QUALITY MANUAL

(ISO/IEC 17025:2017)

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Approved BY	Executive Director
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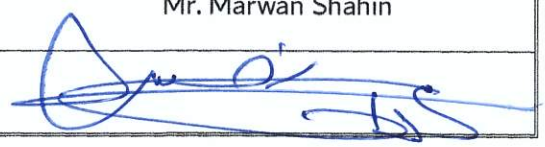
Signature:	

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	QUALITY MANUAL	Issue No.	01
		Rev. No.	01
	INDEX TO QUALITY MANUAL (SECTION 0.1)	Rev Date	25/12/2023
		Prepared By	Quality Engineer
		Approved By	Executive Director

Section	Revision	Revision Date	Title
0.1	01	25/12/2023	Index to Quality Manual
0.2	01	25/12/2023	Approval and Amendment
1.0	01	25/12/2023	Introduction
2.0	01	25/12/2023	Exclusion
3.0	01	25/12/2023	Quality Policy
4.1	01	25/12/2023	General requirements-Impartiality
4.2	01	25/12/2023	General requirements -Confidentiality
5.0	01	25/12/2023	Structural Requirements
6.1	01	25/12/2023	Resource Requirements-General
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6.6	01	25/12/2023	Resource Requirements -Externally Provided Products & Services
7.1	01	25/12/2023	Process requirements-Review of Requests, Tenders & Contracts
7.2	01	25/12/2023	Process requirements-Selection, Verification & Validation
7.3	01	25/12/2023	Process requirements-Sampling
7.4	01	25/12/2023	Process requirements-Handling of Testing Items
7.5	01	25/12/2023	Process requirements-Technical Records
7.6	01	25/12/2023	Process requirements-Evaluation of Measurement of Uncertainty
7.7	01	25/12/2023	Process requirements-Ensuring Validity of Results
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ANNEXURES			
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Amendment Sheet

Document No.	Issue No	Revision No.	Revision Date	Nature of Revision
01	01	01	25/12/2023	Management change and approval by executive director
Annex A	01	01	25/12/2023	Management change and approved by executive director
Annex c	01	01	25/12/2023	Management change and approved by executive director
6.2	01	01	25/12/2023	Minor change in Cl. No 6.2.5 & 6.2.6
6.6	01	01	25/12/2023	Minor change in Cl. No 6.6.3
7.1	01	01	25/12/2023	Minor Change in Cl. No 7.1.1 & 7.1.4
7.2	01	01	25/12/2023	Minor Change in Cl. No 7.2.2.4
8.3	01	01	25/12/2023	Minor Change in Cl. No 8.3.2.1
8.5	01	01	25/12/2023	Minor Change in Cl. No 8.5.3
8.7	01	01	25/12/2023	Minor Change in Cl. No 8.7.1.1,8.7.1.4, &8.7.2

NOTE: Upon receipt of amendments, please

a) Remove and discard the amended sheet(s) / page(s)
b) Replace it with superseded sheet(s) / page(s)
c) Check the controlled status
d) Inform any discrepancy observed to Quality Engineer immediately.

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	INDEX TO QUALITY MANUAL (SECTION 0.1)	Rev Date	25/12/2023
		Prepared By	Quality Engineer
		Approved By	Executive Director

Copy Holder		**Executive Director**	**Quality Engineer**	**Laboratory Supervisor**
Received by	Signature			
	Date			

3.0 PROCEDURE APPROVAL, AMENDMENT AND DISTRIBUTION

3.1 Approval, Amendment Procedure

Any amendment to this Quality Manual shall be update & distribute by the Quality Engineer.

In case of minor changes, requiring amendment of one or several pages of the Quality Manual, only such page or pages shall be revised. In such cases the revision number of the relevant page(s) will be incremented, printed, inserted and the issue indicator will remain unchanged. The type of amendment will be denoted on the History of Revision List.

The amended part of the manual shall be written in italic with the bold letter.

In case of the change to the Quality Manual require amendment of a several numbers of pages, or after a significant number of minor changes, the document will be reissued. In this case the issue indicator will be incremented and the revision number shall be re-set to zero.

3.3 Distribution of the Quality Manual

Distribution of Quality Manual shall be controlled and authorized by the Quality Engineer. Controlled copy of the Quality Manual will be issued in accordance with established distribution list. The Quality Engineer will ensure that the controlled copies will be updated promptly. She will distribute all amendments to the Quality Manual to all holders of the controlled copies, and retrieve the obsolete pages or documents.

Uncontrolled copies of the Quality Manual may be issued to the customers on demand for reference purposes. The uncontrolled copies shall not be updated.

2.1 INTRODUCTION

Central Lab for Construction Materials Testing (CTL) - Umm Al Quwain was established in 2022, in order to fulfilled and cater the ever-growing need of the building and construction industry customers.

Central Lab for Construction Materials Testing- Umm Al Quwain mainly provides the construction materials testing services to the construction industry. It has modern set up Umm Al Quwain in Industrial Area managed by the high-level professionals in the field.

2.1.1 LEGAL IDENTIFICATION

The laboratory is legally identified as: "**Central Lab for Construction Materials Testing (CTL) - Umm Al Quwain "**and Commercial License Number: 33409 issued on 04/07/2021

P.O. Box – 3330,
Tel: +971 6 7657633
E mail: info@centrallabuaq.ae
Umm Al Quwain,
U.A.E.

Registered with Umm Al Quwain Economic Development Department, Umm Al Quwain Commercial Department.

2.2 OBJECTIVES AND SCOPE

2.2.1 The Laboratories scope of activity covers testing services as listed below:

- Material Testing.
- Geotechnical Investigations.

2.3 REFERENCES

- ISO / IEC 17025: 2017 - General requirements for the competence of testing and calibration laboratories.

- ISO / IEC Guide 2:1991 - General terms and their definitions concerning standardization and related activities.
- ISO 8402:1986 - Quality Vocabulary.
- International vocabulary of basic and general terms in metrology (VIM):1984
- ISO 9001: 2015 –Quality Management Systems-Fundamentals and Vocabulary

2.4 TERMS AND DEFINITIONS

2.4.1 Reference Equipment/Material: An equipment/material generally of the highest meteorological quality available at a given location from which measurements at that location can be derived.

2.4.2 Traceability: The property of a measurement whereby it can be related to appropriate standards, generally National or International Standards through an unbroken chain of comparisons.

2.4.3 Conformity: Fulfilment by a product, process or service of specified requirements.

2.4.4 Evaluation of Conformity: Systematic examination of the extent to which a product, process or service fulfils specified requirements.

2.4.5 Verification of Conformity: Conformation, by examination of evidence, that a product, process or service fulfils specified requirements.

2.4.6 Working Standard: A standard which, usually calibrated against a reference standard, is used routinely to calibrate or check material measures or measuring instruments. (VIM 6.09)

2.4.7 Uncertainty of Measurement: An estimate characterizing the range of values within which true value of measured lies. (VIM 3.09)

2.4.8 Assurance of Conformity: Procedure resulting in a statement giving confidence that a product, process or service fulfils specified requirements.

The management system shall be relevant to the nature of the organization and products; and to customer and regulatory requirements. For this reason, those requirements of ISO/IEC 17025 and ISO 9001 that do not apply are excluded from the scope of our management system.

Following rules and criteria are used for excluding irrelevant requirements:

1. A requirement may be excluded only when both of the following conditions are met.

i. The requirements must be within ISO 9001 Clause 8.

ii. The exclusion may not affect the laboratories' ability to provide product that meets customer and applicable regulatory requirements.

2. The Management is responsible for identifying those requirements that do not apply to the organization or products or services and to propose exclusions of such requirements from the scope of the management system.

3. Top management has the responsibility and authority for evaluating whether the proposed exclusions are appropriate and for approving them.

4. Any exclusion taken is documented in this section of the Quality Manual. The excluded requirements are precisely identified with reference to the specific clauses of the standard and the reason why it is excluded.

Exclusions

1. ISO 9001: 2015 Section 8.3, Design and Development, including all sub sections

Central Lab for Construction Materials Testing (CTL)- Umm Al Quwain does not carry out any design or development activities. Our activities are limited to perform the test based on the International standard test methods as specified by the customer.

Executive Director

QUALITY POLICY STATEMENT

It is the policy of **Central Lab for Construction Materials Testing- Umm Al Quwain (CTL)** to have full commitment to quality and to provide integrity and reliability in all laboratory services fulfilling the requirements of quality in all aspects of work, continuously meeting or exceeding customer's expectations.

Identify potential risks to its impartiality and initiate appropriate measures to eliminate or minimize its existence through effective implementation of **CTL's** established management system.

Execute all laboratory services meeting the standard test methods as well as quality aspects in a timely manner.

To establish, maintain and continually improve an integrated laboratory management system based on the requirements of international standards of ISO/IEC 17025, ISO 9001 and applicable local regulatory requirements.

To accord highest importance to safety, health and environmental issues. **Central Lab for Construction Materials Testing** shall be committed to educate, familiarize and implement this policy and established management system to all activities in the laboratory by its personnel.

Executive Director

CENTRAL LAB. L.L.C

4.1 Impartiality

Central Lab for Construction Materials Testing (CTL) shall be fully committed to ensure all laboratory activities are conducted impartially and shall not allow commercial, financial or other pressures to diminish its competence and influence its impartiality. Any relationships between **CTL** or individuals employed by **CTL** or Sub-contractors to **CTL** with other organizations or individuals, who are customers or potential customers to **CTL**, shall be declared, reviewed, documented and risk assessed.

