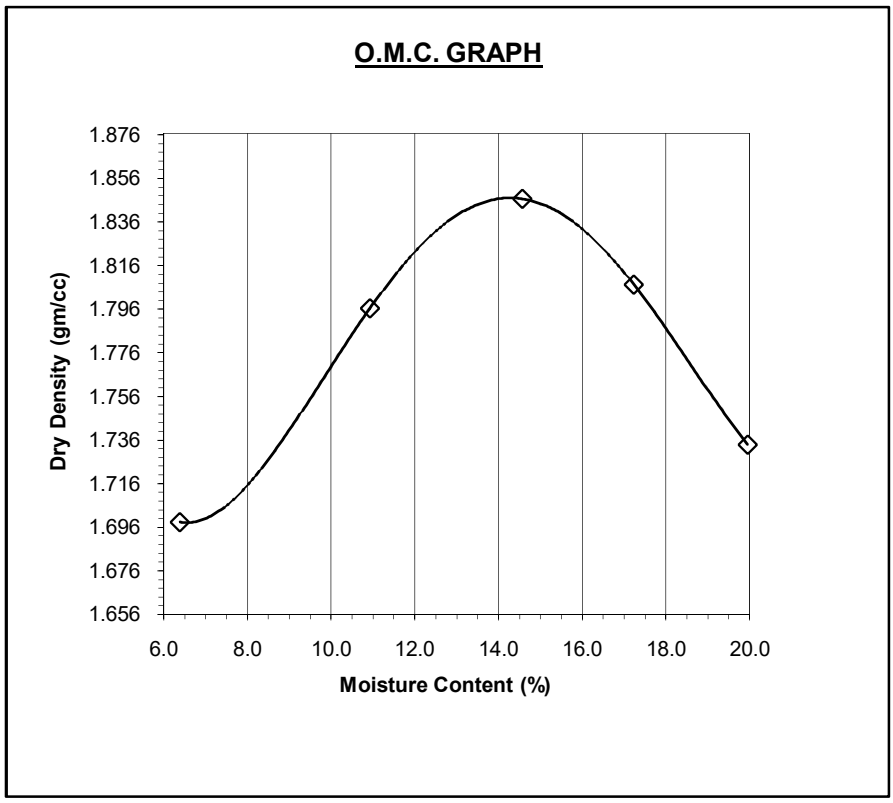


C.B.R. & PROCTOR TEST RESULTS.

