

Quality System Manual

Georgia Department of Transportation
Office of Materials and Testing
15 Kennedy Drive
Forest Park, Georgia 30297

Ian Rish, P.E. State
Materials Engineer

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TERMINOLOGY AND ABBREVIATIONS

1. AASHTO - American Association of State Highway and Transportation Officials
2. AASHTO re:source - AASHTO Accreditation Program (Formerly AMRL)
3. ASTM - American Society for Testing and Materials
4. CCRL - Cement and Concrete Reference Laboratory
5. CET - Civil Engineer Technologist
6. CVP - Calibration and/or Verification Procedures
7. FHWA - Federal Highway Administration
8. GDOT - Georgia Department of Transportation
7. GDT - Georgia Department of Transportation
10. OMAT - Office of Materials and Testing
11. SME - State Materials Engineer
12. SOP - Standard Operating Procedures
13. QM - Quality Manager
14. QSM - Quality System Manual
15. QUALITY SYSTEM - The organizational structure, staff responsibility policies, standard operating procedures, and processes which will assist the Laboratory in achieving quality objectives.

**Georgia Department of Transportation
Office of Materials and Testing**

Quality System Manual

Introduction

This Quality System Manual has been prepared in accordance with the requirements outlined in AASHTO R18, Establishing and Implementing A Quality Management System For Construction Materials Testing Laboratories.

This manual is intended to provide specific guidelines for the establishment and maintenance of a Quality Management System for the Office of Materials and Testing (OMAT). The purpose of this Quality System Manual is to describe or refer to quality control procedures that will be conducted within this Office on a routine basis. Within this manual are descriptions of the various elements of the Quality Management System and how they are to be implemented.

Included within this manual are documents indicating organizational structure, staff responsibilities, standard operating procedures, and the various processes which have been implemented to assist this Office in the maintenance of our quality management objectives. In addition, described or included as a part of this manual are the activities associated with the development of policies, standard operation procedures, standard forms, charts, listings, record keeping requirements, and actions to be taken by OMAT Personnel in complying with quality control procedures.

The Office of Materials and Testing of the Georgia Department of Transportation has the responsibility of conducting standard and non-standard tests on highway construction and maintenance materials. In addition, OMAT has the responsibility for the testing and evaluation of new products and making decisions concerning the feasibility of incorporating the use of these products into the State's construction and maintenance programs. The numerous and various tests conducted by this Office and the final test reports that are distributed are used to make important construction, maintenance, and environmental decisions. Therefore, it is imperative that these decisions be based on experience, sound judgment, and test results that are of the highest quality.

This manual and our Quality Control Systems described within will be a valuable resource to this Office if effectively applied throughout the various testing units that conduct tests by AASHTO, ASTM, or GDT methods. Adequate training and evaluation of technicians in conjunction with mandated documentation, and verification and calibration of equipment will assist this Laboratory in meeting all Quality Control objectives.

The purpose of the Quality Systems Manual is not to guarantee that the Quality Control Goals of this Laboratory are being met. Rather, it is the responsibility of each individual technician and supervisor to strive for quality testing on a daily basis. PRIDE (Personal Responsibility In Daily Effort) in the performance of our assigned duties in combination with the initiation and maintenance of our Quality Control System will help ensure the overall success of this program.

List of AASHTO Accreditations

OMAT is accredited by AASHTO in the areas listed below. The contents of this manual apply to all areas of testing.

- 1) Asphalt Binder
- 2) Cutback Asphalt/Emulsified Asphalt
- 3) Asphalt Mixture
- 4) Aggregate Testing
- 5) Soils
- 6) Portland Cement Concrete
- 7) Hydraulic Cement

1 TEST METHODS AND PROCEDURES

The Office of Materials and Testing shall electronically maintain copies of standard and non-standard procedures (AASHTO, ASTM, GDT, etc.) for all tests performed within the various testing units. These books, manuals, or copies of specific test procedures shall be electronically available for each testing unit or on the ASTM Compass website. These procedures and specifications shall be updated as required to ensure that the most current editions are available and readily accessible for use by OMAT employees.

2 PRINCIPLE MANAGEMENT STRUCTURE OF LABORATORY

Legal Name and Address: Georgia Department of Transportation
Office of Materials and Testing
15 Kennedy Drive
Forest Park, Georgia 30297

Ownership: State of Georgia

Management:

<u>Position</u>	<u>Name</u>
Transportation Engineering Administrator (State Materials Engineer)	Ian Rish, P.E.
Transportation Engineering Assistant Administrator Assistant Materials Engineer (Testing Bureau)	Vacant
Transportation Engineering Assistant Administrator Assistant Materials Engineer (Technical Assistance Bureau)	Peter Wu, Ph.D., P.E.
Transportation Engineering Assistant Administrator Assistant Materials Engineer (Geotechnical/Environment Bureau)	Glen E. Foster, P.E.
Transportation Engineering Assistant Administrator Assistant Materials Engineer (Quality Administration Bureau/Pavement)	Vacant

3 ORGANIZATIONAL CHARTS & QUALIFICATIONS

The Office of Materials and Testing is located in the Construction Division of the [Department of Transportation](#). The Office of Materials and Testing shall maintain an [organizational chart](#) that accurately indicates the various personnel positions and the lines of authority. The organizational chart(s) will be updated on a quarterly basis. After the changes are completed, an updated organizational chart will be posted.

3.1 Class Specifications for Supervisory and Technical Positions on the Organizational Chart

The Office of Materials and Testing shall maintain a class specification document which describes the position, general duties, required skills, education and work experience, and supervisory requirements for all positions (including GDOT Consultant Personnel) within OMAT. The complete listing of titles and general job descriptions shall be maintained at the following web addresses below:

<http://doas.ga.gov/assets/Human%20Resources%20Administration/Job%20Code%20Catalogs/Job%20Code%20Catalog%20-%20Engineering%20080420.pdf>

<http://doas.ga.gov/assets/Human%20Resources%20Administration/Job%20Code%20Catalogs/Job%20Code%20Catalog%20-%20Transportation%20080420.pdf>

<u>JOB TITLE</u>	<u>JOB CODE(S)</u>
State Materials Engineer	ETM123
Assistant State Materials Engineer, Administrator	ETM122,TRM032
Materials and Testing Branch Chief	ETM041,TRM030
Materials and Testing Branch Supervisor	TRP054
Materials and Testing Unit Supervisor	TRP053
Testing Management Operations Supervisor	TRP052
Program Operations Manager	TRP052
Laboratory Test Supervisor	TRP050,TRP051
Special Projects Coordinator	TRT053
Laboratory Test Technician	TRT050 to TRT053
Engineering Technician	TRT050 to TRT053
Technical Services Specialist	TRP050 to TRP052

3.2 Biographical Sketches of Supervisory and Consultant Personnel

The Office of Materials and Testing shall maintain a biographical summary document which accurately indicates the education, work experience, special license or certifications, study courses, and current position of all supervisory and consultant personnel. These documents shall be maintained and updated annually as a part of the Quality Management System. These documents shall be electronically filed for the following:

- Transportation Engineer Administrator
- Transportation Engineer Assistant Administrator
- Materials and Testing Branch Chief
- Materials and Testing Branch Supervisor
- Materials and Testing Unit Supervisor
- Program Operation Manager (Quality Manager)
- Laboratory Test Supervisor II
- Laboratory Test Supervisor I
- Laboratory Test Technician Supervisor I
- GDOT Consultant Personnel

3.3 Technical Manager of the Office of Materials And Testing (State Materials Engineer)

The State Materials Engineer, Mr. Ian Rish, shall have the overall responsibility for the administrative and technical operation of the Office of Materials and Testing. In the Engineer's absence, Dr. Peter Wu, shall serve as Technical Manager.

