

SUMMARY OF CHANGES 2024

Updates for the 17th edition NPCA QC Manual QCM-001

Posting of November 1, 2023

During the 2023 NPCA Committee Week, the NPCA QA/QC Committee updated the NPCA Quality Control Manual for Precast Concrete Plants in a number of sections.

The format for notifying members and certified plants of these changes will be via the NPCA Certification Express or Precast Express email blast tool. Members and certified plants will be notified of changes in multiple emails distributed to the designated primary contact and liaison to the auditor. A letter outlining changes will not be mailed to the liaison to the auditor for each certified plant location this year.

The 17th edition of the Quality Control Manual will include several changes and editorial updates that take effect at the start of the 2024 program year. Please see the posted manual for editorial changes indicated in red highlighted text. Members will have the opportunity to review and comment on the changes during a 60-day comment period from Nov. 1, 2023 to Dec. 31, 2023.

The table of contents has been renumbered as required to accommodate the changes in language throughout the manual as detailed below.

FOREWORD:

Updated the Quality Assurance Committee roster to reflect the membership of the 2022 – 2023 committee members and the edition of the manual.

INTRODUCTION:

Remove the Precast Prestressed Concrete Institute (PCI) from the second paragraph.

Chapter 1 - General

Section 1.1.2 Plant Specific Quality Control Manual:

Add requirement number 18.

If a plant participates in Section 1.1.4 Continuous Improvement, then policies and procedures shall be in the plant-specific QC Manual.

Section 1.1.3.2a QC Personnel Training:

Editorial changes.

- a) the ~~American Concrete Institute (ACI)~~ Concrete Field Testing Technician – Grade 1

Section 1.1.4 Continuous Improvement:

Add clarification and language regarding semi-annual self-audits and the portal.

2. Perform semi-annual self-audits using the self-audit tool available in the myNPCA Producer Portal or using a plant generated equivalent self-audit tool and uploading results into the myNPCA Producer Portal.

See Part 2.5 of the Plant Terms and Conditions regarding the scoring of Continuous Improvement activities.

Section 1.1.5.7 & 1.1.5.8 Plant Requirements:

7. NPCA certified plants must document and track the following:

- a. All product related complaints received from external customers such as contractors, specifiers, or owners.
- b. Quality related issues by a plant representative including issues they were informed of while at a jobsite.
- c. Repetitive deficiencies found by the plant affecting the quality of product.
- d. All corrective actions taken to resolve the issue or deficiency and actions taken to prevent recurrence.

8. Management or a designated representative shall routinely meet with QC, applicable key personnel, and other necessary personnel at a minimum of once every 6 months to discuss these tracked complaints, issues, and deficiencies. Management or a designated representative must verify proper corrective actions were taken, resolution was obtained, and determine if any further actions are needed to prevent recurrence of similar quality related issues. The meeting date, a list of attendees, and a record of the minutes is required to be kept in the plant files. Documentation shall be kept on file for a period of three years and made available to the auditor during each plant audit.

Section 1.2 Plant Safety:

Added Section 1.2.2 Housekeeping

Added Section 1.2.3 Handling Equipment

Requirements and Commentary moved from Sections 4.1.2 and 4.1.4

Section 1.3 Drawings & Mock-ups:

Editorial changes Section 1.3.1, 1.3.1.1, & 1.3.1.2

Section 1.3.2 Mock-ups requirements and commentary moved to new section in Chapter 6; Section 6.7.1.

Chapter 2 – Materials

Section 2.0 Buy America:

Section renamed **BUY AMERICA and BUILD AMERICA, BUY AMERICA PROVISIONS**
Editorial changes and commentary added.

Section 2.1.2 Blended Hydraulic and Hydraulic Cements:

Added to commentary types of blended cements under ASTM C595.

Section 2.1.3 Aggregates:

Editorial change, removed ASTM C1778 language and moved it to Section 2.1.3.2 Deleterious Substances.

