



## Remote Cement, Pozzolan, Slag Cement, and Quality Systems Inspection Checklist

This checklist is intended to represent preparation for the special circumstances required for presenting Cement, Pozzolan, Slag Cement, or a combination of those three in a remote inspection during the COVID-19 Pandemic.

**It is advised that a careful review of the following be undertaken in order to best prepare for these special circumstances, as the preparation requirements for a remote inspection should be expected to differ significantly from previous inspections.**

### Scope of Inspection if Presenting Cement:

The following ASTM test methods are included during a CCRL Cement Inspection:

- C109 Compressive Strength of Hydraulic Cement Mortars
- C114 Chemical Analysis of Hydraulic Cement
- C114 Loss on Ignition
- C151 Autoclave Expansion of Hydraulic Cement
- C183 Sampling and the Amount of Testing of Hydraulic Cement
- C185 Air Content of Hydraulic Cement Mortar
- C187 Amount of Water Required for Normal Consistency
- C188 Density of Hydraulic Cement
- C191 Time of Setting of Hydraulic Cement by Vicat Needle
- C204 Fineness of Hydraulic Cement by Air-Permeability Apparatus
- C230 Flow Table for Use in Tests of Hydraulic Cement
- C266 Time of Setting of Hydraulic-Cement Paste by Gillmore Needles
- C305 Mechanical Mixing of Hydraulic Cement Pastes and Mortars of Plastic Consistency
- C430 Fineness of Hydraulic Cement by the 45- $\mu$ m (No. 325) Sieve
- C451 Early Stiffening of Hydraulic Cement (Paste Method)
- C490 Use of Apparatus for the Determination of Length Change of Hardened Cement Paste
- C511 Mixing Rooms, Moist Cabinets, Moist Rooms, Water Storage Tanks, and Mix Water
- C778 Standard Sand
- C1005 Reference Masses, Graduated Cylinders, and Balances
- C1437 Flow of Hydraulic Cement Mortar
- C1506 Water Retention of Hydraulic Cement-Based Mortars and Plasters

There are several additional test methods that the laboratory may wish to add on to the scope of their inspection. Any additional tests that the laboratory might wish to include for inspection should be clearly conveyed to the inspector **prior to the scheduled inspection date**.

### **Scope of Inspection if Presenting Pozzolan:**

The following ASTM test methods are included during a CCRL Pozzolan Inspection:

- C109 Compressive Strength of Hydraulic Cement Mortars
- C114 Chemical Analysis of Hydraulic Cement
- C151 Autoclave Expansion of Hydraulic Cement
- C157 Length Change of Hardened Hydraulic-Cement Mortar and Concrete
- C185 Air Content of Hydraulic Cement Mortar
- C187 Amount of Water Required for Normal Consistency
- C188 Density of Hydraulic Cement
- C227 Potential Alkali Reactivity of Cement-Aggregate Combinations (Mortar-Bar Method)
- C230 Flow Table for Use in Tests of Hydraulic Cement
- C305 Mechanical Mixing of Hydraulic Cement Pastes and Mortars of Plastic Consistency
- C430 Fineness of Hydraulic Cement by the 45- $\mu$ m (No. 325) Sieve
- C490 Use of Apparatus for the Determination of Length Change of Hardened Cement Paste
- C511 Mixing Rooms, Moist Cabinets, Moist Rooms, Water Storage Tanks, and Mix Water
- C778 Standard Sand
- C1005 Reference Masses, Graduated Cylinders, and Balances
- C1012 Length Change of Hydraulic-Cement Mortars Exposed to a Sulfate Solution
- C1437 Flow of Hydraulic Cement Mortar

### **Scope of Inspection if Presenting Slag Cement:**

The following ASTM test methods are included during a CCRL Slag Cement Inspection:

- C109 Compressive Strength of Hydraulic Cement Mortars
- C114 Chemical Analysis of Hydraulic Cement
- C185 Air Content of Hydraulic Cement Mortar
- C188 Density of Hydraulic Cement
- C204 Fineness of Hydraulic Cement by Air-Permeability Apparatus
- C230 Flow Table for Use in Tests of Hydraulic Cement
- C430 Fineness of Hydraulic Cement by the 45- $\mu$ m (No. 325) Sieve
- C490 Use of Apparatus for the Determination of Length Change of Hardened Cement Paste
- C511 Mixing Rooms, Moist Cabinets, Moist Rooms, and Water Storage Tanks
- C778 Standard Sand
- C1005 Reference Masses, Graduated Cylinders, and Balances
- C1038 Expansion of Hydraulic Cement Mortar Bars Stored in Water
- C1437 Flow of Hydraulic Cement Mortar