3.4 QUALITY CONTROL SYSTEM MANAGEMENT

The personnel listed below shall have the responsibility for determining if the Quality Control Systems described within this manual are being maintained. The Quality System Management Team shall review the Quality System to ensure the Quality System's continuing suitability and effectiveness. Any necessary changes or improvements will be introduced by the Quality System Management Team. The review of the Quality System shall be conducted annually or whenever deemed necessary.

- Ian Rish, P.E., State Materials Engineer
- Peter Wu, P.E., Assistant State Materials Engineer (Technical Assistance Bureau)
- Glen E. Foster, P.E., Assistant State Materials Engineer (Geotechnical/ Environmental Bureau)
- Jason Oglesby, Materials Branch Chief (Bituminous Construction Branch)
- Shahid Jenkins, Materials Branch Chief (Chemical/Physical Branch)
- Jason Waters, Materials Branch Chief (Concrete Branch)
- Torrey Wall, Materials Branch Chief (Testing Management Branch)
- Vacant, Materials Branch Chief (Pavement Management)
- Shahid Jenkins, Materials Branch Supervisor (Physical/Chemical Branch)
- Alexander Bando, Materials Branch Supervisor (Bituminous Construction Branch)
- James Brandon, Materials Branch Supervisor (Bituminous Construction Branch)
- Amanda Sheldon, Materials Branch Supervisor (Concrete Branch)
- Marc Payne, Materials Branch Supervisor (Quality Assurance Branch)
- Brent Johnson, Independent Assurance Unit Supervisor (Quality Assurance Branch)
- Jamie Pilkenton, QA Operations Manager (Quality Assurance Branch)
- Guohua (George) Lian, Materials Unit Supervisor/Hazardous Materials Disposal Officer (Physical/Chemical Branch)

4 STAFF TRAINING POLICY FOR OMAT PERSONNEL

Each Branch Laboratory Supervisor is responsible for training personnel under his/her supervision. As each technician advances through each phase of training, copies of a training progress report shall be electronically distributed to the appropriate Branch Chief, Testing Management Supervisor, or Assistant State Materials Engineer.

All testing technicians shall be trained prior to performing any test procedure. Upon completion of each phase of training the technician shall be “approved” by the Laboratory Supervisor to conduct tests covered within that phase of training. Technicians are not allowed to conduct tests until they have successfully completed the phase of training that covers the tests. Each technician shall follow the approved training schedule appropriate for his/her position.

A typical OJT training schedule and [flow chart](#) are maintained for testing technicians. Each Laboratory Test Supervisor or Testing Management Supervisor shall maintain an electronic file of all training records in his/her office, the administrative section, or the Training Coordinator’s office.

4.1 TRAINING

There are four types of training provided for employees of the Office of Materials and Testing as follows:

Professional Engineer Development Program

All graduate engineers assigned to the Office of Materials and Testing participate in a professional development training program. The objective of this program is to familiarize trainees with various operations and functions of the Department. OMAT trainees are assigned to the following offices and to a construction project: Bridge, Roadway Design, Maintenance, Planning, Engineering Services, Design Policy and Support, Office of Materials and Testing. This program is administered by the Training Office.

Programmed Instructional Texts, Certifications & Presentations for Technicians

Programmed Instructional Texts have been developed for use in training technicians assigned to the Office of Materials and Testing.

The following is a schedule of training and certification opportunities that technicians are encouraged to follow.

- Basic Highway Math
- Advanced Highway Math
- Basic Plan Reading
- Basic Asphaltic Concrete Plant Inspection
- Advanced Asphaltic concrete Plant Inspection
- Portland Cement Concrete Plant Inspection
- Asphalt Paving Inspection
- Portland Cement Concrete Paving Inspection
- Base Course Inspection
- Excavation and Embankment
- Prestressed Concrete Plant Inspection
- Basic Concrete Surveying
- Mathematics for Surveying
- Linear Surveying
- Transit Surveying
- Basic Quality Assurance and Quality Control
- Quality Control Technician Level I and II
- Roadway Testing Technician Certification
- Field Concrete Certification
- PG Binder Certification
- Emulsified Asphalt Certification
- Cutback Asphalt Certification
- Asphalt Mix Design Certification
- Concrete Strength Technician Certification
- Soil Testing Technician – Level 1
- Aggregate Testing Technician – Level 1

OMAT maintains training videos that are available on such subjects as asphaltic concrete pavement, Portland cement concrete structures and pavement, structural steel painting, various computer software programs, and other topics are available for use as work schedules allow.

Skills Development Courses

Skills Development Courses are available for employees in various other fields of work including clerical, secretarial, and accounting. These courses are presented either by State Personnel Administration personnel or by other highly qualified instructors.

Scheduled or as required seminars shall be conducted at the Central Laboratory or other appropriate locations. New test methods or modifications in older methods shall be fully explained to appropriate personnel. In addition, the Office of Materials and Testing shall maintain electronic copies with publications relating to the various areas of highway construction, maintenance, test methods, safety, etc. These publications shall be available to all OMAT Employees. All employees shall be allowed to attend courses in fields that are related to the employee's work assignment, including employee development and management offered by the State Personnel Administration. These courses require the recommendation of the employee's supervisor.

On-the-Job Training

New personnel with little or no prior experience in Materials Laboratory testing shall be taught through "on the job" training in the section where they are originally assigned. The new employee shall be thoroughly familiarized with the objectives of the Office of Materials and Testing and be trained until the Unit Supervisor determines that he or she is competent to conduct a specific test. The trainee shall be shown the proper care and calibration-verification checks of the test equipment involved. The purpose of the Sampling and Testing and Inspection Manual, Qualified Products Manual, Standard Operating Procedures, AASHTO, and ASTM Test Methods, and the Quality Control Systems Manual shall be explained to the trainee. The Office of Materials and Testing shall maintain an On-the-Job Training Method which outlines in detail the OJT Procedures and Schedules.