The top management of the laboratory is committed not to indulge in any activities that create doubts in competence, impartiality, judgment or operational integrity**.** The laboratory personnel are protected from Internal / External pressures which might adversely affect the quality of the work. The top management of **CTL** is committed to impartiality and demonstrated through establishing the organization's Policy Statement on Impartiality. The policy statement is displayed at strategic locations in **CTL** Office.

CTL has detailed procedure in identifying risks to its impartiality, maintaining impartiality, monitoring the laid down impartiality norms and its adequacy. **CTL** shall identify, analyze, evaluate, treat, monitor, document the risks related to conflict of interests arising from providing its services including any conflicts arising from its relationships on an ongoing basis. Where there are any threats to impartiality, **CTL** shall document and demonstrate to eliminate or minimize such threats and document any residual risk. The demonstration shall cover all potential threats that are identified, whether they arise from within the **CTL** or from the activities of other persons, bodies or organizations. When a relationship possesses an unacceptable threat to impartiality (such as a wholly owned subsidiary of the **CTL** requesting services), additional/extra attention is exercised to maintain impartiality in delivering the services.

The Quality Department shall review any residual risk to determine whether it is within the level of acceptable risk. If the top management of the **CTL** is not following the input of this mechanism for safeguarding the impartiality, the mechanism has the right to take independent action (e.g., informing authorities, accreditation bodies, stakeholders).

Whenever the input that is in conflict with the operating procedures of **CTL** or other mandatory requirements are not being followed. In such cases, these shall be documented including the reason behind the decision not to follow the input and maintain the document for review by appropriate personnel.

Referenced Procedure:

QP-101, Procedure for Confidence and Operational Integrity

4.2 Confidentiality

Central Lab for Construction Materials Testing (CTL) ensures confidentiality on all information obtained or created during the performance of all laboratory activities. **CTL** shall inform its customers in advance any information the laboratory intends to place in the public domain except for the information the customer's makes publicly available or when agreed contractually between the laboratory and the customer. **CTL** shall consider all other information as proprietary and shall be considered as confidential.

CTL shall not disclose of the confidential or proprietary information's of a customer unless otherwise required by the law or the regulatory body or the accreditation body that requires such disclosure.

Information obtained from sources other than the customer shall be also treated confidentially by **CTL**. The source provider of the said information shall be also treated confidentially and shall not be shared with the customer unless agreed by the source provider.

CTL shall ensure all personnel including any committee members, contractors, personnel of external bodies or individual representing on the laboratory's behalf shall keep all information obtained or created during the performance of all laboratory activities confidential unless mandated by the law to release such information.

Referenced Procedure:

QP-102, Procedure for Confidence and Operational Integrity

5.1 Central Lab for Construction Materials Testing (CTL) is an independent testing laboratory legalized under the authority of the Emirate in which the laboratory is situated. **CTL** has identified and complied the requirements of the local regulatory in which the laboratory is situated. The scope of the laboratory's activities is identified in the license and legalized in the Emirate of Umm Al Quwain in which the laboratory is situated.

CTL is legally responsible for its operations and it was registered under the Department of Economic Development in Umm Al Quwain and the physical address of,

P.O. Box – 3330,
Tel: +971 6 7657633
E mail: info@centrallabuaq.ae
Umm Al Quwain,
U.A.E.

5.2 Central Lab for Construction Materials Testing (CTL) is independently operating the laboratory Central Lab for Construction Materials Testing (CTL) ensures all laboratory activities and services provided to the customers are under CTL's control and responsibility, as it appears in the organizational chart the presence of the Executive Director, as the Executive Director job is limited to decisions to purchase the large equipment needed by the laboratory, increasing salaries, and approving the appointment of employees, and he has no relation to the results of tests or signing the reports issued by the laboratory.

5.3 CTL is providing independent testing services in the field of Construction Material Testing and Geotechnical Investigation in accordance with the requirements of ISO/IEC 17025:2017 excluding externally provided laboratory testing services.

5.3 This Quality Manual is applicable to all divisions including any permanent or temporary site activities. **CTL** has developed and implemented a management system in accordance with the requirements of ISO / IEC 17025:2017 as well as ISO 9001:2015 to demonstrate its ability to provide consistent products / services that meets the customer and applicable regulatory, accreditation / certification bodies requirements and to address customer satisfaction through the effective application of the system including continual improvement and the prevention of non-conformity.

5.5 operates under the umbrella of its parent company, Macro Investments, as it is an investment company operating in various fields (real estate, civil defence companies, training companies...etc.) As Macro Investments Company, managed by the Executive Director, does not interfere in matters related to the tests and final results, as its mission is only limited to the tasks of the Executive Director, as was indicated in 5.2 The corporate organization structure of CTL is well defined as detailed in the Appendix A of this Quality Manual. The duties, responsibilities, authorities and interrelationships of all personnel managing, performing and verifying the work directly or indirectly which is affecting the quality of the tests are detailed in Appendix C of this Quality Manual.

5.6 CTL has identified personnel irrespective of other responsibilities have the authority and resources needed to carry out duties relevant to the management system including:

5.6.1 Implementation, Maintenance and Improvement of Management System

5.6.2 Identification of deviations from the Management System or from the procedures for performing laboratory activities

5.6.3 Initiation of actions to prevent or minimize the identified deviations

5.6.4 Reporting to the top management on the performance of the Management System and any need for improvement

5.6.5 Ensuring the effectiveness of the laboratory activities

The duties, responsibilities and authorities of all personnel relevant to the management system realization are also detailed in Appendix C of this Quality Manual. The Quality Engineer, irrespective of all other duties and responsibilities shall act as the Management Representative in implementing the designed management system and to continuously monitor the effectiveness of the management.

5.7 CTL shall have open communication within the organization regarding the effectiveness of the management system including the importance of meeting customer's and other requirements. **CTL** shall ensure the integrity of the management system is maintained whenever changes are planned and implemented. **CTL** shall identify the organization's external & internal issues by monitoring and addressing the performance indicators of its key processes and services controlling the issue which affects the organization's ability to achieve intended results.

Central Lab for Construction Materials Testing (CTL) determines the interested parties and their requirements relevant to the Quality Management System and relevant to the laboratory activities in providing the services offered.

- Customers (Test Reports, Contracts, Communication, etc.)
- Suppliers (Supplied Product & Services, Service after sales, etc.)
- Employees (Competency, Training, Working Environment, Remuneration, etc.)
- Statutory/ Regulatory Authorities (Work permits, Approvals, Accreditations, etc.)

Compliance to the requirements of interested parties shall be achieved through effective implementation of Quality Management System.

5.8 Management of Change:

5.8.1 Change in the Document: - Changes to the existing documents shall be initiated by filling a 'Document Change/ Amendment sheet. Any changes to the Internal Quality Documents shall be reviewed by the corresponding process owner, and verified by the Quality Engineer. Based on their recommendation the concerned documents shall be approved by the Laboratory Supervisor Care shall be taken to validate/ Test documents in cases of the changes, before being amended.

In case of minor changes requiring the revision of one or several pages of Internal Quality Document, only such page or pages shall be revised. In such case the revision number of relevant pages will be incremented and the issue indicator will remain unchanged. Whenever practicable, the change in the document will be highlighted by using the italic or shaded font and the revision will be denoted on amendment sheet.

Handwritten changes are allowed to be done by the process owners in consultation with the Quality Engineer. However, these changes shall be regularized within 30 days from its handwritten change. All hand written changes shall be accompanied by a change date by the side of it.

Should the nature of change to Internal Quality Document require a revision of a substantial number of pages or after a number of minor changes, the document will be reissued. The issue indicator will be incremented and the revision number shall become zero.

Document status shall be amended after the amendment is finalized and ready for issue. The amended documents shall be controlled while the superseded document shall be stamp 'OBSOLETE'. As a policy all obsolete documents will be removed from the place of issue and all places of use and destroyed.

Should the Quality Engineer decide that any obsolete documents need to be retained for legal, contractual or knowledge preservation purpose, such document will be stamp by "OBSOLETE" and filed separately in his office only.

5.8.2 Change in the Key Personal: - Any change in the key personal need to follow the procedure of personal requirement **(QP-104)**

5.8.3 Change in the location: - need to follow the procedure of monitoring of environmental

condition & procedure of calibration equipment **(QP-105 & QP-106)**

5.8.4 Change in the Equipment: - need to follow the procedure of testing and measuring equipment **(QP-109)**

6.1 General

Central Lab for Construction Materials Testing (CTL) management holds legal responsibility for its operation and is organized to operate in accordance with the requirements of ISO/IEC 17025, whether carrying out work in its permanent facilities or on location, at customer sites.

Central Lab for Construction Materials Testing (CTL) management provides managerial and technical personnel with the authority and resources needed to carry out their duties. The lab maintains a documented procedure for identifying and correcting the occurrence of departures from the quality system. The authorities vested in the ***Quality Engineer*** are described in their respective job descriptions. All the laboratory personnel are aware about the relevance and importance of their work related to management system. Appropriate training given to all staff.

The ***Executive Director*** of the company can only approve amendments to the organizational and management policies in this manual.

Central Lab for Construction Materials Testing (CTL) is committed to carry out its testing activities in such a way as to satisfy the needs of the customer and regulatory authorities and to satisfy the requirements of International Standard ISO/IEC 17025. The laboratory is also all local legal requirement

6.2 Personnel

6.2.1 **A Central Lab for Construction Materials Testing (CTL)** ensures all personnel in the laboratory that contributes to the quality of the laboratory activities are impartially oriented and competent with regards to their respective responsibilities.

