AMRL
AASHTO Materials Reference Laboratory

Date Issued: January 9, 2014

Dr. Stacy Williams, P.E., Ph.D
Research Associate Professor
University of Arkansas
700 Research Center Boulevard
Fayetteville, Arkansas 72701

Subject: AMRL On-Site Assessment of Materials Testing Laboratory

Dear Dr. Williams:

The following is a confirmatory report on Assessment No. 632R, which was completed in your testing laboratory in Fayetteville, Arkansas on December 10, 2013, by Ryan LaQuay, a representative of the AASHTO Materials Reference Laboratory (AMRL). An examination of the Hot Mix Asphalt, Soil and Aggregate testing facilities was conducted during this assessment. In addition, the quality system of the laboratory was evaluated based on the criteria specified in AASHTO Standard Practice R18.

This report is also available to you in PDF format on the AMRL website, www.amrl.net, if your laboratory has registered for the site. Please contact us if you have any questions about registering for the website.

This letter and the accompanying report provide written evidence that your laboratory has been assessed. It is requested that this report not be used for advertising, publication, or promotional purposes.

Sincerely,

Steven E. Lenker, P.E.
Director, Construction Materials Reference Laboratories
AASHTO Materials Reference Laboratory

Enclosure

REPORT ON MATERIALS TESTING LABORATORY ASSESSMENT:

University of Arkansas
700 Research Center Boulevard
Fayetteville, Arkansas 72701

AMRL Assessor: **Ryan LaQuay**
Assessment Number: **632R**
Date of Assessment: **December 10, 2013**

GENERAL INFORMATION

The assessment covered by this report included a review of the Hot Mix Asphalt, Soil and Aggregate testing facilities. In addition, an examination of the laboratory's Quality System based on the criteria specified in AASHTO Standard Practice R18 was performed.

This report contains a "Summary of Findings" table for each of the areas examined during the assessment. A "Findings" section follows each "Summary of Findings" table, which describes deviations from specification requirements (nonconformities), states specific observations, and notes other relevant matters.

AMRL applied the most recent versions of AASHTO, ASTM or other governing standards available at the time of the assessment. At the conclusion of the assessment, the assessor presented a preliminary report summarizing the findings to the laboratory staff. The findings presented in this final report may vary slightly from those included in the preliminary report.

ASSESSMENT FINDINGS

Findings in this report are classified as **nonconformities**, ***observations***, or ***informational***. Definitions for these terms are provided below.

- **Nonconformities:** A finding that indicates policy or practice contrary to the requirements of applicable standards or documented quality system procedures.
- ***Observations:*** (**1**) A technically-related finding that is not likely to affect the ability of the laboratory to produce valid and accurate test results; (**2**) A minor failure in some part of the organization's quality management system, such as a single observed lapse in following one procedure or the lack of information required on a record. *NOTE: Observations are required to be addressed internally by the laboratory. Repeat observations can result in a nonconformity.*
- ***Informational:*** (**1**) Specific technical information provided for informational purposes only. (**2**) Information about pending or anticipated changes to test standards, AASHTO R 18, and the AAP Procedures Manual.

RESOLUTION OF FINDINGS

Resolving Nonconformities
Laboratories seeking AASHTO accreditation or wishing to maintain their accreditation status must **resolve** all findings labeled as "Nonconformities" within 90 calendar days of the issuance of this final report. The responses must include a description of the corrective action taken and substantiating evidence, such as records; copies of newly prepared or revised documents; equipment packing slips; calibration, standardization, and check records; and photographs. A **root cause analysis** may be required to resolve nonconformities. Repeat nonconformities will require more extensive responses.

RESOLUTION OF FINDINGS (CONT'D)

Corrective Action of Nonconformities and Root Cause Analysis
Resolving nonconformities requires corrective action as follows: (**1**) Take immediate interim action to isolate the effects of the problem, (**2**) Take immediate action to correct the problem, (**3**) Investigate the *root cause* of the problem, if needed, and (**4**) Implement permanent corrective action to prevent recurrence of the problem.

Note: Root cause analysis can be the most difficult and most important part of the corrective action process. Root cause analysis attempts to determine why the nonconformity occurred in the first place. Its focus is "Why did this happen?" Potential causes could include: insufficient staff training and skills; vague policies and procedures; inadequate frequencies for calibrating or checking equipment; and human error.

If more than 90 calendar days are needed to resolve a nonconformity, your laboratory must provide AMRL with a written plan for resolving the nonconformity including an estimated completion date and any evidence of action taken, such as equipment purchase orders. Plans for future resolution of nonconformities will be reviewed and may result in accreditation being granted, denied, suspended, or revoked. If your laboratory does not resolve a nonconformity within 180 calendar days of the issuance of the final report, and desires to maintain its accreditation, an additional on-site assessment may be required.

