

Quality Management System Evaluation

Table of Contents – QMS evaluation

Management Requirements	R18 Section #	Page #	"✓" if OK
Quality Management System	5.1	2	
Document Control	5.2	2	
Organization	5.3	2	
Staff	5.4	3	
Technician Training and Evaluation	5.5	3	
Internal Audits	5.6	4	
Corrective Action	5.7	4	
Records Retention	5.8	4	
Technical Requirements	R18 Section #	Page #	"✓" if OK
Equipment	6.1	5	
Equipment Calibration, Standardization, and Check	6.1	15-18	
Sample Management	6.2	6	
Test Records and Reports	6.3	6	
Subcontracting	6.4	6	
Assuring the Quality of Results	6.5	6	
Additional Requirements (Optional)	-----	Page #	"✓" if OK
ASTM C1077 (Aggregate)	-----	7-8	
ASTM D3666 (Bituminous and Aggregate)	-----	9-10	
ASTM D3740 (Soil)	-----	11-12	
ASTM E329 (All Fields)	-----	13-14	
Calibration, Standardization, & Check Tables	R18 Annex A1	15-18	-----
Maintenance Tables	R18 Annex A1	18	-----

Note: An "X" indicates that a finding exists for one or more of the items listed under that heading.
 "NP" or a dash indicates that the section was not reviewed.

★	Summary of changes (AASHTO R18-10, September 2010)
Section 5.1	A quality policy statement and quality objectives are no longer required.
Section 5.2	Retained out-of-date standards are no longer required to be marked.
Section 5.3	Organizational charts shall show relationships with partner organizations, where applicable, and shall include names and positions of employees in relevant internal organization components.
Section 5.5.2	Competency evaluation procedure shall ensure that each technician receives a performance evaluation for each test that person performs.
Section 5.7	Management reviews are no longer required.
Section 6.1.2.3	Equipment that is used over a range shall be C/S/C at several points in the range of use (ROU).
Section 6.1.3	Reference standards are now called measurement standards.
Section 6.1.4	Maintenance has its own section and an interval table in Annex A1.
Annex A1	The following equipment has been added to the list of C/S/C equipment: equipment for D7000 (12 mo.), CBR penetration pistons (12 mo.), and Expansion Index (EI) vertical load (12 mo.).
Annex A1	These intervals have been changed to 12 months: T49/D5 equipment, sieves, and thermometers. They are still 6 months for D3666 and D3740.

Note to Assessor: Equipment required to be C/S/C over its Range of Use (ROU) should be checked at multiple points (3 or more) that encompass the range typically used. Ovens and thermometers should be standardized at or near temperatures used (this may be a single point.)

❖ - Indicates the line has been modified since the previous version of the worksheets, 2011-02-01

■ - Indicates the line is optional for abbreviated quality system reviews.

QUALITY MANAGEMENT SYSTEM FOR CONSTRUCTION MATERIALS LABORATORIES**R18**

Date: _____

Scope of QMS review: Indicate the fields of test included in the scope of the quality management system review. A quality management system evaluation should be conducted in all fields associated with the laboratory's on-site assessment.

Asphalt Emul HMA Soil Agg Metals and Metals Coatings SFRM

Indicate any other areas the laboratory is accredited for through AAP: Portland Cement Concrete Masonry Cement

Management Requirements (Section 5)**Quality Management System (Section 5.1):**

1. Has the construction materials laboratory (CML) established, implemented, and maintained a quality management system (QMS) appropriate to the scope of its activities? ★ _____
 2. Is the QMS available for use and understood by laboratory staff? _____
- Note:** A QMS may be documented and distributed in hard copy format, electronic format, or both.

AAP Procedures Manual Requirements:

Note to Assessor: Please record evidence, such as min/max lab temperature, or any unusual circumstances as needed to support the finding. If unsure of a finding in these areas, please consult your supervisor.

3. Does the laboratory have test areas, energy sources, lighting, heating/cooling, and ventilation necessary to facilitate the performance of testing (AAP Procedures Manual Section 3.5.14)? ❖ _____
4. Does the laboratory have sufficient environmental controls and appropriate conditions to prevent adversely affecting test results (such as levelness, lack of vibration, water supply, etc)? ❖ _____

Document Control (Section 5.2):

1. Does each QMS document indicate its preparation date or revision date? _____
2. Are copies of the test methods readily accessible to employees performing testing? _____

Organization (Section 5.3):

1. Is the legal name and address of the laboratory – and that of the main office or company, if different – and any other information needed to identify the organization, documented in the QMS? _____
2. Is the ownership and management structure of the laboratory documented including the names, affiliations, and positions of principal officers and directors? _____
3. Is an organization chart maintained showing relationships with partner organizations, where applicable? ★ _____
4. Does the organization chart include positions and names of employees from relevant internal organizational components? ★ _____

COMMENTS: ★ - Updated in R18-10, September 2010.

QUALITY MANAGEMENT SYSTEM FOR CONSTRUCTION MATERIALS LABORATORIES**R18**

Date: _____

Staff (Section 5.4):**1. Position Descriptions (Section 5.4.1)**

- (a) Are there descriptions for each technical operational position shown on the lab's org. chart? ☐
- (b) Does each position description identify the position, and the duties, required skills, education, and experience associated with the position? ☐

2. Biographical Sketches (Section 5.4.2)

- (a) Are biographical sketches maintained for each supervisory technical staff member? ☐
- (b) Does each biographical sketch indicate the education, work experience, licensure, certifications, and current position of each supervisory technical staff member? ☐

3. Laboratory Management Personnel - Technical Manager (Section 5.4.3)

- (a) Is there a technical manager with overall responsibility for the technical operations of lab? ☐
Name: _____ Title: _____
- (b) Has the laboratory nominated an individual to serve in the technical manager's absence? ☐
Name: _____ Title: _____

4. Laboratory Management Personnel - QMS Management (Section 5.4.4)

- (a) Is there a person responsible for determining if the quality management system activities are being implemented by the laboratory staff (this person shall have direct access to top management)? ☐
Name: _____ Title: _____

