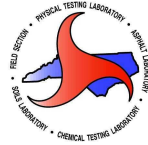


**Materials & Tests Unit**



**NCDOT**

**2018 Guidelines**

**Ready Mix Concrete Plant Inspection Checklist Addendum- Procedure**

**General Notes:**

- The following items are to be verified (if applicable) during the NRMCA plant inspection for concrete plants seeking NCDOT Certification.
- If a plant is actively producing concrete for use on a NCDOT project all items must be verified.
- All items should be marked with the respective results – please indicate a response for each item.
- If an item needs additional explanation, enter into the comments field.
- Do not forget to complete the last page of the addendum, and include a signature with printed name.
- **When the inspection is completed, a copy of the addendum should be left with the facility.**
- The following documentation is required to be completed during the inspection process by the 3<sup>rd</sup> party inspector. Once completed, the Ready Mix Facility is responsible for submitting all documentation to NCDOT within 10 business days.
  - Plant Certification Checklist (attachment example A1)
  - Verification of Inspection and Application for Certificate (attachment example A2)
  - Agreement by Company Official (attachment example A3)
  - Section 5-Delivery Fleet Inspection (attachment example A4)
  - 5.7 Inspection Record of Delivery Fleet (attachment example A5)
- The 3<sup>rd</sup> party inspector is required to complete and send (within in 2 business days) the “NCDOT Materials & Tests Unit Ready Mix Concrete Plant Inspection Checklist Addendum” (attachment A7) to one of the following:
 

[srburns1@ncdot.gov](mailto:srburns1@ncdot.gov)  
 NCDOT Materials & Tests Unit  
 Attn. Shannon Burns  
 1801 Blue Ridge Road  
 Raleigh, NC 27607  
 Phone: 919-814-2220  
 FAX (919-329-8492)

**Aggregates:**

- A1: The 3<sup>rd</sup> party inspector shall verify the on-site aggregate stock piles (fine and coarse) that are utilized in the production of concrete for NCDOT or FHWA supported projects be supplied by approved facilities. These facilities are maintained on the Departments “Approved List”. The “Approved List” can be accessed through the M&T web site.
- A2: The 3<sup>rd</sup> party inspector is responsible for reviewing the approved on-site mix designs and confirming the on-site aggregate stock piles are listed on the approved mix designs. Approved mix designs are required to have a M&T lab supervisor’s signature.
- A3: The 3<sup>rd</sup> party inspector must view each approved on-site stockpiles to verify the aggregates are kept moist or meet the Saturated Surface Dry conditions. On-site aggregate stock piles are to be free of debris, exist separately and not connected to other stockpiles, and easily accessible.

**Cement And Fly Ash:**

- A4: The 3<sup>rd</sup> party inspector shall review the on-site Bill Of Ladings to confirm the cement and fly ash meet the policy requirements. Bill Of ladings shall: be provided with each tanker/railcar of material, include the source's city location, include the source's state location, include the source's country location, and include traceability to the associated shipment.
- A5: The 3<sup>rd</sup> party inspector shall review the on-site approved mix designs to verify the cement and fly ash sources are on the "Approved List", and comply with the mix design.

**Water:**

- A6: The 3<sup>rd</sup> party inspector shall review the on-site water analysis documentation to verify compliance with Department specifications (Table 1024-2). If a facility is receiving water by a municipality or public water system - the facility must contact the municipality (a minimum of once per year) and request a recent water analysis which the municipality performed at the water source. If the facility is receiving water via another source (ie well), a water sample must be obtained and analysis performed a minimum of once per year. The water analysis documentation must be on-site. The water analysis report must meet the requirements as stated in Section 1024-4, Table 1024-2. **It is the responsibility of the facility to sample/test or obtain documentation regarding a water sample and is on-site.** It is recommended the water sample be obtained six months after the M&T Annual Facility Audit.
- A7: During the NCDOT M&T's annual facility audit, a M&T representative will obtain a water sample and submit to the Department's lab for analysis. The 3<sup>rd</sup> party inspector shall confirm the sample was obtained, the documentation is on-site, and the sample "Meets Specification". It is the responsibility of the M&T Technician to send the facility a copy of the water analysis that was obtained during the annual facility audit.
- NOTE: The 3<sup>rd</sup> party inspector shall document if a water analysis report is on file and sample date – this should be documented in the "Comments" block.

