

## **SECTION 875 Materials Testing and Acceptance - Structures**

### **875.1 Plant Certification Program for Fabrication of Prestressed Concrete Members**

#### **875.1.1 Introduction**

Prestressed concrete members must be fabricated at plants certified by the department in order to be used on department projects. The purpose of this document is to outline the processes to obtain and maintain plant certification with the department. Generally, the fabricator must provide a quality control (QC) program for plant manufacturing. QC is all operations that control the product manufacturing process within the specification requirements. The fabricator is responsible for all QC functions for materials and fabrication identified in the specification and this plant certification procedure. Quality verification (QV) oversight (verification of the QC processes) is provided by the department or its agent. Acceptance of prestressed concrete member items is contingent on the items being manufactured at plants complying with both this plant certification program and [standard spec 503](#).

To provide prestressed concrete members to WisDOT projects, plants must:

- Be certified by the Precast/Prestressed Concrete Institute's (PCI) certification program for the type(s) of prestressed members to be produced.
- Have a PCI certified Level II inspector responsible for QC sampling, testing, and inspection.
- Be approved by the department as a certified prestressed concrete member fabrication plant before start of production for WisDOT projects.
- Comply with the additional requirements of this procedure (attachment 875-1).

Plants, at a minimum, must undergo an annual operation review and approval process. Certification is granted/renewed or denied subsequent to the review.

WisDOT projects include state, county, and municipal federal aid and authorized county and municipal state aid projects. Fabricators whose plants are not on the approved list to provide prestressed concrete members to WisDOT projects are given one year to establish certification according to this program. This period starts with their first notification to the department of their intent to provide products for WisDOT projects.

#### **875.1.2 Scope**

Throughout this document there are two distinctive inspection issues of plant certification addressed:

1. Materials incorporated into the products
2. Fabrication of the products

##### **875.1.2.1 Fabrication Items**

The items included under this plant certification program are as described in [standard spec 503](#):

- Prestressed concrete girders
- Other prestressed concrete members

The item requirements must be according to the plans and specifications and contract. Prestressing of concrete members must be by the pretensioning method consisting of the following steps:

- Initial stressing of reinforcing tendons
- Placement of reinforcing steel, hardware and forms
- Production, placement, and curing of concrete
- Releasing stress from anchorages to the concrete after development of specified concrete strength
- Repairs, storage, and shipment

##### **875.1.2.2 Department Plant Certification**

The department's plant certification requirements are as follows (refer to attachment 875-1 for expanded information):

1. Prequalification by PCI plant certification as a fabricator in good standing.
2. A PCI certified Level II inspector responsible for QC.
3. A current quality control plan, based on PCI guidelines, and approved by the department.
4. WisDOT's annual plant review by the department's certification review team (refer to the "Authority for Plant Certification" section of this procedure) and approval process including QC/QV inspection requirements of this procedure and maintaining records identified in attachment 875-2 and 875-3.

#### **875.1.3 General**

Fabrication plants must provide facilities and qualified personnel to perform the specified tests (attachment 875-2) and maintain an acceptable quality control program. The plant must have a PCI Level II certified QC inspector either on the plant staff or from a consultant employed by the plant owner. This

inspector must report to personnel other than those responsible for production. The Level II QC inspector must be on duty at all times when the plant is in production of products for WisDOT projects. When differences exist between the PCI plant certification program aspects and standard spec 503, [standard spec 503](#) prevails.

All materials intended for use in the fabrication of prestressed concrete members must be tested according to attachment 875-2. The fabricator must maintain records of all product ingredient test reports, certifications, and quality control testing done in the production of prestressed concrete members. These records must be available at all times for examination by the department QV inspector and must be retained for a minimum period of five years after the item has been accepted by the department.

Continued certification of a fabrication plant is contingent upon acceptable completion of an initial plant operation review by the department and, then, sustained by a minimum of one annual review thereafter.

The fabricator must be required to perform quality control inspections. The department intends only to perform quality verification inspections. By its QV inspection, the department intends only to facilitate the work and review the quality of work. This QV inspection does not relieve the fabricator of any responsibility for identifying and replacing defective material and workmanship.