### **How to Prepare for Your Remote Inspection**

LIP-FXX

- **IMPORTANT: Please make sure that background noise levels are kept at a minimum during procedure demonstrations.**
- Any additional test methods not covered here should be discussed with your inspector ahead of time to understand how to prepare
- The demonstrations of these procedures should be made in accordance with the requirements of the applicable ASTM test methods, and **special laboratory practices should be avoided.**
- Only one technician may perform any single test, and **no assistance is permitted.**
- Procedures are open-book, and the demonstrating technician may use any reference materials desired including, but not limited to: ASTM standards, personal notes, and special laboratory checklists.
- Equipment during demonstrations should be positioned in a way that the video camera has a clear and close enough view of actions being performed.
- Technicians are encouraged to explain what steps they are doing or are about to do. This is ordinarily not required, but will help your remote inspector to better understand your actions.
- Laboratory staff responsible for moving the video camera during observation of demonstrations must be able to follow instructions of the inspector to adjust the field of view to better observe details of the procedure.
- **Upon starting the video conference with your inspector for demonstrations, the laboratory should be prepared to take the camera on a brief “tour” of the demonstration area so that the inspector can confirm all equipment and accessories needed for demonstration are available.**

**The Cement and Concrete Reference Laboratory and its Inspectors appreciate your patience and understanding as we work to provide you with the best experience possible in these difficult times.**

*Be prepared to demonstrate the following, based upon materials presented:*

- The laboratory must have one (1) cured cube prepared in advance for demonstration.

✓	Section Reviewed	General Requirements	Cement	Pozzolan	Slag Cem.
	Normal Consistency, Time of Set (C305, C187, C191 and/or C266)	Mix fresh cement and prepare a Normal Consistency, Vicat sample, and/or Gillmore pat, as desired	✓	✓	
	Molding of Cube Specimens (C109, C305, and C1437)	Mix fresh mortar, perform flow procedure, and make one full set of cubes. If an alternative tamping method is presented, qualification records must also be presented.	✓	✓	✓
	Autoclave Testing (C151, C305, C490)	Leftover cement from Normal Consistency test may be used as applicable to make a bar. Fill and operate autoclave at the inspector’s direction.	✓	✓	
	Testing of Compressive Strength (C109)	Break one cube	✓	✓	✓
	Water Retention (C305, C1437, C1506)	Mix material, perform flows and fill dish as required under working vacuum	✓		

✓	Section Reviewed	General Requirements	Cement	Pozzolan	Slag Cem.
	Air Content (400 mL) (C185)	Mix material, run flow, fill measure per the standard	✓	✓	✓
	Fineness of Cement (C430 and/or C204)	Test materials per the standard	✓	✓	✓
	Loss on Ignition (C114)	Be prepared to measure and ignite a sample per the standard	✓	✓	
	Density (C188)	Perform test per the standard	✓	✓	✓
	Early Stiffening (C451)	Mix material and perform test within the specified time limit	✓		
	Controlling Alkali-Silica Reactions (C311, C441, and C227)	Mold one set of bars		✓	
	Drying Shrinkage of Mortar Bars (C311, C157)	Mold and measure one set of bars		✓	
	Sulfate Resistance (C311 and C1012)	Perform a length comparison		✓	
	Length Change (C490, C1038)	Mix material, make a bar, determine length change			✓

## Quality Systems

This checklist is not intended to be a complete list of CCRL inspection items or AAP Accreditation requirements. Specific concerns and questions should be directed to your inspector.

- **IMPORTANT:** Records documentation will require **two “cycles” of records**, meaning that the laboratory will be required to present the most recent record, and the record immediately before that. For example, a C511 Recording Thermometer “two cycles” may look like complete records from 6/1/2020 and 12/1/2019.
- **All documentation listed below must be provided to the inspector in a digital format.** The inspector will not be able to read or inspect paperwork shown during video conferences.