**Mix Proportions:**

- A8: The 3<sup>rd</sup> party inspector shall review concrete mix designs to verify: a hard copy of the mix designs are on-site, all materials are supplied by an approved source, a M&T lab supervisor's signature is on the bottom of form, quantities are established, if applicable- a contract number is assigned, and the assigned facility name, location, and Department assigned number (RM-XX) are present on the documentation.
- A9: The 3<sup>rd</sup> party inspector shall confirm moisture tests are being performed and adjustments for moisture are executed in accordance with Department procedures.
- A10: The 3<sup>rd</sup> party inspector shall review a represented sample of final documentation/print outs of batched loads. This documentation shall include: actual quantities of materials batched, adjustments for moisture, additional water added at the facility, certified batcher's name, facility name, location, and Department assigned number (RMXX). All documentation or copy must remain on-site.

**Moisture Content:**

- A11: The 3<sup>rd</sup> party inspector shall review and confirm moisture contents for each aggregate type are being performed by the certified batcher, and documented. Moisture by the "Drying" method should be performed prior to start of operations for NCDOT concrete production. If the batching operations are extended more than four hours, an additional moisture by the "Drying" method

should be performed, and documented. Moisture probes can be utilized during the concrete production, but applied as a “check” method. Calculated moisture contents shall be entered into the batching computer operations and verified by the certified batcher the adjustments are being made during the batching operations.

- A12: The 3<sup>rd</sup> party inspector shall: verify all equipment utilized in determining moistures are working properly, calibrated – if applicable (minimum once per year), and in good working condition. Moisture probes are typically employed in the fine aggregates, but not the coarse aggregate. Special attention is required to confirm a moisture test is applied to the coarse aggregate. The inspection should include examining the location, buildup of material on the probe, cleanness of probe, and condition of all moisture probes.
- A13: The 3<sup>rd</sup> party inspector shall confirm moisture calculations are being performed and calculations are correct. These operations shall be performed and recorded on the proper documentation by the certified batcher. Calculations, times, and results shall be documented on the “Daily Plant Operations” worksheet, and calculated moistures shall be placed on the form 903 for all aggregate types.

### **Routine Duties:**

- A14: The 3<sup>rd</sup> party inspector shall verify the facility is reviewing and documenting the arrival of every load of cement, and the accuracy of documentation that is supplied with each shipment. The facility shall explain their protocol for receiving cement, and a random selection of this documentation shall be verified. Special attention should be made to verify the Bill Of lading and certification match what is stated on the approved mix designs.
- A15: The 3<sup>rd</sup> party inspector shall verify the facility is performing moisture contents on all aggregate types when producing concrete for NCDOT projects. Special attention should be made on the times when moisture contents are performed, specifically prior to start up operations and if a pour is extended more than four hours. Additional moisture contents are required if weather changes are evident. All moistures shall be documented on the appropriate NCDOT forms, and available for viewing.
- A16: The 3<sup>rd</sup> party inspector shall view a random sample of NCDOT forms to verify that documentation is accurately completed and a copy remains on site for a minimum of 60 days.

### **Equipment:**

- A17: The 3<sup>rd</sup> party inspector shall verify all equipment incorporated in the batching operations has been properly calibrated. Calibration stickers/documentation must be readily available or attached to the equipment. Special attention needs to comply with NCDOT specifications with regards to scales – performed a minimum of once per year by a third party entity or the manufacturer.
- A18: The 3<sup>rd</sup> party inspector shall visually verify that all equipment utilized in the testing or sampling of NCDOT concrete meets the calibration specifications. All testing and sampling equipment shall be in good working conditions and the tests performed in accordance with ASTM specifications. In addition, the technician performing the tests must meet the NCDOT certification requirements. Selective equipment, such as: scales, unit weight containers, chace indicators, and compression machines shall be calibrated by a third party entity or the manufacturer. Equipment such as, slump cones, air pots, roller meters, and moisture detection devices may be calibrated by certified technicians. All equipment shall be calibrated a minimum of once per year, or when questionable results occur. Calibration stickers/documentation must be readily available or attached to the equipment.