Technician Training and Evaluation (Section 5.5):**1. Training (Section 5.5.1)** *Note: There may be several different methods depending on previous experience of new staff. New employees with previous experience performing the tests can be evaluated for competency instead.*

- (a) Is there a procedure describing the method used to ensure that new laboratory personnel are trained to perform the tests in accordance with standard procedures (which can include on-the-job training, formal in-house training, or training by external organizations)? ☐
- (b) Does it indicate what position / employee is responsible for the laboratory's training program? ☐
- (c) Does it indicate what position / employee is responsible for maintaining training records? ☐

2. Competency Evaluation Procedures (Section 5.5.2)

- (a) Is there a procedure describing the method used in-house to evaluate staff competency in testing? ☐
Note: Procedure should include observation of actual testing performed, not just proficiency sample testing.
Note to Assessors: Procedures using AMRL on-site assessments for competency evaluations are not acceptable.
Does the procedure:
- (b) Describe the frequency of competency evaluations for each technician? (note frequency: _____) .. ☐
- (c) Indicate what position / employee is responsible for the CML's competency evaluation program? ☐
- (d) Indicate what position / employee is responsible for maintaining competency evaluation records? ☐
- (e) Ensure that each technician receives a performance evaluation for each test that person performs? ... ★ ☐

3. Training Records (Section 5.5.3)

- (a) Do the records include the technician name, date on which competence was determined or confirmed, test method(s) evaluated, the name of the evaluator, and comments about the evaluation activity? ☐
- (b) Has the CML trained / evaluated the competency of all technicians who are performing tests covered by the scope of associated on-site assessment in the manner described in the QMS? ☐

COMMENTS: ★ - Updated in R18-10, September 2010.

QUALITY MANAGEMENT SYSTEM FOR CONSTRUCTION MATERIALS LABORATORIES**R18**

Date: _____

Internal Audits (Section 5.6):

1. Does the QMS contain a document describing the scope of internal audits (internal audits shall verify that the CML's operations continue to comply with its policies, procedures, and the requirements of R18)? ☐
2. Does the document indicate the frequency of the reviews? (**must be ≤ 12 months**, note frequency: _____) . ☐
3. Does it identify what position / employee is responsible for the internal audit review? ☐
4. Does internal audit program address all elements of the QMS? ☐
5. Where possible, have the internal audits been performed by trained personnel that are independent of the activity being audited? ☐
6. Are findings from internal audits recorded? (check records and verify frequency of reviews) ☐

Corrective Action (Section 5.7):

1. Does the QMS contain a procedure for implementing corrective action when nonconforming work or departures from policies and procedures are discovered? ☐
Note: *The corrective action procedure should be implemented for nonconformities in the following areas: internal audits; customer complaints; equipment calibrations, standardizations, checks, and maintenance; external assessments; and proficiency sample testing.*
2. Does the procedure identify the individual responsible for implementing corrective action? ☐
3. Does the procedure begin with an investigation to determine the root cause of the problem? ☐
4. Are records of corrective action maintained? ☐
5. Does the QMS contain a document describing the method used in responding to customer complaints? ☐
6. Are records of customer complaints and the resulting actions maintained? ☐

Records Retention (Section 5.8):

1. **Quality Management System Records (Section 5.8.1)**
Are records of activities in the following areas retained by the laboratory for a minimum of five years?
 - (a) External assessments and proficiency sample testing? ☐
 - (b) Internal audits (internal quality management system reviews) of QMS? ☐**Note to assessors:** *If records NP for IA, you do not need to write the note twice. Dash here.*
 - (c) Test technician training, evaluation, and personnel records? ☐
2. **Technical Records (Section 5.8.2)**
Are records pertaining to the following retained by the laboratory for a minimum of five years?
 - (a) Records of test data and test reports? ☐
 - (b) Equipment calibration, standardization, check, and maintenance activities? ☐

COMMENTS:

QUALITY MANAGEMENT SYSTEM FOR CONSTRUCTION MATERIALS LABORATORIES**R18**

Date: _____

Technical Requirements (Section 6)**Equipment (Section 6.1):****1. Inventory (Section 6.1.1)**

Inventory list of major sampling, testing, C/S/C equipment, and measurement standards? _____

Note: Major equipment does not usually include expendable items such as glassware, sieves, molds, and viscometers. It should include shakers, balances, ovens, compression testing machines, and other equipment amortized by the laboratory.

Inventory includes (where available):

- (a) Name and manufacturer of equipment? _____
- (b) Date placed in service? _____
- (c) Model and serial number (or in-house identification number)? _____

2. Equipment Calibrations, Standardizations, and Checks (C/S/C) Documents (Section 6.1.2)**C/S/C Interval List (Section 6.1.2.1)**

- (a) Does the laboratory maintain a list giving a general description of equipment that requires calibration, standardization, or check (C/S/C)? _____
- (b) Is the interval of calibration, standardization, or check, listed for each item? _____
- (c) Are references to procedures used listed for each item (or indicates performed by outside agency)? _____

Procedures for timely performance of C/S/C activities (Section 6.1.2.2 and Section 6.1.2.3)

- (a) Is there a procedure for ensuring that the C/S/C activities are performed on time? ☐
- (b) Does the procedure indicate the individuals/positions responsible for ensuring C/S/C are performed? .. ☐
- (c) Procedure for handling equipment which is newly acquired, removed from service, or defective? ☐
- (d) Does the lab maintain detailed written procedures for all C/S/C activities? *see tables*

3. Measurement Standards (Section 6.1.3) (reference standards)

- (a) Does the laboratory have certificates or other documents that establish the traceability of measurement standards and in-house equipment used for C/S/C, including estimates of measurement uncertainty? ★ ☐
- (b) Is there a procedure that ensures the calibration of measurement standards is performed on time? ☐

4. Equipment Maintenance (Sections 6.1.4)

- (a) Does the laboratory have a system for performing regular maintenance on applicable equipment?..... ☐
- (b) Does the lab maintain a list of equipment that requires maintenance, indicating the interval at which maintenance is conducted, and the procedure used (or indicate Mfg's Instr. are followed)? _____
- (c) Does the laboratory have detailed written procedures and records of equipment maintenance?* . *see tables*

5. Manufacturer's Instructions (Sections 6.1.4.5)

- (a) Does the lab maintain the manufacturer's instructions for operating and maintaining the equipment? .. _____
- Note:** Mfg's Instr. are required even for equip. that does not require maintenance, ex: ignition ovens.