Resolving Observations
Laboratories are not required to provide written documentation to AMRL describing action taken to address findings identified as "Observations." The laboratory should, however, take necessary corrective action to address the observation to prevent possible recurrence. Repeat observations may result in nonconformities.

Resolving Informational Findings
Laboratories are not required to provide written documentation to AMRL describing action taken to address findings identified as "Informational."

For a complete explanation of the AASHTO Accreditation Program policies and procedures, please see the Procedures Manual located at www.amrl.net.

SUBMITTING RESPONSES TO FINDINGS

To respond to nonconformities contained in this report, log in to www.amrl.net using your laboratory's credentials and select the "My Tab" option at the top of the page. Select the "View My Accreditation Events" link at the top of the left-hand column and select the Accreditation Event that corresponds to the report number as issued in this report. Please follow the instructions included on this web page to submit responses to the nonconformities.

CONTACT INFORMATION

For general questions about the assessment program, please use the following contact information:

Contact Information		
AMRL 4441 Buckeystown Pike Suite A Frederick, MD 21704-7507	**Fax:** 240-436-4899 **Phone:** 240-436-4900	**Email:** aap@amrl.net

Laboratories Seeking AASHTO Accreditation
If your laboratory is not accredited by AASHTO, but desires AASHTO accreditation, your laboratory may obtain accreditation based on an application submitted subsequent to an on-site assessment provided: (**1**) the on-site assessment includes an AASHTO R 18 quality management system review of the applicable field(s), (**2**) the application is submitted within 90 calendar days of the date of issuance of this final report, and (**3**) nonconformities are resolved as described previously.

SUMMARY OF FINDINGS
GENERAL APPARATUS

The table below indicates the Standards observed and discussed during the assessment, and the conformance of the laboratory to specified requirements. A "- - - - - - -" in the Status columns indicates that this item was not included.

ITEM EVALUATED	STATUS
Mechanical Sieving Apparatus	**Satisfactory**
Ovens	**See Finding (a)**
Literature	**Satisfactory**
Sample Reducing Apparatus	**Satisfactory**
Sieves	**Satisfactory**
Thermometers	**Satisfactory**
General Purpose Balances	**Satisfactory**

FINDINGS

(a) Ovens

Nonconformity
The temperature of the QL-make oven (Serial No. 9602246) presented was not maintained at 110 ± 5°C (230 ± 9°F). The temperature ranged from 99.8 to 111.8°C.

SUMMARY OF FINDINGS (HOT MIX ASPHALT)

The table below indicates the Standard test methods observed and discussed during the assessment, and the conformance of the laboratory to specified equipment and procedural requirements. A " - - - - - - -" in the Status columns indicates that the laboratory elected not to include this item as part of the assessment.

Test Method	Designation	AASHTO/Other	ASTM
Reducing Samples of Hot-Mix Asphalt	**R47 / -----**	**Satisfactory**	**-----**
Mechanical Analysis of HMA	**T30 / D5444**	**Satisfactory**	**-----**
Bulk Specific Gravity of Compacted Hot Mix Asphalt	**T166 / D2726**	**Satisfactory**	**-----**
Maximum Specific Gravity of Hot Mix Asphalt Paving Mixtures	**T209 / D2041**	**Satisfactory**	**-----**
Percent Air Voids in Bituminous Paving Mixtures	**T269 / D3203**	**Satisfactory**	**-----**
Asphalt Content of Asphalt Mixtures (Nuclear Method)	**T287 / D4125**	**Satisfactory**	**-----**
Asphalt Content by Ignition Method	**T308 / D6307**	**Satisfactory**	**-----**
Hot Mix Asphalt Superpave Gyratory Compactor	**T312 / D6925**	**Satisfactory**	**-----**
Moisture Content of HMA by Oven	**T329 / -----**	**Satisfactory**	**-----**
Bulk Specific Gravity Using Vacuum Sealing Method	**T331 / D6752**	**Satisfactory**	**-----**

FINDINGS

None.

SUMMARY OF FINDINGS (SOIL)

The table below indicates the Standard test methods observed and discussed during the assessment, and the conformance of the laboratory to specified equipment and procedural requirements. A " - - - - - - -" in the Status columns indicates that the laboratory elected not to include this item as part of the assessment.