4.2 TYPICAL ON-THE-JOB TRAINING PROGRAM FOR TESTING TECHNICIANS

Each material testing technician shall be thoroughly trained prior to performing any testing procedures not previously performed by the Technician. These steps shall be followed for each test:

- 1) The trainee shall be given a copy of the appropriate test procedure.
- 2) The trainee shall study the test procedure thoroughly along with the applicable test report. The technician shall become familiar with the equipment, terminology, test procedures, necessary calculations, and test reports.
- 3) The Unit Supervisor or a certified and experienced technician shall demonstrate the correct procedure for the trainee.
- 4) The trainee shall perform the test procedure with the Unit Supervisor or a certified and experienced technician until proficiency is obtained.
- 5) The Laboratory Unit Supervisor shall observe the trainee demonstrating the procedure and document that the technician properly conducted the test by entering applicable information on the initial Technician Training and Evaluation Record.
- 6) After the initial training and successful evaluation, the technician's certification shall be evaluated on a calendar year basis by a certified and experienced technician or the Laboratory Unit Supervisor. The evaluations shall also be appropriately noted on the Technician Training and Evaluation Record. This record shall be periodically reviewed to ensure that each technician's certification has been successfully evaluated within the calendar year period by the Laboratory Unit Supervisor.

5 REVIEW OF TESTING TECHNICIAN COMPETENCY

Each Lab Supervisor shall be responsible for evaluating the competency of each testing technician under his/her supervision. Each Technician's evaluation frequency will be set based on his/her experience. New hires will have an Initial competency evaluation before officially conducting AASHTO and ASTM procedures and then will be evaluated every calendar year. A technician having four or more years of experience routinely performing an AASHTO or ASTM procedure shall have a competency evaluation performed every two calendar years (not to exceed 36 months). All other technicians shall be evaluated at least once every calendar year (not to exceed 24 months).

The Lab Supervisor's competency will be evaluated at least every two calendar years (not to exceed 36 months) by the approved Laboratory Manager.

It may be un-necessary to perform competency evaluations on Technicians who do not routinely perform a test. However, a technician's competency shall be evaluated prior to performing that test.

After each evaluation (Initial or Annual) the unit supervisor shall record the following information on the *Testing Technician Training and Evaluation Record*:

- Test Method Evaluated (AASHTO, ASTM, GDT)
- Type of Training or Evaluation
- Date of Training or Evaluation
- Comments (satisfactory or unsatisfactory)
- Any Appropriate Comments in Comments Section
- Signature of Unit Supervisor

The following tools will be used as an aid in evaluating technician competency:

- Supervisors and technicians shall be evaluated on a fiscal year or as-needed basis with the use of the e-Performance Process. Employees shall be evaluated on the overall performance of expectations listed on the employee's job description.
- AASHTO re:source and CCRL Proficiency Samples results shall be used by the Unit Supervisor in evaluating the competency of a technician on various test procedures.
- AASHTO re:source and CCRL on-site Inspections and evaluations shall be used in the process of evaluating a technician's competency.
- Internal Laboratory Evaluations shall be maintained as a part of the Quality Control System. These results will be used in the identification of possible procedural or equipment deficiencies.

Any unsatisfactory evaluation or low scores on proficiency samples shall be appropriately noted and followed by further OJT or Instruction. When a satisfactory evaluation is obtained, it shall be appropriately noted on the *Testing Technician Training and Evaluation Record*. The records of each evaluation, initial or annual, are to be maintained in the unit Supervisor's electronic file. Copies of these records are to be electronically distributed to the Branch Chief or Testing Management Supervisor.

6 INTERNAL QUALITY SYSTEM REVIEW PROCEDURES

The QM shall review the following records, reports and associated documentation to ensure that established quality procedures are being followed. This review shall be conducted at the time interval indicated.

- | | |
|---|---------------------|
| a) Internal Lab Audits | 12 months |
| b) Management Reviews | 12 months |
| c) On-Site Lab Inspection Reports
(Internal- Asphalt Lab) | 12 months |
| d) External On-Site Lab Assessment (AASHTO
Re:source and CCRL) | 18 - 24 months |
| e) External Quality System Evaluation Reports | 12 months |
| f) AMRL and CCRL Proficiency Sample Report | 12 months |
| g) Test Technician Training Records | 12 months |
| h) Test Technician Evaluation Records | Every calendar year |

After each review, the Quality Assurance Manager shall discuss any deficiencies noted with appropriate staff, make sure corrective action is taken, and prepare a report to the State Materials Engineer describing the items reviewed, the deficiencies identified, and the corrective action taken.

The Quality Assurance Manager shall maintain a file containing all documents relating to the quality system review. The file shall be maintained in the Quality Assurance Branch electronic file folder duplicate on the Materials and Testing shared file server.

7 PROCEDURES FOR HANDLING TECHNICAL COMPLAINTS OR QUESTIONABLE TEST RESULTS

- 1) The appropriate Branch Chief or Testing Management Supervisor shall be notified of a technical complaint or questionable test results.
- 2) The appropriate Unit Supervisor shall review all pertinent information and discuss the complaint with the Branch Chief/Testing Management Supervisor and the Lead Technician.
- 3) The Branch Chief or Testing Management Supervisor shall contact the person(s) who initiated the complaint in an effort to resolve the complaint.

If the complaint cannot be resolved, do the following:

- 4) All equipment involved in the complaint shall be taken out of service until it can be calibrated/verified to determine that it is within the allowable specifications.
- 5) The Unit Supervisor or Testing Management Supervisor shall contact the person initiating the complaint by mail and request any data or information that supports the complaint.
- 6) This information and all reports, records, equipment calibration and any other related information shall be reviewed for accuracy by the unit supervisor.
- 7) The Unit Supervisor shall discuss the test procedures with the technician involved in the complaint to determine if the test procedures were followed.
- 8) If a discrepancy was found, the test results will be clearly marked as "INVALID," the Branch Chief or Testing Management Supervisor will contact the complainer and advise him/her of the invalid test results and will request that a replacement sample be sent.
- 9) If no discrepancy is found in equipment or procedure, the Branch Chief or Testing Management Supervisor will contact the person initiating the complaint and advise him/her that the test results are acceptable.
- 10) With the approval of the Branch Chief or Testing Management Supervisor the complainer can submit another sample. The sample card is to be clearly marked in red ink as a duplicate sample.
At all times during the process, clear communication will be maintained between all parties involved.

8 RECORDS RETENTION POLICY

Records that pertain to the following areas will be electronically maintained and remain on file in a secure location within the Laboratory for a minimum of 5 years:

- Testing equipment calibration, verification, standardizations, checks and maintenance
- Test data and reports
- Internal quality system reviews
- Proficiency sample testing and responses to poor results
- Technician training and evaluations
- Personnel records
- AASHTO re:source and CCRL
- Final reports
- External assessments
- Customer complaints
- Corrective actions

These records shall be electronically maintained by each of the following areas:

- Individual Laboratory by Supervisor
- Laboratory Files Section
- Administrative Section

Note: Five years is to be considered a minimum for all records and is adequate in some instances. However, records concerning equipment such as calibration, verification and repair, should be retained throughout the useful life of the equipment. Further instructions regarding the agency's policy on the transfer and disposal of the previously mentioned records can be found in the following document

<http://mygdot.dot.ga.gov/applications/gdotpubs/Publications/7140-1.pdf>

9 MAJOR TESTING EQUIPMENT INVENTORY

Each testing Unit Supervisor shall maintain an inventory of major sampling, testing, and calibration, or verification equipment. Major equipment shall be identified using the following examples: shakers, mechanical rammers, balances, baths, ovens, physical or chemical testing machines, etc. Equipment that is normally disposable should not be listed as major equipment. For example: molds, sieves, glassware, thermometers, viscometers, etc. All operator's manuals, maintenance manuals, etc., of equipment shall be retained in the laboratory or in the unit supervisor's office.