Section 2.1.6 Chemical Admixtures:

Removed ASTM C1017 since withdrawn by ASTM, also removed from Appendix A.

Section 2.2.1 Reinforcing Bars:

Added ASTM D7957 Standard Specification for Solid Round Glass Fiber Reinforced Polymer Bars for Concrete Reinforcement, also added to Appendix A.

Added New Section 2.2.5 Fiber Reinforcement and Commentary:

Section was previously, 2.3.5.

Data shall be provided to show conclusively that the type, brand, quality, and quantity of fibers to be included in the concrete mix are not detrimental to the concrete or to the precast concrete product.

Fiber reinforced concrete shall conform to ASTM C1116, "Standard Specification for Fiber-Reinforced Concrete and Shotcrete," (Type I or Type III).

Renumbered Section 2.2 Reinforcement:

Section 2.2.5 was Plant Requirements now 2.2.6. Section 2.2.6.3 added fiber reinforcement.

- 2. Fiber reinforcement shall be appropriate for intended use.**

Chapter 3 – Concrete

Editorial changes in Sections 3.1.2 Water-Cementitious Materials Ratio commentary, table 3.1.3 Total Air Content for Frost – Resistant Concrete, Section 3.1.5 Admixtures, Section 3.1.6 Plant Requirements, Section 3.2.1 Requirements for Batching and Mixing Plants, Section 3.2.4.1 Mass Batching ASTM C94, and Section 3.2.8 Ready-Mixed Concrete

Chapter 4 – Production Practices

Section 4.1.6 Architectural Precast Concrete:

Requirements and commentary moved to a new Section 6.7 in Chapter 6.

Section 4.1.7.5 of Plant Requirements:

Moved to Section 6.7.3 Plant Requirements.

Section 4.3.2 Application of Form Release Agent:

Minor editorial change.

Section 4.5.1 General Commentary:

Minor editorial change.

Section 4.8.3 Storage of Products:

Minor editorial change.

Chapter 5 – Quality Control Operations

Section 5.1.1 Raw Materials & Test Reports

Minor editorial changes.

Section 5.1.1.1 – Independent Third-Party Testing Laboratory

Minor editorial changes.

Section 5.1.3 – Equipment Calibration Records:

Minor editorial changes.

Critical Section 5.3 – Concrete Testing**

Editorial change: **Verification of corrective action shall be through retesting and documentation.**

Section 5.3.1.1 Slump:

A slump test of fresh concrete of each mix design shall be performed for each 150 cubic yard (115 cubic meters) of concrete, or once a day, whichever comes first, **per batching location**. Slump tests shall be performed in accordance with ASTM C143, “Standard Test Method for Slump of Hydraulic-Cement Concrete.” SCC, no-slump, or dry-cast concrete does not need to be tested for slump.

5.3.1.2 Slump Flow and VSI:

For SCC mixtures, slump flow and Visual Stability Index (VSI) tests of fresh concrete of each mix design shall be performed **for each 150 cubic yards of concrete, or once** each day by testing one of the first two batches of SCC as defined by the initial mix qualification process, **per batching location**. Reject the concrete if the upper specification limit is exceeded. If the slump flow test result is less than the lower production range limit reject the concrete unless the mixture has been approved for vibration and is subsequently vibrated. Thereafter, slump flow and VSI testing shall be performed as follows:

- When changing mix designs
- When changing raw materials;

-and

-As required in Section 5.2.2.2

5.3.3 Density (Unit Weight) Commentary:

Density (Unit Weight) provides us with valuable information about mix proportioning, yield, and air content. Since air content testing is a daily requirement, plants are encouraged to simply use the strike off plate on the pot and take the extra minute and record the unit weight data.

