Quality Management System

ZYQ Testing Laboratory
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Date Prepared:
[Date]

Please note that this Quality Management System (QMS) was originated on _____. Any changes made after this date will be reflected on a later revision date indicated on the bottom of each respective page.

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Document Control Policy

Preparation and Revision Dates:

Each document within this Quality Management System indicates its preparation or revision date. Any changes made to this manual after the origination date shown above are reflected in an updated revision date noted at the bottom of each affected page.

Test Methods, Practices, and Specifications:

The laboratory maintains applicable standards through purchase or authorized licensing for use by testing personnel. The [Quality Manager] is responsible for confirming that these standards are current editions and are readily available to the employees performing testing.

Organization and Organizational Policies

Organization

Legal Name: _____
_____

Corporate Office Address: _____
Phone: _____

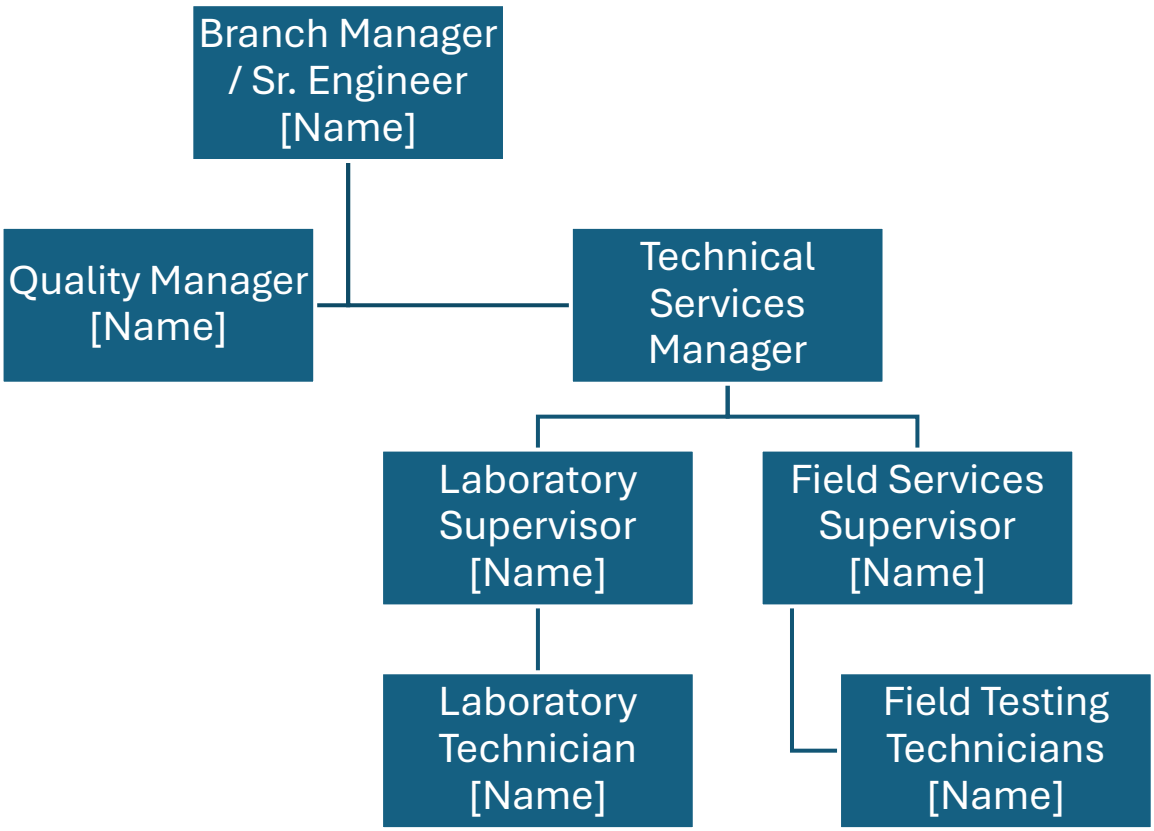
Local office:
_____
Phone: _____

Chief Executive Officer / _____
President / _____
Vice President / _____
Secretary / _____
Treasurer / _____

Parent/Subsidiary
Organization/_____
_____

Organization Chart

Note: If the laboratory has relationships with other partner organizations, or operating from more than one location, these relationships need to be reflected in this chart.