The Major Testing Equipment Inventory Document shall be maintained on file by the appropriate unit supervisor and revisions shall be made as equipment is purchased or discarded. The document shall indicate the following information:

- Name and Location of Equipment
- Manufacturer
- Model Number
- Serial Number (Mfg. or DOT Number)
- Date Purchased (if known)
- Date Placed in Service
- Age
- Condition (New - Used - Refurbished)

9.1 Equipment Calibration and Verification Information

Each testing unit supervisor shall be responsible for maintaining and periodically reviewing the equipment calibration and verification information documents. These documents shall accurately list all equipment within the test unit that requires calibration or verification at specified intervals. Tables 1-5 in the Indexes and Tables list equipment requiring calibration or verification. The equipment calibration and verification information document shall indicate the following information:

- Description of the equipment including Model Number, and Serial Number or DOT Number assigned by OMAT which identifies the equipment.
- Detailed results of the work performed. (Dimensions, frequency, temperature, and so on.)
- Date calibration or verification was performed.
- Identification of the Standard or In-house calibration or verification procedure performed.
- The previous calibration or verification date, the date of the next calibration or verification, and the calibration or verification frequency.
- Identification of any in-house calibration or verification devices used (calipers, thermometers, feeler gauge, and so on.).
- Identification of employee performing the calibration or verification.
- Name of outside verification or calibration service, if applicable.

All records of equipment calibration or verification shall be maintained in the office of each testing unit supervisor.

9.2 Equipment Calibration and Verification Policies and Procedures

The following procedures are for equipment calibration or verification:

- 1) Each piece of equipment requiring calibration or verification shall have a calibration or verification procedure on file electronically. The Indexes and Tables list equipment requiring calibration or verification and provide a link to the test procedures and documentation of each piece of equipment listed. When possible, the calibration or verification procedure shall be referenced to the appropriate AASHTO or ASTM Standard.
- 2) Calibration or verification procedures that cannot be referenced to an AASHTO or ASTM Standard shall be designated as "IN HOUSE."
- 3) The Unit Supervisor is responsible for assuring that each piece of equipment within his/her unit has a current calibration or verification. The following is suggested as a method to assure that each piece of equipment is calibrated or verified at the correct interval:

-
- a) The Unit Supervisor will mark twelve expandable file holders one for each month within the year and keep an electronic file for all documents.
 - b) The Unit Supervisor shall maintain a file on each piece of equipment requiring calibration or verification within each test unit. The file is to be placed in the expandable file holder corresponding to the month in which the piece of equipment is to be calibrated or verified. The files are to be in chronological order. Also, all documents should be stored in an electronic file.
 - c) During the first week of each month, the equipment files within the expandable file holder for that month shall be reviewed by the unit Supervisor to identify the equipment that is due a calibration or verification within that month.
 - d) The appropriate calibration or verification procedure shall be completed, and the results recorded for each piece of equipment due calibration or verification within that month. The completed calibration-verification form will be electronically filed with the other records for that piece of equipment.

The following procedures shall be OMAT's policy concerning new, removed from service, out-of-calibration, or defective equipment.

- **Newly acquired equipment** that does not have a manufacturer's certificate of calibration shall not be used for testing until the appropriate calibration or verification procedure is completed.
- **Equipment removed from service** shall be clearly marked as "OUT OF SERVICE" and notation made on the appropriate equipment inventory list as to why it was removed from service. All required calibration(s) shall be current prior to the equipment being placed back in service.
- **Any equipment that has not been calibrated or verified** within the specified time interval shall be removed from service until the appropriate procedure can be performed. A notation shall be made in the remarks section of the appropriate equipment inventory list as to why the equipment was allowed to become out of calibration.
- **Any equipment that has been damaged, produces poor test results, or does not meet specified tolerances** shall be removed from service. It shall be clearly marked as "OUT OF SERVICE" to prevent it from being used in a test procedure. The equipment shall be calibrated or verified by the appropriate procedure. The equipment meeting the calibration or verification procedures may be placed back in service. Equipment that cannot be repaired and does not meet the calibration or verification specifications shall be discarded in the approved manner.
- All calibration and verification documents shall be maintained in the office of each unit supervisor and electronically filed. As requested, copies of these documents shall be electronically distributed to appropriate personnel.

9.3 Certificates and Documents Establishing Traceability of In- House or Outside Calibration Service Equipment or Referenced Standards Used for Calibration or Verification

The Office of Materials and Testing will maintain electronic file(s) of certificates or other documents to establish the traceability of all equipment or reference standards used for calibration or verification, such as referenced thermometers, calipers, feeler gauges, etc.) These files will be in the unit supervisor’s office and will be electronically maintained by the unit supervisor.

A file will be maintained by the Quality Assurance Engineer of all “Outside Calibration Services” used by the Office of Materials and Testing. The file will contain the calibration standard or procedure (ASTM, Military, etc.). Other documents for traceability that are available will also be electronically filed.

Currently the Office of Materials and Testing uses the following outside services:

<u>Certificate or Document</u>	<u>Location</u>
Sartorius Scale or Balance Calibration Certificate Branch	Quality Assurance
Load Cells Calibration Certificate Branch	Physical-Chemical Testing
Mettler Scale or Balance Calibration Certificate Weight Calibration Certificate Branch	Quality Assurance Branch Testing Management
Dynamic Shear Rheometer Calibration Certificate Branch	Testing Management
Digital Thermometer Calibration Certificate Branch	Bituminous Construction
Pressure Gauge (for PAV) Calibration Certificate Branch	Bituminous Construction
Flow Meter (for RTFO) Calibration Certificate Branch	Bituminous Construction
Digital Gauge (for Abs. Visc.) Calibration Certificate Branch	Bituminous
Pressure Gauge (for Vac. Oven) Calibration Certificate Branch	Bituminous Construction

10 ON SITE INSPECTION AND EVALUATION

Note: Mandatory On-Site Inspections and Evaluations will be conducted as scheduled by AASHTO re:source, CCRL, and OMAT Personnel as a part of the Quality Control System of the Office of Materials and Testing.

