STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

December 4, 2018

Dear Precast Concrete Producer,
A policy for Precast Concrete Producers was established in 2011. This policy stated all Precast Concrete Producers were required to have a third-party certification in order to provide precast concrete products for NCDOT projects. This inspection can be completed by the following organizations; National Precast Concrete Association (NPCA), or The American Concrete Pipe Association (ACPA), or the Prestressed Concrete Institute (PCI). Part of the 3rd party inspection process is, the inspector will complete a facility inspection, and a NCDOT Precast Concrete Plant Inspection Checklist Addendum. This inspection process will ensure that Precast Concrete plants are in compliance with NCDOT standards and are capable of producing NCDOT approved products. If a facility wants to be NCDOT certified, the plant must conform to all requirements of the inspection process. In order to be on the NCDOT approved list, a 3rd party inspection must be successfully completed, with passing results, and the following documents must be sent to the Materials and Tests Unit.

ALL DOCUMENTATION MUST BE CLEARLY LABELED WITH THE NCDOT PC#

- NCDOT Precast Concrete Plant Inspection Checklist Addendum (attached example A5) – Must be submitted within **2 BUSINESS DAYS** after the unannounced inspection.

ACPA (American Concrete Pipe Association)
The required documentation to be submitted **PRIOR TO EXPIRATION DATE** includes:

- ACPA Letter of Certification (attached example A1)
- ACPA Certificate of Compliance (attached example A2)

The required documentation to be submitted within **10 BUSINESS DAYS** after unannounced inspection includes:

- ACPA Letter of Inspection (attached example A3)
- ACPA Audit Summary Sheet (attached example A4)

NPCA (National Precast Concrete Association)
The required documentation to be submitted **PRIOR TO EXPIRATION DATE** includes:

- NPCA Plant Certification Certificate (attached example A1)

The required documentation to be submitted within **10 BUSINESS DAYS** after unannounced inspection includes:

- NPCA Preliminary audit letter (attached example A2)
- NPCA Grading Schedule (attached example A3)

PCI (Precast/Prestressed Concrete Institute)

- The PCI Plant Certification Program is accepted. Please contact Materials and Test Unit for requirement details.

Mailing Address:
NC DEPARTMENT OF TRANSPORTATION
MATERIALS AND TESTS UNIT
1563 MAIL SERVICE CENTER
RALEIGH, NC 27699-1563

Telephone: (919) 329-4000
Fax: (919) 733-8742
Customer Service: 1-877-368-4968

Website: www.ncdot.gov

Location:
1801 BLUE RIDGE ROAD
RALEIGH, NC 27607

All listed required documents must be mailed, emailed, or faxed to the NCDOT Materials and Tests Unit (attention Jason Poppe). If you do not furnish M&T with ALL the required documents, your facility will not be certified and will be removed from the NCDOT approved list, causing your facility to become inactive in the Vendor system. The 3rd party organization/representative is not responsible for sending M&T the documents. It is the producer's responsibility to ensure the required documents are received by M&T in a timely manner. If alterations to the facility or an owner change occur, the Materials and Tests Unit must be notified of these changes.

All required documents must be submitted to:

NCDOT Materials and Tests Unit
Attention Jason Poppe
1801 Blue Ridge Road
Raleigh, NC 27607
FAX: 919-733-8742
Email: jepoppe@ncdot.gov

Once received, all documentation will be reviewed for compliance. If all documentation is correct, and the facility proves to be in compliance, your facility will remain (or be placed) on the NCDOT approved list. If a facility experiences a failure or discrepancy, the facility has 10 days to respond to the 3rd party inspection organization in writing. The response should include the corrective action to amend the failure/discrepancy. If the facility receives an unsatisfactory inspection score, a maximum of two visits from the 3rd party inspector is granted by NCDOT to satisfactory pass the 3rd party inspection process. In addition, all items listed on the NCDOT addendum must pass in order to produce for NCDOT projects. Any failures marked on the addendum does not mean the facilities acceptance is rejected or is immediately removed from the approved list. If the facility experiences a failure, a M&T representative will contact the facility. A response to failures is required within 10 business days. The response will include the corrective action plan, and assurance the failure will be corrected within 10 business days. The corrective action plan will be reviewed and if found to be acceptable; the facility will remain on the approved list. If the corrective action plan does not meet approval once reviewed, the facility will be removed from the approved list. If the corrective actions are not completed or no response is received within 10 business days, the facility will be removed from the approved list. **There will be no exceptions**. The addendum inspection procedures have been added to this policy packet and is **attachment A6**. It is encouraged that producers review this attachment to be familiar with NCDOT requirements.