**Certifications:**

- A19: The 3<sup>rd</sup> party inspector shall verify technicians responsible for testing, and sampling of NCDOT concrete meet the certification program requirements. Certification certificates must be available for viewing or displayed on site. All certifications must be active, and the technicians performing the duties are on site during their respective operations. The applicable technicians, certification number, and expiration date shall be listed on the addendum in the appropriate locations.
- A20: The 3<sup>rd</sup> party inspector shall verify technicians responsible for batching of NCDOT concrete meet the certification program requirements. Certification certificates must be available for viewing or displayed on site. All certifications must be active, and the technicians performing the duties are on site during their respective operations. The applicable technicians, certification number, and expiration date shall be listed on the addendum in the appropriate locations.
- A21: The 3<sup>rd</sup> party inspector shall visually verify the facility displays their approved Department Plant Certification certificate. The certificates must be active and display the NCDOT facility assigned number respective to that individual facility. If the original certificate is stored at a main location, a copy of the active certificate is acceptable, but must be displayed in plain view.

**Personnel:**

- The 3<sup>rd</sup> party inspector shall verify all/any personnel involved in the QC testing of the product and must have an active/current NCDOT Field Testing Technician certification. **THIS TECHNICIAN MUST BE ON SITE DURING THE PRODUCTION OF THIS PRODUCT TO BE UTILIZED ON NCDOT/FHWA PROJECTS.** The 3<sup>rd</sup> party inspector shall verify all/any personnel involved in the batching operations must have an active/current NCDOT Batch Technician certification. **THIS TECHNICIAN MUST BE ON SITE DURING THE PRODUCTION OF THIS PRODUCT TO BE UTILIZED ON NCDOT/FHWA PROJECTS.** The 3<sup>rd</sup> party inspector is to complete the list of technician information.
- The list of personnel shall include Technicians actually on site when the inspection is performed. If there is not a certified batcher on site, this should be noted.

**Discrepancies:**

- If the 3<sup>rd</sup> party inspector determines/notes a “Failure” or discrepancies within the addendum, the facility has ten working days to respond in writing, to M&T, any/all corrective actions or explanations. This action plan/explanation is then reviewed by the appropriate NCDOT M&T personnel and appropriate response is rendered.

**North Carolina Department of Transportation  
Materials & Tests Unit  
Ready Mix Concrete Plant Inspection Checklist Addendum - 2018**

Date Of Inspection:		NCDOT Facility Number:	RM
Facility Company Name:			
Facility Address:			

The following items are to be verified (if applicable) during the NRMCA plant inspection for concrete plants seeking NCDOT Certification. If a plant is actively producing concrete for use on a NCDOT project all items must be verified. If the plant is not active (i.e. has not produced concrete for use on a NCDOT project in the last 2 months or does not intend to produce concrete for the next 2 months) only those items in *italics* need to be verified. (Please indicate a response for each item).

**A COPY OF THE ADDENDUM MUST BE LEFT AT THE FACILITY AFTER INSPECTION**

**Aggregates**

A1.	Pass	Fail	Aggregates are listed on approved list maintained by the Department.
A2.	Pass	Fail	Aggregates stockpiled at plant are confirmed by Department's approved concrete mix designs. <b>If the plant is currently providing material for a NCDOT project, then the source and size of aggregates should be verified to comply with the approved mix design.</b>
A3.	Pass	Fail	Aggregate stockpiles maintained above Saturated Surface Dry (SSD) condition.
Comments:			

**Cement and Fly Ash**

A4.	Pass	Fail	Proper Bill of Lading and material certifications are on hand as outlined in Department's policy for tracking cement and fly ash suppliers.
A.5	Pass	Fail	Verify cement and fly ash source with Department approved concrete mix design. <b>If the plant is currently providing material for a NCDOT project, then the sources should be verified to comply with the approved mix design.</b>
Comments:			

