



# BUREAU OF MATERIALS

# MATERIALS

# PROCEDURES

**MP NUMBER: 1-25**  
**EFFECTIVE DATE: 03/03/2025**

**APPROVAL:** *Edward Inman*

## FIELD INSPECTION AND TESTING OF CONCRETE

### **PURPOSE:**

To establish a standard procedure for the field inspection of concrete.

### **SUPERSEDES:**

Materials Procedure Number 1 - Dated 07/01/2008

### **REFERENCES:**

- NJDOT Standard Specifications for Road and Bridge Construction, Addenda and Attachments
- ASTM C-172 Sampling of Freshly Mixed Concrete
- ASTM C-1064 Temperature of Freshly Mixed Hydraulic-Cement Concrete
- ASTM C-143 Slump of Hydraulic-Cement Concrete
- ASTM C-173 Air Content of Freshly Mixed Concrete by the Volumetric Method
- ASTM C-231 Air Content of Freshly Mixed Concrete by the Pressure Method
- ASTM C-138 Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete
- AASHTO R-100 Making and Curing Concrete Test Specimens in the Field
- ASTM C-39 Compressive Strength of Cylindrical Concrete
- ASTM C-78 Flexural Strength of Concrete (Using Simple Beam with Third Point Loading)

### **FORMS:**

- LB-125 - Portland Cement Concrete Proportions
- LB-201 - Portland Cement Concrete-Inspection/Testing
- LB-296 - Notice of Non-Complying Material
- LB-326 - Cylinder Data
- Random Sampling Plan

## INSTRUCTIONS:

### I. Assignment procedures:

The Team Leader shall:

- A. Receive the next day's orders from the RE before 1pm and from the ME's Office by 3pm the prior day.
- B. Assign inspectors to scheduled pours. Inspectors must be certified as an ACI Concrete Field Technician, Grade 1. If an employee is not ACI certified, they must attend the pour with an individual who is.
- C. Ensure that all equipment is properly maintained and operational.
- D. Supervise and assist the inspector(s) with sampling and testing or perform tests when workload requires it.
- E. Ensure that all tests are performed in compliance with NJDOT Standard Specifications and established procedures.
- F. Ensure that all required forms are completed accurately in a timely manner.
- G. Provide the inspector(s) with the following:
  1. Time, location, approximate quantity, class and type of mix for each pour and each project.  
Inform the inspector(s) about any early break cylinder requests from the RE.
  2. The pertinent information on the form LB-125.
  3. Telephone numbers of the ME, RE, and the concrete supplier.
  4. A random sampling schedule for each pour if concrete cylinders are to be made.
  5. The pertinent information including specifications for air entrainment, slump tests, type of mixing, time limitations and revolutions allowed.
  6. The proper equipment and appropriate forms needed to accomplish their duties.
- H. The inspector shall check for proper curing box that meets the NJDOT Standard Specifications. They should also ensure that a high/low thermometer is provided with each curing box, where there is a concrete pour.
- I. The inspector shall check for a concrete washout system. The design of the concrete washout system is to fully contain the concrete washout needs including: concrete slurry, cleaning equipment, and other concrete cleaning needs.

### II. Sampling Fresh Concrete:

A. Procedure: AASHTO C-172

B. Documentation:

1. Verify that the concrete truck is approved.
2. Check concrete ticket for information required by Section 903.03.03 of the Standard Specifications.

C. Random Sampling and Timeliness of Tests:

1. Use random sampling plan to determine necessary trucks to be tested for compressive strength.
2. The size of the sample shall be a minimum of one cubic foot. Smaller samples are permitted for routine air content and slump tests.
3. Sampling from stationary mixers, revolving drum truck mixers, or agitators. The sample shall be taken after at least 10% of concrete has been discharged. Sample by repeatedly passing a receptacle through the entire discharge stream or by completely diverting the

discharge into a sample container. Sample should not be obtained until all water and any additional admixture have been added.

4. Tests are to be run within specified time limits.

*NOTE: While slump and air entrainment tests are being performed, discharge from the truck being tested shall be halted!*

D. Re-mixing the Sample:

1. The sample shall be transported to the place where testing is to be performed and shall be re-mixed to form a composite sample. The sample specimen shall be protected from rapid evaporation and contamination during the period between sampling and testing.

**III. Slump Test:**

- A. Procedure: ASTM C143 Slump of Hydraulic-Cement Concrete

B. Reporting Results:

1. Notify construction personnel of the test results. If the slump does not comply with the specification, notify plant inspector. Complete Form LB-296 (if applicable) and Form LB-201. If a plant inspector is not available, the field inspector should call the regional office.

**IV. Air Content:**

- A. Procedure: ASTM C173 Air Content of Freshly Mixed Concrete by the Volumetric Method or ASTM C231 Air Content of Freshly Mixed Concrete by the Pressure Method

- B. Checking Accuracy of Air Meter: Regularly check the accuracy of the air meter. Additional checks should be made when air results are questionable.

- C. Reporting Results: Notify construction personnel of the test results. If the result of the air test does not comply with the specification, notify plant inspection. Complete Form LB-296 if applicable and complete Form LB-201.

- D. Calibrate Apparatus As per Manufacturers Recommendations.

**V. Weight Per Cubic Yards, Yield and Water Cement Ratio of Concrete:**

- A. Procedure: ASTM C138 Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete

**VI. Molding Concrete Specimens:**

- A. Procedure AASHTO R-100

1. Care should be taken to ensure that the seal is not embedded to the point where it will be covered by flow of the mortar.
2. During the months of May 1<sup>st</sup> through October 31<sup>st</sup>, cylinders shall be immediately immersed in water tanks or tubs at the jobsite for overnight storage. Tanks or tubs should include a high/low thermometer as per our specifications.
3. During cold weather months the contractor should provide insulated box or some heating system by the location of the pour for the initial curing of the cylinders. They should include a high/low thermometer in the box as per our specifications.

B. Reporting Results:

1. Complete Forms LB-201 and LB-326. Original report and cylinder data forms shall accompany specimens when they are delivered to the Laboratory.

C. Marking Specimens:

1. After removing specimens from molds, specimens shall be marked with waterproof ink for identification. The identification must include job title (Route and Section number), seal number and date made. Indicate lot number, class of concrete, and day of test, i.e., 3-day, 7-day, 28-day, etc.

D. Transporting Specimens

1. Procedure: AASHTO R100

*NOTE: Extreme care should be taken when transporting specimens. Specimens shall be placed in the transporting vehicle in such a manner as to prevent damage by rolling or jarring. Under no circumstances should specimens be stacked.*

## VII. Distribution of Forms

<u>Form</u>	<u>Distribution</u>
LB-201	<ol style="list-style-type: none"><li>1. Original with LB-326 to Laboratory</li><li>2. Project Field Office File</li></ol>
LB-296	<ol style="list-style-type: none"><li>1. Original - Bureau of Materials</li><li>2. RE</li><li>3. Regional Materials Office</li><li>4. Regional Construction Engineer</li><li>5. Project Field Office</li></ol>
LB-326	<ol style="list-style-type: none"><li>1. Attach to specimen delivered to Bureau of Materials</li></ol>