

October 13, 2020

Mr. Michael Groom Transportation Manager II Oklahoma Department of Transportation 5201 NE 122nd Street Building 4011 Edmond, Oklahoma 73013

Subject: Remote Inspection of Concrete, Cement and Pozzolan Testing Laboratory

Enclosed is a confirmatory report on Inspection E382, which was completed in your testing laboratory in Edmond, Oklahoma, on September 21, 2020, by a representative of the Cement and Concrete Reference Laboratory.

This letter, and the accompanying report, provides written evidence that your laboratory has been inspected during the 38th Inspection Tour.

Very truly yours,

Jan A. Promull

Jan A. Prowell

Director

Cement and Concrete Reference Laboratory

Enclosure

cc: D. McCullough FHWA



Inspection Report Introduction

This report covers the concrete, cement and pozzolan inspection conducted in the laboratory of Oklahoma Department of Transportation, at Edmond, Oklahoma. This inspection, designated as Inspection Number E382, was completed in the laboratory on September 21, 2020.

Inspections generally cover three areas: quality systems; testing equipment; and procedures. Under all material types inspected there will be a Summary of Findings and a Footnote Section. The Summary of Findings will denote items examined, which may include: documents, equipment and procedures performed by the laboratory. Entries in the Summary of Finding Section cover availability, physical condition, and/or conformance to specification requirements. These items, when checked, will indicate whether the items conformed to the ASTM standard or will state briefly any deviation from the standard and will be listed in the Footnote Section. The Footnote Section is also used to convey observations, recommendations or explanations of conditions found. When a footnote of this nature appears in a report it is labeled as an "Informational Footnote". These informational footnotes do not require deficiency corrections.

Corrections of minor deficiencies are encouraged during the course of each inspection. In the interest of brevity, any adjustments of this nature which may have been made have not been mentioned in the report.

For a more in-depth description of the scope of each inspection, please see www.ccrl.us/Lip/lip.html. The inspection was conducted using the most recent version of the applicable Book of ASTM Standards available at the time of the inspection, unless otherwise indicated in this report.

This report confirms the condition of the laboratory on the inspection date noted above. It does not approve, certify or accredit this laboratory; therefore, publicizing the inspection without offering a review of this report is prohibited.

AASHTO ACCREDITATION SUMMARY OF FINDINGS

Equipment

Inspection Item	<u>Status</u>
General Requirements for Accreditation	Satisfactory
Laboratory Temperature Requirement	Satisfactory
Temperature of workroom: 19.5 °C	
Date of temperature check: 9/17/20	
Time of temperature check: 10:00 am	
Review of Temperature Recorder Data-1 C511-19	Satisfactory
Recorder Identification Number: FL2396	
Used for: Moist Storage and Water Storage	
Review of Temperature Recorder Data-2 C511-19	See footnote (1)
Recorder Identification Number: LAT02051	
Used for: Moist Storage	
Director of Testing	Satisfactory
Director of Testing: Matt Romero	
Years of Experience in Materials Testing: 30	
Registered Professional Engineer: Yes	
P.E. License Number: 26483	
State of License Issuance: Oklahoma	
Expiration date of License: 12/31/20	
Supervisor of Concrete Laboratory Testing	See footnote (2)
Concrete Laboratory Supervisor: Daryl Johnson	
Years of relevant experience: 33	
Current Concrete Laboratory Certification: None	
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Technician Demonstrating Concrete Field Tests-1	Satisfactory
Technician: Daniel Gittings	
Current Concrete Field Certification: ODOT (Internal)	
Technician Demonstrating Concrete Field Tests-2	Satisfactory
Technician: David Crawford	

Current Concrete Field Certification: ODOT (Internal)

Technician Demonstrating Concrete Laboratory Tests-1 Satisfactory · Technician: Victoria Hart • Current Concrete Laboratory Certification: ODOT (Internal) Technician Demonstrating Concrete Laboratory Tests-2 Satisfactory

· Technician: David Crawford

• Current Concrete Laboratory Certification: ODOT (Internal)

Technician Demonstrating Concrete Laboratory Tests-3

Satisfactory

· Technician: Daniel Gittings

• Current Concrete Laboratory Certification: ODOT (Internal)

AASHTO ACCREDITATION FOOTNOTE SECTION

1) Review of Temperature Recorder Data-2 C511-19

• Data from the temperature recorder was not available for review. It was understood that the moisture room is undergoing mechanical work to adequately cool the room during warmer weather.