6.2.2 **Central Lab for Construction Materials Testing (CTL)** recognizes the importance of competent staff to support the quality of the laboratory processes. CTL shall use qualified, experienced and trained personnel to perform and conduct the testing activities as per the management system requirements. Appointment of the staff shall strictly be followed in accordance with the local regulatory requirements, where applicable. Work Instruction shall be maintained by the laboratory clearly defining the criteria for the appointment with regards to the education, qualification, training, technical knowledge, skills and experience for each category of the staff.

6.2.3 **Central Lab for Construction Materials Testing (CTL)** ensures relevant personnel are competent in their area of responsibility and capable of identifying significant deviations in the laboratory activities. The Laboratory Supervisor shall be competent in identifying significant deviations in the testing activities of the personnel performing the tests. The Laboratory Supervisor shall ensure that required competency of personnel are identified for the activities influencing the results of the tests.

6.2.4 The Management of **Central Lab for Construction Materials Testing (CTL)** ensures that duties, responsibilities and authorities of relevant personnel is communicated and understood. The HR department shall communicate with the relevant personnel their duties, responsibilities and authorities during their orientation at the time of their joining the laboratory.

6.2.5 C**entral Lab for Construction Materials Testing (CTL)** ensures that relevant procedures are established for determining the competence requirements, selection of personnel, training of personnel, supervision of personnel, authorization of personnel and monitoring the competence of personnel including maintenance of records as evidence of the performance of each activity.

The need for the technical training shall be identified by the respective Laboratory Supervisor and shall be communicated to the Quality Department with tentative period of the training. The Quality Department shall prepare the annual training plan.

With reference to the plan, training shall be carried out by the assigned trainer and records of the training shall be maintained. On completion of the training evaluation shall be carried out to determine the level of competency and effectiveness of the training. The evaluation shall be carried out through practical demonstration / trial runs, written exams or personnel interviews. In cases where practically possible, the accuracy of the results will be verified by the Laboratory Supervisor. The technical training shall also include the various safety measures and legal regulations where applicable for the particular test under training.

Records of training shall be maintained by the Quality Department in the respective personnel file along with the details of the personnel which includes the educational, professional qualification certificates, experience, technical knowledge, skills, if any etc. A copy of the training history shall also be maintained in the personnel file.

In case of any external training requirement, either Management System or Technical the external training request shall be forwarded to the ***Quality Engineer & Executive Director*** for approval. The external training request shall include the training agency, the tentative date of training and the cost involved in the training.

6.2.6 **Central Lab for Construction Materials Testing (CTL)** shall authorize the personnel to perform specific laboratory activities, including but not limited to development, modification, verification and validation of methods, analysis of results, including statements of conformity or opinions and interpretations, and report, review and authorization of results. Authorization for laboratory activities (e.g., sampling, testing, checking/verification of results, etc.) shall be granted to relevant personnel based on the outcome of the technical training evaluation, the laboratory shall maintain a list of authorized personnel to perform the specified tests / activities. The list shall be ***prepared by the Laboratory Supervisor based on the training evaluation and shall be verified by the Quality Engineer***. Authorization relevant to laboratory activities (e.g., providing statements of conformity, opinions, interpretation, etc.) shall be granted based on the previous background of the personnel (e.g., education, qualification, technical knowledge, experience, etc.). The authorization shall be documented to provide evidence on how the laboratory is considering the criticality of activities and assigning competent personnel in handling such activities.

References Procedures:

QP-103, Procedure for Personnel Training and Evaluation

QP-104, Procedure for Personnel Recruitment

6.3 Facilities and Environmental Conditions

6.3.1 Facility

Laboratory management shall ensure that the environmental conditions shall not invalidate the results of the analysis or adversely affect the required quality of any measurement.

It is important that the working environment of the laboratory is free from excessive draughts. The temperature should be reasonably stable and uniform and any temperature gradients measured vertically, horizontally should be small.

6.3.2 Documentation of environmental conditions

The laboratory environmental records are kept on daily basis.

6.3.3 Monitoring

Apart from above, due attention shall be paid, for example, to biological sterility, dust, electromagnetic disturbances, radiation, humidity, electrical supply, and sound and vibration levels, as appropriate to the technical activities concerned. Tests and internal calibrations shall be stopped when the environmental conditions jeopardize the results of the test and /or calibration activities.

Any areas considered as incompatible activities are effectively separated. This can include also a proper sanitation facility to exclude the possibility of cross-contamination. Segregation of activities is achieved through time and space allocations.

6.3.4 Controlled Access

Access to and use of areas affecting quality of testing is adequately defined and controlled.

Access to the laboratory is restricted to authorized personnel. The authorized personnel are made aware of the following items;

- The intended use of the area
- The restrictions imposed on working within such areas
- The reasons for imposing the restrictions

6.3.5 Good Housekeeping

The Lab ensures good housekeeping. Special procedures are prepared when necessary. Controlled use of cleaning and pest control materials is exercised. The laboratory complies with the local health and safety requirements.

References: QP-105, Procedure for Monitoring Environmental Conditions

6.4 Equipment's

6.4.1 Required Equipment

Central Lab for Construction Materials Testing (CTL) is furnished with the necessary infrastructure, measurement, and test equipment required for the correct performance of its testing. All equipment's are used in an environment appropriate to its proper performance. All equipment's required by a test are described in each method, including the equipment's tolerance.

6.4.2 Monitoring

All items of equipment that go outside the control of the laboratory for a period is checked to ensure the function and calibration are satisfactory before being returned to service.

6.4.3 Equipment Procedures

The Lab has a procedure for safe handling, transport, and storage of testing equipment to ensure proper functioning to prevent contamination or deterioration. Test equipment (both hardware and software) is safeguarded from adjustments that would invalidate the test results. Procedures for each piece of measuring equipment are located in the appropriate room where the equipment is located.

6.4.4 Verification of equipment's functioning status

All items of equipment that go outside the control of the laboratory for a period is checked to ensure the function and calibration are satisfactory before being returned to service.

6.4.5 Required Accuracy

The equipment and related computer software are capable of achieving the accuracy required and suitable for the test specifications. Testing and verification programs are established for all items of equipment having a significant effect on results. All Lab equipment is tested and calibrated or checked to ensure it meets the equipment specification requirements and complies with relevant

standard specifications.

The procedures for checking newly received equipment are as determined by manufacturers

specification and /or those determined by the laboratory during procurement.

6.4.6 Measuring equipment calibration requirements

All equipment's use for any lab activity is being calibrated before put in use, and has a proper program to monitor the calibration status.

6.4.7 Calibration program

Central Lab for Construction Materials Testing (CTL) maintains a proper external and internal calibration programs for all laboratory equipment's which are in use. These programs are reviewed to check the calibration status of the equipment's.

6.4.8 Calibration Status

Calibration labels have a write-on surface and a pressure sensitive adhesive (or a piece of paper with company logo on it). The areas that are filled out include the person who performed the calibration, the date it was performed, the date it is due for re-calibration, and the equipment's identification number.

Measuring equipment that has failed calibration or is deemed out of service is labeled with Out of Service.

6.4.9 Out of Service Equipment

All Lab equipment subjected to overloading or mishandling, or shown to be defective, outside of specified limits or giving suspect results is taken out of service. Such equipment is isolated or clearly marked as out-of-service until it has been repaired and shown to perform correctly. The Lab examines the effect of the equipment problem on previous calibrations and implements any

nonconforming procedures, as required.

Out of service equipment is clearly marked as outlined in section 6.4.9.

The laboratory examines the effect of the defect or departure from specified limits on previous test/and or calibrations and institutes the "Control of Nonconforming Work" procedure

6.4.10 Periodic Checks

Periodic checks for equipment are carried out in a define procedure to maintain confidence in calibration status.

6.4.11 Correction Factors

Calibrations that give rise to a set of correction factors are updated along with all copies of this data (e.g., in computer software).

6.4.12 Safeguards and Adjustments

Test and calibration equipment including hardware and software are safeguarded from adjustments that invalidate test and/or calibration results/status.

1) Safeguards against adjustment for laboratory equipment (Hardware) include;
   - Detailed manufacturers manuals on the operation of the equipment.
   - Policies permitting only fully trained and competent personnel to operate equipment.
   - Access to the laboratory is restricted to authorized personnel.
2) Safeguards against adjustment software include;

- Password protection for important files and packages.
- Access to laboratory is restricted to authorized personnel.

6.4.13 Inventory and Maintenance Records

Records are maintained of each item of equipment and its software significant to the calibrations performed. The information related to service and maintenance is kept in individual equipment files/and or binders or stored electronically. Other information kept in files include;

- Condition when received (e.g., new, used, refurbished)
- Dates and results of calibration and/or verification and date of next calibration and/or verification.
- Performance history when appropriate (e.g., response time, drift, noise level)

References:

QP-106, Procedure for Calibration of Equipment's
QP-107, Procedure for Preventive maintenance
QP-108, Procedure for Corrective Maintenance
QP-109, Procedure for Testing & Measuring Equipment Control
QP-110, Procedure for Intermediate Checks of Equipment's

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6.5 Metrological Traceability

6.5.1 General

The laboratory has an established programmed and procedure (e.g., Equipment instruction manual) for calibration of all equipment that are used for testing /calibration including equipment for subsidiary measurements that has a significant effect on the accuracy of the test result.

It is necessary to establish a program for the maintenance and calibration of equipment. The program includes a system for selecting, using, calibrating, checking, controlling and maintaining:

- Measurement standards
- Reference standards used as measurement standards
- Measuring and test equipment used to perform test and calibration

Procedures are documented where appropriate. All measurements that contribute a defining role in testing accuracy are based directly or indirectly on reference standards, reference materials, certified reference materials or other standards or materials having appropriate trace ability.