6. Equipment Calibrations, Standardizations, and Checks Frequency and Records (Sections 6.1.5 to 6.1.6)

- (a) Has the CML calibrated, standardized, and checked all applicable testing equipment?* *see tables*

COMMENTS: ★ - Updated in R18-10, September 2010.

see tables - indicates that the findings for these requirements are located in the equipment tables (p. 15-18)

QUALITY MANAGEMENT SYSTEM FOR CONSTRUCTION MATERIALS LABORATORIES**R18**

Date: _____

Sample Management (Section 6.2):

1. Procedure for storage (before testing), retention (after testing), and disposal of test samples?..... ☐
2. Procedure for identifying test sample throughout the life of the sample in the laboratory? ☐

Test Records and Reports (Section 6.3):**1. Test Records and Reports procedures documents (Section 6.3.1)**

- (a) Is there a document describing method used by laboratory to produce test records?..... ☐
- (b) Is there a document describing how to prepare and check test reports?..... ☐
- (c) Is there a document describing how to amend test reports, including a requirement that the previously existing report be clearly reference when an amendment is made and establishing a clear audit trail from the latest issuance or deletion to the original report and data (Section 6.3.2.3)? ☐
- (d) Does the document identify individual(s) responsible for maintaining test records and reports? ☐
- (e) Does the document describe the distribution of test reports? ☐

2. Test Records (Section 6.3.2)

- (a) Does the laboratory maintain test records which contain sufficient information to permit verification of any test reports, including original observations, calculations, derived data, and identification of personnel involved in sampling and testing? ☐

3. Do the test reports clearly, accurately, and unambiguously present the following (Section 6.3.2.1):

- (a) Identification of the report, the date issued, and the standard test method used?..... ☐
- (b) Description, identification, and condition of the test sample? ☐
- (c) Test results and other pertinent data required by the standard test method? ☐
- (d) Identification of any test result obtained from tests performed by a subcontractor?..... ☐
- (e) Name of the person(s) accepting technical responsibility for the test report (if applicable)? ☐

4. Is the following information available and traceable to the test reports (Section 6.3.2.2):

- (a) Name and address of the testing laboratory? ☐
- (b) Name and address of the client or identification of the project? ☐
- (c) Date of receipt of the test sample and date(s) of test performance?..... ☐
- (d) Deviations from, additions to, or exclusions from the standard test method?..... ☐

Subcontracting (Section 6.4):

1. Does the QMS contain a document describing the policies the CML follows relative to subcontracting (or a statement that the CML does not subcontract)? ☐
2. Do the policies include procedures for selecting competent subcontractors? ☐
3. Does the QMS contain a procedure for identifying the results (Section 6.3.2.1) and reporting the results of testing performed by subcontractors (Section 6.4)? ☐

Assuring the Quality of Results (Section 6.5):

1. Does the QSM contain documented procedures for planned monitoring of the validity of test results such as (one or more of the following):
 - (a) Participation in external assessment programs, such as AMRL or CCRL on-site assessments?..... ☐
 - (b) Participation in proficiency sample or interlaboratory comparison testing? ☐
 - (c) Retesting of retained items?..... ☐
2. Does the laboratory retain results of monitoring activities, including steps taken to determine the root cause of any nonconformities and the corrective actions taken?..... ☐
3. Is the laboratory currently enrolled in all applicable AMRL proficiency sample programs? ☐

COMMENTS:

ADDITIONAL REQUIREMENTS – ASTM C1077**C1077**

Date: _____

Labs Testing Concrete and Concrete Aggregates For Use in Construction and Criteria for Lab Evaluation

Note: These are requirements, in addition to what is required by AASHTO R18, that the laboratory must meet in order to become accredited for ASTM C1077 (aggregate testing only). These requirements are intended for laboratories that have not had a C1077 review for aggregate by CCRL.

1. Has the laboratory demonstrated the following aggregate test methods during the most recent AMRL and/or CCRL on-site assessment(s): C40, C117, C127, C128, and C136 (Section 7.2.2)?..... _____

Note: The ASTM, rather than the AASHTO, versions of these test methods must be demonstrated.

2. Is the following information available for review (Section 6.1.1):
- (a) Name and position of the responsible, registered professional engineer in charge? _____
 - (b) Listing of the relevant technical services (i.e. test methods) offered? _____
 - (c) Listing of all external technical services normally utilized (i.e. calibration services, vendors and subcontractors)? _____

3. **Laboratory Manager** requirements (Section 6.1.1):

- (a) Full-time registered professional engineer with at least 5 years experience in materials testing? _____

Name: _____ License No.: _____

State(s) of Registry: _____ Expiration Date(s): _____

4. **Supervising Aggregate Laboratory Technician** requirements (Section 6.1.2):

- (a) At least 3 years relevant experience? _____
- (b) Current technician certification by a technician certification program that includes a written examination and a performance examination of C40, C117, C127, C128, and C136? _____

Note to Assessors: The following programs have been found to be acceptable in the past; however, other programs that meet the requirements are also acceptable, (1) **Both** an ACI Aggregate Laboratory Testing Technician – Grade 1 **and** an ACI Aggregate Field Testing Technician – Grade 1, **or** (2) ACI Concrete Laboratory Testing Technician – Grade 1 or Level 1, **or** (3) ACI Aggregate Testing Technician – Level 1, **or** (4) A NICET Construction Materials Testing – Concrete Level 1 Engineering Technician (if the technician passed all of the required test elements listed in the transcript).