During previous inspections, several items within the NCDOT addendum required additional amplification. Note the clarifications for the following items:

- Water (A6): Water samples must be obtained and documented results from these samples must be onsite and accessible for review. A water sample with documented results will be the responsibility of the producer. A water analysis is all that is required and may be obtained from local municipalities. Water samples must be obtained a minimum of once per year, but recommended obtaining the sample approximately six months after the M&T annual facility audit. All water utilized during production must meet the requirements as stated in the 2012 Standard Specifications for Roads and Structures (Section 1024-4, Table 1024-2).
- Water (A7): Water sample must be obtained and documented results from the sample must be onsite and accessible for review. A representative from M&T will obtain a water sample during an annual facility audit and submit to the NCDOT Laboratory for QA testing. Results of the

M&T water sample will be sent to the facility to be placed in their files. All water utilized during production must meet the requirements as stated in the 2012 Standard Specifications for Roads and Structures (Section 1024-4, Table 1024-2).

- Moisture Content (A10): The active certified batcher will obtain samples from both fine and coarse aggregates and perform a moisture determination – per certification school instruction/method. These moistures will be documented and accessible for review and verification during the facility inspection and/or during routine on-site visits. Moisture determination documentation may be in the form of hard copy or electronic.
- Routine Duties (A14): Moisture determinations for both fine and coarse aggregates are recommended to be performed during all operations. As a **MINIMUM**, moisture analysis will be performed on both fine and coarse aggregates during the initial startup of the facility, **AND** again if production is greater than four hours.
- Certifications (A16): An active NCDOT Concrete Field Technician certification is required for any personal performing acceptance sampling, testing, and/or casting cylinders.
- Certifications (17): An active NCDOT Concrete Batch Technician certification is required for any personal performing batching operations. The active certified batcher **MUST REMAIN** at the batching controls and monitor all batching activities during the production of NCDOT products.

Failure to meet the third party or NCDOT certification requirements or failure to perform adequate quality control processes may result in your facility being removed from the approved producer list.

Sincerely,



Samuel J. Frederick
Quality Systems Engineer

American Concrete Pipe Association

Main 972 506 7216
Fax 972 506 7682
info@concrete-pipe.org

8445 Freeport Parkway, Ste. 350
Irving, TX 75063-2595
www.concrete-pipe.org

July 1, 2017

Example

Dear NCDOT Producer,

It is a pleasure to inform you that your plant at Raleigh, North Carolina, has successfully surpassed all of the requirements necessary to achieve certification under American Concrete Pipe Association's quality assurance.

Congratulations to you, the management and the plant personnel for accomplishing the level of quality assurance required to meet these high standards of excellence.

Sincerely,

Kim Spahn, P.E.
Vice President of Operations
American Concrete Pipe Association

Certificate of Compliance

Awarded

Storm Sewer and Culvert Pipe Plant

By

American **Concrete Pipe** Association

This Certificate represents that at the time of the audit,

NCDOT Producer

Salisbury, North Carolina

was manufacturing precast concrete pipe in accordance with ACPA published guidelines and that sufficient and appropriate procedures and documentation of the manufacturing process were in place as evidence of continued manufacturing practice in accordance with those guidelines.