TP04 / DS01

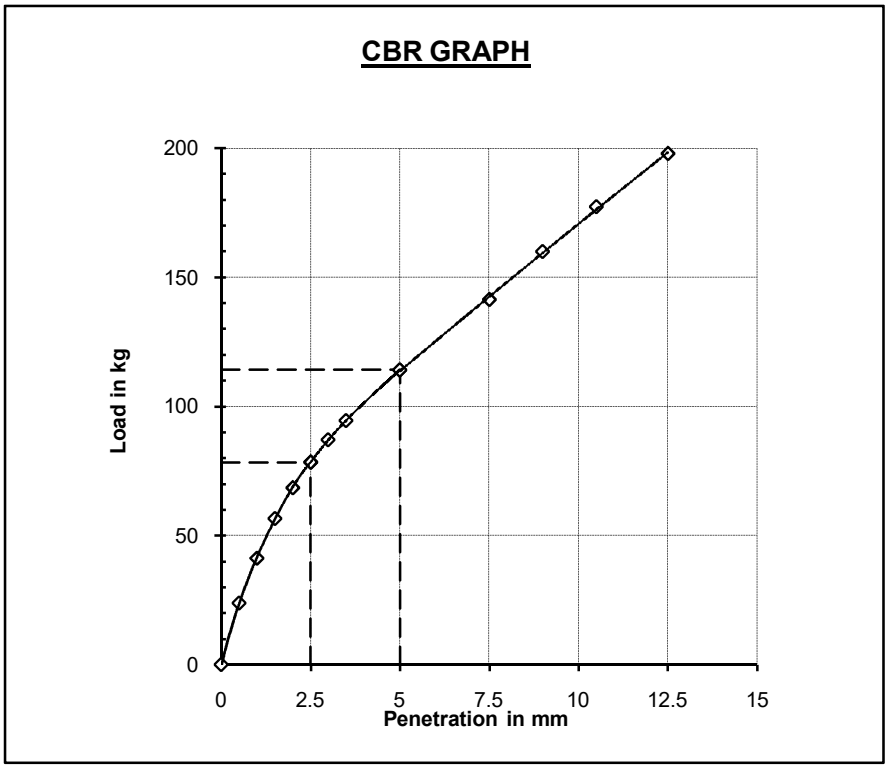
Depth = 1.00m

Maximum Dry Density : 1.847 gm/cc
Optimum Moisture Content: 14.40 %



TYPE :- SOAKED

Penetration (mm)	CBR (%)
2.5	5.71
5.0	5.56

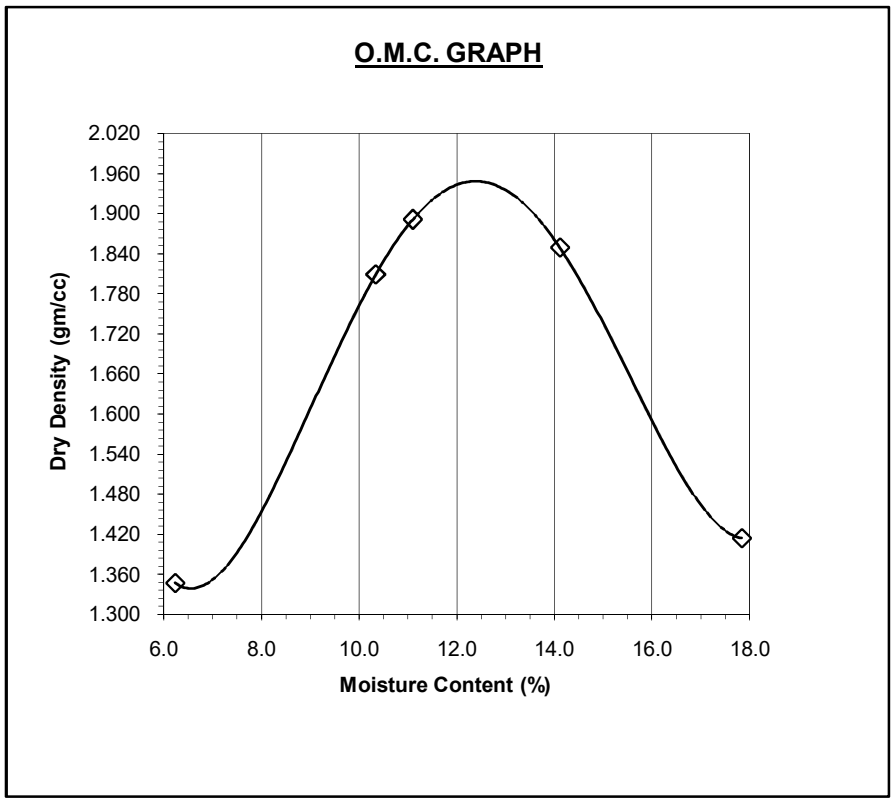


C.B.R. & PROCTOR TEST RESULTS.