Name: _____ Certs: _____

Name: _____ Certs: _____

5. **Aggregate Laboratory Technician** requirements (Section 6.1.5):

- (a) Current technician certification by a technician certification program that includes a written examination and a performance examination of C40, C117, C127, C128, and C136? _____

Note to Assessors: See note under Supervising Aggregate Laboratory Technician.

Name: _____ Certs: _____

Name: _____ Certs: _____

Name: _____ Certs: _____

Name: _____ Certs: _____

COMMENTS (C1077):

(C1077)

ADDITIONAL REQUIREMENTS – ASTM C1077**C1077**

Date: _____

6. Does the laboratory have a method of confirming sieve accuracy annually for each sieve used in the tests for sieve analysis (Test Methods C117 and C136), such as one of the following (Section 8.4.1):
- (a) Verification of each sieve used according to the procedures in the Annex of Specification E11? _____
- or** (b) A comparison of results of split samples sieved on different sieve sets? _____
- Note:** Results shall be verified for single operator precision to be within the acceptable range of two results stated in the test method.
- or** (c) Participation in the sieve analysis test of an aggregate proficiency sample program? _____
- Note:** Participation in the AMRL PSP for Coarse and Fine Aggregate, or equivalent, is acceptable. Assessors do not need to verify ratings results or data.
7. When mechanical sieving devices are used, is the **period** (time) of mechanical agitation checked at least annually for adequacy of sieving (Section 8.4.2)? _____
8. Have mechanical agitation periods been established for each different type of aggregate tested (Section 8.4.2)? _____
- Note:** Different types of aggregate refer to shape and composition, not supplier. For example, agitation periods for elongated materials may need to be extended, while softer materials that break down easily may require a shorter period to minimize alteration of the particle size distribution.
9. Are duplicate tests for C128 and C127 (sp. gr. tests) made at least every 6 months for each test and the results verified for single-operator precision within the tolerances stated in the test methods (Section 8.4.3)? _____
- Note:** Participation in a proficiency sample program with specific gravity and absorption testing is an acceptable alternative.
10. Does the laboratory have standard operating procedures which include the transfer of samples (aggregate) from the field to the laboratory (Section 9.2.1)? _____
11. Records maintained for all laboratory personnel documenting work experience / education (Section 9.2.5)? _____
- Note to Assessors:** C1077 requires this information for all technical staff. R18 requires this information for supervisory technical staff only.
12. Are records maintained of all audits and inspections by outside agencies; and of all reports or certifications, with applicable dates, of any evaluation or accreditations issued by any evaluating authorities (Section 9.2.6)? _____
13. Do aggregate test reports include the name of the registered professional engineer or their designee (Section 9.4.8)? _____
14. Has the laboratory established procedures for ensuring the quality of external technical services, such as calibration services, equipment, and materials procured by the laboratory from vendors, and subcontractors (Section 10.1.4)? _____
15. Does the laboratory maintain records of the subcontractor and vendor evaluations? _____
- Note:** Records may include a review of external audits, inspections, certifications, and laboratory accreditations held.

COMMENTS (C1077):

(C1077)

ADDITIONAL REQUIREMENTS – ASTM D3666**D3666**

Date: _____

Minimum Requirements for Agencies Testing and Inspecting Bituminous Paving Materials

Note: These are requirements, in addition to what is required by AASHTO R18, that the laboratory must meet in order to become accredited for ASTM D3666.

1. Laboratory Manager requirements (Section 7.1):

- (a) Full-time employee of the laboratory? _____
- (b) At least 5 years experience in inspecting and testing of road and paving materials and construction? .. _____
- (c) One of the following:
- (1) Registered engineer? _____
- (2) Equivalent science-oriented education and experience in having satisfactorily directed testing or inspection services, or both, of road and paving materials?..... _____

Note: A NICET Level IV certification in Construction Materials Testing – Asphalt is an example of acceptable certification of the experience of this individual.

Note to Assessors: If not a registered engineer or NICET Level IV certified, attach a copy of Manager's biographical sketch/resume. Be sure to check to check the ATG files for previous approval.

Name: _____ License No.: _____

State(s) of Registry: _____ Expiration Date(s): _____

License / Certification applies to: AC Emulsions HMA AGG

2. Field / Plant Inspector or Testing Technician Supervisor requirements (Section 7.2):

- (a) At least 3 years experience in testing and/or inspection of road and paving materials and hot mix asphalt construction? _____
- (b) One of the following:
- (1) Applicable certifications/qualifications through a program approved by a State DoT? _____
- (2) NICET Level II certification in Construction Materials Testing - Asphalt?..... _____
- (3) NICET certification in Transportation Technologist - Highway Materials?..... _____

Note: A person may fill one or more of the levels of management, supervision, or technician positions provided that person qualifies for the highest level.

Name: _____ Certs: _____

Name: _____ Certs: _____

Note to Assessors: Before writing a note about a Laboratory Manager not fulfilling the requirements be sure that you have checked the ATG files in the AAP supervisor's office for possible pre-approvals. Also, please be specific regarding the certifications that were presented.

COMMENTS (D3666):

(D3666)

ADDITIONAL REQUIREMENTS – ASTM D3666**D3666**

Date: _____

Minimum Requirements for Agencies Testing and Inspecting Bituminous Paving Materials**3. Testing Technician requirements (Section 7.3):**

(a) One of the following:

- (1) Applicable technician or inspector level certifications/qualifications through a State DoT approved program? _____
- (2) NICET Level I certification in Construction Materials Testing - Asphalt? _____
- (3) NICET certification in Transportation Technologist - Highway Materials? _____

Note: Trainees working toward certification is acceptable if they work under the supervision of a certified/qualified individual at the same lab. The trainee must achieve certification within 2 years from the start of work as a trainee.

Note to Assessors: Make a note on the worksheets if Technicians are working toward certification.

Note: A person may fill one or more of the levels of management, supervision, or technician positions provided that person qualifies for the highest level. Also, please be specific regarding the certifications that were presented.