✓	Section Reviewed	General Requirements	R18	C1222
	AASHTO Accreditation	Technicians performing tests must be certified in testing.	✓	
	Organization	Legal information, management and ownership structure documentation.	✓	✓
	Position Descriptions	Descriptions for each technical operational position.	✓	

LIP-FXX

✓	Section Reviewed	General Requirements	R18	C1222
	Management Qualifications	Biographical sketches for supervisory staff, and confirmation that staff members have required experience, certification, and education.	✓	✓
	Laboratory and Field Qualifications	Records documenting experience and education of supervisory staff, certifications of supervisory staff and technicians.		✓
	Training and Evaluation Procedures	Procedures specifying responsibility and process of training and evaluating technician proficiency.	✓	
	Training and Evaluation Records	Records of training for all technicians, and <b>two cycles</b> of evaluation records.	✓	✓
	Internal Reviews	Procedures for implementing Internal Audit and Management Review as required. Copies of <b>two cycles</b> of Internal Audits and Management Reviews.	✓	✓
	Corrective Actions	Procedures for responding to customer complaints and implementing corrective action when deficiencies are discovered.	✓	
	Record Retention	Demonstrate records maintained for minimum time period required by applicable standards.	✓	✓
	Standard Operating Procedures	Procedures for sample, test record, test report, and document management.	✓	✓
	Test Reports	Present a completed test report <b>as it would be issued to a client</b> , with cover letter if applicable.	✓	✓
	Test Records	Present a completed <b>test record</b> (e.g. field report, daily break sheet) for the <b>test report</b> given to the inspector for review.	✓	
	External Services	Procedures for assuring subcontractor quality, list of external services, and other information as required.	✓	✓
	Monitoring Test Results	Procedures for monitoring the validity of test results (e.g. CCRL Inspection and PSP) and related documentation.	✓	
	Proficiency Sample Program	Records of <b>two cycles</b> of participation in all required Proficiency Programs	✓	✓
	Standard Practice and Test Method Availability	Show ownership of the most recent edition of AASHTO R18 and current copies of ASTM methods, and corresponding AASHTO test methods, if desired for accreditation	✓	✓
	Inventory List	Present the inspector with a copy of your <b>most recent</b> inventory.	✓	✓
	Calibration List	Present the inspector with a copy of the calibration list.	✓	
	General Equipment Procedures	Procedures for handling equipment and ensuring calibrations are performed on time and as appropriate, with records demonstrating these procedures are followed.	✓	✓
	Calibration Equipment and Reference Standards	Documentation for calibration equipment used such as: <ul style="list-style-type: none"> <li>• Reference thermometers</li> <li>• Calipers used for verifying equipment</li> <li>• Rulers used for verifying equipment</li> <li>• Reference weights for verifying scales</li> </ul> Load cells for verifying compression machines	✓	✓

✓	Section Reviewed	General Requirements	R18	C1222
	Maintenance	Procedures and records for <b>two cycles</b> of maintenance as applicable: <ul style="list-style-type: none"> <li>• Compression Machines</li> <li>• Moist Rooms</li> <li>• Storage Tanks</li> </ul>	✓	
	Cementitious Equipment Calibration Records	Calibration, maintenance, and verification records for <b>two cycles</b> for all in-service equipment. This list represents all cementitious equipment inspected by CCRL, and only records for equipment utilized by the laboratory need be presented: <ul style="list-style-type: none"> <li>• Air Content Measures</li> <li>• Analytical Balances</li> <li>• Autoclave Safety Valves</li> <li>• Bearing Blocks</li> <li>• Blaine Apparatuses</li> <li>• Blaine Cells</li> <li>• Cube Molds</li> <li>• Flow Tables</li> <li>• General Purpose Balances</li> <li>• Gillmore Needles</li> <li>• Mixers</li> <li>• No.325 Nozzles</li> <li>• No.325 Sieves</li> <li>• Recording Thermometers</li> <li>• Standard Sands</li> <li>• Standard Sieves</li> <li>• Storage Water</li> <li>• Tampers</li> <li>• Compression Machines</li> <li>• Vicat Apparatuses</li> <li>• Water Retention Apparatuses</li> </ul>	✓	✓