TP05 / DS03

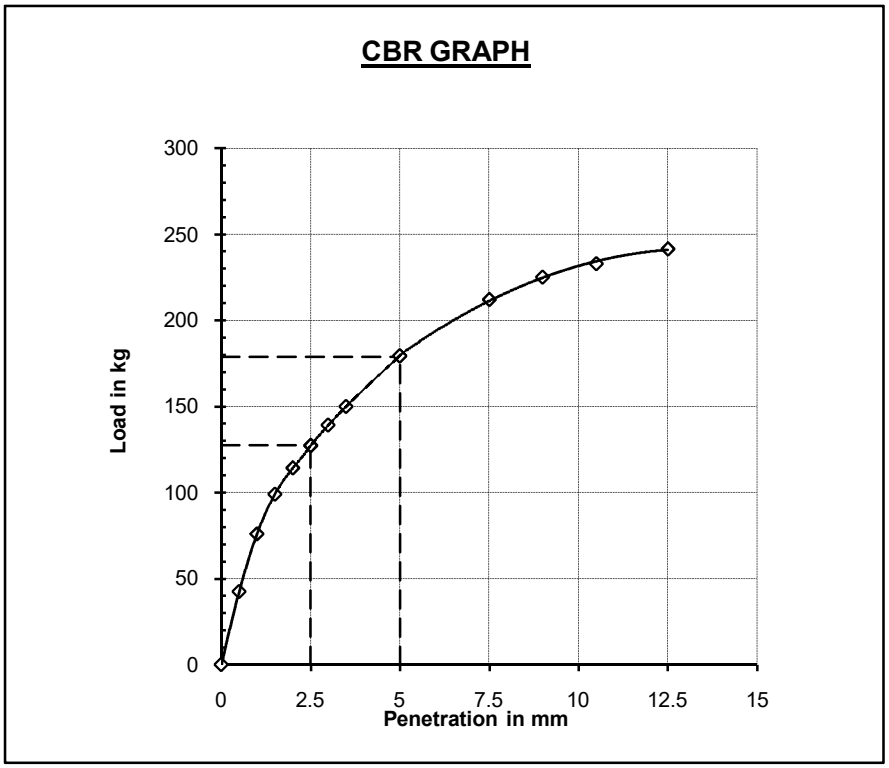
Depth = 3.00m

Maximum Dry Density : 1.945 gm/cc
Optimum Moisture Content: 12.50 %



TYPE :- SOAKED

Penetration (mm)	CBR (%)
2.5	9.31
5.0	8.71

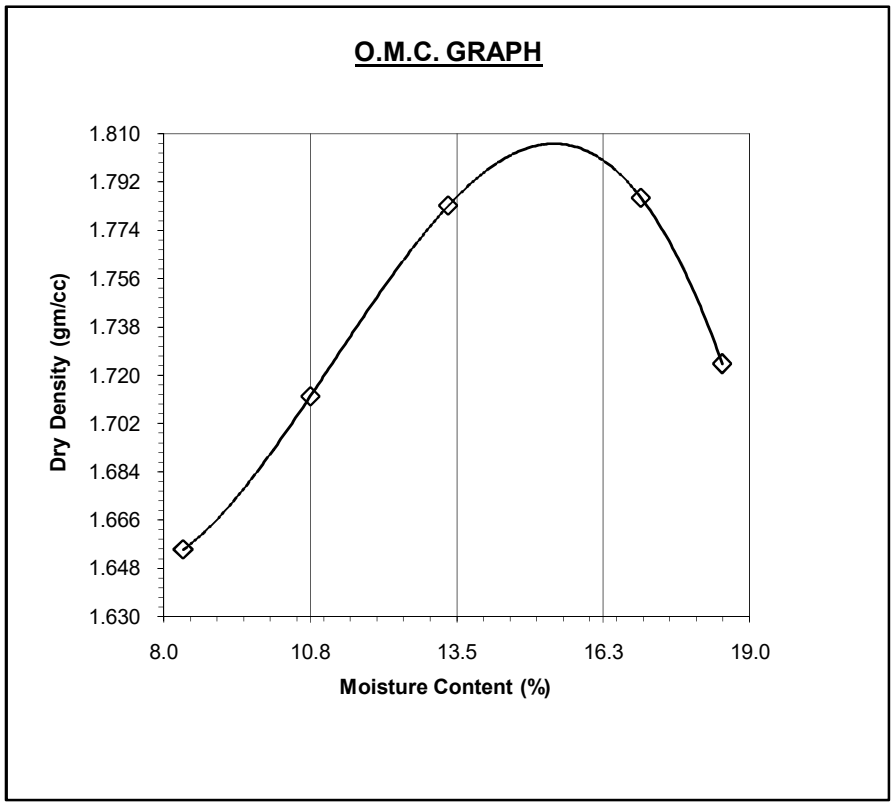


PROCTOR TEST RESULTS.