2) Supervisor of Concrete Laboratory Testing

• The supervisor of concrete testing was not certified for the following test methods (the laboratory does not perform concrete testing in the field): C39, C78, C617 or C1231, C138, C143, C172, C231, and C1064.

Satisfactory

QUALITY SYSTEMS SUMMARY OF FINDINGS

Quality System

Inspection Item	<u>Status</u>
Quality Systems Presented	
 AASHTO R18-18: Presented for Review ASTM C1077-17: Not Presented for Review ASTM C1222-17: Presented for Review ASTM E329-18: Not Presented for Review 	
General Requirements	Satisfactory
Organization	Satisfactory
Position Descriptions	Satisfactory
Management Qualifications	Satisfactory
Laboratory and Field Qualifications	Satisfactory
Training and Performance Evaluation Procedures	Satisfactory
Training and Performance Evaluation Records	Satisfactory
Internal Reviews	Satisfactory
Corrective Actions	Satisfactory
Record Retention	Satisfactory
Standard Operating Procedures	Satisfactory
Cement Test Report	Satisfactory
Concrete Test Report	Satisfactory
Test Records	Satisfactory

External Services

Monitoring Test Results	Satisfactory
Cement Proficiency Sample Program	Satisfactory
Concrete Proficiency Sample Program	Satisfactory
Pozzolan Proficiency Sample Program	Satisfactory
AASHTO R18 Standard Practice Availability	Satisfactory
Cement Test Methods Availability	Satisfactory
Cement Test Methods Presented: ASTM and AASHTO Methods	
Concrete Test Methods Availability	Satisfactory
Concrete Test Methods Presented: ASTM and AASHTO Methods	
Pozzolan Test Methods Availability • Pozzolan Test Methods Presented: ASTM and AASHTO Methods	Satisfactory
Inventory List	Satisfactory
Calibration List	Satisfactory
General Equipment Procedures	Satisfactory
Calibration Equipment and Reference Standards	Satisfactory
Maintenance	Satisfactory
Cement Equipment Calibrations	See footnote (3)
Concrete Equipment Calibrations	See footnote (4)
Pozzolan Equipment Calibrations	See footnote (5)
Equipment Identification	Satisfactory

QUALITY SYSTEMS FOOTNOTE SECTION

3) Cement Equipment Calibrations

- The autoclave safety valve was not verified at the frequency specified in Section 7.4 of C151 and Section 6.4.1 of AASHTO R18.
- The recording thermometer was verified within the last six months, however records indicated that the verification was not routinely performed at the frequency specified in Section 5.2.1 of C511 and Section 6.4.1 of AASHTO R18.
- The standard sand verification records did not include the identification of the equipment (mechanical sieve shaker and balance) used to perform the verification as required by Section 6.5.1.9 of AASHTO R18.

4) Concrete Equipment Calibrations

- The recording thermometer was not verified at the frequency specified in Section 5.2.1 of C511 and Section 6.4.1 of AASHTO R18.
- The verification records for the single use molds did not include the identification of the equipment being verified (shipment date or lot number) as required by Section 9.2.2.1 of C1077 and Section 6.5.1.4 of AASHTO R18.
- The unit weight measure calibration records did not include the volume of the measure calculated to 0.001 ft³ as required in Section 8.1.3 of C138. The measure volumes were not calculated correctly, and it is recommended that the calibrations be redone.

5) Pozzolan Equipment Calibrations

- The autoclave safety valve was not verified at the frequency specified in Section 7.4 of C151 and Section 6.4.1 of AASHTO R18.
- The recording thermometer was verified within the last six months, however records indicated that the verification was not routinely performed at the frequency specified in Section 5.2.1 of C511 and Section 6.4.1 of AASHTO R18.
- The standard sand verification records did not include the identification of the equipment (mechanical sieve shaker and balance) used to perform the verification as required by Section 6.5.1.9 of AASHTO R18.