- AASHTO re:source On-Site Soils Inspection
- AASHTO re:source On-Site Coarse Aggregate Inspection
- AASHTO re:source On-Site Fine Aggregate Inspection
- AASHTO re:source On-Site Bituminous Inspection
- AASHTO re:source On-Site Portland Cement Concrete Inspection
- AASHTO re:source On-Site Hydraulic Cement Inspection
- Internal Laboratory Evaluation of Central and Branch Laboratories

The following procedure shall be followed when equipment deficiencies are noted by the Inspector:

- The AASHTO re:source, CCRL, or OMAT inspector will discuss any deficiency noted during the inspection with the appropriate supervisors and technicians.
- The Unit Supervisor or qualified technician shall verify equipment to ensure that it does not meet governing specifications.
- Defective equipment shall be repaired or replaced.
- The Unit Supervisor shall discuss any noted procedural deficiency with the technician who conducted the test improperly.
- The Unit Supervisor or a qualified Technician shall observe the technician conduct the test properly until competency is obtained.
- Upon receipt of the Preliminary Report of the inspection by AASHTO re:source or CCRL, the appropriate Unit/Branch supervisor will receive copies of any deficiencies noted during the assessment. Within 60 days of the receipt of the Final Report, the unit supervisor shall write a response to indicate what corrective action has been made to correct each deficiency. The Unit Supervisor will electronically submit his/her response to the AASHTO re:source Accreditation Events Portal for review by the Quality Analyst. The QM will assure that all responses have been submitted to the portal in a timely manner.

In the event of consecutive deficiencies, the Unit/Branch Supervisor will submit copies of corrective actions and pertinent records or reports to the QM. The documents will be stored electronically by the Quality Assurance Branch and will be provided to OMAT management upon request.

10.1 Internal Laboratory Evaluation

Evaluations of the active lab technicians shall be throughout a calendar year. Each certified technician who has performed acceptance testing within the prior calendar year is required to have an annual Laboratory evaluation. The evaluations will be performed by an Independent Assurance Specialist (IAS). Observation allows the IAS to check both the equipment and the technicians under actual testing conditions, using a checklist based on GDOT and industry standard published procedures.

Certified Laboratory Technicians will be evaluated in the following Georgia Standard Test Methods:

10.1.1 GDT 4

10.1.2 GDT 6

10.1.3 GDT 49

10.1.4 GDT 63

10.1.5 GDT 67

The IAS will use Checklist Summary Sheets to determine if the technician is "Proficient", "Satisfactory", or "Unsatisfactory" in each applicable certification area. Refusal to participate or lack of cooperation in the IA evaluation will be referred to the technician's immediate supervisor and will be sufficient reason to consider an evaluation "Unsatisfactory."

a. Procedures Performed Proficiently

A "Proficient" Technician is highly skilled in the sampling and/or testing method(s). Test results provided by this technician can be used in the materials acceptance decision. When the Technician achieves a total score of at least 95% in the sampling and testing methods evaluated for each certification type, the Technician receives an evaluation of "Proficient."

b. Procedures Performed Satisfactorily

A "Satisfactory" Technician is skilled in the sampling and/or testing method(s). Test results provided by this technician can also be used in the materials acceptance decision. When the Technician achieves a total score of at least 85%, but less than 95% in the sampling and testing methods evaluated for each certification type, the Technician receives an evaluation of "Satisfactory." The IAS should encourage the technician to strive for Proficient status on the next evaluation.

c. Procedures Performed Unsatisfactorily

An "Unsatisfactory" Technician does not meet the minimum requirements for test results to be used in the materials acceptance decision. When the Technician achieves a total score of less than 85% in the sampling and testing methods evaluated for each certification type, the Technician receives an evaluation of "Unsatisfactory."

11 **PROCESSING SAMPLES (Sample Management)**

11.1 Identification

All samples shall be taken at frequencies as directed by *The Georgia Department of Transportation Sampling and Testing Inspection Manual*. All samples shall be given a sample number by the sampling technician. This number shall be placed on *DOT 170 Sample Card for All Materials* along with the following pertinent information:

- Type sample (soil, aggregate, bituminous, and so on)
- DOT project number
- Type material submitted (description)
- Date sampled
- Sample location (station number, stockpile, pit, etc.)
- Field sample number
- Quantity sample represents (if applicable)
- Producer (if applicable)
- Contractor (if applicable)
- DOT pay item (if applicable)
- Test method to be conducted (ASTM, AASHTO, or GDOT)
- Sampling technician identification
- Use of material being sampled
- Any special instructions or remarks

The sample shall be submitted to the laboratory (Central or Branch) as soon as practical along with the appropriate sample card with all necessary information. A work card indicating the date sample is received shall be attached to the sample card and both will be assigned an identical laboratory number which will identify the specific sample until all tests are completed, and a test report is finalized and submitted for distribution. The condition of the sample shall be noted on the work card. (Examples of "Condition": sample container busted, insufficient material, material contaminated, samples mixed, anything that could adversely affect the test results.)

11.2 Storage of Samples to be Tested

After the sample is received and all necessary documentation is completed, it shall be stored in the laboratory unit in which the tests will be conducted. Care shall be taken to prevent contamination of all samples. Any special (AASHTO, ASTM) storage requirements (cylinders in moisture room, soil samples stored at a temperature of 140°F, etc.) will be followed.

11.3 Retention of Samples After Testing is Completed

Samples with acceptable test results may be disposed of properly with the permission of the unit supervisor. Samples with failing results shall be retained until the sample can be retested or a sample of the same material is submitted for retesting.

11.4 Disposal of Hazardous and Non-Hazardous Materials

All samples shall be disposed of in accordance with all local, state and federal guidelines. Non-hazardous samples shall be disposed of daily (or as required) in an assigned disposal area. Disposal of toxic and hazardous materials shall be properly contained in an isolated area until the Hazardous Materials Disposal Officer arranges for removal by a certified hazard materials disposal contractor.

11.5 Procedures for Concrete Cylinders

11.5.1 Field

- The Project Engineer, his designee, or the technician is responsible for assigning the concrete cylinder(s) a **Sample Number**. This number is placed on the cylinder mold(s), the top of the cylinder(s), and the cylinder card. It is recorded with all pertinent information in the Project Diary.
- The Project Engineer establishes and maintains the system used for determining the Sample Number.

11.5.2 Transporting

- The Project Engineer, his designee, or the technician is responsible for transporting the cylinders to the appropriate laboratory. The cylinders shall be transported in a manner that meets the requirements of ASTM C31/C31 Section 10.
- The Project Engineer determines when the cylinders are transported and is responsible for maintaining the transporting system.

11.5.3 Laboratory

- At the Laboratory, the Receiving Technician matches the cylinder card with the correct cylinder as soon as possible. At this time, a **Laboratory Number** is assigned to the cylinder and is recorded on the side of the cylinder and on the cylinder card on the same line as the corresponding sample number. Effort is made to assure that the correct Laboratory Number is recorded with the corresponding sample number.
- The Laboratory uses a sequential numbering system to determine the **Laboratory Number**. The Laboratory Number is advanced by one each

time a number is assigned to a sample. The entire Laboratory uses only one numbering system and the numbers are assigned by the Receiving Technician. This numbering system is monitored and maintained by the Physical Laboratory Supervisor.