TP-06 / DS02

Depth = 2.00M

Maximum Dry Density : 1.806 gm/cc
Optimum Moisture Content: 15.41 %



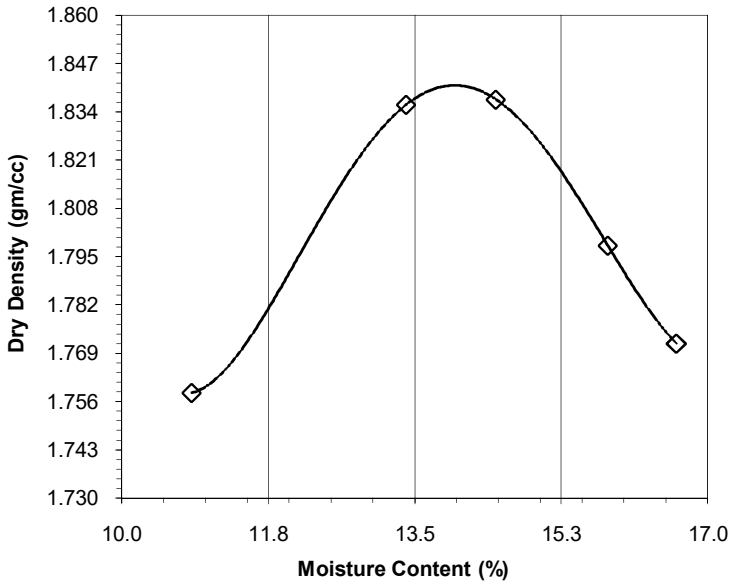
CBR & PROCTOR TEST RESULTS.

ITP-01 / DS03

Depth = 3.00M

Maximum Dry Density : 1.841 gm/cc
Optimum Moisture Content: 14.00 %

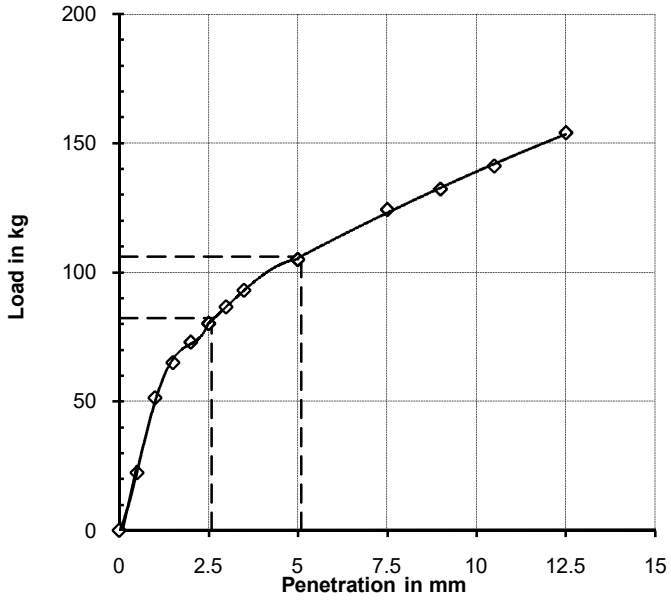
O.M.C. GRAPH



TYPE :- SOAKED

Penetration (mm)	CBR (%)
2.5	6.00
5.0	5.16

CBR GRAPH



PART IV: SAMPLE CALCULATION

IN-SITU PERMEABILITY TEST IN OVERBURDEN (FALLING HEAD METHOD)

Test location	BH-15		
Ground elevation	37.655M	Static water level	1.70m below G.L.
Diameter of hole (2R)	174.0mm	Ht. of casing from GL	0.30m
Inner diameter of casing/ intake pipe (d)	150.0mm		
Depth tested	4.70m to 5.40m		
Length of test section (L)	0.70m		