Certification applies to: AC Emulsions HMA AGG

Name: _____ Certs: _____

Name: _____ Certs: _____

Name: _____ Certs: _____

Name: _____ Certs: _____

Name: _____ Certs: _____

4. Does the laboratory maintain records of any external audits and documentation describing how the deficiencies were corrected (Section 8.1.10)? _____

5. Does the laboratory's quality manual contain brief biographical sketches for all bituminous and aggregate technical staff (Section 9.1.2.3)? _____

Note: A reference to where biographical sketches are found is acceptable if they are not in the QMS.

Note to Assessors: D3666 requires this information for all technical staff. R18 requires this information for supervisory technical staff only.

6. Does the laboratory check equipment according to the intervals found in D3666 (Section 8.1.3)? (see table)

Penetrometer needles (check condition and critical dimension)	(T49/D5)	6 months	
Timing devices (calibrate)	(T49/D5, T201/D2170, T202/D2171)	6 months	
Sieves (check physical condition of all, check openings of No. 4 and larger)		6 months	
Temperature Measuring Devices and Thermometers (standardize)		6 months	

COMMENTS (D3666):

(D3666)

ADDITIONAL REQUIREMENTS – ASTM D3740**D3740**

Date: _____

Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction**Note:** These are requirements, in addition to what is required by AASHTO R18, that the laboratory must meet in order to become accredited for ASTM D3740.

1. Has the laboratory performed at least five ASTM standards relating to testing and/or inspection methods, from the standards covered under the jurisdictions of Committee D18 (Section 4.4)? _____

Note to Assessors: D18 standards include all Soil methods currently covered by AMRL programs, except D2419 (SE).

2. **Laboratory Manager** requirements (Section 7.1):

(a) Full-time employee of the laboratory? _____

(b) At least 5 years engineering or scientific experience in the inspection and testing of soil and rock? _____

(c) One of the following:

(1) Licensed registered engineer or other licensed registered professional? _____

(2) Equivalent science-oriented education and experience in having satisfactorily supervised or directed testing or inspection services, or both, of soil and rock? _____

Note: A NICET Level IV certification in Construction Materials Testing – Soils, Geotechnical Engineering Technology or Transportation Engineering – Subfield Highway Materials is one means of evidence of the experience of this individual.**Note to Assessors:** If not a registered engineer or NICET Level IV certified, attach a copy of Manager's biographical sketch/resume. Be sure to check to check the ATG files for previous approval.

Name: _____ License No.: _____

State(s) of Registry: _____ Expiration Date(s): _____

License / Certification: _____

3. **Supervising Field or Laboratory Technician** requirements (Sections 7.2 and 7.3):

Note: A person may fill one or more of the levels of management, supervision, or technician positions provided that person qualifies for the highest level.

(a) At least 3 years experience performing tests on soil and rock? _____

(b) Has demonstrated by written examination the ability to perform the test methods (current certification by national, regional, or state authorities is one way to fulfill this requirement)? _____

(1) Certification is appropriate to the work required? _____

(2) Written examination includes at least five test methods listed in ASTM Volumes 4.08 and 4.09 (Soil & Rock "D" standards)? _____

(c) Supervising Tech. competency to perform the test methods evaluated by a performance evaluation? ... _____

Note: The performance evaluation can be performed in-house separately from the written exam.

(1) Performance evaluation conducted before technician performs a test independently for the first time? _____

(2) Performance evaluated again at least every 36 months for each test the person is authorized to perform? _____

Note to assessors: Certification issued by state or regional authorities that use slightly modified ASTM procedures (example: state modified methods) are typically acceptable.

Name: _____ Certs: _____

Name: _____ Certs: _____

Note to Assessors: Before writing a note about a Laboratory Manager not fulfilling the requirements be sure that you have checked the ATG files in the AAP supervisor's office for possible pre-approvals.

COMMENTS (D3740):

(D3740)

ADDITIONAL REQUIREMENTS – ASTM D3740**D3740**

Date: _____

Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction**4. Testing Technician requirements (Section 7.4):**

- (a) Has demonstrated by written examination the ability to perform the test methods (current certification by national, regional, or state authorities is one way to fulfill this requirement)? _____
- (1) Certification is appropriate to the work required? _____
- (2) Written examination includes at least five test methods listed in ASTM Volumes 4.08 and 4.09 (Soil & Rock “D” standards)? _____
- (b) Testing Technician competency to perform the test methods evaluated by a performance evaluation?.. _____

Note: *The performance evaluation can be performed in-house separately from the written exam.*

- (1) Performance evaluation conducted before technician performs a test independently for the first time? _____
- (2) Performance evaluated again at least every 24 months for each test the person is authorized to perform?..... _____

Note: *Trainees working toward certification is acceptable if they work under the direct supervision of a qualified individual.***Note:** *A person may fill one or more of the levels of management, supervision, or technician positions provided that person qualifies for the highest level.*

Name: _____ Certs: _____

Name: _____ Certs: _____

Name: _____ Certs: _____

Name: _____ Certs: _____

Name: _____ Certs: _____

5. Does the agency maintain records of the verification of competency of any external organizations used (Section 10.2.6)?..... _____**Note to Assessors:** *This would include outside agencies that are used for equipment C/S/C/M as well as subcontractor laboratories. Records may include a review of external audits, inspections, certifications, and laboratory accreditations held.***6. Does the laboratory check equipment according to the intervals found in D3740 (Section 8.1.5)? (see table)**

Straightedges (check planeness of edge) (T99/D698, T134/D558, T135/D559, T136/D560, T180/D1557)	6 months	
Length Measurement Devices (T193/D1883, T208/D2166, T216/D2435) (LVDTs, Dial Indicators - standardize) (T236/D3080, T296/D2850, T297/D4767)	6 months	
Sieves (check physical condition of all, check openings of No. 4 and larger)	6 months	
Ovens (standardize thermometric device)	4 months	

COMMENTS (D3740):

(D3740)

ADDITIONAL REQUIREMENTS – ASTM E329**E329**

Date: _____

Agencies Engaged in Construction Inspection and/or Testing

Note: *These are requirements, in addition to what is required by AASHTO R18 and of C1077, D3666, or D3740, that the laboratory must meet in order to become accredited for ASTM E329.*

The laboratory must comply with the most recent edition of C1077, D3666, and/or D3740 (E329, Sections 13, 14 & 16).