12 OMAT'S POLICY ON TEST REPORT PROCEDURES

12.1 Records to be Maintained and Information Required on the Final Test Report

The Office of Materials and Testing shall maintain electronic test records which contain sufficient information to permit verification of all test reports. Records pertaining to testing shall include calculations, derived data, personal observations, if applicable, and personnel involved in sampling and testing. In addition, the finalized test report shall indicate the following information:

1. Name and address of Laboratory
2. Identification of report and date issued
3. Identification of project
4. Description, identification, and condition of test sample
5. Date test sample submitted to Laboratory for testing
6. Date(s) test performed
7. Identification of standard test method performed (any deviations from Standard Test Method shall be noted)
8. Test results and any other pertinent data required by the test method
9. Identification of any test results obtained from test performed by a contractor
10. Name of person(s) accepting technical responsibility for the test report. (State Materials Engineer)

Notes:

- Information required in items 1,3,5,6 and 7 are not required on the test report if it is included in the test records and is traceable to the specific test report.
 - Item Number 4 "Condition": When the sample arrives at the Laboratory, the person initially receiving it will list the sample condition on the sample work card. An explanation of what is wrong with the sample will be listed for any condition other than "Good". When the testing technician receives the sample, he/she will make a notation on the work card concerning the sample condition, if the condition has changed. When the final report is produced, the sample condition, at the time of testing, will be listed in the "Remarks" Section of the final report.
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12.2 Procedure for Reporting Test Results

The Office of Materials and Testing shall have a standard procedure for recording, identifying, testing, and reporting test results for materials used by the Department of Transportation. This procedure shall be the following:

- 1) The appropriate technician will complete DOT 170, "Sample Card for all Materials." This sample card shall clearly identify the type material sampled for testing, project number, date sampled, sampled from what location (pit, stockpile, roadway, station number, etc.), field sample number, quantity represented, producer, contractor, pay item, testing requirements, identification of person taking sample, use of material sampled, and any special remarks. The sample card will be marked in red ink "RE-SAMPLE" when appropriate.
- 2) When the sample(s) is received at the Central or Branch Laboratory for testing, the receiving clerk shall assign the DOT 170 (Sample Card) a "date received" and it shall be attached to the appropriate work card. The DOT 170 and laboratory work card shall be assigned identical laboratory numbers. The receiving clerk or the person receiving the sample will list the sample condition on the work card and deliver the sample(s) and cards to the appropriate testing unit for testing and reporting the final results.
- 3) The Testing Unit Supervisor shall record the receipt of the sample in the unit log book and assign the sample to a technician for testing. The test technician shall perform all required test procedures. The test technician shall initial the work card and record all test results on the laboratory work card. Any change in "sample condition" will be noted on the card by the technician. The testing data shall be reviewed for completeness and accuracy by the unit supervisor or by a qualified technician. If applicable, the test results shall be recorded in the testing unit's log book. The DOT 170 and the work card shall be submitted to the appropriate branch office for reporting. The DOT 170 and work card will be filed electronically in the branch office making the final report.
- 4) The completed work card will be used to prepare a computer-generated test report. The finalized test report will include the 10 items previously listed. The finalized report is reviewed for accuracy by the unit supervisor and distributed as required by [SOP-7, "Distribution of Test Reports."](#)
- 5) The completed test report shall be reviewed by the Unit Supervisor to ensure that no errors were made in the preparation of the report. After being checked for accuracy, the report shall be forwarded to the reproduction section for distribution to various offices, construction project and the laboratory project files.

- 6) Should a typographical or test result error be found on a previously distributed test report, a corrected test report shall be immediately issued reflecting the correct data. This corrected report shall be clearly noted as a "Corrected Test Report." This "Corrected Test Report" shall be attached to a copy of the original incorrect report and electronically redistributed according to SOP-7. A copy of the "Corrected Test Report" and the original report shall be attached and placed in the appropriate electronic project file.

13 **SUBCONTRACTING**

At this time the Laboratory does not subcontract testing in applicable fields of test covered by the scope of R-18.

13.1 **ASPHALTIC CONCRETE PAVING CONTRACTOR ACCEPTANCE TESTING**

Contractors accepted by the Department's bidding process shall comply with all requirements of Special Provision, [Section 400, HOT MIX ASPHALTIC CONCRETE CONSTRUCTION](#) and [GSP-21, SAMPLING PROCEDURES FOR CONTRACTOR ACCEPTANCE TESTING](#). Section 400.3.06, *Quality Acceptance*, provides the requirements for the contractor's quality control program. GSP-21 provides the contractor with testing frequency and the required test.

The Department's Independent Assurance Testing Program shall continue to perform the required test covered in that program.

The District TMOS and the Area Bituminous Construction Engineer shall assure that the contractor complies with the provisions of Section 400 and GSP-21. Records of all QC inspections and testing shall be maintained in the Bituminous Branch Office.

14 PROCEDURES RELATED TO TESTING PROFICIENCY SAMPLES

OMAT shall participate in proficiency sample testing programs from AAASHTO re:source and CCRL for all areas for which the Laboratory has been accredited. The Branch Laboratories shall participate in the programs listed below that have an * before the program.

Proficiency samples shall be tested in the following areas:

- *AASHTO re:source Soil Proficiency Sample Program
- *AASHTO re:source Aggregate Proficiency Sample Program
- *AASHTO re:source Bituminous Proficiency Sample Program
- AASHTO re:source Paint Proficiency Sample Program
- CCRL Concrete Proficiency Sample Program
- CCRL Hydraulic Cement Proficiency Sample Program

The following procedures are for AASHTO re:source and CCRL Proficiency Samples:

- 1) In the Central Laboratory the QM shall receive all letters that notify that samples are to be shipped. The QM will make copies of the testing instructions and report form then give the copies to the appropriate unit(s) Supervisor. At this time a "due date", not less than 5 working days prior to the closing date indicated by AASHTO re:source or CCRL shall be established. When the test material arrives the Unit Supervisor shall schedule the test so as to meet the established due date. For each type material all test that the Central Laboratory is accredited to perform shall be conducted per the instructions sent by AASHTO re:source or CCRL. Particular attention should be given to the test procedures indicated. Only technicians approved to conduct the required test will be allowed to conduct test on proficiency samples from AASHTO re:source or CCRL. Upon completion of the testing, the Unit Supervisor shall review the results and send the report to AASHTO re:source and CCRL; additionally, a copy of the report shall be given to the QM.
- 2) In the Branch Laboratories, the Testing Management Operation Supervisor will schedule a time for the material to be tested. After the tests are conducted, he/she will review the results and prepare the test report. The test report will then be sent to AASHTO re:source or CCRL as appropriate (with a copy sent to the QM in the event of consecutive unsatisfactory proficiency scores).
- 3) Upon receipt of the final report, the QM shall review the report, mark low scores and make copies of the report. The copies are then distributed to the appropriate Unit Supervisor. The Unit Supervisor shall review the report for the unit's results and discuss the report with the technician(s). The current report should be compared with previous reports in an effort to identify trends such as results that are always above or below the mean.