### Water

A6.	Pass	Fail	Water source has been sampled and tested by producer within the last 12 months. The water analysis report is on site and meets the requirements as stated in Section 1024-4, Table 1024-2.
A7.	Pass	Fail	Water source has been sampled and tested by M&T Technician within the last 12 months. This report is on site and states the sample "Meets Specification".
Comments: Producers Water Analysis Report Date: _____  M&T's Water Analysis Report Date: _____			

### Mix Proportions

A8.	Pass	Fail	Department approved concrete mix designs are on site and match materials on site.
A9.	Pass	Fail	Concrete mix design proportions adjusted for moisture content according to Department procedures.
A10.	Pass	Fail	Maintenance of permanent record of the quantity of cementitious materials, aggregates, water, and admixtures batched per load. <b>Digital and graphical recorders provide printed records. Plants without either type of recorder, must maintain documentation of the batch quantities. The documentation is retrievable upon demand.</b>
Comments:			

### Moisture Content

A11.	Pass	Fail	Percent total moisture for each aggregate is determined by Department's Certified Batcher during inspection. <b>Documentation must be accessible and on-site.</b>
A12.	Pass	Fail	Moisture equipment, including moisture probes, checked for accuracy and proper working operation.
A13.	Pass	Fail	Review moisture calculations and w/c calculated for each batch.
Comments:			

### Routine Duties

A14.	Pass	Fail	Daily checks on cement received and used. <b>Does the BOL and Certifications match what is called for in the mix design?</b>
A15.	Pass	Fail	Constant testing and checking moisture contents of aggregates. <b>Minimum of two moistures will be performed each day: one at startup, second moisture will be performed if production is greater than four hours. Additional checks may be needed if weather conditions dictate [rain, wind, high temps, etc].</b>
A16.	Pass	Fail	Daily report prepared and batch weight tickets kept on site for 60 days.
Comments:			

**Equipment**

A17.	Pass	Fail	All equipment used in the batching operations has been calibrated within the last 12 months. Scales and dispensing devices must be calibrated by a third party entity or the manufacturer (in-house calibration is not acceptable).
A18.	Pass	Fail	All the equipment used in the quality control sampling and testing has been calibrated within the last 12 months if applicable and is in good working condition. Scales, unit weight containers, chace indicators, and compression machines must be calibrated by a third party entity or the manufacturer (in-house calibration is not acceptable) . Slump cone, air pot/roller meters, and moisture detection devices may be calibrated by certified technician.
Comments:			

**Certifications**

A19.	Pass	Fail	<i>All personnel have current/active Department certifications for their job responsibility, and documentation is on site. (List Below)</i> <ul style="list-style-type: none"> <li>• <i>NCDOT Concrete Field Technician</i></li> </ul>
A20.	Pass	Fail	<i>All personnel have current/active Department certifications for their job responsibility, and documentation is on site. (List Below)</i> <ul style="list-style-type: none"> <li>• <i>NCDOT Concrete Batch Technician</i></li> </ul>
A21.	Pass	Fail	Plant has been approved and displays current Department Plant Certification
Comments:			

**Personnel**

*Any personnel involved in the QC testing of the product must have a current NCDOT Field Testing Technician certification. Any personnel involved in the batching operations at the plant must have a current NCDOT Batch Technician Certification. List all Field Testing, and Batch Technicians below:*

**NCDOT CONCRETE FIELD TECHNICIAN (PCT)**

<b>Name</b>	<b>Title</b>	<b>NCDOT Certification Number - PCT</b>	<b>NCDOT Certification Expiration Date</b>

**NCDOT CONCRETE BATCH TECHNICIAN (PCB)**

<b>Name</b>	<b>Title</b>	<b>NCDOT Certification Number - PCB</b>	<b>NCDOT Certification Expiration Date</b>

Last date of producing concrete for a NCDOT project: (estimate) \_\_\_\_\_

Possible date of next concrete production for NCDOT project: (estimate) \_\_\_\_\_

Inspecting Engineer's Signature: \_\_\_\_\_

Inspected Engineer Name (Printed) \_\_\_\_\_