1. Has the laboratory nominated a deputy in case of absence of the Technical or Quality Manager (Section 5.2.8)?

Name: _____ Title: _____

2. Does the laboratory have a documented policy and procedures to ensure the protection of clients' confidential information and proprietary rights (Sections 5.2.9 and 8.2.17)? _____

3. **Laboratory Manager** requirements (Section 6.2.1):

(a) Licensed professional/registered engineer? _____

Note: *P.E. is not required for quality control laboratories that do not produce tests for acceptance (such as some HMA producers and quarries). In those cases, the Quality Control Manager shall be full-time, have at least 5 years relevant experience and have certs. appropriate to the testing of materials being supervised.*

(b) Full-time employee of the agency? _____

Note: *The P.E. may manage one or more laboratories within the organization.*

(c) At least 5 years relevant engineering experience? _____

Name: _____ License No.: _____

State(s) of Registry: _____ Expiration Date(s): _____

License / Certification: _____

4. **Laboratory Supervisor** requirements (Section 6.2.2):

(a) At least 3 years relevant experience? _____

(b) Has demonstrated either by oral or written examination, or both, ability to perform applicable tests? .. _____

(c) Certification by qualified national, regional or state authorities as appropriate to the work? _____

Note to Assessors: *See requirements in C1077, D3666, and/or D3740, as appropriate. If in-house examinations are being used for C1077 and D3740, they are not acceptable for E329 for this position.*

Note: *If a Supervisor also serves as Manager (and meets the requirements of Section 6.2.1), they do not have to comply with certification requirements.*

Name: _____ Certs: _____

Name: _____ Certs: _____

COMMENTS (E329):

(E329)

ADDITIONAL REQUIREMENTS – ASTM E329**E329**

Date: _____

Agencies Engaged in Construction Inspection and/or Testing**5. Technician requirements (Section 6.2.4):**

- (a) Has demonstrated competence to perform applicable tests either by oral or written examination, or both? (See certification/level information on C1077, D3666 and/or D3740)..... _____

Name: _____ Certs: _____

Name: _____ Certs: _____

Name: _____ Certs: _____

Name: _____ Certs: _____

Name: _____ Certs: _____

Name: _____ Certs: _____

Note: A person may fill one or more of the levels of management, supervision, or technician positions provided that person qualifies for the highest level.

Note: Examples of acceptable certification include ACI, ICC Reinforced Concrete Special Inspector, AWS, ASNT, NICET, or certification by other qualified national authorities, as appropriate to the work being performed.

6. When equipment has been subjected to overloading or mishandling, gives suspect results, or has been shown by verification or otherwise to be defective:

- (a) Has the laboratory examined the effect of this defect on previous tests (Section 7.2.1.1)? _____
- (b) Are records of any damage, malfunction, or repair kept (Section 7.4.8)? _____

7. Is each item of equipment, including reference materials, labeled, marked or otherwise identified to indicate its calibration status, when appropriate (Section 7.3)? _____

Note to Assessors: This should indicate if the piece of equipment is useable or out of service, regardless of whether it is checked, standardized, or calibrated. If unlabeled equipment is being used, write a finding.

COMMENTS (E329):

(E329)

QUALITY MANAGEMENT SYSTEM FOR CONSTRUCTION MATERIALS LABORATORIES**R18**

Date: _____

Bituminous Equipment (R18 Annex Table A1.3)	R18 Interval (m)		Procedure		Record Current?		Record Content
"✓" if OK	NP (A)	(B) If > R18 (record #)	NP (C)	Equip (D)	Status (E,F,G)	Date (F, G)	Details (H, I, J, K, L, M)
Cleveland flash cups (check critical dimensions) (T48/D92)	12						
Tag flash cups (check critical dimensions) (T79/D3143)	12						
Penetrometers (standardize penetration depth) (T49/D5)	12						
Penetrometer needles (check condition and critical dimension) (T49/D5)	12*						
Timing devices (standardize) (T49/D5, T201/D2170, T202/D2171)	12*						
Collars and floats (check critical dimensions) (T50/D139)	12						
Ductility, elastic recovery, and force ductility machines (check speed of travel) (T51/D113, T300, T301/D6084)	12						
Ductility, elastic recovery, and force ductility molds (check critical dimensions) (T51/D113, T300, T301/D6084)	12						
Brass rings and assemblies (check critical dimensions) (T53/D36)	12						
Thin-film ovens (check rotation speed, standardize thermometric device) (T179/D1754)	12						
Rolling thin-film oven (check rotation speed, standardize thermometric device) (T240/D2872)	12						
Flow meters (standardize) (T240/D2872)	12						
Pycnometers (standardize volume and check physical condition) (T228/D70)	12						
Rotational Viscometer (standardize with reference fluids) (T316/D4402)	6						
Dynamic Shear Rheometer (standardize with reference fluids) (T315/D7175)	6		T315				
Pressurized Aging Vessel (standardize temperature and pressure) (R28/D6521)	6						
Bending Beam Rheometer (calibrate masses) (T313/D6648)	12						
Saybolt viscometers (standardize) (T59/D244)	36		T72				
Brush Holder, Brush, and Nylon Strip (check critical dimensions) (D7000)★	12						
R18 Interval Findings (Section 6.1.2.1)	Record Content Findings (Section 6.1.5.1)						
(A) NC: Intervals were not specified. (B) NC: Intervals specified were greater than those in R18 (record # of months specified, for example "36")	(H) NC: Records did not include detailed results / ROU. (I) Obs: Records had no name / serial number of the equipment. (J) Obs: Records did not include the date the work was completed.						
Written Procedure Finding (Section 6.1.2.3)	(K) Obs: Records did not include the name of the worker.						
(C) NC: Procedures were not presented. (D) Obs: Procedures did not include a list of calibration, standardization, or check equipment.	(L) Obs: Records did not include a reference to the procedure used. (M) Obs: Records did not include ID of calibration, standardization, or check equipment.						
Record Status Findings (Section 6.1.2.4)	Definitions						
(E) NC: Records were not presented. (F) NC: Records were not current (record previous date). (G) Obs: Records indicated that a previous interval was missed.	NC = Nonconformity Obs = Observation OA = Outside Agency performed the work ROU = Shall include several measurements over the range of use ★						

* - D3666 - Timing devices 6 months, penetrometer needles 6 months.