CONCRETE SUMMARY OF FINDINGS

Equipment

<u>Inspection Item</u> <u>Status</u>

Items of Interest for Remote Inspection

See footnote (6)

- Type of Storage Facility: Moist Storage
- Recording Thermometer ID Number: LAT02051, probe 27
- · Size of Cylinder Molds Available: 4 Inch Diameter
- · Method of Treating Cylinder Ends: Bonded Capping; Unbonded Capping; Grinding
- Maximum Strength Capacity of Bonded Caps: 10,400 psi
- Maximum Strength Capacity of Unbonded Caps: 7,000 psi
- Compression Testing Machine ID Number: 06129-FRAME 1
- · Compression Testing Machine Capacity: 400,000 lbf
- Slump Cone ID Number: CSC-3
- Unit Weight ID Number: CAUW-2
- Unit Weight Scale ID Number: LBT0279
- Pressure Air Content Apparatus ID Number: LAE557

Procedures

Inspection Item	<u>Status</u>
Sampling Freshly Mixed Concrete C172-17	Satisfactory
Measuring Temperature of Concrete C1064-17	Satisfactory
Slump of Concrete C143-15a	Satisfactory
Weight per Cubic Foot of Concrete C138-17a	Satisfactory
Air Content of Concrete (Pressure Method-Type B) C231-17a	See footnote (7)
Fabrication of Four Inch Diameter Cylinder C31-19	Satisfactory
Fabrication of Beams C31-19	Satisfactory
Density of Concrete C39-18	Satisfactory
Cylinder Diameter Measurements C39-18	Satisfactory
Capping of Cylinders C617-15	Satisfactory
Cylinder Checks for Unbonded Caps C1231-15	Satisfactory
Compressive Strength of Cylinders C39-18	Satisfactory

Additional Observations of Remote Inspection Prod	ocedures
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Satisfactory

CONCRETE FOOTNOTE SECTION

6) Items of Interest for Remote Inspection

• This inspection was performed remotely using video conferencing tools; therefore, the equipment used to perform the test(s) was unable to be verified by the inspector for conformance to the standard.

7) Air Content of Concrete (Pressure Method-Type B) C231-17a

- In reading the air content, the gage hand was not stabilized by tapping the gage lightly by hand as specified in Section 8.3.2 of C231.
- When calculating the air content of the concrete, it was understood that an aggregate correction factor was added rather than subtracted as required in Section 9.1 of C231.

CEMENTITIOUS CHEMISTRY SUMMARY OF FINDINGS

Equipment

Inspection Item	<u>Status</u>
Silicon Dioxide C114-15	Satisfactory
Method used: Rapid Method (X-Ray)	
Aluminum Oxide C114-15	Satisfactory
Method used: Rapid Method (X-Ray)	
Ferric Oxide C114-15	Satisfactory
Method used: Rapid Method (X-Ray)	
Calcium Oxide C114-15	See footnote (8)
Method used: Rapid Method (X-Ray)	
Magnesium Oxide C114-15	Satisfactory
Method used: Rapid Method (X-Ray)	
Sulfur Trioxide C114-15	Satisfactory
Method used: Reference Method	
Loss on Ignition C114-15	Satisfactory
Method used: Reference Method	
Sodium Oxide C114-15	See footnote (9)
Method used: Rapid Method (X-Ray)	
Potassium Oxide C114-15	Satisfactory
Method used: Rapid Method (X-Ray)	
Titanium Dioxide C114-15	Satisfactory
Method used: Rapid Method (X-Ray)	
Phosphorus Pentoxide C114-15	See footnote (10)
Method used: Rapid Method (X-Ray)	

Zinc Oxide C114-15	Satisfactory
Method used: Rapid Method (X-Ray)	
Manganic Oxide C114-15	Satisfactory
Method used: Rapid Method (X-Ray)	
Insoluble Residue C114-15	Satisfactory
Method used: Reference Method	
Analyst Qualification C114-15	See footnote (11)

CEMENTITIOUS CHEMISTRY FOOTNOTE SECTION

8) Calcium Oxide C114-15

• Less than 77% of the reference materials used in the qualification of calcium oxide using a Rapid Method met the requirement that the difference between the certified value and the average of the duplicates be within the maximum permissible difference specified in Table 1 of C114.