The department QV inspector must be PCI Level II certified. The QV inspector(s) must observe the fabrication process and materials, review required testing and other records on file, and make a visual inspection of the quality of workmanship of completed products for conformance with specifications and freedom from defects. Before the start of production of girders or other prestressed concrete members for WisDOT projects, the fabricator must notify the department QV inspector of the plant production schedule. The fabricator must give the QV inspector safe and free access to the work. If the QV inspector observes any work not meeting specifications or unacceptable quality control practices, the QV inspector must advise the plant manager. If the corrective action is not acceptable to the QV inspector, the girder(s) or other member(s) are rejected by the department.

#### **875.1.4 Plant Certification Qualification**

Plants requesting approval to fabricate prestressed concrete members for use on WisDOT projects must provide the following prequalification documentation and information with their application:

1. PCI plant certification as a fabricator in good standing. A copy of the plant's PCI certification must be submitted to the department when application for certification is made. 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 report must be reproduced or removed from the plant premises.
2. A current quality-control plan based on PCI guidelines, including fabricator documentation of all girders and other prestressed concrete member items.
3. Apply in writing to the director of BTS (Attention: quality management engineer). The request for plant certified status must include information on the plant QC program (i.e. product control operations, testing capabilities, facilities information, programs/tracking mechanisms such as inspection, and testing and personnel to maintain quality including identification of the PCI Level II certified inspector and a copy of the certification, records keeping information, etc.). The QC program must ensure that all fabrication, materials, and processes, consistently comply with applicable specification requirements (attachment 875-2). Example QC plans are furnished by the department upon request.
4. Undergo an on-site plant review by the department's certification review team who observe fabricating processes, review records on file, and make visual inspections of the quality of workmanship of completed products for conformance with specifications and freedom from defects. The certification review team must have safe and free access to the plant at any time.

The certification review team insures that the fabricator has facilities and equipment necessary to perform all operations to produce acceptable quality prestressed concrete products complying with all applicable specification requirements. The fabricator must be capable of consistently supplying acceptable products in quantity sufficient to avoid delays during construction. Any proposed modifications in plant methods, QC program, certified QC inspection personnel, or changes in sources of materials must be reported promptly to the region designated contact person where the plant is located. Department records of plant reviews previously made are used to evaluate those fabricators currently supplying products to WisDOT. Plant reviews are made a minimum of once per year.

Fabricators are notified of their certification status subsequent to the plant review process. The department maintains a list of certified plants on its electronic materials test system (MTS).

#### **875.1.5 Maintenance of Plant Certified Status**

Fabricators must request plant re-approval annually. The request must be in writing and include any changes that have occurred in the fabricator's plant methods, QC program, and certified QC inspection personnel since the last approval. The request must be received by BTS within one year of the previous

approval; otherwise the approval status is terminated. Upon receipt of the request for re-approval, the department initiates a plant inspection review by the certification review team, at a time when the plant is in production of products for WisDOT projects, according to this program.

Plants on the department's approved list are subject to reviews (complete or partial) at any time by the department's certification review team and QV inspector(s). Plant reviews follow the guidelines of this program.

#### **875.1.6 Loss of Plant Certified Status**

Plant certification may be withdrawn for the following conditions:

- Loss of PCI plant certification.
- Inability to consistently fabricate products meeting specification requirements.
- Lack of maintenance of required records and improper documentation.
- Failure to maintain an approved quality control program.
- Failure to acceptably resolve deficiencies identified by certification reviews.

The director of BTS authorizes removal of plants from the certified list. The department provides notification of removal from the list in writing.

#### **875.1.7 Plant Recertification Qualification**

A plant that has lost certification must comply with the following to be recertified:

- Items 1 through 4 of "Plant Certification Qualification" section of this procedure.
- Submit documentation to the director of BTS identifying the reason(s) decertification occurred and the corrective actions taken by the fabricator.

During the time a plant is not on the approved list, due to loss of certification, prestressed concrete members fabricated at the plant are only accepted when the plant is under an increased level of QV inspection as determined by the department. The department's increased costs for QV inspection are paid by the fabrication plant or their agent, unless other arrangements are agreed upon by the department.

Under this program, a fabrication plant has 3 months to regain certified status. If, after three months, the plant has not met all requirements for recertification, prestressed concrete members that are fabricated in the plant are not accepted for use on WisDOT projects until the plant is recertified to furnish these products under this procedure (the department's plant certification program). Notification of this department action is sent to all WisDOT regions by BTS. Decisions regarding future qualification for certification of a plant are by the director of BTS.