COMMENTS: ★ - Updated in R18-10, September 2010.

QUALITY MANAGEMENT SYSTEM FOR CONSTRUCTION MATERIALS LABORATORIES**R18**

Date: _____

Hot Mix Asphalt Equipment (R18 Annex Table A1.4)	R18 Interval (m)		Procedure		Record Current?		Record Content
“✓” if OK	NP (A)	(B) If > R18 (record #)	NP (C)	Equip (D)	Status (E,F,G)	Date (F, G)	Details (H, I, J, K, L, M)
Compression testing machines (standardize) (T167/D1074)	12		E4				ROU
Compressive strength molds (check critical dimensions) (T167/D1074)	12						
Compressive strength plungers (check critical dimensions) (T167/D1074)	12						
Flow meters (standardize) (T170/D1856)	12						
Vacuum/pressure gages (standardize) (T209/D2041)	12						
Mechanical Marshall compactors (standardize) (T245)	36						
Manual compaction hammers (check mass & critical dimensions) (T245/D6926)	12						
Breaking heads (check critical dimensions) (T245/D6927)	12						
Marshall Molds (check critical dimensions) (T245/D6926)	12						
Marshall compression testing machines (standardize) (T245/D6927)	12		E4				
Hveem compression testing machines (standardize) (T246/D1560)	12		E4				ROU
Calibration cylinders (check critical dimensions) (T246/D1560)	12						
Followers (check critical dimensions) (T246/D1560, T247/D1561)	12						
CA Kneading Compactor Molds (check critical dimensions) (T247/D1561)	12						
California kneading compactors (standardize) (T247/D1561)	24						
Compression / loading devices: TSR (standardize) (T283/D4867)	12		E4				ROU
Ignition oven internal balances (standardize) (T308/D6307)	12		M231	D4753			ROU
Gyratory compactors (standardize ram pressure, frequency of gyration, LVDT) (T312/D6925)	12						
Gyratory compactor - Internal Angle of Gyration (T312)★ (standardize internal angle)	12						
Gyratory compactor – External or Internal Angle of Gyration(D6925)★ (standardize external or internal angle)	12						
Gyratory molds, ram face, and base plate faces (check critical dimensions) (T312/D6925)	12						
Length Measurement Devices (T245/D6927, T246/D1560) (LVDTs, Dial Indicators - standardize) (T283/D4867, T324)	12						ROU
R18 Interval Findings (Section 6.1.2.1)		Record Content Findings (Section 6.1.5.1)					
(A) NC: Intervals were not specified. (B) NC: Intervals specified were greater than those in R18 (record # of months specified, for example “36”)		(H) NC: Records did not include detailed results / ROU. (I) Obs: Records had no name / serial number of the equipment. (J) Obs: Records did not include the date the work was completed. (K) Obs: Records did not include the name of the worker.					
Written Procedure Finding (Section 6.1.2.3)		(L) Obs: Records did not include a reference to the procedure used. (M) Obs: Records did not include ID of calibration, standardization, or check equipment.					
(C) NC: Procedures were not presented. (D) Obs: Procedures did not include a list of calibration, standardization, or check equipment.							
Record Status Findings (Section 6.1.2.4)		Definitions					
(E) NC: Records were not presented. (F) NC: Records were not current (record previous date). (G) Obs: Records indicated that a previous interval was missed.		NC = Nonconformity Obs = Observation OA = Outside Agency performed the work ROU = Shall include several measurements over the range of use★					

COMMENTS:

★ - Updated in R18-10, September 2010.

QUALITY MANAGEMENT SYSTEM FOR CONSTRUCTION MATERIALS LABORATORIES**R18**

Date: _____

Soil Equipment (R18 Annex Table A1.5)	R18 Interval (m)	Procedure		Record Current?		Record Content
"✓" if OK	NP (B) If > R18 (A) (record #)	NP (C)	Equip (D)	Status (E,F,G)	Date (F, G)	Details (H, I, J, K, L, M)
Hydrometers (check critical dimensions) (T88/D422)	24					
Liquid Limit Devices (check wear & critical dimensions) (T89/D4318)	12					
Grooving tools (check critical dimensions) (T89/D4318)	12					
5.5-lb. Mechanical Proctor Compactors (standardize) (T99/D698)	12		D2168			
10-lb. Mechanical Proctor Compactors (standardize) (T180/D1557)	12		D2168			
5.5-lb. Manual hammers (check weight & critical dimensions) (T99/D698, D4829)	12					
10-lb. Manual hammers (check weight & critical dimensions) (T180/D1557)	12					
4-in. Proctor Molds (check critical dimensions) (T99/D698, T134/D558, T135/D559, T136/D560, T180/D1557)	12					
6-in. Proctor Molds (check critical dimensions) (T99/D698, T180/D1557)	12					
Straightedges (check planeness of edge) (T99/D698, T134/D558, T135/D559, T136/D560, T180/D1557)	12*					
Vacuum / pressure gages (standardize) (T100/D854)	12					
Weighted foot assemblies (check mass) (T176/D2419)	12					
R-Value Molds (check critical dimensions) (T190/D2844)	12					
California kneading compactors (standardize) (T190/D2844)	24					
Standard metal specimens (check outside diameter) (T190/D2844)	12					
Metal followers (check diameter) (T190/D2844)	12					
CBR Molds (check critical dimensions) (T193/D1883)	12					
CBR Penetration pistons (check critical dimensions) (T193/D1883)★	12					
CBR annular and slotted weights (check mass) (T193/D1883)	12					
Compression / loading devices: CBR (standardize) (T193/D1883)	12		E4			ROU
Compression / loading devices: unconfined (standardize) (T208/D2166)	12		E4			ROU
Compression / loading devices: consolidation (standardize) (T216/D2435)	12		E4			ROU
Normal load, Compression / loading devices: direct shear (T236/D3080) (standardize normal load indications)	12		E4			ROU
Shear load, Compression / loading devices: direct shear (T236/D3080) (standardize shear load indications)	12		E4			ROU
Compression / loading devices: UU & CU (T296/D2850, T297/D4767) (standardize load indications)	12		E4			ROU
Expansion Index Vertical Load (standardize) (D4829)★	12					
Length Measurement Devices (T193/D1883, T208/D2166, T216/D2435) (LVDTs, Dial Indicators - standardize) (T236/D3080, T296/D2850, T297/D4767)	12*					ROU
R18 Interval Findings (Section 6.1.2.1)		Record Content Findings (Section 6.1.5.1)				
(A) NC: Intervals were not specified.		(H) NC: Records did not include detailed results / ROU.				
(B) NC: Intervals specified were greater than those in R18 (record # of months specified, for example "36")		(I) Obs: Records had no name / serial number of the equipment.				
(C) NC: Procedures were not presented.		(J) Obs: Records did not include the date the work was completed.				
(D) Obs: Procedures did not include a list of calibration, standardization, or check equipment.		(K) Obs: Records did not include the name of the worker.				
(E) NC: Records were not presented.		(L) Obs: Records did not include a reference to the procedure used.				
(F) NC: Records were not current (record previous date).		(M) Obs: Records did not include ID of calibration, standardization, or check equipment.				
(G) Obs: Records indicated that a previous interval was missed.						
Record Status Findings (Section 6.1.2.4)		Definitions				
		NC = Nonconformity Obs = Observation				
		OA = Outside Agency performed the work				
		ROU = Shall include several measurements over the range of use ★				