Quality Policy Statement:

Staff

Management Structure: Laboratory name
Location

CEO / President	
Branch Manager	
Technical Manager	
Technical Manager Backup	
Quality Manager	
Field Testing Supervisor	
Field Technicians*	
Laboratory Supervisor	
Laboratory Technicians*	

* All personnel who perform standard test methods and practices are required to adhere to the requirements of CMEC and R18 for technician regardless of position title.

Position Descriptions

Branch Manager / Senior Engineer

Requirements for Branch Manager / Senior Engineer

The Branch Manager / Senior Engineer position requires the following qualifications:

- Registered professional engineer with at least ___ years of experience in inspecting and testing of materials and construction.
- Must be familiar with and be able to use laboratory test results for engineering analysis and recommendations.
- Must be a motivated individual with excellent oral and written communication skills.
- Must be able to manage several projects and personalities simultaneously with a positive, effective attitude.
- Must have a proven record in business development. Must develop, manage and execute marketing plans.
- Must be able to recruit new staff and cultivate and grow existing, capable, energetic engineering staff into profitable project managers and client-servers.

The Branch Manager / Senior Engineer supervises the [Technical Services Manager and Quality Manager].

The Branch Manager / Senior Engineer reports directly to the President.

Technical Services Manager

Requirements for Technical Services Manager

The Technical Services Manager position requires the following qualifications:

- Registered professional engineer with at least ___ years of experience in inspecting and testing of materials and construction.
- Must be familiar with and be able to use laboratory test results for engineering analysis and recommendations.
- Must be familiar with AASHTO, ASTM and DOT standards for testing and inspection.
- Must be a motivated individual with excellent oral and written communication skills.
- Must be able to manage several projects and personalities simultaneously with a positive, effective attitude.
- Must be able to recruit new staff and cultivate and grow existing, capable, energetic engineering staff into profitable project managers and client-servers.

The Technical Services Manager supervises the Laboratory and Field Testing Supervisor in the performing of his duties of materials testing and inspection.

The Technical Services Manager reports directly to the Branch Manager.

The Technical Services Manager has overall responsibility for the technical operations of the laboratory.

The [_____] will serve as the Technical Service Manager in his/her absence.

Quality Manager

Requirements for Quality Manager

The Quality Manager position requires the following qualifications:

- Registered professional engineer with at least ___ years of experience in inspecting and testing of materials and construction.
- Must be responsible for maintaining the QMS and determining whether the quality management system activities are being implemented by staff.
- Must be familiar with AASHTO and ASTM and DOT standards for testing and inspection.
- Must be a motivated individual with excellent oral and written communication skills.
- Must be able to manage several projects and personalities simultaneously with a positive, effective attitude.
- Must be able to recruit new staff and cultivate and grow existing, capable, energetic engineering staff into profitable project managers and client-servers.

The Quality Manager reports directly to the [Branch Manager].

Laboratory Supervisor

Requirements for Laboratory Supervisor

The Lab Supervisor position requires the following qualifications:

- Must have at least ___ years of experience performing various asphalt, earthwork, concrete, masonry, cement, and aggregate testing, both in the field and in the laboratory.
- Must be thoroughly familiar with AASHTO, ASTM and DOT procedures and specifications.
- Must maintain applicable certifications/qualifications through a program approved by a state DOT, national, or regional authority for assigned responsibilities.
- Must be a motivated individual with excellent oral and written communication skills.

The Lab Supervisor supervises engineering testing technicians involved in performing lab testing and reviews their reports prior to being forwarded to the Senior Engineer for final review and signature.

The Lab Supervisor is supervised by the [Technical Services Manager].