This Certificate of Compliance is awarded annually on the basis of successful completion of a compliance audit performed by Wiss, Janney, Elstner Associates, Inc. This Certificate is valid until:

July 1, 2018

J. Russell Tripp, P.E.
President
American Concrete Pipe Association

Jake Jyrkama
Chairman
Quality/Safety Committee

Example

WJE ENGINEERS ARCHITECTS MATERIALS SCIENTISTS

Wiss, Janney, Elstner Associates, Inc.
330 Pfingsten Road
Northbrook, Illinois 60062
847.272.7400 tel | 847.291.9599 fax
www.wje.com

Via email: NCDOTproducer.gov

8/18/2017

Example

Re: ACPA Voluntary Certification
Program WJE No. 12345

Dear NCDOT Producer:

It is our pleasure to inform you that your plant at Raleigh, NC has successfully passed the recent American Concrete Pipe Association (ACPA) plant certification inspection. The plant fulfills the requirements for Storm Sewer and Culvert Pipe certification. The transcript of auditor's comments, the inspection grading sheet, improvements and plant deficiencies are attached.

Please consider and incorporate the improvements provided. A formal response to each deficiency must be sent to ACPA and to Wiss, Janney, Elstner Associates, Inc. Your response to deficiencies is due by September 17, 2017 by mail or email (lmccready@wje.com and wanda@concretepipe.org). The response must be received and demonstrate compliance to remain QCast certified.

We appreciate your dedication to achieving the highest of quality in the manufacture of QCast products. We will gladly discuss our inspection with you and appreciate any of your comments on the inspection or certification program.

Very truly yours,

WISS, JANNEY, ELSTNER ASSOCIATES, INC.

Paul D Krauss

Paul D. Krauss, P.E.
Project Manager
pkrauss@wje.com

PDK:lsm

cc: ACPA w/enclosures

AUDIT MANUAL SCORE SUMMARY SHEET
PIPE REQUIREMENTS

Plant NCDOT Producer **Date of Audit** August 10, 2017

Location Raleigh, NC **Inspector** ACPA

Section	Description	Possible Points (A)	Grade (B)	Score (AxB)
	Product Documentation			
1.0	Quality Control Documents and Info	4	100	4.00
2.0	Raw Materials	3	100	3.00
3.0	Calibration	4	85	3.40
4.0	Mix Designs	4	100	4.00
	Joints			
5.1	Joint Design Drawings	2	100	2.00
5.2	Joint Design Calculations (SS)	2	NA	
5.3	Spigot Gauge System (SS)	2	NA	
5.4	Gasket Quality Control & Testing	3	90	2.70
	Equipment			
6.1	Forms	3	100	3.00
6.2	Joint Forming Equipment Inspection	4	100	4.00
	Pre-pour Product Inspection			
7.0	Reinforcing[1]	6	90	5.40
8.0	Pre-Pour Inspection	5	80	4.00
9.0	Concrete Testing	4	90	3.60
9.7	Compressive Strength Testing[1]	6	95	5.70
	Post-pour Product Inspection			
10.0	Curing	4	100	4.00
11.1	Repairs and Finishing	2	90	1.80
11.2, 11.4	Product Visual Inspection	2	95	1.90
11.3	Dimensional Test Reports	2	95	1.90
11.5	Sanitary Joint Dimensional Inspection (SS)	2	NA	
12.0	Product Marking	3	100	3.00
	Product Testing			
13.1	Water Tightness Test[1] (SS)	6	NA	
13.2	Three Edge Bearing Test[1]	6	85	5.10
13.3	Off Center Joint Test[1] (SS)	6	NA	
13.4	Differential Joint Shear Test[1] (SS)	6	NA	
13.5	Storm & Sewer Joint Test[2] (S)	6	60	3.60
	Storage, Handling, Shipping, and Final Inspection			
14.1	Storage and Handling	3	100	3.00
14.2	Shipping Policy	3	100	3.00
14.3	Final Inspection	3	100	3.00
	Total Applicable Points	82		75.10
	Adjusted Score[3]			91.59

Example

Notes:

1. Critical Element: Minimum Passing Score = 4.5
2. 4 Points for Proof of Design, 2 for Testing
3. Minimum Passing Score = 80, Conditional Certification Score = 75

(SS) = Sanitary Sewer Only

(S) = Storm Sewer and Culvert Only

This is to certify that the quality control procedures of

NCDOT Producer Products Co.