6.5.2 Traceability to international system

Central Laboratory has policy to make sure traceability with internal standards following the bellow steps

a) Always select calibration lab who are accredited by internationally recognized firm. Like ENAS, DAC.

b) Uses certified and accredited reference materials for comparison and intermediate check.

c) Follow SI units for comparison

6.5.3 Reference Standards and Reference Materials

Where traceability of measurements to SI units is not possible or not relevant the laboratory shall use certified reference material supplied by competent supplier to give a reliable physical or chemical characterization of a material or use specified methods that are clearly described and agreed by all concerned parties.

The laboratory participates in proficiency testing and/or check sample programs. The ***Quality Engineer*** maintains the list of programs.

a) Reference Materials

Reference materials, used in the laboratory are traceable as defined in the above standard clause 6.5.3.

b) Reference Standards

The laboratory has programmed and procedure for calibration of reference standard. The reference standard shall be calibrated by approved bodies, which can provide trace ability to the International Standard. These reference standards are only used for calibration and not for regular testing purposes.

References:

QP-106, Procedure for Calibration of Equipment's

QP-112, Procedure for Reference Standards and Reference Materials

6.6 Externally Provided Products and Services

6.6.1 Quality

The lab uses only such services and supplies that are of the quality needed to ensure confidence in its testing. Services and supplies comply with specified requirements. Records of the actions taken to assure compliance are maintained.

Where no independent assurance of the quality of procured goods or services are available or the supplier's evidence is insufficient the laboratory ensures that purchased goods and services comply with specified requirements. Where possible and practical the laboratory ensures that equipment and chemicals are inspected, calibrated, or otherwise in compliance with any standard specification relevant to the calibration or test concerned.

6.6.2 Evaluation of Approved Suppliers

Laboratory shall maintain records on all pertinent supplier / subcontractors; these records shall be kept on file for a particular period of time, and shall be verified as part of the Internal Laboratory Audit Process.

Suppliers shall be evaluated and selected from a business perspective as well as for quality of service and maintain records of evaluation.

6.6.3 Technical Content

The description in the purchasing document may include type, class, grade, precise identification, specification, inspection instructions, other technical data including approval of test results, quality required and quality system standard under which they were produced. Purchasing documents for items affecting the quality of laboratory output shall contain data describing the services and supplies ordered. These purchasing documents shall be reviewed and maintained.

The completion of the Purchase Order (PO) is the responsibility of the ***Quality Engineer. They review the PO form for accuracy and approve the technical content by Quality Engineer*** or his deputy prior to release with their signature and the date. (Signature is not required if the PO generating electronically)

References:

- **QP-113, Procedure for Purchasing**
- **QP-114, Procedure for Subcontracting**
- **QP-115, Procedure for Evaluation of Suppliers**
- **QP-116, Procedure for Evaluation of Subcontractors**

7.1 Review of Requests, Tenders and Contracts

7.1.1 The Laboratory shall establish and maintain procedure for review of tenders as per the requirements of ISO/IEC 17025: 2017 as well as ISO 9001: 2015. The laboratory shall always ensure before accepting any order that it can fully meet the requirements of the customer.

The laboratory accepts enquiries either written or verbal. All verbal enquiries shall be recorded in the verbal enquiry form. All enquiries are processed by the ***coordinator*** or the respective Division. In case of Geotechnical Investigations, the tender or quotation shall be placed by the Division whereas in case of Chemical and Material Division, the same shall be placed by the coordinator.

The enquiry shall be reviewed by the Laboratory Supervisor or the ***Quality Engineer*** to ensure that the requirements are clearly defined understood prior to sending the offer or quotation. The review shall take into consideration for minimum but not limited to the following:

- laboratory capability to perform the work
- availability of the resources including the standard test method
- capability to meet the customer's requirements with regards to selecting the appropriate test method

The review shall be conducted to ensure that all aspects relevant to the services offered are covered and in a practical and efficient manner taking into consideration the financial, statutory and regulatory requirements and time schedule.

7.1.2 In the event that the customer is requesting a method that is inappropriate or out of date, the Laboratory Supervisor or the Quality Engineer shall discuss to the customer and recommend the appropriate method to use. If the customer still insists the requested method, this shall be noted in the quotation prior acquiring approval from the customer.

7.1.3 In the event that the customer is requesting a statement of conformity to a specification or standard, the specification or standard decision rule shall be clearly defined, communicated and agreed with the customer.

Based on the outcome of the review, tender or quotation shall be submitted clearly specifying all the scope of the services offered and if any works that are subcontracted to external service provider. The quotations / tender shall be followed up with the customer regarding its status and if required, further negotiations and revisions shall be made.

7.1.4 On receipt of confirmation of a job, the same shall be reviewed and any differences in the tender and the contract shall be resolved with the customer. On completion of the review, the confirmation or the contract shall be submit to the ***Quality Engineer*** for his final review & approval.

7.1.5 Any deviation from the requests, tender or contract shall be informed to the customer prior commencing the work and records for the same shall be maintained by the laboratory.

7.1.6 In case of any amendments in the contract after the work has commenced ***coordinator*** or the Laboratory Supervisor shall be reviewed and any such amendments shall be informed to the customer. All amendments and revisions shall be documented and informed to the concerned persons and the customer.

7.1.7 The Laboratory Supervisor shall coordinate with the customer in clarifying their request or any test witnessing requirements to verify customer specific laboratory activities.

7.1.8 All records related to the review of quotations, contracts including any significant changes and pertinent discussions with the customer related to customer requirements during the execution of the contract shall be maintained by the laboratory.

In case of non-approval of the tender, the coordinator, Laboratory Supervisor and the Quality Engineer shall take all the necessary steps to analyze and record the reason for failure. The analysis shall be discussed during the Management Review Meeting.

References:

QP-117, Procedure for Review of Tenders, Requests and Contracts

7.2 Selection, Verification and Validation of Methods

7.2.1 Selection and Verification of Methods

7.2.1.1 The laboratory shall always adopt appropriate test methods to meet the requirements of the customer as well as applicable regulatory requirements. The methods adopted shall be based on National / International standards and shall include sampling, handling, transport, storage and preparation, which ever applicable to the type of the test including measurement uncertainty as well as statistical technique for analysis of data.

7.2.1.2 All methods, procedures, instructions and other supporting documents shall be maintained by the laboratory where necessary for the consistent application of laboratory activities and shall be kept up to date including availability to personnel using the documents. A copy of the test methods and other relevant documents related to the testing or on the operation of the machine shall be readily available at all applicable locations for the reference of the technical staff. These documents are periodically reviewed as per the document review procedure and latest updates are made available for use.

7.2.1.3 The laboratory only uses the updated / latest edition of methods and shall be used unless otherwise requested by the customer or not appropriate / possible to use for the specific application.

7.2.1.4 When in case of non-availability of the standard test method, the test shall be carried out using methods specified in reputable technical organizations or in relevant scientific texts or journals or internal developed procedures subjected to the agreement of the customer or the procedure specified by the customer.

7.2.1.5 The laboratory shall conduct verification of the method prior to use to ensure it can achieve the required performance. Records of the verification shall be retained. Whenever the method is revised by the issuing body, verification shall be conducted to the extent necessary for the updated method.

7.2.1.6 When the laboratory intends to develop its own test method, the same shall be carried out under planned activity and shall be assigned / guided by competent personnel equipped with adequate resources. Periodic review shall be conducted to assure the needs of the customer are still being fulfilled. All activities relevant to the method development shall be approved and authorized.

7.2.1.7 Deviations from the standard test methods for all laboratory activities are acceptable only when such deviations are documented, technically justified, authorized and accepted by the customer.

7.2.2 Validation of Methods

7.2.2.1 The laboratory shall establish validation of test method for all non-standard methods, in-house methods or standard methods used outside their intended scope or otherwise modified. The validation process shall take into account the intended use of the method as well as costs, risks and technical possibilities. The validation process shall be thorough to ensure it meets the needs of the application or field of application.

7.2.2.2 The laboratory shall take consideration any changes in the originally validated method that will influence the initial validation results, the laboratory shall perform new validation process for the revised method.

7.2.2.3 The laboratory shall ensure that the performance of the validated methods as assessed for the intended use is relevant to the customer's needs and consistent with the specific requirements. Performance of validated method can include but are not limited to measurement range, accuracy, measurement uncertainty, limit of detection, limit of quantification, selectivity, linearity, repeatability or reproducibility, robustness or cross sensitivity and bias.

7.2.2.4 Records of the validation activities shall be maintained by the laboratory including validation procedure used, specification of the requirements, and determination of performance characteristics of the method, results obtained and a statement on the validity of method with details of its fitness for intended use. Such methods shall be ***approved by the Quality Engineer*** prior to the use and shall be subjected to review as per the document review procedure.

References:

QP-118, Procedure for Developing New In-house Test / Calibration
QP-119, Procedures for Estimation of Uncertainty

7.3 Sampling

7.3.1 When the laboratory performs the sampling for further testing at the laboratory, it shall be ensured that the sampling shall be carried out as per the standard test methods or local municipality guidelines, as applicable. In absence of such standards or guidelines, customer advised sampling techniques or methods shall be adopted by the laboratory and in which case, the adopted method shall be briefly described in the sampling report as well as in the test report.

