Date Issued: September 1, 2021

Mr. Michael Groom
QA / IA Branch Manager
Oklahoma Department of Transportation
Materials Division 5201 NE 122nd Street
BLDG 4011
Edmond, Oklahoma 73013

Subject: AASHTO re:source remote assessment of Materials Testing Laboratory

Dear Mr. Groom:

The following is a confirmatory report on Assessment No. R30826, which was completed remotely in your testing laboratory in Edmond, Oklahoma on August 11, 2021, by Solomon McCullough & Sean Carmean, representing AASHTO re:source. An examination of the Asphalt Binder, Emulsified Asphalt, Asphalt Mixture, Soil, Rock, Aggregate and Iron and Steel 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 AASHTO re:source website, www.aashtoresource.org. To access your report online, log into the website and go to "My Lab." Your report will be viewable under Laboratory Assessment History.

This letter and the accompanying report provide written evidence that your laboratory has been assessed. This report may not be used for advertising, publication, or promotional purposes. Thank you for your participation in the AASHTO re:source Laboratory Assessment Program. Please let us know about your experiences with the program by submitting feedback through the AASHTO re:source website.

Sincerely,

Maria Knake

Maria Knake
Program Manager, Laboratory Assessment Program
AASHTO re:source

cc: Division Administrator, FHWA

re:
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AASHTO re:source (formerly AMRL)

REPORT ON MATERIALS TESTING LABORATORY ASSESSMENT:

Oklahoma Department of Transportation
Materials Division 5201 NE 122nd Street
BLDG 4011
Edmond, Oklahoma 73013

Assessor: **Solomon McCullough & Sean Carmean**
Assessment Number: **R30826**
Date of Assessment: **August 11, 2021**

GENERAL INFORMATION

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

The purpose of the assessment was to collect objective evidence of conformance to applicable quality system and test standards. 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 the requirements outlined in the standards that were evaluated as part of this assessment, as well as any other relevant information. This assessment was performed independently without comparison to other laboratories that are part of the AASHTO re:source programs. The information obtained during the assessment will not be shared with agencies outside of AASHTO without explicit consent from you.

AASHTO re:source applied the most recent versions of AASHTO, ASTM or other 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. While our goal is to provide a thorough and detailed review of your laboratory's conformance to stated standards, it is possible that nonconformities may exist that were not uncovered during this assessment.

ASSESSMENT FINDINGS

Findings in this report are classified as **nonconformities**, ***observations***, or ***informational*** as defined 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 nonconformities.*
- ***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 AASHTO Accreditation Program 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 **60** 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 findings will require more extensive responses. New standards will not be granted unless all nonconformities that are related to a specific standard and the general accreditation requirements have been resolved.

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 your laboratory does not complete this action before the 60-day deadline, the laboratory accreditation will be either denied or suspended based on the unresolved nonconformities; however, the laboratory may receive an additional 30 days to submit evidence of resolution of a nonconformity 1) if the laboratory provides the AAP with a written plan for resolving the remaining nonconformity including an estimated completion date and any evidence of action taken such as equipment purchase orders, or 2) if only minor changes are required. If your laboratory receives an additional 30 days to complete the resolution to any remaining nonconformity, and your laboratory does not resolve the nonconformity by the end of this 30-day period, the laboratory accreditation will be either denied or suspended based on the unresolved nonconformities. If your laboratory does not resolve a nonconformity within 120 calendar days of the issuance of the final report, and desires to maintain its accreditation, an additional assessment may be required.

Resolving Observations
Laboratories are not required to provide written documentation to AASHTO re:source describing action taken to address findings identified as "Observations." However, the laboratory should take necessary corrective action to address the observation to prevent possible recurrence. Repeat observations may result in nonconformities. If an observation was written regarding information missing from a calibration, standardization, or check record performed by an outside agency, it is acceptable to wait until the next due date for that activity in order to address the finding.

Resolving Informational Findings
Informational findings are not deviations from stated procedures. Therefore, laboratories are not required to provide written documentation to AASHTO re:source 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 http://www.aashtoresource.org.