100 NCDOT Road
Raleigh, NC 27603

were audited during an on-site plant inspection on June 16, 2017 and have met the

Precast Concrete Requirements

stated in the NPCA Quality Control Manual for Precast Concrete Plants

Renewal Granted on November 21, 2017

Participation in the NPCA Plant Certification program affirms an ongoing commitment to producing quality precast concrete products to recognized standards of the *American Association of State Highway and Transportation Officials* (AASHTO), the American Concrete Institute (ACI), the ASTM International (ASTM), the American Welding Society (AWS), the Precast Prestressed Concrete Institute (PCI), and the Concrete Reinforcing Steel Institute (CRSI).

This renewal certificate is valid through December 31, 2018.

Example

NPCA CERTIFIED PLANT

ANSI ACCREDITED ISO/IEC 17065 Product Certification Body #1018

Ashley Smith, Chairman of the Board

Ty E. Gable, NPCA President

Phillip B. Cutler, P.E., Director of Quality Assurance Programs

NPCA | 1320 City Center Drive, Suite 200 | Carmel, IN 46032

This document shall be reproduced in its entirety

NCDOT required document
NPCA Plant Certification Certificate

A1

A2

CONSULTING INC.

PRELIMINARY REPORT

August 31, 2017

Example

RE: NPCA Precast Concrete Certification

Dear NCDOT Producer:

The attached is a preliminary audit report and score based upon NCDOT Producer — audit by HPS Consulting Inc..

NCDOT Producer will receive a hard copy of the final audit report from NPCA within 30 days of the audit. In compliance with NPCA's Quality Control Manual and the rigorous quality assurance processes of HPS Consulting Inc., all of the preliminary reports must be reviewed and the report signed by a Professional Engineer, and have been reviewed by NPCA before being considered final.

If you have any questions about NCDOT Producer preliminary report please discuss them with the auditor during the exit interview process or contact Phil Cutler at pcutler@precast.org or (800) 366-7731.

Best Regards,

Auditor
HPS Consulting Inc.

cc: HPS Consulting Inc./enclosures

PRELIMINARY REPORT

Grading Schedule

Plant:	NCDOT Producer	Location:	Raleigh, NC
Date:	1/1/0001	Auditor:	Auditor

Chapter 1 GENERAL		Points (A)	Grade % (B)	A x B
1.1	Plant Quality Control Procedures and Management Policies			
	1.1.1 Plant Management and Personnel	3	95	2.85
	1.1.2 Plant-Specific Quality Control Manual			
	1.1.4 Plant Requirements			
1.1.3	QC Personnel Training			
	1.1.3.1 QC Personnel Training	6	100	6
1.2	Plant Safety			
	1.2.1 Safety Program	1	100	1
	1.2.2 Plant Requirements			
1.3	Drawings and Mock-Ups	N/A		
Total Chapter 1		10		9.85

Chapter 2 MATERIALS		Points (A)	Grade % (B)	A x B
2.1	Concrete			
	2.1.1 Cement	3	100	3
	2.1.2 Aggregates			
	2.1.3 Lightweight Aggregate			
	2.1.4 Mixing Water			
	2.1.5 Chemical Admixtures			
	2.1.6 Supplementary Cementitious Materials			
	2.1.7 Plant Requirements			
2.2	Reinforcement			
	2.2.1 Reinforcing Bars	3	100	3
	2.2.2 Reinforcing Wire			
	2.2.3 Bar Mats and Welded-Wire Reinforcement			
	2.2.4 Zinc or Epoxy-Coated Reinforcement			
	2.2.5 Plant Requirements			
2.3	Miscellaneous Materials			
	2.3.1 Lifting Inserts and Lifting Hardware	2	100	2
	2.3.2 Embedded Steel Shapes and Plates			
	2.3.3 Headed Studs and Deformed Anchor Studs			
	2.3.4 Manufacturing Accessories			
	2.3.5 Fiber Reinforcement			
	2.3.6 Joint Sealants and Connectors			
	2.3.7 Plant Requirements			
Total Chapter 2		8		8