In absence of above all, the laboratory shall have its own sampling plan, which shall be based on appropriate statistical methods and shall include controls of all factors that have influence on the test results. Such sampling plan shall be applied only with the approval of the customer and shall be available in the site where sampling is undertaken. When such plans are applied, the test report shall briefly describe the procedure adopted for the sampling.

7.3.2 The sampling method shall describe how the site or sample is being selected, sampling plan, how the samples are prepared or treated from a substance, material or product to yield a representative item required for subsequent testing.

7.3.3 When the laboratory performs the sampling, sampling certificate or data shall be maintained, which includes the following minimum but not limited to the following:

a. Sampling method used
b. Date and time of sampling
c. Data relevant to identify and describe the sample
d. Identification of the personnel performing the sampling
e. Identification of the equipment used
f. Environmental and transport conditions (if relevant to the type of the sample)
g. Identification of the sampling location (if necessary, include diagrams)
h. Deviations, additions to or exclusions from the sampling method and sampling plan

Reference Procedure:
QP-132 Procedure for Sampling and Sample Storage.

7.4 Handling of Test or Calibration Items

7.4.1 Procedures

The Lab has procedures for the transportation, receipt, handling, protection, storage, retention and disposal of test items to assure the integrity of the test and the interests of the laboratory and the customer. Samples are stored so as to ensure their integrity by preventing against deterioration, contamination, and loss of identity. It is recognized that this is a general statement, but details shall be elaborated in the relevant procedures/work instructions.

7.4.2 Identification of Test Items

The Central Laboratory has an established system for identifying test items throughout the life of the item in the Lab to ensure items cannot be confused physically. Sample labeling indicates the unique identification and conforms to applicable legal requirements.

7.4.3 Receipt

The lab records abnormalities or departures of the test item from the normal or specified condition required by the test method. The Lab consults the customer for further instructions before proceeding and records the discussion when there is doubt as to the suitability of a test item or when an item does not conform to the description provided, or when the test required is not specified in sufficient detail.

Arrangements are in place to ensure that elapsed time between sampling and testing does not exceed test method specifications (holding time).

7.4.4 Protection

The Lab has a procedure and information on storage and transport of samples, includes all information that may influence the test result. This procedure has provided to those responsible for taking and transporting the samples.

The laboratory establishes whether the sample has received all necessary preparation or

whether the customer requires preparation to be undertaken or arranged by the laboratory. Proper requirements for packaging, environmental conditions, and separation from

incompatible materials are observed. Where samples have to be stored or conditioned under specific conditions, these conditions are maintained, monitored and recorded, where necessary. Where a sample, or portion of sample, is to be held secure (e.g.; for reasons of record, due diligence or to enable re-check analysis), the laboratory has storage and security arrangements that protect the condition and integrity of the sample.

References:

QP-120, Procedure for Receiving, Identification and Registration of Test Sample

7.5 Technical Records

7.5.1 Technical records include the request, worksheets, calibration reports, staff records, training records, copy of test reports etc. Sufficient information shall be maintained to establish an audit trail. All test observations, environmental conditions, equipment's, person conducting the test, factors affecting the measurement result and person conducting the sampling if applicable shall be recorded to facilitate information in estimating the uncertainty as well as for establishing repeatability conditions. The person performing the test shall initial the record upon completion of the test. The record shall be checked by the Laboratory Supervisor prior to the preparation of the test report. All information, observations and calculations shall be clearly, accurately and permanently recorded at the time they are made.

7.5.2 Whenever correction is required to the technical record, the laboratory ensures that it is traceable to the original observations. The corrected information shall only be crossed out, not erased, and the correct value shall be entered alongside. Such amendment shall be signed or initialed by the person making the corrections. The same person shall make sure that such alterations will affect any other documents or records generated from that and in such case, the same shall be informed to all the concerned persons.

References:

QP-121, Procedure for Maintenance, Protection and Backup of Computerized Documents and Records

QP-122, Procedure for Control of Records

7.6 Evaluation of Measurement Uncertainty

7.6.1 The laboratory has procedure to identify the significant contributor to measurement uncertainty including sampling activity. The laboratory shall develop procedures for estimating the uncertainty for all in-house calibrations and tests, where applicable depending on the type and nature of the test and make a reasonable estimation using appropriate method of analysis.

7.6.2 The laboratory shall include in the establishing the uncertainty measurement of the calibration of its own equipment and evaluate the contributors to the measurement of uncertainty in calibration.

7.6.3 In cases where the nature of test method precludes rigorous calculation of uncertainty of measurement, the laboratory shall attempt to identify all the possible sources of uncertainty based on an understanding of the theoretical principles or practical experience of the performance of the method.

References:

QP-119, Estimation of Uncertainty

7.7 Ensuring Validity of Results

7.7.1 The laboratory has procedure for monitoring the validity of test results. The data collected from these monitoring activities are plotted to identify trends using statistical techniques to evaluate the results. The laboratory monitoring activities are planned, reviewed and includes where appropriate but not limited to:

a. Use of Reference or Quality Control Materials
b. Use of Alternative Instrumentation that has been Calibrated to Provide Traceable Results
c. Functional Check(s) of Measuring and Testing Equipment
d. Use of Checks or Working Standards with Control Charts, where Applicable
e. Intermediate Checks on Measuring Equipment
f. Replicate Tests or Calibrations Using the Same of Different Methods
g. Retesting or Recalibration of Retained Items
h. Correlation of Results for Different Characteristics of an Item
i. Review of Reported Results
j. Intra laboratory Comparisons
k. Testing of Blind Samples

7.7.2 The laboratory has program for monitoring its performance by comparison of its results with other laboratories where available and appropriate. The monitoring program is planned and reviewed and shall include but not limited to either or both:

a. Participation in Proficiency Testing
b. Participation in Inter-Laboratory Comparison other than Proficiency Testing

7.7.3 Results of the monitoring activities shall be analyzed, use to control and if applicable improve the laboratory performance. Whenever the results of the monitoring activities are found outside the pre- defined criteria, appropriate action shall be taken to prevent incorrect results from being reported.

References:

QP-123, Procedure for Internal Quality Control Program

7.8 Reporting of Results

7.8.1 The Laboratory reports the results of tests carried out accurately and clearly in accordance with the specific instructions in the test methods and applicable local municipality or other legal requirements. The Laboratory ensures that the results are reviewed and authorized prior to release. The Laboratory reports the results accurately, clearly, unambiguously and objectively and shall include all the information and shall include all the information required by the method used. The laboratory provides option to customers to report the results in simplified way and this shall be part of the agreement with the customer.

7.8.2 Each laboratory test report shall include at least the following information unless a valid reason for not doing so, in which cases the reason shall be stated and thereby minimizing possibility of misunderstanding or misuse.

a. Title
b. Name & Address of the laboratory
c. The location where the laboratory test was performed, including when performed at a customer facility or at sites away from the laboratory's permanent facilities or in associated temporary or mobile facilities.
d. Unique identification that all its components are recognized as a portion of a complete report and a clear identification of theend.
e. The name and contact information of the customer
f. Identification of the method used
g. Description of, condition of, an unambiguous identification of the item tested and when necessary, the condition of the test item
h. The date of receipt of the test item and the sampling date, where this is critical to the validity and application of the results
i. The date of performance of the test
j. The date of issuance of report
k. Reference to the sampling plan and sampling method used by the laboratory or other bodies where these are relevant to the validity of or application of the results
l. A statement to the effect that the results relate only to the item tested or sampled
m. The test results with, where appropriate, the units of measurement
n. Additions to, deviations or exclusions from the method

o. The identification of person(s) authorizing the test report and name of the person conducting the test
p. Clear identification when the results are from external providers

The laboratory is responsible for all the information provided in the test report, except when information is provided by the customer. Data provided by the customer is clearly identified. In addition, a disclaimer is included in the report when the information is provided by the customer and can affect the validity of results. The laboratory states in the report that the results apply to the sample received whenever the laboratory is not responsible for sampling the test item(s).

7.8.3 In addition to the above requirements, whenever the test results require interpretation, the following shall be included:

a. Information on specific test conditions, such as environmental conditions
b. Where relevant, a statement of conformity with the requirements or specifications
c. Where applicable, the measurement uncertainty when:
i. It is relevant to the validity or application of the test results
ii. Customer's requirements
iii. The measurement uncertainty affects the conformity of the tested sample to a specification limit

d. Where appropriate, opinions and interpretations
e. Additional information that maybe required by specific methods, authorities, customers or group of customers

7.8.4 Whenever sampling is conducted by the laboratory, the test report includes the following information relevant to sampling activities where necessary for the interpretation of test results:

a. The date of Sampling
b. Unique identification of the item or material sampled
c. The location of sampling including any diagrams, sketches or photographs.
d. Reference sampling Plan and sampling method

e. Details of any environmental conditions during sampling that can affect the interpretation of the results
f. Information required to evaluate measurement uncertainty for subsequent testing

7.8.5 The laboratory ensures whenever statement of conformity to a specification or standard is provided, the decision rule is documented taking into account the level of risk associated with the decision rule employed and apply the decision rule. The

laboratory report on the statement of conformity shall clearly identifies the following:

a. Which results the statement of conformity applies?
b. Which specifications, standards or parts thereof complies or does not comply
c. The decision rule applied unless inherent in the requested specification or standard

7.8.6 The laboratory ensures only authorized personnel shall release the opinions and interpretations statement in the test reports. The basis of the opinions and interpretation is documented to ensure traceability of the statement. The opinions and interpretation expressed in the reports is based on the results obtained from the tested sample and is clearly identified. Whenever opinions and interpretations are communicated through a discussion with the customer, the discussion shall be recorded and retained for traceability.

