

Department Plant Certification Program Requirements

The department's plant certification requirements are:

1. Prequalification by PCI plant certification as a fabricator in good standing. Certification must be according to the PCI "Manual for Quality Control for Plants and Production of Precast and Prestressed Concrete Products. For information or a copy of this manual contact:

PCI Director of Certification Programs
175 West Jackson Boulevard
Chicago, IL 60604-9773
Phone: 312-786-0300

A copy of the plant's PCI certification must be submitted to the department when application is made for plant certification. The plant's two most recent audit reports by PCI must be available at all times for review by the department and the department's certification review team. The reports must be reviewed only in the presence of plant personnel. The contents of the audit reports must remain confidential between the plant and the department and no parts of the reports must be reproduced or removed.

2. The fabricator must have a PCI certified Level II inspector who is responsible for QC sampling, testing and inspection who reports to personnel other than those responsible for production. Qualifications of other personnel performing QC work must be identified in the fabricator's QC plan.
3. A current quality control plan based on PCI guidelines, approved by the department.
4. In addition to the items listed above, a WisDOT annual certification review process which will include but not be limited to the following:
 - 4.1 Requests for approval of material sources
 - 4.2 Concrete mix design(s)
 - 4.3 Laboratory scale/balance calibrations
 - 4.4 Concrete mixer scale calibrations
 - 4.5 Cylinder testing machine calibrations
 - 4.6 Prestressing ram and dynamometer calibrations
 - 4.7 Aggregate gradations
 - 4.8 Fabrication procedures:
 - Hold down devices
 - Reinforcement placement, stressing and distressing sequences
 - Concrete production and placement
 - 4.9 Curing procedures
 - 4.10 Pre-approved girder repairs
 - 4.11 Storage operations
 - 4.12 Shipment operations

Schedule of Tests

| TEST | TEST DESIGNATION | FABRICATOR'S MINIMUM QUALITY CONTROL (QC) | | WISDOT'S MINIMUM QUALITY VERIFICATION (QV) | |
|--|---------------------------|---|---|--|----------------------|
| | | TEST BY | FREQUENCY | TEST BY | FREQUENCY |
| CONCRETE INGREDIENT MATERIALS | | | | | |
| Aggregate Quality (Fine & Coarse) | | | Must be from a WisDOT approved source ^[1] | WisDOT Central Lab | |
| Aggregate Sieve Analysis (Fine & Coarse) | AASHTO T27 | QC | One/source/week (for each aggregate) | | |
| Water | AASHTO T26 | QC | One/source/year | WisDOT Central Lab | One/Source/Year |
| Cement | | Mfr's Cert. | Must be according to WisDOT Method of Certification Acceptance ^[2] | | |
| Fly Ash | ASTM C311 | Mfr's Cert. | Must be according to WisDOT standard spec 501.3.7 ^[3] | WisDOT Central Lab | One/400 Tons(364 Mg) |
| Additives | | | Must be from WisDOT approved list of products ^[4] | | |
| STEEL MATERIALS ^[5] | | | | | |
| Prestressing Bars(one 5ft length) | AASHTO T244 (Tensile) | Mfr's Cert. | | WisDOT Central Lab | One/Heat |
| | AASHTO T285 (Bend) | Mfr's Cert. | | WisDOT Central Lab | One/Heat |
| Prestressing Strands (8ft sample field cut in two 48" lengths) | AASHTO T244 | Mfr's Cert QC | One/Heat | WisDOT Central Lab | One/Heat |
| CONCRETE MIXTURES | | | | | |
| Aggregate Moisture | AASHTO T255 | QC | One/Day | | |
| Slump | AASHTO T119 | QC | Four/Line | | |
| Air ^[6] | AASHTO T152 | QC | One/Line | | |
| Cylinders ^[7] ; Release 28-Day Strength | AASHTO T22 | QC QC | Two/Line Three/Line | WisDOT Central Lab | One/3 Month |

^[1] Aggregate sources must be tested for approval according to WisDOT Materials Testing and Acceptance Guide for PCC aggregate (refer to GUIDE in Construction and Materials Manual, Chapter 13).

^[2] Portland cement must be selected from an approved source according to the WisDOT Method of Certification Acceptance.

^[3] 30 days before use and every 30 days during work. Daily uniformity tests: specific gravity, % R#325, loss on ignition, moisture, sulphur trioxide and mortar air content.