Test Method	Designation	AASHTO/Other	ASTM
Dry Preparation of Samples	**R58 / D421**	**Satisfactory**	-----
Liquid Limit of Soils (Atterberg Limits)	**T89 / D4318**	**Satisfactory**	-----
Plastic Limit of Soils (Atterberg Limits)	**T90 / D4318**	**Satisfactory**	-----
Moisture-Density (Proctor) of Soils, Standard Effort	**T99 / D698**	**Satisfactory**	-----
Moisture-Density (Proctor) of Soils, Modified Effort	**T180 / D1557**	**Satisfactory**	-----
Moisture Content of Soils	**T265 / D2216**	**Satisfactory**	-----
Nuclear Density and Moisture Gauge for Soil	**T310 / D6938**	**Satisfactory**	-----

FINDINGS

None.

SUMMARY OF FINDINGS (AGGREGATE)

The table below indicates the Standard test methods observed and discussed during the assessment, and the conformance of the laboratory to specified equipment and procedural requirements. A " - - - - - - -" in the Status columns indicates that the laboratory elected not to include this item as part of the assessment.

Test Method	Designation	AASHTO/Other	ASTM
Sampling Aggregate	**T2 / D75**	**Satisfactory**	-----
Material Finer Than 75-µm (No. 200) Sieve	**T11 / C117**	**Satisfactory**	**Satisfactory**
Organic Impurities in Sands	**T21 / C40**	**Satisfactory**	**Satisfactory**
Sieve Analysis of Aggregates	**T27 / C136**	**Satisfactory**	**Satisfactory**
Fine Aggregate Specific Gravity and Absorption	**T84 / C128**	**Satisfactory**	**Satisfactory**
Coarse Aggregate Specific Gravity and Absorption	**T85 / C127**	**Satisfactory**	**Satisfactory**
Reducing Samples of Aggregate to Test Size	**T248 / C702**	**Satisfactory**	-----
Moisture Content of Aggregate by Oven Drying	**T255 / C566**	**Satisfactory**	-----
Uncompacted Void Content of Fine Aggregate	**T304 / C1252**	**Satisfactory**	-----

FINDINGS

None.

SUMMARY OF FINDINGS
QUALITY SYSTEM CRITERIA

The table below indicates the Standards observed and discussed during the assessment, and the conformance of the laboratory to specified requirements. A "- - - - - - -" in the Status columns indicates that this item was not included.

Standard Practice R18 Management Requirements

ITEM EVALUATED	STATUS
Quality Management System	**Satisfactory**
Document Control	**Satisfactory**
Organization	**Satisfactory**
Staff	**Satisfactory**
Technician Training and Evaluation	**Satisfactory**
Internal Audits	**Satisfactory**
Corrective Action	**Satisfactory**
Records Retention	**Satisfactory**

Standard Practice R18 Technical Requirements

ITEM EVALUATED	STATUS
Equipment	**Satisfactory**
Equipment Calibration, Standardization, Check, and Maintenance Records	**Satisfactory**
Sample Management	**Satisfactory**
Test Records and Reports	**Satisfactory**
Subcontracting	**Satisfactory**
Assuring the Quality of Results	**Satisfactory**

Additional Quality System Evaluations

ITEM EVALUATED	STATUS
ASTM C1077 - Standard Practice for Laboratories Testing Concrete and Concrete Aggregates	**See Finding (a)**
ASTM D3666 - Standard Specification for Agencies Testing and Inspecting Road and Paving Materials	-----
ASTM D3740 - Standard Practice for Agencies Testing Soil and Rock	-----
ASTM E329 - Standard Specification for Agencies Testing Materials Used in Construction	-----

FINDINGS

(a) ASTM C1077 - Standard Practice for Laboratories Testing Concrete and Concrete Aggregates

Informational

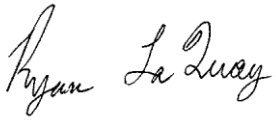
Any findings are incorporated in the preceding AASHTO R18 quality system findings. In addition, laboratory personnel qualifications were not reviewed during the on-site assessment. Personnel qualifications are evaluated for conformance to applicable quality system criteria prior to obtaining AASHTO accreditation and annually for all AASHTO accredited laboratories.

CLOSURE

The findings upon which this report is based were discussed with the laboratory personnel during the course of the on-site assessment. At the conclusion of the assessment, a preliminary report summarizing these comments was presented to the laboratory staff, and all departures from applicable standard test methods and specifications were discussed in detail.

It is recommended that this report be compared with the report of the preceding assessment that was made in this laboratory in September 2011.

AASHTO MATERIALS REFERENCE LABORATORY



Ryan LaQuay
Assessor