5.3.5.4 Compressive Strength Specimens:

At least four compressive strength specimens shall be made for each 150 cubic yards (115 cubic meters) of concrete of each mix or once per week, whichever occurs first. **Two specimens shall be tested at or before 7 days and, if the specified design strength has not been met at that time, the other two shall be tested at or before 28 days, or at the age specified by design.** A compression strength test (see Section 3.1.4) shall be performed at or before 7 days, and if the specified design strength has not been met at that time, another compression strength test (see Section 3.1.4) shall be performed at or before 28 days, or at the age specified by the design. Specimens made in cylinder molds shall be tested in accordance with ASTM C39, "Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens." Cubes or cores cut from products shall be tested in accordance with ASTM C42, "Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete."

5.3.6 Plant Requirements:

1. **Persons Personnel** conducting QC tests shall be properly trained **or certified** to perform the tests (see Section 1.1.3).
2. Proper **ACI Field Technician Grade 4 ACI Concrete Field Testing Technician – Grade I or ASTM** test techniques and procedures shall be demonstrated for slump, temperature, density (unit weight), air content, and fabrication of compressive strength cylinders during the NCPA audit. **Additionally, for SCC proper ACI Self-Consolidating Concrete Testing Technician or ASTM test techniques and procedures shall be demonstrated for slump flow, VSI, temperature, density (unit weight), air content, and fabrication of SCC compressive strength cylinders during the NCPA audit.**
3. Track the number of tests on each neoprene compression test pad, if used.
4. If concrete testing is performed by an outside testing agency, the testing shall be conducted at the point of placement and the plant shall obtain the ACI certificate(s) of the **tester technician** along with calibration records of equipment used. Obtaining this documentation from the supplier **ensures** that the personnel performing the tests have been properly trained and equipment used has current calibration.
5. Testing of concrete compressive strength cylinders by third parties is not required to be performed on the plant premises. Plants using third party suppliers for compressive strength testing shall obtain copies of the **testers technician** ACI certificate and current equipment calibration certificate.

Chapter 6 – Special Requirements for Specific Products

Section 6.1.1 Product Manufacture:

Minor editorial changes.

Critical Section 6.3.1 Reinforcing Steel Inspection**

Clarification language added.

Manhole reinforcing steel checks shall be performed on a minimum of one (1) reinforcing steel cage or 3% of each fabrication run daily, whichever is greater, chosen on a random basis by QC personnel, **for each product category produced (grade rings, flat slab tops, riser sections, conical tops, and base sections)** regardless of fabrication method. These checks shall be documented and maintained in the plant records for a minimum of three (3) years.

Section 6.3.2 Flat Slab Tops:

Minor editorial change.

Section 6.3.3.2 Step Testing:

Minor editorial change.

Section 6.3.3.3 Dimensional Checks:

Minor editorial change.

Section 6.4.2 Joint Design:

Editorial change.

Section 6.5.1 Structural Proof-of-Design:

Minor editorial change.

Section 6.5.3.3 Plant Requirements:

Section removed.

Section 6.6.1 Structural Proof-of-Design:

Minor editorial change.

Section 6.6.3.3 Plant Requirements:

Section removed.

Section 6.7 Architectural Precast Concrete

Moved entire section requirements and commentary from chapter 4 (Section 4.1.6) no changes to content have been made.

Appendix A

Editorial changes.

Plant Terms and Conditions

Editorial changes: Removed Optional Product Listing For Water and Wastewater Tanks

Part 1 – Purpose, Scope, and Audits:

Numerous editorial changes.

Part 2 – Administration of NPCA Plant Certification:

Numerous editorial changes.

Part 2.5 Continuous Improvement: Scoring clarification.

Part 5 – Grading, Certification Status, and Corrective Actions:

Editorial changes.

Part 6 – Appeal Procedure:

Editorial changes.

Part 7 – 7.1 Applicable Plant:

NPCA Plant Certification is available to precast concrete manufacturing plants in the United States of America and its territories and Canada.

Part 8 – Additional Random Unannounced Audits:

Numerous editorial changes.

Diagrams:

Updated process flowchart diagrams of the processes.