7.8.7 The laboratory ensures changes, amendments or re-issues the reports which are already been issued, this is clearly identified and where appropriate the reason for the change is included in the report. Amendments on the reports after issuance is made only in a form of a further document or data transfer which includes the statement “This report supersedes Report #... due to …” The laboratory ensures unique identification is assigned whenever it necessary to issue a completely new report and shall be traceable to the initial issued report (report that itreplaces).

References:

QP-124, Procedure for Issuance of Test Reports

7.9 Complaints

7.9.1 The laboratory has documented process to receive, evaluate and make decisions on complaints.

7.9.2 The process for handling complaints is readily available to all interested parties upon request. Whenever a complaint is receipt, the laboratory shall evaluate whether the complaint relates to the laboratory activities that is under its responsibility. The laboratory shall deal with all complaints that is confirmed under its responsibility. The laboratory shall be responsible for all decisions at all levels of the handling process of the complaint.

7.9.3 The laboratory process of handling complaints includes at least the following elements and methods:

a. Description of the process for receiving, validating, investigating the complaint and deciding the actions to be taken in respond to the complaint.
b. Tracking and recording complaints including actions undertaken to resolve the complaint
c. Ensuring appropriate action is taken relevant to the complaint

7.9.4 The laboratory assigns a responsible person to receive the complaint including gathering and verifying all necessary information to validate the complaint.

7.9.5 The laboratory is acknowledging receipt of the complaints and provides the status of the complaint including the outcome of it.

7.9.6 The laboratory communicates the outcome of the complaints to the customer by the Quality Department including reviewing and approval of the actions taken to address the complaints.

7.9.7 The laboratory provides formal notice to the customer regarding the closure of their complaints, the Quality Department shall be coordinating with the customer regarding the closure of their complaint.

References:
QP-125, Procedure for Handling Customer Complaints
QP-126, Procedure for Control of Non-Conforming Work & Corrective Acti

7.10.1 Non-Conforming Work

7.10.1 The laboratory has established procedure followed when any aspect of the laboratory activities or results of the completed work do not conform to the procedures or agreed customer requirements. The procedure ensures the following:

a. The responsibilities and authorities for the management of nonconforming work are defined.
b. Actions are based on the risk levels established by the laboratory including holding or repeating of the work and withholding of reports depending on the severity of the nonconformance.
c. Evaluation of the significance of the nonconforming work including analysis on previous results.
d. Decision is taken on the acceptability of the nonconforming work.
e. Establishing communication with the customer and recall of the provided work.
f. Defining the responsibility for authorizing the resumption of work.

7.10.2 The laboratory ensures retention of nonconforming work records including actions taken based on the risk levels established including the authorization of resumption work.

7.10.3 The laboratory implements corrective action whenever the evaluation indicates the nonconforming work could recur or that there is doubt on the conformity of laboratory's operations with its management system.

References:

QP-126, Procedure for Control of Nonconforming Work & Corrective Action

7.11 Control of Data and Information Management

7.11.1 The laboratory has access to data and information needed to perform laboratory activities. The laboratory has collection of standard test methods form National, International Standards including reference books from reputed organizations for adopting in the laboratory activities.

7.11.2 The laboratory ensure that the laboratory information management system used for the collection, processing, recording, reporting, storage and retrieval of data is validated for its functionality including proper functioning of interfaces within the laboratory information management system. The Laboratory information management system changes or any modifications shall be authorized, documented and validated prior implementation.

7.11.3 The laboratory ensures that the laboratory information management system is protected from unauthorized access. The access is only given to authorized person and access can only be done through the use of username and password. The laboratory information management system is safeguarded against tampering and loss. Only the service provider has the access and authorized to modify the system and the laboratory information management system is server-based application wherein it is also access controlled platform. The laboratory information management system server location is separate wherein only authorized person has the access and the server room environment is maintained for optimal working condition including ensuring the data and information integrity while in the server platform. The laboratory information management system has a built-in recording system to detect system failures and the authorized person is competent to address appropriate immediate and corrective action whenever necessary while the system is running.

7.11.4 The laboratory has IT department for monitoring the laboratory information management system and also the department is responsible for coordinating with the service provider regarding any concerns with the laboratory information management system.

7.11.5 The laboratory ensures the necessary instructions, manuals and reference data relevant to the laboratory information management system are readily available to all personnel using the system.

the system.

7.11.6 The laboratory ensures the calculations and data transfers is checked, verified and approved prior to releasing to the client.

References:

QP-121, Procedure for Maintenance, Protection and Backup of Computerized Documents and Records

QP-127, Procedure for Validation of Software

8.1.1: General

Central Lab for Construction Materials Testing (CTL) follows Option A to maintain management system in the organization, and addresses the following side of the ISO 17025 requirements.

8.1.2: Option A

Following **option "A"** Central Lab for Construction Materials Testing (CTL) management system includes the following

- Management system documentation
- Control of management system documents
- Control of records
- Actions to address risks and opportunities.
- Improvement
- Corrective actions
- Internal audits.
- Management reviews

8.2 Management System Documentation

8.2.1 The laboratory has established, documented and maintained policies and objectives in accordance with the requirements of this standard. The quality policy of the organization, approved by the ***Executive Director***, is defined and documented in Section 3.0 of this quality manual. The quality policy shall be subjected to review during the management review to ensure its continuing suitability. Divisional wise quality objectives are established to support and implement the quality policy and continual improvement.

8.2.2 The laboratory shall establish quality policy and shall address the competence, impartiality and consistent operation of the laboratory. Training programs are conducted to all the staff in the laboratory, whose work directly or indirectly affect the quality, regarding the awareness of the quality manual, policies, objectives and procedures. This will enable them to work together for the achievement of the management objectives. Responsibility for defining the quality system, implementing, monitoring its effectiveness and continually improve the system has been defined in this quality manual.

8.2.3 The quality planning includes identification and determination of quality system processes; priorities for continual improvement and resources needed to achieve quality objectives and to maintain and improve the management system. Quality plans are periodically reviewed to maintain the integrity of the management system during organizational or other changes.

8.2.4 The processes needed for the management system are identified in this quality manual and procedures. The documentation defines these quality system processes and their sequence and interrelations and instructs on how to implement and apply them throughout the organization. The management system documentation also defines criteria and methods needed to ensure that the operation and management system processes are effective. This usually includes assignment of responsibility and allocation of resources for the process and methods for monitoring and measuring the effectiveness of the process. The documented information will be retained to demonstrate that the processes are being carried out as planned.

8.2.5 The laboratory established a system wherein applicable management system documentation are accessible to relevant personnel involved in the laboratory activities to ensure consistent implementation and records are maintained to demonstrate that the processes are carried out effectively.

8.3 Control of Management System Documents

8.3.1 **Central Lab for Construction Materials Testing (CTL)** has well defined its scope of the management system documentation. The laboratory maintains a five-tier documentation structure as depicted in Appendix 'B' of this quality manual and detailed under. Establishment, revision and distribution of the documents are controlled including documents from external origin. New internal documents and its revisions are reviewed and approved prior to use by the designated authorities. All documents as part of the management system are identified with a unique identification number along with the latest issue and revision status. Appropriate documents shall be made available at all locations of use.

8.3.2 Central Lab for Construction Materials Testing (CTL) ensure that management system documentation:

8.3.2.1 Are approved for adequacy by relevant ***Quality Engineer*** prior to releasing. New internal documents and its document changes may be initiated by anyone in the organization by the use of document request form and hand over to the Quality Department. The requested changes will be subjected to review by the respective divisional / department managers depending on the type of the document. The Quality department shall maintain a list identifying the document review team members for the review of the documents identifying the type of the document and the reviewing function/s. Upon getting approval, the new internal document or document changes shall be prepared and issued for use reflecting the issue and the revision status.

8.3.2.2 Are periodically reviewed and updated whenever necessary. All documents are subjected to review at least once in a year to ensure its continuing suitability and compliance with applicable requirements. The Quality Department shall maintain a list of document review team members identifying the responsibility relevant to the type of document.

8.3.2.3 Are identified their status of current version including the information on the changes made to the management system documentation. Changes to the documents are subjected to review and shall be approved by the same function that performed the original review unless specifically stated. Where practically possible, the altered or the amended portions are marked in italics to easily identify the amended or the altered text. The amendment documents shall be distributed to all the function/s, which previous issue was distributed.

8.3.2.4 Are relevant versions of the management system documents available at points of use and the documents are issued as soft through Laboratory Quality Management System (LQMS) or in hard copies whenever LQMS is not yet available, in case of hard copies, the document will be stamped ("CONTROLLED") in blue color. Appropriate documents are readily distributed at all locations for the effective functioning of the laboratory.

8.3.2.5 Are unique identification is assigned to all internal management systems documents to properly, easily trace and control the documents, all internal originated documents are identified with document number. Appendix B of this Quality Manual details the documentation structure and the indexing of the documents.

8.3.2.6 Are prevented of unintended use of obsolete and are properly identified whenever retained for reference use. Obsolete documents are removed from all places of issue and destroyed. One copy of obsolete document will be maintained by Quality Assurance Department as hard or soft copies. If maintained as hard prints, it will be clearly identified as "SUPERSEDED"/ "OBSOLETE".

References:

QP-128, Procedures for Development of Procedure
QP-129, Procedure for Control of Documents

8.4 Control of Records

8.4.1 Central Lab for Construction Materials Testing (CTL) ensures that legible records are maintained to demonstrate fulfillment of the requirements of the implemented standards. Records are maintained to provide evidence that

- All activities, parameters and processes meet specified requirements
- Testing has been carried out as per the customer requirements
- Test results submitted to the customer are as per the standard test methods and delivered within the required time.
- The management system is implemented and adopted effectively.