Chapter 3 CONCRETE		Points (A)	Grade % (B)	A x B
3.1	Concrete Mixes			

Example

	3.1.1 Mix Proportions	5	100	5
	3.1.2 Water-Cementitious Ratio			
	3.1.3 Air Content			
	3.1.4 Compressive Strength			
	3.1.5 Admixtures			
	3.1.6 Plant Requirements			
3.2	Batching and Mixing			
	3.2.1 Requirements for Batching and Mixing Plants	10	100	10
	3.2.2 Storage of Cement and Supplementary Cementitious Materials			
	3.2.3 Handling and Storage of Aggregates			
	3.2.4 Batching Equipment			
	3.2.5 Discharge of Materials into Mixers			
	3.2.6 Mixers			
	3.2.7 Mixing			
	3.2.8 Ready-Mixed Concrete			
	3.2.9 Plant Requirements			
	Total Chapter 3	15		15
Chapter 4 PRODUCTION PRACTICES		Points (A)	Grade % (B)	A x B
4.1	General			
	4.1.1 Plant Layout	10	100	10
	4.1.2 Housekeeping			
	4.1.3 Forms and Forming Equipment			
	4.1.4 Handling Equipment			
	4.1.5 Machine-Made and/or Dry-Cast Products			
	4.1.7 Plant Requirements			
4.1.6	Architectural Precast Concrete	N/A		
4.2	Fabrication of Reinforcement and Blockouts			
	4.2.1 Fabrication of Reinforcement CRITICAL SECTION	4	100	4
	4.2.2 Welding of Reinforcing Steel	8	100	8
	4.2.3 Welding of Steel Assemblies			
	4.2.4 Fabrication and Positioning of Blockouts			
	4.2.5 Plant Requirements			
4.3	Pre-Pour Operations			
	4.3.3 Positioning of Reinforcement CRITICAL SECTION	10	100	10
	4.3.1 Cleaning of Forms	8	100	8
	4.3.2 Application of Form Release Agent			
	4.3.4 Positioning of Miscellaneous Embedded Items			
	4.3.5 Plant Requirements			
4.4	Casting Concrete			

Example

	4.4.1 Transporting Concrete	8	100	8
	4.4.2 Depositing Concrete into Forms			
	4.4.3 Consolidating Concrete			
	4.4.4 Finishing Unformed Surfaces			
	4.4.5 Secondary Pours			
	4.4.6 Hot Weather Precautions			
	4.4.7 Cold Weather Precautions			
	4.4.8 Plant Requirements			
4.5	Curing Concrete			
	4.5.1 General	4	100	4
	4.5.2 Curing by Moisture Retention			
	4.5.3 Curing with Heat and Moisture			
	4.5.4 Plant Requirements			
4.6	Stripping Products from Forms			
	4.6.1 Minimum Strength Requirement	5	100	5
	4.6.2 Product Damage During Stripping			
	4.6.3 Formed Surfaces			
	4.6.4 Post-Pour Inspection			
	4.6.5 Plant Requirements			
4.7	Repairing Concrete			
	4.7.1 Repairing Minor Defects	4	100	4
	4.7.2 Repairing Major Defects			
	4.7.3 Inspection of Repairs			
	4.7.4 Plant Requirements			
4.8	Marking, Storage and Shipment of Products			
	4.8.1 Product Marking	5	100	5
	4.8.2 Storage Areas			
	4.8.3 Storage of Products			
	4.8.4 Shipment of Products			
	4.8.5 Final Inspection			
	4.8.6 Plant Requirements			
	Total Chapter 4	66		66
Chapter 5 QUALITY CONTROL OPERATIONS		Points (A)	Grade % (B)	A x B
5.1	Summary of Required Records			
	5.1.1 Raw Material & Test Records	9	100	9
	5.1.2 Work Orders and Product Drawings			
	5.1.3 Equipment Calibration Records			
	5.1.4 Aggregate and Concrete Test Records			
	5.1.5 Concrete Batching Reports			
	5.1.6 General Plant and Product Inspection Reports			
	5.1.7 Plant Requirements			
5.2	Aggregate Testing			
	5.2.1 Aggregate Gradation	3	100	3
	5.2.2 Moisture Content			
	5.2.3 Plant Requirements			
5.3	Concrete Testing - CRITICAL SECTION			