9) Sodium Oxide C114-15

• Less than 77% of the reference materials used in the qualification of sodium oxide using a Rapid Method met the requirement that the difference between the certified value and the average of the duplicates be within the maximum permissible difference specified in Table 1 of C114.

10) Phosphorus Pentoxide C114-15

- Less than 77% of the reference materials used in the qualification of phosphorus pentoxide using a Rapid Method met the requirement that the difference between the certified value and the average of the duplicates be within the maximum permissible difference specified in Table 1 of C114.
- When performing qualification testing for phosphorus pentoxide using a Rapid Method, the difference between
 the certified value and the average of duplicate results exceeded twice the maximum permissible difference
 specified in Table 1 of C114. Attention is invited to Section 5.4.2.3 of C114 which requires that all qualification
 testing be within twice the maximum difference.

11) Analyst Qualification C114-15

• The analysts were not requalified every two years as required by Section 5.2.1 of C114.

CEMENT SUMMARY OF FINDINGS

Equipment

Inspection Item Status

Items of Interest for Remote Inspection

See footnote (12)

- Type of Storage Facility: Moist and Water Storage
 Recording Thermometer ID Number: FL2396
 Analytical Balance ID Number: 1483/LBT0293
- Muffle Furnace ID Number: L00399
 No. 325 Sieve ID Number(s): 5
 Autoclave ID Number: 101124
- Method of Adding Mix Water: Graduate
- Flow mold ID Number: K1618
- Compression Testing Machine ID Number: 222424
 Compression Testing Machine Capacity: 60,000 lbf
- Mix Balance ID Number: LBT0364
- Vicat Apparatus ID Number(s): U2450; P280
- Type of Vicat(s) Available: Manual
- Mechanical Mixer ID Number(s): 31-1391-318 (0097)
- Initial Gillmore Needle ID Number: T3001
 Final Gillmore Needle ID Number: W3334
 Blaine Apparatus ID Number(s): LA 9
 Type of Blaine Apparatus Available: Manual

Procedures

Inspection Item	<u>Status</u>
Handling of Samples C183-16	Satisfactory
Testing of Autoclave Bars C151-18	Satisfactory
Preparation of Mortar Cubes C109-16a, C1437-15	See footnote (13)
Testing of Mortar Cubes C109-16a	Satisfactory
Density Test C188-17	Satisfactory
Loss on Ignition Test C114-18	Satisfactory
No. 325 Sieve Fineness Test C430-17	See footnote (14)
Preparation of Autoclave Bars C151-18	Satisfactory

Normal Consistency Test C187-16	See footnote (15)
Vicat Time of Set Test Method A (Manual) C191-18a	Satisfactory
Preparation of Gillmore Pat C266-18	Satisfactory
Air Content Determination C185-15a	Satisfactory
Air Permeability Fineness Test Method A (Manual) C204-18	Satisfactory
Additional Observations of Remote Inspection Procedures	Satisfactory

CEMENT FOOTNOTE SECTION

12) Items of Interest for Remote Inspection

• This inspection was performed remotely using video conferencing tools; therefore, the equipment used to perform the test(s) was unable to be verified by the inspector for conformance to the standard.

13) Preparation of Mortar Cubes C109-16a, C1437-15

- The mortar from the sides of the bowl was not scraped down prior to re-mixing as required by Section 10.3.4 of C109.
- Upon completion of mixing, the excess mortar was not shaken from the paddle as required by Section 10.3.4 of C109.

14) No. 325 Sieve Fineness Test C430-17

A 1.000 gram sample was not used for this test as required by Section 6.1 of C430. A balance with 0.01 g
readability was used to weigh the sample.