Data sheet

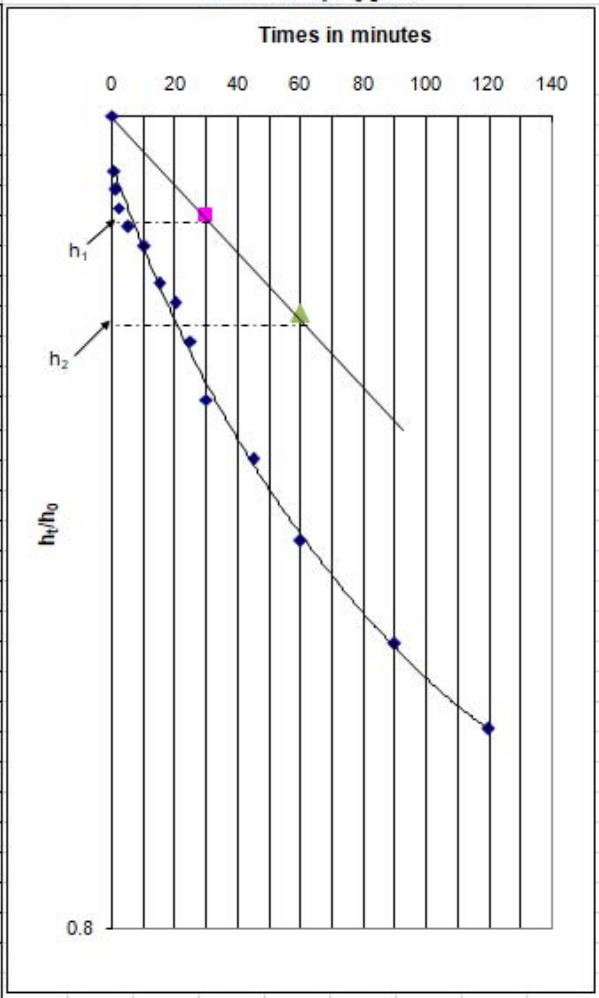
Time interval (minute)	Water level in intake pipe (cm)	h_t (cm)	h_t/h_0
0	0.00	200.000	1.0000
0.5	3.00	197.000	0.9850
1	4.00	196.000	0.9800
2	5.00	195.000	0.9750
5	6.00	194.000	0.9700
10	7.00	193.000	0.9650
15	9.00	191.000	0.9550
20	10.00	190.000	0.9500
25	12.00	188.000	0.9400
30	15.00	185.000	0.9250
45	18.00	182.000	0.9100
60	22.00	178.000	0.8900
90	27.00	173.000	0.8650
120	31.00	169.000	0.8450

From the above Graph, We have

h1 ↳	0.973	t1 ↳	30 min
h2 ↳	0.947	t2 ↳	60 min

$$K = \frac{d^2}{8L}\log_e \frac{L}{R}\frac{\log_e(h_1/h_2)}{t_2 - t_1}$$ ↳ 1.261E-05cm/sec

Time vs. h_t/h_0 plot



Legend: h_1 = head of water in the intake pipe at time t_1 above static water level,
h_2 = head of water in the intake pipe at time t_2 above static water level;
h_0 = depth of static water level at time t_0,
h_t = head of water in the intake pipe at any time t