Field Testing Supervisor

Requirements for Field Testing Supervisor

The Field Testing Supervisor position requires the following qualifications:

- Must have at least ___ years of experience performing various asphalt, earthwork, concrete, masonry, cement, and aggregate testing, both in the field and in the laboratory.
- Must be thoroughly familiar with AASHTO, ASTM and DOT procedures and specifications.
- Must maintain applicable certifications/qualifications through a program approved by a state DOT, national, or regional authority for assigned responsibilities.
- Must be a motivated individual with excellent oral and written communication skills.

The Field Testing Supervisor supervises field testing technicians involved in performing field testing and reviews their reports prior to being forwarded to the Senior Engineer for final review and signature.

The Field Testing Supervisor is supervised by the [Technical Services Manager].

Field Testing Technician

Requirements for Field Testing Technician

The Testing / Field Technician position requires the following qualifications:

- Must be thoroughly familiar with AASHTO, ASTM and DOT procedures and specifications.
- Must maintain applicable certifications/qualifications through a program approved by a state DOT, national, or regional authority for assigned responsibilities.
- Adequate mathematical skills, ability to pass written exam.
- Adequate oral and written communication skills.
- If the job requires solo work assignments outside the office, then a valid driver's license is required.
- Flexibility to work outside normal business hours as required.

The Field Testing Technician is supervised by the Field Testing Supervisor.

Laboratory Technician

Requirements for Laboratory Technician

The Laboratory Technician position requires the following qualifications:

- Must be thoroughly familiar with AASHTO, ASTM and DOT procedures and specifications.
- Must maintain applicable certifications/qualifications through a program approved by a state DOT, national, or regional authority for assigned responsibilities.
- Adequate mathematical skills, ability to pass written exam.
- Adequate oral and written communication skills.
- If the job requires solo work assignments outside the office, then a valid driver's license is required.
- Flexibility to work outside normal business hours as required.

The Laboratory Technician is supervised by the Laboratory Supervisor.

Biographies

Branch Manager / Senior Engineer

Name: _____

Title: Branch Manager / Senior Engineer

Certifications: _____
_____
_____
_____
_____

General Duties: General duties include overseeing the lab technicians to ensure that lab procedures are being correctly followed and all equipment calibrations are kept up to date.

Supervision Exercised / Received: Periodic review of lab paperwork, and equipment. Lab is subjected to yearly reference testing and / or assessment by CMEC and DOT.

Formal Education: _____

Experience: _____

Technical Services Manager

Name:_____

Title: Technical Services Manager

Certifications: _____
_____
_____
_____

General Duties: This individual acts as technical services manager of the laboratory. General duties include periodic testing of materials, overseeing the lab and technicians to ensure that lab procedures are being correctly followed and all equipment calibrations are kept up to date whenever the lab supervisor is either unavailable or unable to perform these duties.

Supervision Exercised / Received: Supervised by the Branch Manager/Senior Engineer.

Formal Education: _____

Experience: _____

Quality Manager

Name: _____

Title: Quality Manager

Certifications: _____
_____
_____
_____

General Duties: This individual acts as quality manager of the laboratory. General duties include overseeing that lab procedures are being correctly followed and all equipment calibrations are kept up to date whenever the lab supervisor is either unavailable or unable to perform these duties. This is to ensure that the Quality System Manual stays current and up to date if unforeseen circumstances prevent the Laboratory Supervisor from performing these duties.

Supervision Exercised / Received: Supervised by the Branch Manager/ Senior Engineer.

Formal Education: _____

Experience: _____

Laboratory Supervisor

Name: _____

Title: Laboratory Supervisor

Certifications: _____
_____
_____
_____
_____

General Duties: General duties include periodic testing of construction materials, overseeing the lab and technicians to ensure that lab procedures are being correctly followed and all equipment calibrations are kept up to date.

Supervision Exercised / Received: Supervised by [Technical Services Manager]. Conducts training and evaluations of the laboratory staff.