Example

	5.3.1 Slump, Slump Flow and Visual Stability Index	9	83.33	7.5
	5.3.2 Temperature			
	5.3.3 Density (Unit Weight)			
	5.3.4 Air Content			
	5.3.5 Compressive Strength			
	5.3.6 Plant Requirements			
Total Chapter 5		21		19.5
Chapter 6 SPECIAL REQUIREMENTS FOR SPECIFIC PRODUCTS		Points (A)	Grade % (B)	A x B
6.1	Products Manufactured According to ASTM International and Other Industry Standards			
	6.1.1 Product Manufacture	3	100	3
	6.1.2 Proof of Conformance			
	6.1.3 Plant Requirements			
6.2	Stormwater Concrete Pipe Requirements			
	6.2.1 Reinforcing Steel Inspection CRITICAL SECTION	10	100	10
	6.2.2 Three-Edge Bearing Testing CRITICAL SECTION	10	100	10
	6.2.3 Absorption Testing CRITICAL SECTION	1	100	1
	6.2.4 Dimensional Checks	6	100	6
	6.2.5 Joint Design and Testing			
	6.2.6 Gasket Quality Control			
	6.2.7 Plant Requirements			
6.3	Round Manhole Component Requirements			
	6.3.1 Reinforcing Steel Inspection CRITICAL SECTION	10	100	10
	6.3.3.1 Absorption Testing CRITICAL SECTION	1	100	1
	6.3.2 Flat Slab Tops	5	100	5
	6.3.3.2 Step Testing			
	6.3.3 Base, Riser and Cone Sections			
	6.3.3.3 Dimensional Checks			
	6.3.3.4 Sanitary Manhole Vacuum Testing			
	6.3.4 Joint Design			
	6.3.5 Gasket Quality Control			
	6.3.6 Plant Requirements			
6.4	Box Culvert Requirements	N/A		
6.5	Septic Tank Requirements	N/A		
6.6	Grease Interceptor Requirements	N/A		
Total Chapter 6		46		46
			Sum of AxB for all Chapters	164.35
			Total Applicable Points	166
			PLANT SCORE	99.01

Example

North Carolina Department of Transportation
Materials & Tests Unit
Precast Concrete Plant Inspection Checklist Addendum - 2019

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

The following are tasks to be performed during the plant inspection for a precast concrete producer seeking NCDOT Certification.

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.
A3.	Pass	Fail	Aggregate stockpiles maintained above Saturated Surface Dry (SSD) condition.
Comments:			

Cement and Fly Ash

A4.	Pass	Fail	Proper Bill of Lading meeting Department criteria and certifications as outlined in Department's Specifications received.
A.5	Pass	Fail	Verify cement and fly ash source with Department approved concrete mix design.
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 hand and match materials on site.
A9.	Pass	Fail	Concrete mix design proportions adjusted for moisture content according to Department procedures.
Comments:			

Moisture Content

A10.	Pass	Fail	Percent total moisture for each aggregate is determined by Department's Certified Batcher during inspection. **Documentation must be accessible and on-site.**
A11.	Pass	Fail	Moisture equipment, including moisture probes, checked for accuracy and proper working operation.
A12.	Pass	Fail	Review moisture calculations and w/c calculated for each batch.
Comments:			

Routine Duties

A13.	Pass	Fail	Daily checks on cement received and used. **Does the BOL and Certifications match what is called for in the mix design?**
A14.	Pass	Fail	Constant testing and checking moisture contents of aggregates. **Initial moistures will be performed at startup of each day, a 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].**
A15.	Pass	Fail	Daily report prepared and batch weight tickets kept on site.
Comments:			