PART V: PHOTOGRAPHS

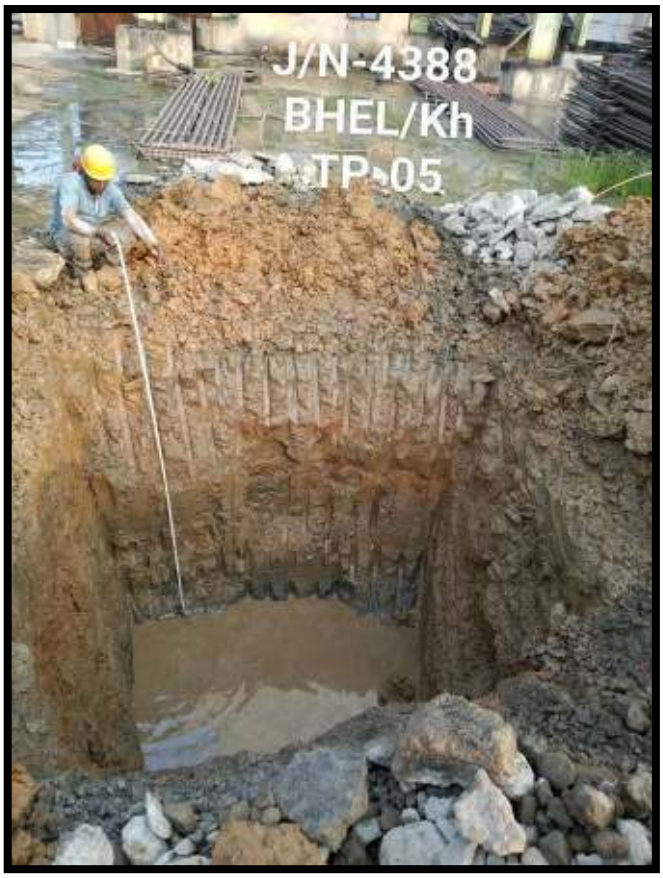
FIELD TEST

i


Site-Kahalgaon
Job-4388/PHS1
BH-14
DATE-10.09.20
REDMI NOTE 9 PRO
AI QUAD CAMERA


JIN-4388
BHEL/Kahalgaon
BH-IGH-04

Borehole



Trial Pit



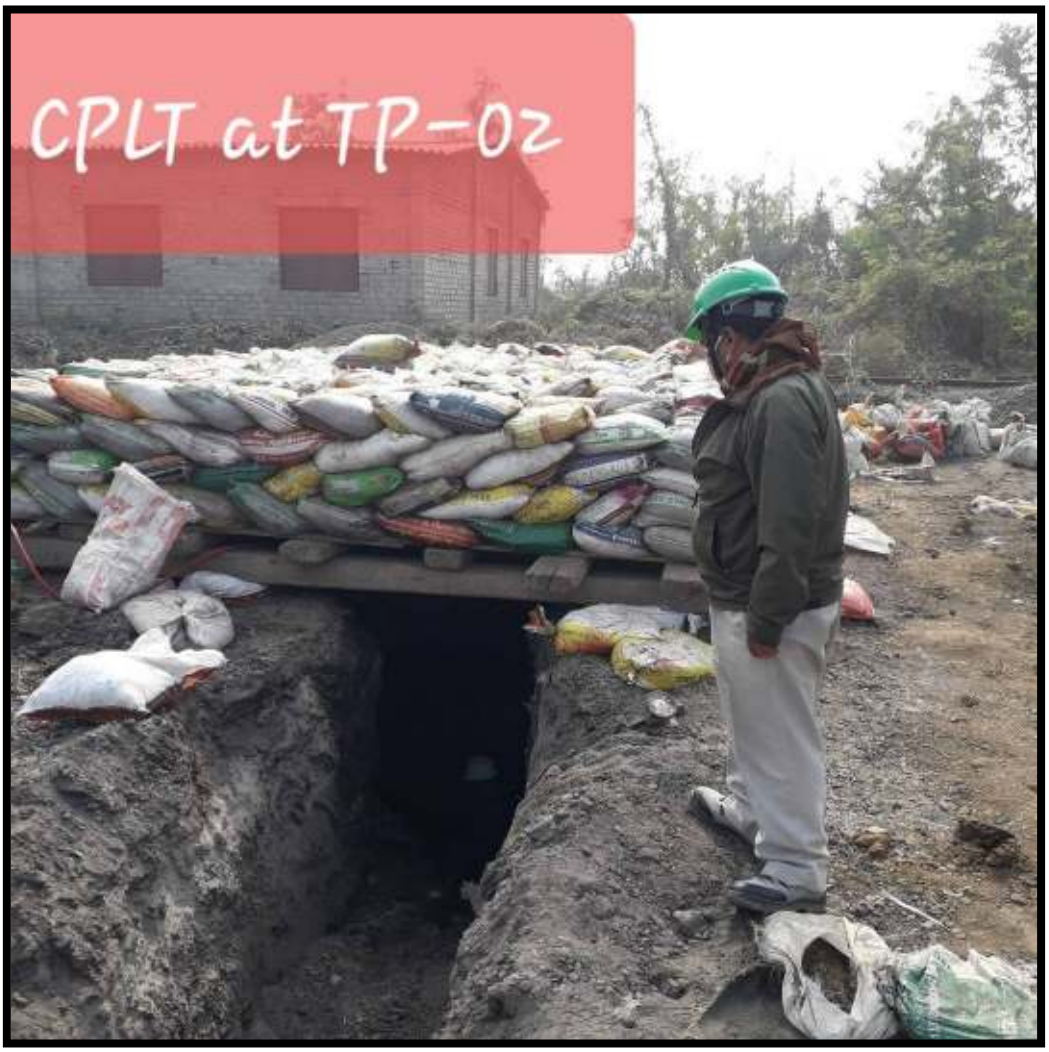
FPT



CHST



ERT



CPLT

LABORATORY TEST




JOBNO. 4388
BH. 31
UDS. 07
DATE. 20-11-2020


JOB NO-4388
BH - 45
Sample: UDS-01
Depth: 2.50-2.95
Date: 01 02 21

JOB: CIVIL, STRUCTURAL & ARCHITECTURAL WORKS(INCLUDING PILING WORKS) FOR FGD SYSTEM AREA OF 3 X 500 MW, STAGE-II KAHALGAON STPP, BIHAR.

Tender no: PSER:SCT:KGN-C2108:21 TCN-06 (ANNEXURE-A)

Sl.	Reference tender clause no.	EXISTING PROVISION	Bidder's querry	BHEL reply/clarification
1	GENERAL	_	Kindly provide safe load data of different types of pile as per BOQ	Geotechnical Investigation Report(Revision-3) is attached for reference. Rate revision/compensation will not be admissible on account of revision inGeotechnical Investigation Report(Revision-3) at later date.
2	GENERAL	_	Please confirm the cement & reinforcement steel shall be provided free issue for the manufacturing of Kentledge RCC block	Cement & reinforcement steel s for the manufacturing of Kentledge RCC block is in successful bidder's scope.

ANNEXURE-2

FORMAT FOR NO DEVIATION CERTIFICATE
(To be submitted in the bidder's letter head)

BHARAT HEAVY ELECTRICALS LIMITED,
Power Sector - Eastern Region,
Plot no 9/1, DJ Block, Sector – II, Salt Lake City,
Kolkata – 700 091

Sub	No Deviation Certificate.	
Job	CIVIL, STRUCTURAL & ARCHITECTURAL WORKS (INCLUDING PILING WORKS) FOR FGD SYSTEM AREA OF 3 X 500 MW, STAGE-II KAHALGAON STPP, BIHAR.	
Ref	1.0	Tender no PSER:SCT:KGN-C2108:21
	2.0	BHEL's NIT, vide reference no PSER:SCT:KGN-C2108:8624 Date: 13-05-2021