Formal Education: _____

Experience: _____

Field Testing Supervisor

Name: _____

Title: Field Testing Supervisor

Certifications: _____
_____
_____
_____
_____

General Duties: General duties include periodic testing of construction materials, overseeing the field technicians to ensure that field testing procedures are being correctly followed and all equipment calibrations are kept up to date whenever the lab supervisor is either unavailable or unable to perform these duties.

Supervision Exercised / Received: Supervised by [Technical Services Manager]. Conducts training and evaluations of the field staff.

Formal Education: _____

Experience: _____

Field Testing Technician

Name: _____

Title: Field Testing Technician

Certifications: _____
_____
_____
_____
_____

General Duties: General duties include periodic testing of construction materials. May be asked to perform equipment calibrations and checks by the Field Testing Supervisor.

Supervision Exercised / Received: Supervised by the Field Testing Supervisor. Receives training and annual reviews from the Field Testing Supervisor.

Formal Education: _____

Experience: _____

Laboratory Technician

Name: _____

Title: Laboratory Technician

Certifications: _____
_____
_____
_____
_____

General Duties: General duties include periodic testing of construction materials. May be asked to perform equipment calibrations and checks by the Laboratory or Field Testing Supervisor.

Supervision Exercised / Received: Supervised by Laboratory Supervisor. Receives training and annual reviews from the Laboratory Supervisor.

Formal Education: _____

Experience: _____

STAFF TRAINING PROGRAM FOR TESTING TECHNICIANS

The [Laboratory Supervisor and Field Testing Supervisor] are responsible for implementing the training programs. The [Quality Manager] is responsible for maintaining the training records. The training records shall be retained in the Materials Testing Laboratory office.

The following procedure shall be followed for each test:

1. The trainee is given a copy of the test method he/she is to perform.

2. The trainee studies the procedure, test report form, equipment and calculations to become familiar with the test.

3. The Laboratory Supervisor, Field Testing Supervisor, or by staff familiar with the test will first demonstrate the procedure and calculations for each test.

4. The trainee should repeat the test procedure until proficiency is demonstrated.

5. The Laboratory Supervisor, Field Testing Supervisor, or designee approved by the Quality Manager will observe the trainee demonstrate the procedure and acknowledge his/her ability to perform the test. The acknowledgement is recorded and included in the trainee's training record.

- Use of alternative methods that have been documented and approved by the [Quality Manager] or their designee is acceptable.

- A newly hired technician with prior experience performing a standard test method or practice may only need to undergo a competency evaluation to determine if training is required.

Technician Training Record

Technician Training Record Technician: _____					
Test Method	**Initial Training**	**Method of Training**	**Trained by:**	**Date**	**Comments**

METHOD FOR REVIEWING TECHNICIAN COMPETENCY

The Laboratory Supervisor and Field Testing Supervisor are responsible for evaluating the lab / field technician's competency at least once every ___ months by requiring each technician to demonstrate his/her ability to perform the AASHTO, ASTM, and/or DOT test procedures for which they have been trained to perform.

For each technician, the Supervisor shall record the test demonstrated, the date of the demonstration, and the results of the evaluation. The Laboratory Supervisor or Field Testing Supervisor shall date each entry on the evaluation record.

If an external certification or assessment program is used as a means of evaluating competency, the date of the evaluation and the name of the evaluator shall be recorded on the competency evaluation record.

If an unsatisfactory result is recorded for a specific test, the Supervisor shall review all observed deviations from the standard test method with the testing technician, observe the technician re-demonstrate the procedure and record the results as stated above.

The [Quality Manager] is responsible for maintaining records of technician competency evaluation records.

Technician Evaluation Record

Technician Evaluation Record Technician: _____					
Test Method	**Initial Training**	**Method of Evaluation**	**Evaluated by:**	**Date**	**Comments**

Procedure for Handling Customer Complaints

Upon receipt of a customer complaint the following actions shall be taken:

1. The [Quality Manager, Technical Services Manager, and Laboratory Supervisor] shall be notified.

2. The [Quality Manager, Technical Services Manager, or Laboratory Supervisor] contacts the source of the complaint to verify the specifics of the complaint and establish a resolution date (if necessary)

3. The [Quality Manager, Technical Services Manager, or Laboratory Supervisor] shall review all specific technical data and all calculations shall be checked for accuracy.