In the event low scores are found on the AASHTO re:source or CCRL final report (results more than two standard deviations from the mean), the Unit Supervisor or Testing Management Supervisor will investigate and determine the reason for the low scores by using the following procedures:

- 1) Determine that the results were correctly calculated.
- 2) Determine that the data was correctly reported.
- 3) Determine if the equipment used to perform the test is correctly calibrated.
- 4) Take corrective action to repair, replace, or calibrate defective equipment as required.
- 5) Determine if the correct procedures were followed to perform the test.
- 6) Take corrective action to instruct the technician in the correct test procedure as required.
- 7) If possible, the remainder of the material shall be re-tested.
- 8) Within 30 days of the final report date, the unit supervisor or testing management supervisor shall write a response to the QM summarizing the results of the investigation, identifying the cause of the poor results, if determined, and describe the corrective action taken.
- 9) After the corrective action report is completed, it is reviewed and signed by the Testing Management Operations Supervisor (TMOS), it will be sent to QM and be electronically filed with the Quality Assurance Branch.
- 10) In the case of repeat unsatisfactory proficiency sample scores, using the summarized results from the Branch Laboratories, the QM will prepare a response to the State Materials Engineer for review and comment within 15 days of the TMOS response.
- 11) After the responses for repeat unsatisfactory proficiency sample scores have been reviewed and the letter of response signed by the State Materials Engineer, a copy of the response shall be attached to the final report and the report electronically filed in the Quality Assurance Branch.

OMAT-CVP INDEX

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PHY-CHEM	3	TESTING MACHINES	ASTM E-4
PHY-CHEM	4	MECHANICAL RAMMERS (SOIL)	T-99, T-180
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TABLE NO. 1**BITUMINOUS MATERIALS TEST EQUIPMENT**

<u>OMAT-CVP</u>	<u>Equipment</u>	<u>Test Method</u>	<u>Requirement</u>	<u>Maximum Interval (months)</u>
OMAT-CVP-1	Mech. Shakers	T-27	Sieving Thoroughness	12
OMAT-CVP-2	Analytical Balances, Balances, Outside Source Scales, and Weights	M-231	Verify Accuracy	12
OMAT-CVP-3	Comp. Machine Comp. Machine	ASTME E-4	Verify Load Indication Verify Travel Speed	12 3
OMAT-CVP-5	Ovens		Verify Operating Temperature	4
OMAT-CVP-5a	Thin Film Oven	T-179	Shelf/Carriage Ck. Rotation	12
OMAT-CVP-5b	Rolling Thin Film Oven	T-240	Speed and Temperature	12
OMAT-CVP-6	Vacuum System	T-209	Verify Pressure	12
OMAT-CVP-8	Sieves	M-92	Ck. Labels and Condition	6
OMAT-CVP-26	Mech. Compactor	T-245	Calibrate	12
OMAT-CVP-27	Breaking Heads	T-245	Ck. Critical Dimensions/ Mass of Hammer	12
OMAT-CVP-30	Brass Rings and Assembly	T-53	Ck. Critical Dimensions	12
OMAT-CVP-31	Pycnometers	T-228	Ck. Critical Dimensions and Physical condition	12
OMAT-CVP-32	Collars and Floats	T-50	Ck. Critical Dimensions	12
OMAT-CVP-33	Flash Cups	T-48	Ck Critical Dimensions	12
OMAT-CVP-33a	Tester	T-48	Ck. Critical Dimensions	12
OMAT-CVP-34	Tag Open Cup	T-79	Ck Critical Dimensions	12
OMAT-CVP-34a	Tester	T-79	Ck. Critical Dimensions	12
OMAT-CVP-35	Ductility Machine	T-51	Ck. Molds/Travel Speed	12
OMAT-CVP-51	Thermometers	T-201, T-202 T-209, T-2, T-49, T-51	Calibrate	12
OMAT-CVP-50	Viscometers	T-59, T-240	Calibrate	36
OMAT-CVP-53	Timers	T-201, T-202	Verify Accuracy	12
OMAT-CVP-54	Penetrometer	T-49	Ck. Dial/Timer Accuracy	12

TABLE NO. 1 (Continued)

BITUMINOUS MATERIALS TEST EQUIPMENT

<u>OMAT-CVP</u>	<u>Equipment</u>	<u>Test Method</u>	<u>Requirement</u>	<u>Maximum Interval (months)</u>
OMAT-CVP-55	Accessories	T-316	Verify w/Ref. Fluid	6
OMAT-CVP-56	PAV	R-28	Ck. Temp. & Pressure	6
OMAT-CVP-57	Flowmeter	T-170, T-240	Calibrate	12
OMAT-CVP-59	PAV	T-313	Calibrate Masses	12
OMAT-CVP-60	DSR	T-315	Verify w/Reference Fluid	6
OMAT-CVP-61	Gyratory Compactor	T-312	Calibrate	12
OMAT-CVP-62	Ignition Oven	T-308	Calibrate	12
OMAT-CVP-63	Gyratory Compactor Mold	T-312	Ck. Critical Dimensions	12

TABLE NO. 2**SOILS TEST EQUIPMENT**

<u>OMAT-CVP</u>	<u>Equipment</u>	<u>Test Method</u>	<u>Requirement</u>	<u>Maximum Interval(months)</u>
1	Mech. Shakers		Sieving thoroughness	12
2	Balances, Scales, Wts.		Verify Accuracy	12
3	Compression Machines	T 193, T 208 T 216, T 234 T 236	Verify Load Indications	12
4	Manual and Mechanical Compactors	T 99, T 180	Verify Critical Dimensions/Calibrat Mech. Comp.	12
5	Ovens		Verify Temp. Setting	4
6	Vacuum System	T 100	Check Pressure	24
7	Molds	T 99, T 134, T 180, T 193	Check Critical Dimensions	12
7-A	Molds	T 99, T134, T 180, T 193	Calibrate w/H2O (T 19)	12
8	Sieves		Check Labels and Condition	6
9	LL Device	T 89	Check Wear/Critical Dimensions	12
10	Grooving Tool	T 89	Check Critical Dimensions	12
11	Hydrometers	T 88	Check Critical Dimensions	24
12	Straight Edges	T 99, T134, T 180	Check Planeness of Edge	6
13	Weighted Foot Assembly	T 176	Check Weight	12
14	CBR Annular & Slotted Wts.	T 193	Check Weight	12
15	CBR Penetration Piston	T 193	Check Diameter	12

TABLE NO. 3**AGGREGATE TEST EQUIPMENT**

<u>OMAT-CVP</u>	<u>Equipment</u>	<u>Test Method</u>	<u>Requirement</u>	<u>Maximum Interval (months)</u>
7A	Unit Wt. Measures	T 19	Calibrate	12
1	Mechanical Shakers		Sieving Thoroughness	12
2	Balances, Scales, Weights		Verify Accuracy	12
5	Ovens		Verify Temp. Settings	4
8	Sieves		Check Labels and Condition	6
16	Sulfate Oven	T 104	Ck. Rate of Evaporation	12
17	L.A. Abrasion Machine	T 96	Ck. RPM and Critical Dimensions	24
17	Steel Balls	T 96	Ck. Individual Wt. And Charge Wt.	24
18	Magnesium Sulfate Container	T 104	Ck. Physical Condition	12
19	Conical Mold, Tamper	T 84	Ck. Critical Dimensions	24
58	100 ml Measure	ASTM C 1252	Ck. Critical Dimensions	12