#### **875.1.8 Authority for Plant Certification**

The director of BTS determines the plants to be certified based on recommendations of the department's certification review team. Notification of plant certification is made in writing to the fabricator.

The certification review team consists of representatives from WisDOT Central Office, WisDOT regions, and any others included by the department. FHWA may assist with the review upon request by the department.

#### **875.1.9 Department Verification and Plant Certification Stamp**

Each prestressed concrete member fabricated under this plant certification program requires, for acceptance of items upon delivery to projects, a shipping document stamped with the following plant certification and an acceptable visual inspection by the engineer at the job site.<sup>[2]</sup>

CERTIFIED TO MEET WISDOT SPECIFICATIONS  
(Name of Manufacturing Company)

<sup>[2]</sup> The stamp serves as the fabricator's certification that the item has been fabricated in compliance with all specifications and the fabricator has all the pertinent documentation available for examination by the appropriate department personnel.

Furthermore, acceptance is contingent upon receipt and evaluation, by the department, of the cylinder test results as provided by the fabricator.

#### **875.1.10 Certification of Plants Not on the Approved List**

Prestressed concrete members fabricated in plants not on the WisDOT approved list may be accepted when the plant is under increased QV inspection by the department for an interim period not to exceed one year. After that time, the plant must have attained certification under the department's plant certification program or products are not accepted for use on WisDOT projects. The department's increased costs for QV inspection is paid for by the fabrication plant or their agent, unless other arrangements are agreed upon by the department.

### **875.1.11 Department Contact Person**

Inquiries and comments regarding this plant certification procedure may be addressed to:

Concrete Materials Supervisor  
Wisconsin Department of Transportation  
Truax Center  
3502 Kinsman Boulevard  
Madison, Wisconsin 53704  
Tel.: (608) 246-5320

## **875.2 Approved Fabricators for Steel Bridge Primary Members**

### **875.2.1 General**

Steel bridge primary members must be fabricated at shops that are on the APL for primary member fabricators, consistent with [standard spec 101.2\(2\)](#), on the bid closing date in order to be used on department projects. The purpose of this section is to outline the requirements for obtaining and maintaining fabricator shop approval status with the department. Acceptance of steel bridge primary members is contingent on the items being fabricated at shops complying with both these shop approval requirements and [standard spec 506](#).

Fabrication must comply with the American Welding Society (AWS) D1.5 Bridge Welding Code To fabricate steel bridge primary members for WisDOT projects a fabricator must be certified by the American Institute of Steel Construction (AISC) as detailed in [CMM 875.2.2](#).

The fabricator must provide facilities and qualified personnel to maintain an acceptable quality control program. The fabricator must provide a current copy of their Quality Management/Control Plan directly to the Structural Metals and Fabrication Quality Assurance Inspection Unit Supervisor. The fabricator must upload mill test reports and certifications, shop drawings, and weld procedure specifications to the SharePoint fabrication library before starting the assembly process. The records must be available at all times for examination by the department inspector and for a period of 5 years after use on a project.

Acceptance of steel bridge primary members by the department is also contingent upon continued acceptable verification inspection at the project site by project personnel.

### **875.2.2 Qualification for Approved Fabricator List**

To be included in the department's list of Approved Steel Bridge Fabricators, the fabricator must provide proof of AISC certification and an updated Quality Control/Management Plan (QMP/QCP) directly to the Structural Metals and Fabrication Quality Assurance Inspection Unit Supervisor on a yearly basis. These submittals must be received by March 1 of each calendar year to maintain an approved fabricator status on the [APL](#). Fabricators requesting product approval under the Certification Program must provide an application form to: [DOTDLStructuresFabrication@dot.wi.gov](mailto:DOTDLStructuresFabrication@dot.wi.gov)

The application form is available at:

<https://wisconsindot.gov/dtsdManuals/strct/fabrication/apl-bridge.docx>

The required level of AISC certification is based on the complexity of the structure as detailed in table 875-1. Fabrication of structures with higher complexities than those allowed by the highest level of certification held by a fabrication shop is not allowed to occur at that facility.