4. The technician or technicians performing the tests are consulted by the [Quality Manager, Technical Services Manager, or Laboratory Supervisor] to discuss the specific circumstances.

5. The [Quality Manager, Technical Services Manager, or Laboratory Supervisor] shall formulate an appropriate reply to the complainer.

6. The [Quality Manager, Technical Services Manager, or Laboratory Supervisor] shall prepare a Diagnostic and Corrective Action Report summarizing the action taken.

Internal Audit Procedure

The [Quality Manager] shall review the following records, reports, and associated documentation every ___ months to assure that the established quality procedures are being followed:

1. Quality Management System policies and procedures, including document control
2. Staff member adherence to the laboratory's QMS policies and procedures
3. Technician Training Records
4. Technician Competency Evaluation Records
5. External assessment (on-site assessments) completion and any resulting corrective actions
6. Proficiency Sample Reports and any resulting corrective actions
7. Previous Internal Audit findings and any resulting corrective actions
8. Management Review findings and any resulting corrective actions
9. Customer complaints and any resulting corrective actions
10. Records retention
11. Equipment calibration, standardization, check and maintenance lists and records
12. Test records and reports

1. Records, reports, corrective actions, etc. are reviewed to ensure completeness and conformance to the requirements of R18 and any other applicable quality management system standards to ensure that established policies and procedures are being followed. Such documentation is also checked to ensure a minimum of 5 years retention. Access to AASHTO and ASTM standards is also evaluated.
2. Quality management system policies and procedures are reviewed to ensure conformance to the requirements of R18 and any other applicable quality management system standards.
3. Interviews with applicable staff shall be included with the audit to ensure that policies and procedures accurately reflect current practices.
4. The findings of the internal audit shall be recorded on the Internal Audit Check Sheet.
5. After each ___ month review the [Quality Manager] will discuss any deficiencies noted with the appropriate staff to make sure all corrective actions are taken. All documents reviewed and the Internal Audit Check Sheets are filed in this QMS.

Internal Audit Checklist

Are records and corrective actions complete:

1. Conformance to QMS policies and procedures, including document control? ___
    a. ASTM and/or AASHTO standards updated and accessible to staff performing testing? ___
2. Staff member adherence to the laboratory's QMS policies and procedures? ___
3. Technician training and records? ___
4. Technician competency evaluations? ___
5. External assessment completion and resulting corrective actions? ___
6. Proficiency sample reports and any resulting corrective actions? ___
7. Previous Internal Audit findings and any resulting corrective actions? ___
8. Management Review completion, findings, and any resulting corrective actions? ___
9. Customer complaints and any resulting corrective actions? ___
10. Records retention? ___
11. Equipment calibration, standardization, check and maintenance lists and records? ___
12. Test records and reports? ___

Date: _____
Audit conducted by: _____
Additional participants: _____
_____

Management Review Procedure

The Quality Manager and laboratory's top management, including the Technical Services Manager shall meet to review and discuss the laboratory's QMS policies, procedures and records at planned intervals not exceeding 12 months. The purpose of the review is to ensure the continuing suitability and effectiveness of the QMS in satisfying the relevant requirements, including those specified in R18, and to introduce any necessary changes or improvements. The [Quality Manager] is responsible for coordinating the management review.
At a minimum, the following information shall be included and documented in the management review:

1. Summary of follow-up actions from the previous management review,
2. Results of internal audits,
3. Results of external monitoring audits and assessments
4. Results of proficiency sample performance trends
5. Status of corrective actions,
6. Personnel staffing changes and training needs,
7. Effectiveness of current QMS policies and procedures,
8. Customer Complaints.