SUBMITTING RESPONSES TO FINDINGS

To respond to nonconformities contained in this report, log in to www.aashtoresource.org using your laboratory's credentials and select "Accreditation Events" on the top of the left-hand side of the page. Select the Accreditation Event that corresponds to the report number as issued in this report. Please follow 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		
AASHTO re:source 4441 Buckeystown Pike Suite A Frederick, MD 21704-7507	**Fax:** 240-436-4899 **Phone:** 240-436-4900	**Email:** mailto:info@aashtoresource.org

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 assessment provided: (**1**) the 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	-----
Ovens	-----
Literature	**Satisfactory**
Sample Reducing Apparatus	-----
Sieves	-----
Thermometers	**Satisfactory**
eneral Purpose Balances	-----

FINDINGS

None.

SUMMARY OF FINDINGS (ASPHALT BINDER)

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
Pressurized Aging Vessel (PAV)	**R28 / D6521**	**Satisfactory**	**-----**
Solubility of Asphalt Materials in Trichloroethylene	**T44 / D2042**	**Satisfactory**	**-----**
Flash Point by Cleveland Open Cup	**T48 / D92**	**Satisfactory**	**-----**
Penetration of Bituminous Materials	**T49 / D5**	**Satisfactory**	**-----**
Float Test for Bituminous Materials	**T50 / D139**	**Satisfactory**	**-----**
Ductility of Bituminous Materials	**T51 / D113**	**Satisfactory**	**-----**
Softening Point of Bitumen (Ring-and-Ball)	**T53 / D36**	**Satisfactory**	**-----**
Distillation of Cut-Back Asphaltic Products	**T78 / D402**	**Satisfactory**	**-----**
Flash Point With Tag Open-Cup Apparatus	**T79 / D3143**	**Satisfactory**	**-----**
Kinematic Viscosity of Asphalts	**T201 / D2170**	**See Finding (a)**	**-----**
Viscosity by Vacuum Capillary	**T202 / D2171**	**Satisfactory**	**-----**
Specific Gravity of Asphalt Cement	**T228 / D70**	**Satisfactory**	**-----**
Rolling Thin-Film Oven Test	**T240 / D2872**	**Satisfactory**	**-----**
Specific Gravity of Liquid Asphalts by Hydrometer	**T295 / D3142**	**Satisfactory**	**-----**
Elastic Recovery Test	**T301 / D6084**	**-----**	**Satisfactory**
Bending Beam Rheometer (BBR)	**T313 / D6648**	**Satisfactory**	**-----**
Dynamic Shear Rheometer (DSR)	**T315 / D7175**	**Satisfactory**	**-----**
Viscosity of Asphalt Binder Using Rotational Viscometer	**T316 / D4402**	**Satisfactory**	**-----**
Multiple Stress Creep and Recovery (MSCR)	**T350 / D7405**	**Satisfactory**	**-----**

FINDINGS

(a) Kinematic Viscosity of Asphalts

AASHTO T201-2015
Informational
The laboratory only tests cutback asphalts using the kinematic viscosity test.

SUMMARY OF FINDINGS (EMULSIFIED 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
Settlement and Storage Stability	**T59 / D6930**	**Satisfactory**	**-----**
Sieve Test	**T59 / D6933**	**Satisfactory**	**-----**
Residue by Evaporation	**T59 / D6934**	**Satisfactory**	**-----**
Particle Charge	**T59 / D7402**	**Satisfactory**	**-----**
Saybolt Viscosity at 25°C (77°F)	**T59 / D7496**	**Satisfactory**	**-----**
Saybolt Viscosity at 50°C (122°F)	**T59 / D7496**	**Satisfactory**	**-----**

FINDINGS

None.

SUMMARY OF FINDINGS (ASPHALT MIXTURE)

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**	**-----**
Rapid Vacuum Drying	**R79 / D7227**	**Satisfactory**	**-----**
Mechanical Analysis of HMA	**T30 / D5444**	**Satisfactory**	**-----**
Quantitative Extraction of Asphalt Binder from HMA	**T164 / D2172**	**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**	**-----**
Moisture-Induced Damage of HMA (Tensile Strength Ratio)	**T283 / D4867**	**See Finding (a)**	**-----**
Asphalt Content by Ignition Method	**T308 / D6307**	**Satisfactory**	**-----**
Hot Mix Asphalt Superpave Gyratory Compactor	**T312 / D6925**	**Satisfactory**	**-----**
Hamburg Wheel-Track Test	**T324 / -----**	**Satisfactory**	**-----**
Moisture Content of HMA by Oven	**T329 / -----**	**Satisfactory**	**-----**
Bulk Specific Gravity Using Vacuum Sealing Method	**T331 / D6752**	**Satisfactory**	**-----**
Thickness or Height of Compacted Specimens	**----- / D3549**	**-----**	**Satisfactory**

FINDINGS

(a) Moisture-Induced Damage of HMA (Tensile Strength Ratio)

AASHTO T283-2014

Observation

The thickness of the conditioned subset (t') was not determined after removing the specimens from the 77±1 °F (25.0±0.5 °C) water bath, prior to indirect tensile strength testing.