**TABLE 875-1 AISC Certification Level Requirements for Steel Bridges**

| Bridge Category - Certification Level                     | Allowable Fabrication   |
|---|---|
| Certified Bridge Fabricator - Simple (SBR)                | - Unspliced rolled sections   |
| Certified Bridge Fabricator - Intermediate (IBR)<br>Major | - Field or shop spliced rolled beam bridge, straight or with radius > 500ft<br>- Built-up I-girder with constant web depth, straight or with radius > 500ft, spliced or unspliced<br>- Built-up I-girder with variable web depth, straight or with radius > 1000ft<br>- Truss with length < 200ft, almost entirely preassembled at the certified facility and shipped in no more than three subassemblies |
| Certified Bridge Fabricator - Advanced (ABR)<br>Major     | - Tub or trapezoidal box girders<br>- Closed box girders<br>- Truss with length > 200ft<br>- Arches<br>- Bascule bridges<br>- Cable-supported bridges<br>- Moveable bridges<br>- Bridges with radius < 500ft  |
| Fracture Critical Endorsement (FCE)                       | - Bridges with fracture critical members  |

**875.2.3 Loss of Approved Fabricator Status**

Approval to fabricate steel bridge members may be withdrawn for the following conditions:

- Failing to submit certifications an updated to the shop's QMP/QCP by the yearly deadline.
- Inability of a fabricator to consistently supply products meeting specification requirements.
- Lack of maintenance and submittal of required records, including: certified mill test reports, shop drawings for each structure, updates to the QMP/QCP, WPSs, welder certifications, welder continuity records, and weekly fabrication status reports.
- Failure to communicate and report any of the following: fabrication errors, accidents resulting in structural damage to steel members, intent to deviate from the contract plans, or substitute materials.
- Failure to request/obtain engineer approval for repairs when approval by the engineer is required by AWS/AASHTO codes.
- Improper documentation of shipments.
- Not maintaining an acceptable quality control program.

**875.3 Approved Fabricators for Steel Sign Bridges and Overhead Sign Supports****875.3.1 General**

Sign bridges and overhead sign supports must be fabricated at shops that are on the APL for sign bridge and overhead sign support fabricators, consistent with [standard spec 101.2\(2\)](#), on the bid closing date in order to be used on department projects. The purpose of this section is to outline the requirements for obtaining and maintaining fabricator shop approval status with the department. Acceptance of sign bridges and overhead sign supports is contingent on the items being fabricated at shops complying with both these shop approval requirements and [standard spec 532.2.2](#).

Fabrication must comply with the American Welding Society (AWS) D1 welding codes. Products may be inspected at the fabrication facility by a WisDOT representative. To fabricate steel sign bridges and overhead sign supports for WisDOT projects, a fabricator must be certified by AISC as detailed in [CMM 875.3.2](#).

The fabricator must provide facilities and qualified personnel to maintain an acceptable quality control program. The fabricator must provide a current copy of their Quality Management/Control Plan directly to the Structural Metals and Fabrication Quality Assurance Inspection Unit Supervisor. The fabricator must upload mill test reports and certifications, shop drawings, and weld procedure specifications to the WisDOT fabrication library before starting the assembly process. The project leader or manager must review the certified mill test reports before the components are assembled and incorporated into the

structure. The records must be available at all times for examination by the quality assurance inspector and for a period of 5 years after use on a project.

Acceptance of steel sign structures by the department is also contingent upon continued acceptable verification inspection at the project site by project personnel.

### 875.3.2 Qualification for Approved Fabricator List

To be included in the department's list of Approved Sign Structure Fabricators, the fabricator must provide proof of AISC certification and an updated Quality Control/Management Plan (QMP/QCP) directly to the Structural Metals and Fabrication Quality Assurance Inspection Unit Supervisor on a yearly basis. These submittals must be received by March 1 of each calendar year to maintain an approved fabricator status on the [APL](#). Fabricators requesting product approval under the Certification Program must provide an application form to: [DOTDLStructuresFabrication@dot.wi.gov](mailto:DOTDLStructuresFabrication@dot.wi.gov)

The application form is available at:

<https://wisconsindot.gov/dtsdManuals/strct/fabrication/apl-sign.docx>

The required level of AISC certification is based on the complexity of the structure as tabulated in table 875-2. Fabrication of structures with higher complexities than those allowed by the highest level of certification held by a fabrication shop is not allowed to occur at that facility.