Results of management reviews, including the actions that arise from them, shall be recorded.

Management Review Record

Date:

Names of Participants:

1. Summary of follow-up actions from the previous management review:

2. Results of internal audits:

3. Results of external monitoring audits and assessments:

4. Results of proficiency sample performance trends:

5. Status of corrective actions:

6. Personnel staffing changes and training needs:

7. Effectiveness of current QMS policies and procedures:

8. Customer Complaints:

Corrective Action Procedure

1. The [Quality Manager, Technical Services Manager, or Laboratory Supervisor] is responsible for implementing corrective action when nonconforming work or departures from policies and procedures have been discovered. The [Quality Manager, Technical Services Manager, or Laboratory Supervisor] shall begin an investigation to determine the cause(s) of the problem(s).

2. The corrective action procedure shall be implemented for nonconformities in the following areas: internal audits; management reviews; customer complaints; external assessments; and when low ratings on proficiency sample testing are received.

3. The [Quality Manager, Technical Services Manager, or Laboratory Supervisor] shall prepare a Diagnostic and Corrective Action Report summarizing the action taken. Records of corrective action shall be maintained.

4. The corrective action process will be completed within the following timeframe: _____ days.

Diagnostic and Corrective Action Report Form

Test Procedure:	**Date:**

Non-Conformity Description:
Immediate Action *taken to prevent this nonconformity from affecting test results*
Root Cause Analysis:
What are the reason(s) that allowed the nonconformity to happen:
What improvements to the quality management system can be implemented to prevent a similar finding:
Planned Monitoring Activities *to check the effective implementation of the improvements identified above:*

Made By:	**Approved By:**	**Date:**

Records Retention

Quality Management System Records:

Retention:
Records pertaining to external assessments, internal audits, management reviews, proficiency sample testing, test technician training and evaluation, personnel, test data and reports, customer complaints, corrective actions, and equipment calibration, standardization, check, maintenance activities shall be retained by the laboratory for a minimum of five years.

Storage:
These records shall be stored in the [Quality Manager's] office.

Disposal:
The records will be disposed of by shredding after the specified retention period.

Equipment Inventory

Type of Equipment	Manufacturer	Model #	Serial #	Date in Service

Equipment Calibration / Standardization / Check / Maintenance Policies and Procedures

General Policies:

1. Required equipment used shall be calibrated at specific intervals following the general procedures below.
2. Newly acquired equipment without manufacturer's certification and equipment that has not been calibrated or checked because it has not been in service shall be calibrated or checked before being placed in service.
3. When any of the equipment has been overloaded, mishandled, giving suspect test results, or is not meeting specification tolerances, the [Quality Manager] will remove the test equipment and tag it for repair. The test equipment must be repaired to meet specification tolerances and then calibrated prior to returning to service.
4. Equipment and measurement standards that may be affected by moving them to a new location or environment shall be calibrated, standardized, or checked before being placed in service.

General Procedures:

1. The [Quality Manager] will maintain a record on each piece of equipment requiring calibration, standardization, checks, and maintenance. The record for each piece of equipment shall contain dated, detailed records of calibration, standardization, checks, and maintenance performed. These records will be kept in the Quality System Manual in the [Quality Manager's] office.
2. The Quality Manager will keep a schedule [**on the lab wall / in Microsoft Outlook / in monthly folders**] for each month of the year, which contains a list of equipment to be calibrated, standardized checked, and maintained that month.
3. The [Quality Manager] will review all equipment calibration, standardization, check, and maintenance records.
4. In-house equipment calibration, standardization, check, and maintenance procedures are found in the Quality System Manual. If a standard practice or test method already exists that describes the procedure for equipment calibration, check, standardization, or maintenance, the laboratory may reference the existing procedure.
5. The in-house equipment used to calibrate, standardize or check test equipment, such as a traceable thermometer, shall have a certificate included in this Quality System Manual.