	3.0	BHEL's TCN-01, vide reference no PSER:SCT:KGN-C2108:TCN-01, dated: 22-05-2021
	4.0	BHEL's TCN-02, vide reference no PSER:SCT:KGN-C2108:TCN-02, dated: 26-05-2021
	5.0	BHEL's TCN-03, vide reference no PSER:SCT:KGN-C2108:TCN-03, dated: 31-05-2021
	6.0	BHEL's TCN-04, vide reference no PSER:SCT:KGN-C2108:TCN-04, dated: 31-05-2021
	7.0	BHEL's TCN-05, vide reference no PSER:SCT:KGN-C2108:TCN-05, dated: 04-06-2021
	8.0	BHEL's TCN-06, vide reference no PSER:SCT:KGN-C2108:TCN-06, dated: 05-06-2021
	9.0	All other pertinent issues till date.

Dear Sirs,

With reference to above, this is to confirm that as per tender conditions, we have visited site before submission of our offer and noted the job content & site conditions etc. We also confirm that we have not changed/ modified the tender documents as appeared in the website/ issued by you and in case of such observance at any stage, it shall be treated as null and void.

We hereby confirm that we have not taken any deviation from tender clauses together with other references as enumerated in the above referred NIT. We hereby confirm our unqualified acceptance to all terms & conditions, unqualified compliance to technical specification, integrity pact (if applicable) and acceptance to reverse auctioning process.

In the event of observance of any deviation in any part of our offer at a later date whether implicit or explicit, the deviations shall stand null & void.

We confirm to have submitted/uploaded offer/documents in accordance with tender instructions with acceptance of the terms & conditions of the tender by us and as per aforesaid references.

Thanking you,

Yours faithfully,

(Signature, date & seal of authorized
representative of the bidder)