^[4] Additives must be either from WisDOT approved lists of products or by approval of the WisDOT Physical and Chemical Tests Engineer.

^[5] All steel materials must be in compliance with Buy America provisions according to the contract specification requirements.

^[6] Air testing must be required only when air-entrainment is used.

^[7] Cylinders must be molded according to AASHTO T23.

Note: Test result differences between QC and QV will be monitored by WisDOT on an informal basis until further notification. Precision statements of the AASHTO Methods will be used, if available

Fabricator's QC Schedule of Records

The fabricator must maintain records and have them available for inspection review until five years after final acceptance of the products by the department. The schedule of the records includes:

- Shop and detail drawings
- Equipment calibrations and certificates
- Records of aggregate source quality
- Manufacturer's certifications for materials (cement, fly ash, steel, etc.)
- Cement records required by the WisDOT certification acceptance program
- Buy America certification documents for steel materials
- Concrete mix design(s)
- Temperature charts for curing
- Records (reports) of all testing (cylinder testing and other) ^[1]
- Log of tests for neoprene cylinder caps
- Proof loading date records

^[1] Copies of the test reports for concrete cylinder compressive strength must be provided to the department QV inspector by the completion of each contract.

Plant Inspection Fabrication Forms

It is the consensus of WisDOT, fabricators and the FHWA that the plant inspection fabrication forms to be completed and retained by the fabricator must include the following:

General Information Required:

1. WisDOT Project I.D., Structure I.D. and Girder I.D.'s
2. Fabricator name and Job I.D
3. Date

Required Data for Elongation Calculation Record:

1. Average modulus of elongation for the strands used, from the strand manufacturer's certifications
2. Average area for the strands used, from the strand manufacturer's certifications
3. Nominal diameter of the strands used
4. Total length of strands being stressed
5. Losses in stress and elongation
 - 5.1 Splices - number and calculated loss (slippage)
 - 5.2 Chucks - number and calculated loss (slippage)
 - 5.3 Abutment/Anchor - loss (movement)
 - 5.4 Thermal Correction
 - Total length of girders
 - Air temperature at time of stressing
 - Concrete temperature at time of initial set
6. Total load per line (from plan)
7. Load per strand adjusted for the losses listed above
8. Initial load applied
9. Required elongation
10. Strands used (manufacturer, reel no., heat no., and WisDOT Lab Test No.)

Required data for field stressing and elongation record:

1. Draped strand elongations
2. Straight strand elongations
3. Strand location identification
4. Gauge reading (load applied)
5. Gauge jacking system used

Required data for the record of the concrete mix used:

1. Mix design
 - 1.1. Aggregates used (source/s and grade/size)
 - Quantity of each aggregate used
 - Fine (moisture, absorption and free water)
 - Coarse (moisture, absorption and free water)
 - 1.2. Cement used (source, type and quantity used)
 - 1.3. Admixtures (source, type and quantity used)
 - 1.4. Fly Ash (source, type and quantity used)
 - 1.5. Micro Silica (source, type and quantity used)
 - 1.6. Water (source and quantity used)
2. Concrete testing
 - 2.1. Slump
 - 2.2. Air

- 2.3. Temperature of mix
- 2.4. Cylinders (date, time and number cast with identification)
 - Required release and 28 day strengths
 - Compression test results
 - Age of tested cylinders
3. Time of pour completion
4. Concrete curing
 - 4.1. Type of cure (air, steam, wet, etc.)
 - 4.2. Time steam was applied
 - 4.3. Time steam ended
 - 4.4. Temperature record (chart or report in pour records or provide a traceable path to the information)
5. Release of strand stress into concrete member
 - 5.1. Time of release and age of concrete member
 - 5.2. Method of release (prescribed in QC plan)

Required data for the record of materials used:

1. Aggregate quality tests (WisDOT Lab)
2. Strand quality tests (one per heat no. from WisDOT Lab)
3. Manufacturer certifications or certified reports of tests
 - 3.1. Cement, fly ash and micro silica
 - 3.2. Reinforcement bars (Buy America)
 - 3.3. Strands (Buy America)
 - 3.4. Other metal products (bearing plates, hold-downs, etc.)
 - 3.5. Admixtures (Approved List or meets appropriate ASTM requirements)
4. Aggregate sieve analysis (fabricator)

Required data for the record of product inspections:

1. Shop drawings (as built)
2. Prepour check list (documented)
3. Postpour check list (documented)
4. Initial sweep measurements
5. Initial camber measurements