Reference Standards:

1. The reference standards used for performing any in-house calibrations or standardizations shall be sent out for calibration within the maximum allowable intervals listed in the Annex of AASHTO R18. The reference standards shall be calibrated by a calibration agency meeting the requirements of ISO/IEC 17025. The calibration record shall include estimates of measurement uncertainty.

2. Measurement standards shall not be used for general testing unless they are calibrated prior to their next use as a measurement standard.

3. Calibration records shall show measurement uncertainty no greater than half the accuracy required by the equipment being calibrated or standardized.

4. Measurement standards shall be calibrated by one of the following:

    a. A calibration agency accredited to ISO/IEC 17025 by an accreditation body that is a signatory to the International Laboratory Accreditation Cooperation Mutual Recognition Arrangement (ILAC MRA);

    b. A national metrology institute (NMI) such as the National Institute of Standards and Technology (NIST); or

    c. A state agency with a current verifiable certificate of measurement traceability issued by the NIST Office of Weights and Measures.

Equipment Calibration / Standardization/ Check / Maintenance Schedule

Equipment	Calibration / Standardization/ Check / Maintenance Interval	Calibration / Standardization Check/ Maintenance Procedure	External Agency Used (if applicable)

Sample and Test Specimen Management

Preparing Sample Log:
Each sample brought into the lab for testing is recorded in a logbook maintained by the active technician or the Lab Supervisor. The following is recorded for each sample.

1. Sample number (this is assigned sequentially to each line of the logbook).
2. (Name) contract number.
3. Description of the material.
4. Supplier of the material.
5. Location from which the sample was taken.
6. Name of person(s) who sampled the material.
7. Date of sampling.
8. Date the sample was received in the materials laboratory.

Identification:
Each sample and test specimens will be marked with date and job number if applicable.

Storage:
Samples and test specimens will be stored in accordance with applicable standards or specifications (e.g., ASTM, AASHTO, or other governing specifications).

Retention:
Samples and test specimens with acceptable test results are generally discarded when testing is completed. Samples or test specimens with failing test results are retained until review of the results is complete. At that time the decision is made to retain or discard the sample or test specimens.

Disposal:
All materials are to be disposed of in a safe and non-hazardous manner.

Test Records and Reports

The [Quality Manager] is responsible for maintaining test records and reports. Test records and reports may be generated, retained, published, and transmitted electronically or on paper. Completed reports are distributed by _____.

Test Records
The laboratory will maintain test records that contain sufficient information to permit verification of any test report. The following information will be clearly and accurately presented in the test records:

1. Original observations, calculations, and derived data;
2. Identification of test specimen;
3. Identification of personnel involved in sampling
4. Identification of personnel involved in testing
5. The date testing was performed

Preparing and Checking Test Reports:
Test data are recorded on standard worksheets by the testing technician and are submitted to [Lab Supervisor] for review. The worksheets are kept on file by date and log number. The testing technician accepts responsibility for the correctness for the form.

Test Reports
The laboratory will prepare test reports that clearly and accurately present the following information:

1. Identification of the report and the date issued;
2. Description, identification, and condition of the sample or test specimen, where necessary, for interpretation of results;
3. Identification of the standard test method used;
4. Test results and other pertinent data required by the standard test method;
5. Deviations from, additions to, or exclusions from the test method(s), if applicable;
6. Identification of any test results obtained from tests performed by a subcontractor, if applicable;
7. Name of person accepting technical responsibility for the test report, if applicable;

The information below will be available and traceable to the reports:

1. Name and address of the testing laboratory where the testing took place;
2. Name and address of the client or identification of the project;
3. Date of receipt of the sample or test specimens.

Amending Reports:
When a report must be amended, a report form shall be filled out indicating the amended test results; the report status field “amended” on the report form shall be checked; the comment section on the report form shall state the reason for the amended report; the amended report shall be attached to the original report and

processed in the normal manner, and the amended report shall be filed with the original report.

Test Records and Retention:
The original test worksheets are kept on file for a minimum of 5 years and then shredded.