8.4.2 Central Lab for Construction Materials Testing (CTL) established and maintained procedures for identification, collection, indexing, access, filing, storage, maintenance, protection, retrieval, backup, retention time and disposal of all records. Each of the Department shall maintain the records generated at the respective department according to unique identification number. All records are stored in place which prevents unauthorized access, damage, deterioration and loss. The files are maintained with unique file identification for easy traceability of the records.

Storage of Records

The records shall be stored in a place which provides easy traceability and avoids contamination or deterioration.

Amendments to Records

Where mistake occurs in records of observations, the mistakes shall be crossed out, not erased, and the correct value entered alongside. Such alterations shall be signed or initialed by the person making the corrections. The same person shall make sure that such alterations will affect any other documents or records generated from that and in such case, the same shall be informed to all the concerned.

Retention & Disposal of Records

All records shall be maintained for a period of not less than three (3) years from the date of origin. The retention period shall be further extended if requested by any of the interested parties or for any other legal or knowledge purposes. After the retention period, the records shall be disposed after properly tear or s*herded ensuring that the records could not be reused any way.

Electronic Records

All records which are stored electronically shall be properly backed up and the backup data shall be stored in safe and secure place which will avoid contamination or deterioration or unauthorized access or alterations. The laboratory shall maintain procedure for protection and back up of electronic records. Access to the electronic documents and records are limited through the use of the username and passwords in order to avoid corruption or alterations by unauthorized personnel.

References:

QP-121, Procedure for Maintenance, Protection and Backup of Computerized Documents and Records

QP-122, Procedure for Control of Records

8.5 Actions to Address Risk and Opportunities

8.5.1 **Central Lab for Construction Materials Testing (CTL)** shall identify associated risk and opportunities relevant to the laboratory activities in order to ensure the management system achieves its intended results, enhance opportunities to achieve the purpose and objectives of the laboratory, prevent or reduce undesired impacts and potential failures in the laboratory activities and achieve improvement.

8.5.2 Central Lab for Construction Materials Testing (CTL) has established process on planning the actions to address the identified risk and opportunities, integrate and implement the actions to the management system and evaluate the effectiveness of the actions. The Quality Department shall identify potential risk and opportunities associated to the laboratory activities and shall establish appropriate action to address the identified risk and opportunities including incorporating the necessary actions to the established management system.

8.5.3 The identified risk and opportunities including the actions to address them shall be discussed with the ***Laboratory Supervisor*** to ensure the actions are proportional with the potential impact on the validity of laboratory results.

8.6 Improvement

8.6.1 **Central Lab for Construction Materials Testing (CTL)** recognizes the importance of measurement, analysis and improvement of the management system to continually improve the effectiveness of the management system. All the elements of the management system are reviewed to ensure its continuing suitability depending on the type and volume of activity. Information and data pertaining to improvement are collected from several sources specifically these are:

a. **Internal Procedures**

Management System Procedures implementation provides information on the improvement of the activities within the laboratory. Process flow can give source of changes during implementation which is adopted in the laboratory activities to ensure alignment to the requirements of the standards.

b. **Policies and Objectives**

Policies and Objectives provides framework on the targets the laboratory needs to achieve. The data and information of the implementation is analyzed and actions are taken to improve the laboratory activities to achieve the set targets.

c. **External / Internal Audits**

The result of external and internal audits provides feedback regarding the continual maintenance of the implemented management system. The reports of internal and external audits shall be considered as a tool in identifying the areas for improvement. The Quality Engineer shall compile the data related to the audits at least once in a year and report in the Management Review Meeting along with the action plans.

d. **Corrective Actions**

Implementation of the corrective actions also provides a source of improvement. Improvement is applied to eliminate the non-conformance wherein the implementation of the corrective action is taken into effect

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e. **Management Review**

Management review provides status of the current implementation of the management system, the actions to attain the target generates improvement for established the management system. The monitoring process ensures the continual improvement of the management system in accordance to the requirements of the standard.

f. **Risk Assessment**

Risk assessment is reviewed and the potential actions to address the identified risks provide the improvement needed to the laboratory activities.

g. **Data Analysis**

Data from the measurement activities provide needed information on the actual status of the management system and reflects the required improvement to maintain the effectiveness of the established management system.

h. **Proficiency Testing Results**

The participation in International and national proficiency testing programs which ensures that the test results submitted by the laboratory is accurate and reliable thereby increasing the confidence of the test results within the customers. The Quality Department shall analyze the results of PTP's participated and shall include the number and type of the failures, if any and the effectiveness of the implemented corrective actions.

8.6.2 Central Lab for Construction Materials Testing (CTL) acquires feedback from the customers on the services / laboratory activities provided in a form of surveys. The feedback received shall be analyzed and used to improve the laboratory activities. Customer satisfaction is the principal objective of the quality system and the level of customer satisfaction is amongst the important measure of the effectiveness of the system. Customer satisfaction is measured by collecting and analyzing direct customer feedback and by measuring secondary indicators of customer satisfaction. Customer survey data are used by the top management to identify opportunities and priorities for improvement.

8.7 Corrective Action

8.7.1 **Central Lab for Construction Materials Testing (CTL)** has established process to address the occurrence of nonconformity in its laboratory activities and shall do the following:

8.7.1.1 Whenever nonconformity is identified through any of the sources viz, Customer complaints, Outlier PTP results, Internal Audits, IQC's, Process, etc. the Quality Engineer shall raise Corrective and Preventive Action (CAPA) form. The CAPA shall be registered by the Quality Engineer ***The laboratory supervisor is required to begin implementing corrective and preventive Action***.

8.7.1.2 When addressing the nonconformity, the actions shall identify the cause/s of the nonconformity so that it does not recur or occur within the laboratory activities. When a CAPA is raised, the first step is to identify the root cause. A careful study is required to correctly identify the root cause/s. Various factors such as calibration of the equipment, performance of the machine or the technician, raw materials or reagents used for the testing, sampling process etc. shall be taken into consideration for the root cause analysis.

8.7.1.3 Necessary actions needed shall be implemented. Upon identifying the root cause, the next step is to propose the corrective action clearly defining the responsibility of each action and the target date for completion of the action. Ensure that the proposed corrective action should eliminate / correct the identified nonconformity and provide the ways to avoid its recurrence. The corrective action shall be reviewed by the Quality Engineer. The proposal shall be forwarded to the Quality Department for review. The Quality Engineer shall check the appropriateness and effectiveness of the proposed plan prior to approval and ensure any documentation changes required upon implementation.

8.7.1.4 Effectiveness of the corrective action shall be reviewed. The implementation of such actions shall be planned and monitored. ***Quality Engineer and the Lab Supervisor*** shall monitor the implementation process and effectiveness of the corrective action.

8.7.1.5 Whenever necessary, all affected management system documentation shall be aligned with the implemented corrective action including the updating of risks and opportunities.

8.7.2 The corrective action shall be appropriate to the nature of the nonconformity encountered and shall be based on the root cause analysis conducted. Depending on the severity of the identified non conformity, ***the Quality Engineer shall have the authority to halt the work until necessary corrective actions are implemented. After correction, work resumes again***

8.7.3 Records of the activities regarding identification of root cause and corrective actions including the effectiveness of the implementation of the corrective action shall be maintained as evidence. All records shall be maintained with the Quality department.

References:

QP-126, Control of Nonconforming Work & Corrective action

8.8 Internal Audits

8.8.1 The laboratory shall establish and maintain procedure for conducting Internal Audits at regular intervals as per the planned schedule to ensure the effectiveness of the implemented management system and the management objectives including the requirements of the standard.

8.8.2 The internal audit activities shall ensure that audit program is planned, established, implemented and maintained including the frequency, methods, responsibilities, planning requirements and reporting taking into consideration the laboratory activities, changes affecting the laboratory and previous results of audits. Each of the branch laboratories shall maintain an audit program. The Quality Engineer is responsible for the preparation of the audit schedule. The schedule shall ensure that all the aspects of the management system are covered at least once in a year.

8.8.3 Based on the annual schedule of the Internal Audit, the Quality Engineer shall prepare the notification for monthly audit schedule specifying the date and time of the audit, the auditor/s, criteria and the scope of the audit. The date and time of the audit shall be prepared taking into consideration the availability of the auditee and the auditor. The schedule shall take care that no staff is auditing his own activity. The laboratory shall maintain a list of internal auditors.

8.8.4 The audit shall be conducted as per the schedule and the auditor shall record his / her findings during the course of the audit and prepare the Corrective and Preventive Action (CA/PA) form, if any, acknowledged by the auditee. The auditor shall prepare a summary of the audit in the respective audited area along with the copy of the CAPA's, discuss the findings to relevant concerned persons and forward to the Quality Engineer.

8.8.5 The CA/PA shall follow the procedure for Control of Nonconforming work and Corrective action as detailed in Section 7.10 and 8.7 of this Quality Manual. Corrective action shall be prepared without undue delay to eliminate the cause/s of the nonconformity including prevention to exist in other laboratory activities.

8.8.6 All the records related to the Internal Audits shall be maintained by the Quality Department.

References:

QP-111, Procedure for Internal Quality Audit
QP-126, Control of Nonconforming Work & Corrective action

8.9 Management Review

8.9.1 Management Review Meeting (MRM) is conducted periodically to evaluate the continuing suitability, adequacy and effectiveness of the quality system, identify opportunities for improvement and considers the need for change to the quality policy and quality objectives. Minutes of the Management Review Meeting are documented. Management review meetings are chaired by the Executive Director and attended by staff representing all divisions / departments. MRMs are conducted at least once a year or whenever there is organizational change or sudden breakdown in the system.