TABLE NO. 4
PORTLAND CEMENT CONCRETE TEST
EQUIPMENT

<u>OMAT-CVP</u>	<u>Equipment</u>	<u>Test Method</u>	<u>Requirement</u>	<u>Maximum Interval (months)</u>
OMAT-CVP 2	Balances, Scales, Weights		Verify	12
OMAT-CVP 3	Comp. Testing Machine	T 22, C 39	Verify Load Indications	12
OMAT-CVP 7A	Unit Wt. Measures	T 121, C 138	Calibrate	12
OMAT-CVP 20	Capping Material		Check Strength	3
OMAT-CVP 21	Air Meters (Pressure)	T 152, C 231	Calibrate	3
OMAT-CVP 22	Air Meters (Volumetric)	T 152, C 231	Calibrate	3
OMAT-CVP 23	Plastic Single Use Mold	M 205	Check Dimensions	Per Shipment
OMAT-CVP 24	Slump Cones	T 119, C 143	Check Critical Dimensions	12
OMAT-CVP 25	Metallic Reusable	T 22, T 23, C 31	Check Dimensions	Per Shipment
OMAT-CVP 37	Recording Thermometer	T-106, C 109	Ck. Accuracy	30

TABLE NO. 5**HYDRAULIC CEMENT TEST EQUIPMENT**

<u>OMAT-CVP</u>	<u>Equipment</u>	<u>Test Method</u>	<u>Requirements</u>	<u>Maximum Interval (Months)</u>
OMAT-CVP-37	Recording Thermometer	T 106, C 109	Ck. Accuracy	6
OMAT-CVP-2*	Balance, Scales, Weights		Verify	12
OMAT-CVP-2 *	Analytical Balances Wts.		Verify	12
OMAT-CVP-38	No. 325 Sieves	T 192, C 430	Clean after 5 determinations Calibrate after 100 determinations	
OMAT-CVP-38A	No. 325 Nozzle	T 192, C 109	Ck. Flow Rate	6
OMAT-CVP-3	Compression Machine	T 106, C 109	Verify Load Indications	12
OMAT-CVP-39	Bearing Blocks	T 106, C 109	Ck. Planeness	12
OMAT-CVP-40	Standard Sand		Each new shipment ck. for conformance to C 778	
OMAT-CVP-41**	Air-Permeability Apparatus	T 153, C 204	Standardize Using NIST 114	30
OMAT-CVP-42**	Flow Tables	M 152, C 230	Verify Flow Results	30
OMAT-CVP-43**	Cube Molds and Tampers	T 106, C 109	Ck. crit. dim./phy. cond.	30
OMAT-CVP-44**	Vicat Apparatus and Vicat Ring	T 129, T 131, T 186, C 187, C 191, C 451	Ck. crit. dim./phy. cond./ mass	30
OMAT-CVP-45**	Gillmore Test Apparatus	T 54, C 266	Ck. crit. dim./phy. cond/mass	30
OMAT-CVP-46**	Mechanical Mixing Apparatus	T 162, C 305	Ck. crit. clearances/speeds	30
ADDITIONAL EQUIPMENT REQUIRED BY ASTM				
OMAT-CVP-47**	400 mL Measure	ASTM C 185	Calibrate	30
OMAT-CVP-48**	Autoclave	ASTM C 151	Verify operation	30

Note:

* indicates that this equipment is calibrated by an OUTSIDE SOURCE.

** Indicates that the CCRL inspection will be the calibration of record.

List of Revisions

	Rev. No.	Pages Affected	Comments
Feb 2013	6	Throughout	Added this sheet (Revision List)
Feb 2013	6	Throughout	General format change
Feb 2013	6	Throughout	Added sequential page numbers
Feb 2013	6	Throughout	The Name of the Office is changed to The Office of Materials and
Feb 2013	6	Cover Page, 8, 9, 10, 13	Revised management personnel names and titles
Feb 2013	6	14	Added new positions
Feb 2013	6	15	Removed CET
Feb 2013	6	17	Added Certifications
Feb 2013	6	21	Removed reference to e-Performance
Feb 2013	6	25	Updated List
Feb 2013	6	26	Format change
Feb 2013	6	-	Deleted blank sheet in Section 8
Feb 2013	6	32	Changed Section 10.1, Reporting
Feb 2013	6	34	Added PG Binder to the List
Feb 2013	6	35	Changed frequency of COOP test to semi- annual
Feb 2013	6	36	Added all Branch Chiefs in No. 10
Feb 2013	6	43	Removed "Mandress Test Report"
Feb 2013	6	44	Added CVP-56, 59, 20, corrected 55
Feb 2015	7	OMAT-CVP INDEX	Updated form for CVP 63
May 2015	7	Throughout	Updated section numbers & R18
May 2015	7	17	Updated list of programmed instructional texts and video films for
May 2015	7	39	Updated Section 14 Subcontractors
May 2015	7	6	Added GDT to list of abbreviations
May 2015	7	12	Updated list of quality control system managers
May 2015	7	14	Linked positions to HRA job descriptions
May 2015	7	OMAT-CVP INDEX	Changed TP4 to T-312
May 2015	7	14, 15	Removed Civil Engineer Technologist & Transportation
May 2015	7	23, 24	Updated Document & Certificate List
May 2015	7	Throughout	Added page numbers

LIST OF REVISIONS (Continued)			
Rev. Date	Rev. No.	Pages Affected	Comments
May 2015	7	38	Updated Review Schedule
May 2015	7a	OMAT-CVP 59	Revised
October 2015	7b	OMAT-CVP-4 Revised 8-	Revised
October 2015	7b	OMAT-CVP-7 Revised 8-	Revised
February 2017	7c	Cover, 1, 2, 3	Updated Personnel
July 2017	7d	29	Added "Risk Assessment" as a bulleted item
July 2017	7e	29	Updated time intervals & lab inspection/assessment
March 2018	8	3	Updated Personnel
March 2018	8	OMAT-CVP-7A Revised 2-	Revised
October 2018	8a	Throughout	Revised "AMRL" acronym to "AASHTO re:source"
October 2018	8a	3	Updated Personnel
May 2019	8b	3	Updated Personnel
August 6, 2019	9a	Throughout	Dates in page footer revised to match format as defined by Section 3.3 of
Nov. 2020- Feb 2021	9b	Throughout	Changes made to footers (date, R18 designations and revision
Nov. 2020- Feb 2021	9b	1-6, 11, 13-19, 23-26 and 28	Various edits (Personnel changes, definitions, and QSM policy).
March 2021	9b	iv, v, vi, 7, 10, 23, 24, 37	Various edits throughout
June 2021	9c	Cover Page, 2,4 and 5	Personnel changes
March 2022		Pages 2, 5	Personnel updates
June 15, 2022	10	Sections 4,5,6	Changed frequency from every 12 months to every calendar year for competency checklists
June 30, 2022	11	Section 5	Added for two calendar years (not to exceed 36 months) and calendar year (not to exceed 24 months).

May 15, 2023	12	2,4,5	Updated personnel. Updated Table of Contents (page numbers).
April 23, 2024	13	2,4,5	Updated Personnel.