Subcontracting

On occasions, services are required that are beyond the capabilities of this laboratory. When this occurs, a qualified laboratory will be selected to perform the required tests. This selected laboratory will be accredited through a nationally recognized accreditation authority. Test results obtained from subcontractors will be identified as such on the laboratory's test reports.

Calibration Service Provider Selection Policy

1. The [Quality Manager] is responsible for reviewing and approving calibration service providers under this policy and retaining documentation of this review.

2. The laboratory shall conform to its accrediting body's requirements for the selection and use of calibration agencies accredited to ISO/IEC 17025.

3. External agencies that calibrate measurement standards or that calibrate equipment within the laboratory shall conform to the requirements of ISO/IEC 17025.
    a. Manufacturers that perform proprietary calibrations on the equipment they produce are not required to maintain accreditation for that calibration activity.

4. Measuring and test equipment having a significant effect on the accuracy and validity of the test results and that is calibrated by an external calibration agency shall be calibrated by one of the following:

    a. A calibration agency accredited to ISO/IEC 17025 by an accreditation body that is a signatory to the International Laboratory Accreditation Cooperation Mutual Recognition Arrangement (ILAC MRA);
        i. The equipment and range of measurement used must be within the calibration agency's accredited scope (this can be found on the accreditation body's website).

    b. A national metrology institute (NMI) such as the National Institute of Standards and Technology (NIST); or

    c. A state agency with a current verifiable certificate of measurement traceability issued by the NIST Office of Weights and Measures.

5. The laboratory shall ensure that all testing and calibration results are traceable wherever possible, through NIST or another National Metrology Institute (NMI) to the International System of Units (SI units). Calibration certificates shall, where applicable, provide indication of traceability, through the inclusion of the following information clearly visible on the certificate:

    a. The uncertainty of measurement associated with a specified range of measurement for a specified measurement parameter (e.g., force, mass, temperature),

    b. The symbol of an accreditation body that has recognized the competence of the calibration agency through accreditation, or equivalent.

Assuring the Quality of Results

The laboratory monitors the validity of its test results through the following procedures:

a. Participation in proficiency sample testing; and

b. Participation in external assessment programs

Records:

The laboratory retains the results of these monitoring activities, including any steps taken to determine the cause(s) of nonconformities identified through this monitoring and the corrective actions taken in response.

Participation in Proficiency Sample Programs

Participation: Lab participates in yearly proficiency sample testing by CMEC.

Identifying Low Rating on Proficiency Samples:
Any test result that falls outside of the acceptable limits.

Procedures to Follow When Poor Results Occur:

1. Check the report submitted for correct data entry.
2. Check that the data transferred from the worksheet to the report was correct.
3. Check the calculations on the worksheet.
4. Check the equipment used to perform the test meets spec.
5. Repair or replace equipment if necessary.
6. Evaluate the technician that performed the test.
7. Prepare a Diagnostic and Corrective Action Report summarizing the results of the investigation and any corrective action taken.
8. Corrective action process shall be completed and documented within the timeframe established in this QMS's Corrective Action Procedure.

Participation in External On-Site Assessments

Participation: Lab is assessed yearly by CMEC and DOT

Procedures to Follow When Deficiencies are Reported:

(Apparatus Deficiencies)

1. Determine if equipment meets specification requirements.
2. If equipment is found to be defective take necessary steps to repair or replace it.
3. Prepare a Diagnostic and Corrective Action Report summarizing the results of the investigation and any corrective actions taken.

(Procedural Deficiencies)

1. Review the procedural deficiency with the technician that performed the test.
2. Observe the technician perform the test properly.
3. Prepare a Diagnostic and Corrective Action Report summarizing the results of the investigation and any corrective actions taken.

(Quality System Deficiencies)

1. The [Lab Supervisor] reviews the deficiencies cited by the evaluator with the responsible technician.
2. Corrective actions are taken.
3. The [Lab Supervisor] shall prepare a Diagnostic and Corrective Action Report summarizing the results of the investigation and the corrective actions taken.