15) Normal Consistency Test C187-16

 The plunger of the Vicat apparatus was not released into the paste within the required 30 seconds after completion of mixing as required by Section 7.3 of C187.

POZZOLAN SUMMARY OF FINDINGS

Equipment

Inspection Item Status

Items of Interest for Remote Inspection

See footnote (16)

- Type of Storage Facility: Moist and Water Storage
 Recording Thermometer ID Number: FL2396
 Analytical Balance ID Number: 1483/LBT0293
- Muffle Furnace ID Number: L00399
 No. 325 Sieve ID Number(s): 5
 Autoclave ID Number: 101124
- Method of Adding Mix Water: Graduate
- Flow mold ID Number: K1618
- Compression Testing Machine ID Number: 222424
 Compression Testing Machine Capacity: 60,000 lbf
- Mix Balance ID Number: LBT0364
- Vicat Apparatus ID Number(s): U2450; P280
- Type of Vicat(s) Available: Manual
- Mechanical Mixer ID Number(s): 31-1391-318 (0097)
- Initial Gillmore Needle ID Number: T3001
 Final Gillmore Needle ID Number: W3334
 Blaine Apparatus ID Number(s): LA 9
 Type of Blaine Apparatus Available: Manual

Procedures

Inspection Item	<u>Status</u>
Moisture Content Test C311-18	Satisfactory
Loss on Ignition Test C311-18	Satisfactory
Testing of Autoclave Bars C151-18	Satisfactory
Preparation of Mortar Cubes C109-16a, C1437-15	See footnote (17)
Testing of Mortar Cubes C109-16a	Satisfactory
Density Test C188-17	Satisfactory
No. 325 Sieve Fineness Test C430-17	See footnote (18)
Preparation of Autoclave Bars C151-18	Satisfactory

Normal Consistency Test C187-16	See footnote (19)
Additional Observations of Remote Inspection Procedures	Satisfactory

POZZOLAN FOOTNOTE SECTION

16) Items of Interest for Remote Inspection

• This inspection was performed remotely using video conferencing tools; therefore, the equipment used to perform the test(s) was unable to be verified by the inspector for conformance to the standard.

17) Preparation of Mortar Cubes C109-16a, C1437-15

- The mortar from the sides of the bowl was not scraped down prior to re-mixing as required by Section 10.3.4 of C109.
- Upon completion of mixing, the excess mortar was not shaken from the paddle as required by Section 10.3.4 of C109.

18) No. 325 Sieve Fineness Test C430-17

A 1.000 gram sample was not used for this test as required by Section 6.1 of C430. A balance with 0.01 g
readability was used to weigh the sample.

19) Normal Consistency Test C187-16

 The plunger of the Vicat apparatus was not released into the paste within the required 30 seconds after completion of mixing as required by Section 7.3 of C187.

Satisfactory

ADDITIONAL METHODS SUMMARY OF FINDINGS

Equipment

Inspection Item	<u>Status</u>
Items of Interest for a Remote Inspection	See footnote (20)
Procedures	
Inspection Item	<u>Status</u>
Obtaining and Testing Drilled Cores and Sawed Beams of Concrete Procedure C42-18a	See footnote (21)
Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading) Procedure C78-18	Satisfactory
Making and Curing Concrete Test Specimens in the Laboratory Procedure C192-18	Satisfactory
Fundamental Transverse, Longitudinal, and Torsional Resonant Frequencies of Concrete Specimens Procedure C215-14	Satisfactory
Resistance of Concrete to Rapid Freezing and Thawing Procedure C666-15	Satisfactory
Measuring Length of Concrete Cores Procedure C1542-16a	Satisfactory

Additional Observations of Remote Inspection Procedures

ADDITIONAL METHODS FOOTNOTE SECTION

20) Items of Interest for a Remote Inspection

• This inspection was performed remotely using video conferencing tools; therefore, the equipment used to perform the test(s) was unable to be verified by the inspector for conformance to the standard.