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**	**Satisfactory**
Particle Size Analysis of Soils by Hydrometer	**T88 / D422**	**Satisfactory**	**See Finding (a)**
Liquid Limit of Soils (Atterberg Limits)	**T89 / D4318**	**Satisfactory**	**See Finding (b)**
Plastic Limit of Soils (Atterberg Limits)	**T90 / D4318**	**Satisfactory**	**Satisfactory**
Moisture-Density (Proctor) of Soils, Standard Effort	**T99 / D698**	**Satisfactory**	**Satisfactory**
Specific Gravity of Soils	**T100 / D854**	**Satisfactory**	**-----**
Moisture-Density (Proctor) of Soils, Modified Effort	**T180 / D1557**	**Satisfactory**	**Satisfactory**
California Bearing Ratio	**T193 / D1883**	**Satisfactory**	**Satisfactory**
Unconfined Compressive Strength of Soil	**T208 / D2166**	**Satisfactory**	**Satisfactory**
One-Dimensional Consolidation of Soils	**T216 / D2435**	**Satisfactory**	**Satisfactory**
Direct Shear of Soils	**T236 / D3080**	**Satisfactory**	**-----**
Moisture Content of Soils	**T265 / D2216**	**Satisfactory**	**Satisfactory**
Classification of Soils (Unified System)	**----- / D2487**	**-----**	**Satisfactory**
Description and Identification of Soils (Visual-Manual)	**----- / D2488**	**-----**	**Satisfactory**
Shrinkage Factors of Soils by Wax Method	**----- / D4943**	**-----**	**Satisfactory**

FINDINGS

(a) Particle Size Analysis of Soils by Hydrometer

ASTM D422-1963(2007)
Nonconformity
The material clinging to the stopper and the sides of the sedimentation cylinder was rinsed into the solution using distilled water after the 1-minute period of hand agitation. This step is not specified in the test method.

(b) Liquid Limit of Soils (Atterberg Limits)

ASTM D4318-2017
Nonconformity
During the one-point liquid limit demonstration, a water content specimen was not taken after an initial groove closure in the 20 to 30 blow range was observed. A water content specimen was taken only after the second closure in the specified range was observed. Consequently, the liquid limit was not determined by averaging two trial liquid limit values.

SUMMARY OF FINDINGS (ROCK)

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
Slake Durability of Shales and Weak Rocks	----- / **D4644**	-----	**Satisfactory**
Point Load Strength Index of Rock	----- / **D5731**	-----	**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
Reducing Samples of Aggregate to Test Size	**R76 / C702**	**Satisfactory**	**-----**
Sampling Aggregate	**R90 / D75**	**Satisfactory**	**Satisfactory**
Material Finer Than 75-µm (No. 200) Sieve	**T11 / C117**	**Satisfactory**	**-----**
Bulk Density and Voids in Aggregate	**T19 / C29**	**Satisfactory**	**-----**
Organic Impurities in Sands	**T21 / C40**	**Satisfactory**	**-----**
Sieve Analysis of Aggregates	**T27 / C136**	**Satisfactory**	**-----**
Fine Aggregate Specific Gravity and Absorption	**T84 / C128**	**Satisfactory**	**-----**
Coarse Aggregate Specific Gravity and Absorption	**T85 / C127**	**See Finding (a)**	**-----**
Abrasion of Coarse Aggregate	**T96 / C131**	**Satisfactory**	**-----**
Clay Lumps and Friable Particle Percentage	**T112 / C142**	**See Finding (b)**	**-----**
Sand Equivalent Test	**T176 / D2419**	**Satisfactory**	**Satisfactory**
Aggregate Durability Index	**T210 / D3744**	**See Finding (c)**	**-----**
Moisture Content of Aggregate by Oven Drying	**T255 / C566**	**Satisfactory**	**-----**
Uncompacted Void Content of Fine Aggregate	**T304 / C1252**	**Satisfactory**	**-----**
Resistance to Abrasion by Micro-Deval (Coarse Agg)	**T327 / D6928**	**Satisfactory**	**-----**
Fractured Particles in Coarse Aggregate	**T335 / D5821**	**-----**	**Satisfactory**
Flat, Elongated, or Flat and Elongated Particles	**----- / D4791**	**-----**	**Satisfactory**