8.9.2 Input to the Management Review consists of information and data related to quality performance of the organization. At least this includes review of:

a. Changes in internal and external issues that are relevant to laboratory
b. Fulfillment of quality objectives
c. Suitability of Policies and Procedures
d. Status of actions from previous management reviews
e. Outcome of internal audits
f. Corrective Actions
g. Assessment by external bodies
h. Changes in the volume and type of work or in the range of laboratory activities
i. Customer or personnel feedback
j. Complaints
k. Effectiveness of any implemented improvements
l. Adequacy of resources
m. Result of risk identification
n. Outcomes of the assurance of the validity of results
o. Other relevant factors, such as monitoring activities and training

8.9.3 Results of management reviews are documented in minutes of MRM. The minutes shall detail all the topics discussed during the meeting and the action plans for improvement activities with clear responsibility of action and time frame. The minutes of the management review meeting is prepared by Quality Engineer and circulate among all attendees. Review output shall record all actions and decisions related to at least:

a. The effectiveness of the management system and its processes

b. Improvement of the laboratory activities related to the fulfillment of the requirements of the standard

c. Provision of required resources

d. Any need for change

References:

QP-130, Procedure for Management Reviews

	QUALITY MANUAL **SAMPLING FLOW CHART** **(ANNEX B)**	Issue No.	02
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		Prepared By	Quality Engineer
		Approved By	Executive Director

LABORATORY PROCESS FLOWCHART

Sample Coordinator	**Check and Receive Sample & Verify with the Finance Department, do we have the LPO/any valid documents to receive the sample or not?**
	⬇
Sample Coordinator	**Assign Lab Reference No. (Reference Log book and soft copy)**
	⬇
Sample Coordinator	**Hand Over the Request Form to Lab Supervisor for assigning the work to the Technician**
	⬇
Supervisor	**Forward the Sample to Testing Area and distribute the sample as per Standard requirements**
	⬇
Technician	**Conduct Test as per Requirements**
	⬇
Technician	**Prepare worksheet and calculate the result, hand over to Supervisor for checking**
	⬇
Data Entry Operator	**Prepare the Draft Copy of the report.**
	⬇
Data Verification	**Check the draft copy of the report and hand over to Data Entry Operator for final print**
	⬇
Quality Engineer	**Check the draft copy of the report and final print, sign. and hand over to the Accounts**
	⬇
Account Person	**Prepare delivery note & issue the final report to the customer. Keep copy with acknowledgement receipt.**
	⬇
Data Entry Operator	**Keeps back-up of the final report.**

Name	
Designation	**Laboratory supervisor**

Responsibilities

- Following up external calibration reports
- Checking In-house calibration results
- Prepares test method statements and quality procedures for monitoring compliance to international and local government quality standards.
- Ensure that material test report's backups are taken and submitted to the administrative supervisor on weekly basis.
- Ensures the laboratory's commitment to good professional practice, to the quality of its testing service to the clients, and to the compliance with internationally recognized standards of quality.
- Ensures all test requirements, including the methods used, are adequately defined, documented and understood.
- Conducts training sessions to Technicians and Assistant Technicians when authorized by the Quality Engineer
- Identify departures from the quality system or from the procedures for performing tests, and to initiate actions to prevent or minimize such departures.
- Avoid involvement in any activities that would diminish confidence in the laboratory's competence, impartiality, judgment or operational integrity.
- Specify the responsibilities of all personnel who perform or verify work affecting the quality of tests.
- Performing the following duties for Proficiency Testing programs
  - Delegating jobs to technicians
  - Analyzing results
  - Follow up corrective actions where necessary
- Ensure that testing personnel and trainees were provided with adequate supervision by person who is familiar with the method and procedures, purpose of each test, and with the assessment of the test result.
- Reviews the Quality System on a regular basis.
- Responsible to the Top Management to ensure confidentiality of the testing area
- Perform / conduct the Internal Quality Audit in Quality Management System with quality engineer.
- Keeps safe and clean environment by adopting safety procedures and environment control measures.
- And any task assigned to it by the administration

Name	
Designation	**Laboratory supervisor**

Authorities

- development, modification, verification and validation of methods
- The Laboratory Supervisor shall be competent in identifying significant deviations in the testing activities of the personnel performing
- Authorized to approve the material test reports and other documents as required by the management
- Rejection of samples that do not fit the specification.
- Evaluate the technicians who need training.
- Distributing tasks between technicians in proportion to the nature of work and their experience.

Name	
Designation	**Quality Engineer**

Responsibilities

- Ensures the establishment of the quality system and its maintenance in accordance with the ISO/IEC 17025:2017 International Standards.
- Improving, maintained, implementation of management system &compliance with ISO/IEC 17025:2017
- Reports on the performance of the quality system to the Executive Director for review as a basis for improvement of the quality system.
- Organizes the Management Reviews with the department in charge / Laboratory Supervisors the quality system in their sections as and when required.
- Studies and looks after customer's complaints.
- Formulates the Quality Policy of the laboratory together with the other key top management.
- Establishes and controls the documents and data control system.
- Ensures the regular performance of internal audits of laboratory procedures, including tests, internal calibrations, equipment maintenance, and all other aspects of the Quality System as when required
- Organizes the internal / external quality audits plan.
- Initiates follow up audit activities in order to verify them and record the implementation and effectiveness of the corrective and preventive actions taken.
- Verifies the quality system manual and procedures
- Ensures that laboratory's equipment calibrations are kept up to date and regular maintenance is performed on schedule. To withdraw and keep any items or equipment's that is out of calibration or found to be defective.
- Establishes the program for internal verifications, equipment maintenance and performance check
- Conducts the internal audits and prepares Non-Conformity Reports and Audit Report.
- corrective actions required.
- Carries out follow-up audit (ensures that CAs and PAs are implemented as planned and closes them.

Name	
Designation	**Quality Engineer**

- Performs regular internal audits of laboratory procedures, including tests, internal calibrations, equipment maintenance, and all other aspects of the Quality System as when required.
- Prepares and assists in the evaluation of laboratory check tests and inter-laboratory testing programs.
- Assists in formulating corrective and preventive actions for any non-conforming aspects of the laboratory operations, and to conduct follow-up assessments on the resolution of these non- conformities
- Assists in carrying out routine internal calibrations, equipment maintenance and performance check.
- Conducts training sessions to Technicians and Assistant Technicians when authorized by the Quality Engineer.
- Provides on the job supervision and advice to Team work
- Carries out other laboratory quality duties as instructed by the company management.
- Periodic follow-up of performance indicators and preparing reports on achievement rates in the laboratory and submitting them to the executive management
- Supervising the purchase of materials, equipment and services necessary for the laboratory, managing inventory, monitoring expenses, and developing marketing plans in cooperation with the technical department.
- Reviewing and updating procedures and work models, following up on the necessary licenses and commercial records, ensuring the authenticity and validity of all official documents, and renewing those that will expire in cooperation with the government relations representative.
- Cooperating directly with the accounting department and the technical department to prepare and monitor expenses and supervise other expenses
- Any other tasks assigned by the executive management

Authorities

- Updating the documents in accordance with the ISO/ IEC 17025:2017
- Approval of reports issued by the laboratory
- Proposing administrative decisions for the benefit of the work, obtaining the approval of the executive management regarding them, issuing internal circulars, and following up on the implementation of decisions and instructions.
- Proposing the appointment and training of employees, participating and supervising the evaluation of their performance, and submitting an annual recruitment plan
- Reviewing and approving employees' monthly worksheets, payrolls, and approving requests for permissions for delays, departures, and vacations of all kinds and submitting them to the executive management for final approval and renewal of employees' residencies and everything related to personnel affairs and providing support to them.
- Coordination with human resources on everything related to employee affairs

Name	
Designation	**Geotechnical Engineer**

Responsibilities

- Manage drilling data and drilling operations
- Manage & supervise drilling by Percussion/Rotary Method
- Maintaining the highest quality standards on sites
- Writing geotechnical recommendations
- Supervise Soil Penetration Test (SPT) with SPT sampler Tube method
- Determine the approximate elevations of the boreholes with respect to reference points.
- Determine the borehole locations at the site and on the driller report.
- Responsible to prepare Borehole Logs.
- Implementing plans according to scope of work for drilling operations to achieve target in time.
- Logging field samples in accordance with BS5930.
- Logging results of tests from the field in the driller report.
- Preparing final logs for the report.
- Preparing laboratory test schedules based on type of soils encountered.
- Supervising drilling activities.
- Checking that the activities in the field are carried out properly
- Reviewing samples to be taken.
- Assigning activities to rig operators in the field.
- Ensuring all work done according to schedule and standards of workman-ship.
- Checking in bore runs done by the driller
- Familiarize with the Quality Management System and implement QMS in the work area.
- Arrange NOC for the projects if it's required, in coordination with Site Supervisor.
- Coordinate with Geologist and solve the issues arising from the Site and prepare reports for management.
- Ensure that all the results from the laboratory sample description log sheet from Geologist is complete as per the schedule.
- Check the draft copy of the report and prepare the report.
- Ensure that Geotechnical test report's backups are taken and submitted to the administrative supervisor on weekly basis.
- And any task assigned to it by the administration

Name	
Designation	**Geotechnical Engineer**

Authorities

- Authorized to approve the Geotechnical test reports and other document as required by the management.

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