21) Obtaining and Testing Drilled Cores and Sawed Beams of Concrete Procedure C42-18a

• The density of the core was not determined as required by Section 7.5 of C42.

CLOSURE

This inspection was performed by Justin Garner. While the work was in progress, many of the details covered by this report were discussed with laboratory personnel. At the conclusion of the inspection the special work sheets, on which all observations were recorded, were made available for review by members of the laboratory staff, and all of the entries thereon were discussed in detail.

Identification of the testing equipment used by the CCRL inspector during the inspection can be found on the CCRL website at www.ccrl.us under the heading of traceability.

It is recommended that this report be compared with the report of the preceding inspection which was made in May 2017. For further reference the CCRL laboratory number is 35.

This report does not approve, certify or accredit this laboratory. Publicizing the inspection without full disclosure of this report is not permitted.

Cement and Concrete Reference Laboratory

Justin Garner Inspector



Laboratory Inspection Program Request Form

To participate in the inspection program, complete this form and return it either by e-mail (ccrl@astm.org) or mail. Down payments are only required for laboratories seeking an inspection for the first time, seeking an out of sequence inspection, or have previous collection problems.

Select the type(s) of inspection (see page 2 for scopes):

select the type(s) of hispection (see	hale a ror scopes).	•			
* 🕱 Concrete * 🕱	Cement		CMU		☐ Brick
☐ Concrete Aggregates * 💢	Pozzolan		SRW		☐ Mortar
□ Rebar □	Slag Cement		Interlocking	Pavers *	岚 AASHTO R18
* Included in last inspection.					□ E329
For a listing of test methods & practices ins	pected for each type se	e the	second page of	of this form.	
	-				
Please review and complete:					methods you would like
Company Name: Oklahoma Department o	f Transportation				n. A fee will apply for
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Alternate Phone:			C29, C42	C70, C78 C87,	C88, C97, C99, C115,
Lab Street Address: 200 N.E. 21st Street			C123, C13	1/C535, C142, C	C157, C170, C174, C186,
City/State/Zip: Oklahoma City, Oklahoma		-			C233, C241, C289, C293,
County: Oklahoma Moiling Addraga: 200 N.F. 21st Street					C403, C418, C426, C441,
Mailing Address: 200 N.E. 21st Street City/State/Zip: Oklahoma City, Oklahom	19		7.5		C496, C512, C531, C567,
Primary Contact: Mr. Michael Groom	14				
Job Title: Transportation Manager II					C597, C641, C642 (C666,
Email: mgroom@odot.org				te de agrecia de la companya de la c	agg ratio), C780 (cone
Secondary Contact: Mr. Donald McCullo	ugh		penetration	n), C780 (cubes),	C780 (cylinders), C803,
Email: dmccullough@odot.org			C805, C82	7, C873, C876, C	C878, C880, C882, C884,
Invoice Contact: AASHTO			C900, C91	8, C937, C939,	C940, C942, C944, C953,
Email:			C1012, C1	019, C1038, C10	040, C1074, C1084, C1090,
Comments (optional):	2 0		C1105, C1	138, C1140, C1	152, C1170, C1176, C1202,
					262, C1293, C1314, C1353,
					542, C1543, C1550, C1552,
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1117			1. 100. 2000.		583, C1603, C1604, C1609,
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Dated		_			9, D4791, D4832,
Questions? Please contact us at ccrl@astm.or	g or (240) 436-4800 or		D5821/T3	35, D5971, D64	49, E488, G109, T318,
visit our website at www.ccrl.us.	ormation		T336, CR	D-C48, CRD-C6	1, & CRD-C130
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Oklahoma Department of Transportation

Location: Edmond, Oklahoma, USA Issue Date: 03/29/2021

1. Follow-Up to Unresolved Criteria: (Ref.: 20-4395, Item 1)

Decision

The continuation of accreditation decision has been satisfactorily resolved for the affected scope.

Affected Scope

Quality Management System standard C1222 (Cement)

Reason

The laboratory resolved the applicable nonconformities noted in connection with CCRL Report E382 as specified in the previous notification issued to the laboratory.