FINDINGS

(a) Coarse Aggregate Specific Gravity and Absorption

AASHTO T85-2014
Nonconformity
The mass of the specimen was not first determined in a saturated surface-dry condition and then while immersed in water. The order of these steps in the procedure was reversed.

(b) Clay Lumps and Friable Particle Percentage

AASHTO T112-2000(2004)
Informational
The laboratory only tests for coarse aggregate particles.

(c) Aggregate Durability Index

AASHTO T210-2015
Nonconformity
The volume of water and/or the test specimen mass was not adjusted to account for the specimen not being completely inundated with 1000±5 mL of water.

Observation
After the 10-minute agitation of the coarse aggregate specimen during Procedure A, the washing vessel was not shaken by moving the vessel vigorously in a horizontal circular motion 5 times to bring fines into suspension. The washing vessel was not shaken.

SUMMARY OF FINDINGS (IRON AND STEEL)

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
Zinc Coatings on Iron and Steel: Thickness of Zinc (Stripping)	**M111-T65 / A123-A90**	**Satisfactory**	-----
Zinc Coatings on Iron and Steel: Thickness of Zinc (Magnetic)	**M111 / A123-E376**	**Satisfactory**	-----
Welded Plain Steel Wire: Weld Shear	**M336 / A1064**	**Satisfactory**	-----
Welded Plain Steel Wire: Tension (Ultimate Tensile Strength)	**M336-T244 / A1064-A370**	**Satisfactory**	-----
Welded Deformed Steel Wire: Weld Shear	**M336 / A1064**	**Satisfactory**	-----
Welded Deformed Steel Wire: Tension (Ultimate Tensile Strength)	**M336-T244 / A1064-A370**	**Satisfactory**	-----
Deformed Steel Wire: Tension (Ultimate Tensile Strength)	**M336-T244 / A1064-A370**	**Satisfactory**	-----
Plain Steel Wire: Tension (Ultimate Tensile Strength)	**M336-T244 / A1064-A370**	**Satisfactory**	-----
Carbon-Steel Bars, Deformed and Plain: Tension (Yield Strength)	**M31-T244 / A615-A370**	**Satisfactory**	-----
Carbon-Steel Bars, Deformed and Plain: Tension (Ultimate Tensile)	**M31-T244 / A615-A370**	**Satisfactory**	-----
Carbon-Steel Bars, Deformed and Plain: Tension (Elongation)	**M31-T244 / A615-A370**	**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**
Management Reviews	**Satisfactory**
Corrective Action	**Satisfactory**
Records Retention	**Satisfactory**

Standard Practice R18 Technical Requirements

ITEM EVALUATED	STATUS
Equipment	**Satisfactory**
Equipment Calibration, Standardization, Check, and Maintenance Records	**See Finding (a)**
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	-----
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) Equipment Calibration, Standardization, Check, and Maintenance Records

Nonconformities

Procedures and calibration, standardization, and check records were not presented for consolidometer deadweights (T216/D2435) and direct shear normal load deadweights (T236) (Section 6.1.2).

The calibration, standardization, or check records presented for mechanical shaker (Serial No. FL2305) did not contain sufficiently detailed results to establish the required agitation time for thorough sieving (Section 6.5.1.1). The records did not include the finer sieve portion of the test (only goes down to the No. 8 sieve).

Written procedures were not presented for consolidometer and direct shear shear deflection (Section 6.1.2).

CLOSURE

The findings upon which this report is based were discussed with the laboratory personnel during the course of the 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. While our goal is to provide a thorough and detailed review of your laboratory's conformance to stated standards, it is possible that nonconformities may exists that were not uncovered during this assessment.

It is recommended that this report be compared with the report of the preceding assessment that was made in this laboratory in November 2018.

AASHTO re:source

Solomon M. McCullough
Assessor

Sean Carmean
Assessor