* - D3740 – Straightedges 6 months, LVDTs 6 months.

COMMENTS: ★ - Updated in R18-10, September 2010.

QUALITY MANAGEMENT SYSTEM FOR CONSTRUCTION MATERIALS LABORATORIES**R18**

Date: _____

Aggregate Equipment (R18 Annex Table A1.2)	R18 Interval (m)	Procedure		Record Current?		Record Content
"✓" if OK	NP (B) If > R18 (A) (record #)	NP (C)	Equip (D)	Status (E,F,G)	Date (F, G)	Details (H, I, J, K, L, M)
Unit weight measures (standardize) (T19/C29)	12					
Conical molds and tampers (check critical dimensions) (T84/C128)	24					
L.A. machines (check RPM & critical dimensions) (T96/C131)	24					
Steel spheres (check individual weight & charge weight) (T96/C131)	24					
Sulfate soundness sample containers (check physical condition) (T104/C88)	12					
Sulfate soundness ovens (check rate of evaporation) (T104/C88)	12					
Weighted foot assemblies (check mass) (T176/D2419)	12					

General Equipment (R18 Annex Table A1.1)	R18 Interval (m)	Procedure		Record Current?		Record Content
"✓" if OK	NP (B) If > R18 (A) (record #)	NP (C)	Equip (D)	Status (E,F,G)	Date (F, G)	Details (H, I, J, K, L, M)
Mechanical shakers (check sieving thoroughness)	12					
Sieves (check physical condition of all, check openings of No. 4 and larger)	12*		M92	E11		
Ovens (standardize thermometric device)	12*					ROU
Temperature Measuring Devices and Thermometers (standardize)	12*		E1/E77			ROU
General purpose balances, scales, and weights (standardize)	12		M231	D4753		ROU
Analytical balances and weights (calibrate)	12					
Calipers (standardize)	12					ROU

R18 Interval Findings (Section 6.1.2.1)	Record Content Findings (Section 6.1.5.1)
(A) NC: Intervals were not specified. (B) NC: Intervals specified were greater than those in R18 (record # of months specified, for example "36")	(H) NC: Records did not include detailed results / ROU. (I) Obs: Records had no name / serial number of the equipment. (J) Obs: Records did not include the date the work was completed.
Written Procedure Finding (Section 6.1.2.3)	(K) Obs: Records did not include the name of the worker.
(C) NC: Procedures were not presented. (D) Obs: Procedures did not include a list of calibration, standardization, or check equipment.	(L) Obs: Records did not include a reference to the procedure used. (M) Obs: Records did not include ID of calibration, standardization, or check equipment.
Record Status Findings (Section 6.1.2.4)	Definitions
(E) NC: Records were not presented. (F) NC: Records were not current (record previous date). (G) Obs: Records indicated that a previous interval was missed.	NC = Nonconformity Obs = Observation OA = Outside Agency performed the work ROU = Shall include several measurements over the range of use ★

* - D3666: Sieves 6 months, thermometers 6 months.

* - D3740: Sieves 6 months, ovens 4 months.

Note to Assessors: All notes related to Maintenance go in the Equipment section of the report, not the Equipment C/S/C Records. ❖

Equipment that requires maintenance Section 6.1.4, A1.9 "✓" if OK	Interval (months)	Have Procedure or follow Manufacturer's Instructions?	Name of Worker	Date / Comments
PG-binder equipment (PGB tests)	12			
Ductilometers (T51/D113, T300, T301/D6084)	12			
Mechanical Marshall compactors (T245)	12			
California kneading compactors (T247/D1561, T190/D2844)	12			
Gyratory compactors (T312/D6925)	12			
Mechanical Proctor Compactors 5.5 & 10 lb. (T99/D698, T180/D1557)	12			
Compression machines (as applicable) (not all compression machines require periodic maintenance)	12			
Mechanical shakers (as applicable)	12			

Equipment maintenance - Maintenance activities will typically involve lubricating, tightening fittings, cleaning, replacing fluids, and replacing damaged or worn parts. This will vary based on the type of equipment, how often the equipment is used, the manufacturer's recommendations, etc.

COMMENTS: ★ - Updated in R18-10, September 2010.