Certifications

A16.	Pass	Fail	All personnel have current/active Department certifications for their job responsibility, and documentation is on site. (List Below) • NCDOT Concrete Field Technician
A17.	Pass	Fail	All personnel have current/active Department certifications for their job responsibility, and documentation is on site. (List Below) • NCDOT Concrete Batch Technician
A18.	Pass	Fail	Plant has been approved and displays current Department Plant Certification
Comments:			

Equipment

A19.	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).
A20.	Pass	Fail	All equipment used in the quality control sampling and testing has been calibrated within the last 12 months if applicable and is in good working order. Scales, compression machines, three edge bearing machine, etc., must be calibrated by a third party entity or the manufacturer (in-house calibration is not acceptable).
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)

Name	Title	NCDOT Certification Number - PCT	NCDOT Certification Expiration Date

NCDOT CONCRETE BATCH TECHNICIAN (PCB)

Name	Title	NCDOT Certification Number - PCB	NCDOT Certification Expiration Date

Materials & Tests Unit

NCDOT

2019 Guidelines
Precast Concrete Plant Inspection Checklist Addendum- Procedure

General Notes:

- The following items are to be verified (if applicable) during the 3rd party facility plant inspection for precast concrete plants seeking NCDOT Certification.
- If a plant is actively producing precast concrete product 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 facility information block of the addendum, and include NCDOT assigned facility number (PC??).
- When the inspection is completed, a **copy** of the addendum must be left with the facility.
- The following documentation is required to complete the inspection process:
    - Letter of Certification (submitted prior to expiration date).
    - Certificate of Compliance/Plant Certification (submitted prior to expiration date).
    - Letter of Inspection/Preliminary Audit Letter (submit within 10 business days).
    - Audit Summary Sheet/Grading Schedule (submit within 10 business days).
    - NCDOT Precast Concrete Plant Inspection Checklist Addendum (submit within 2 days after inspection)
- Send all documentation to the following, or email jepoppe@ncdot.gov

  NCDOT Materials & Tests Unit
  Attn. Jason Poppe
  1801 Blue Ridge Road
  Raleigh, NC 27607
  FAX (919-329-8742)

Aggregates:

- A1: The 3rd 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 3rd 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.
- A3: The 3rd 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 3rd 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 3rd 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 3rd 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 3rd 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 3rd 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 3rd party inspector shall review concrete mix designs to verify: a hard copy of the approved mix designs are on-site, all materials are supplied by an approved source, 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 3rd party inspector shall confirm moisture tests are being performed and adjustments for moisture are executed in accordance with Department procedures. Moisture tests are to be performed at startup of production and an additional moisture test is to performed if production exceeds four hours. These moisture tests must be "Drying" or "Burn Off" procedures, not utilizing moisture probes.

Moisture Content:

- A10: The 3rd 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" or "Burn Off" 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" or "Burn Off" 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.
- A11: The 3rd 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.

- A12: The 3rd 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 for all aggregate types.

Routine Duties:

- A13: The 3rd 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.
- A14: The 3rd 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. Additional moisture contents are required if weather changes are evident. All moistures shall be documented on the appropriate NCDOT forms, and available for viewing.
- A15: The 3rd 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.

Certifications:

- A16: The 3rd 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.
- A17: The 3rd 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.
- A18: The 3rd 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.

Equipment:

- A19: The 3rd 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.

- A20: The 3rd 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, and compression machines shall be calibrated by a third party entity or the equipment manufacturer. General testing equipment such as, slump cones (visual inspection), 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.

Personnel:

- The 3rd 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 PROUCTION OF THIS PRODUCT TO BE UTILIZED ON NCDOT/FHWA PROJECTS.** The 3rd 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 PROUCTION OF THIS PRODUCT TO BE UTILIZED ON NCDOT/FHWA PROJECTS.** The 3rd 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 3rd 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.