**TABLE 875-2 AISC Certification Level Requirements for Steel Sign Structures**

| Bridge Category - Certification Level  | Allowable Fabrication                                 |
|--|---|
| Certified Component Manufacturer (CPT) | - Monotube sign structures                            |
| Simple Bridge (SB)                     | - Truss sign structures<br>- Monotube sign structures |

**Monotube sign structures:** Full-span monotube, cantilever monotube, 2-chord with no web elements, and tapered monotubes

**Truss sign structures:** 4-chord full-span, 4-chord cantilever, 2-chord full-span with web elements, 2-chord cantilever with web elements, and sign supports for DMS/VMS signs

### 875.3.3 Loss of Approved Fabricator Status

Approval to fabricate sign structures may be withdrawn for the following conditions:

- Inability of a fabricator to consistently supply products meeting specification requirements. This is defined as three rejections of components, by department inspection, or field engineer, in a three-month period.
- Lack of maintenance and submittal of required records, including: certified mill test reports, shop drawings for each structure, updates to the QMP/QCP, WPSs, welder certifications welder continuity records, and weekly fabrication status reports.
- Failure to communicate and report any of the following: fabrication errors, accidents resulting in structural damage to steel members, intent to deviate from the contract plans, or substitute materials.
- Failure to request/obtain engineer approval for repairs when approval by the engineer is required by AWS/AASHTO codes.
- Failure to follow contract plans, special provisions, and specifications.
- Improper documentation of shipments.
- Not maintaining an acceptable quality control program.

## 875.4 Approved Fabricators for Fabricated Bridge Components

### 875.4.1 General

Fabricated bridge components must be fabricated by a fabricator on the [APL](#) for fabricated bridge component fabricators, consistent with [standard spec 101.2\(2\)](#), on the bid closing date in order to be used on department projects. Fabricators must also comply with the procedures and requirements detailed here in 875.4.

Fabrication must comply with the American Welding Society (AWS) D1 Welding Codes. Fabrication shops are subject to periodic inspections by the department and all products must be inspected at the job site by the engineer before use.

The fabricator must provide facilities and qualified personnel to maintain an acceptable quality control program. The fabricator must upload certified mill test reports for plates, shapes, and fasteners to the fabrication library before starting the assembly process. The project leader or manager must review the certified mill test reports before the components are assembled and incorporated into the structure. The fabricator must maintain records of certified mill test reports. The records must be available at all times for examination by the engineer or department inspector and for a period of 5 years after use on a project.

Acceptance of items by this process is also contingent upon continued acceptable verification inspection at the project site by project personnel.

#### 875.4.2 Scope

Items included under Fabricated Bridge Components are the following:

**TABLE 875-3 Fabricated Bridge Components**

|  |
|--|
| Railing Assemblies                                 |
| Steel Bearing Assemblies                           |
| Expansion Devices                                  |
| Structural Steel Diaphragms (for concrete girders) |

#### 875.4.3 Qualification for Approved Fabricator List

Fabricators requesting product approval under the Certification Program must provide the following to: [DOTDLStructuresFabrication@dot.wi.gov](mailto:DOTDLStructuresFabrication@dot.wi.gov)

1. Application form is available at:  
<https://wisconsin.dot.gov/dtsdManuals/strct/fabrication/apl-fbc.docx>
2. The fabricator must provide an updated Quality Control/Management Plan (QMP/QCP) directly to the Structural Metals and Fabrication Quality Assurance Inspection Unit Supervisor on a yearly basis.

The fabricator is required to undergo an on-site plant inspection by a department representative.

Fabricators are added to the Approved Fabricator List by the Structural Metals and Fabrication Quality Assurance Inspection Unit Supervisor after review and acceptance of the required documentation.

#### 875.4.4 (Vacant)

#### 875.4.5 Loss of Approved Status

Decisions regarding future qualification for approval of an affected shop are made by the Structural Metals and Fabrication Quality Assurance Inspection Unit Supervisor. Approval to provide fabricated bridge components may be withdrawn for the following conditions:

- Inability of a fabricator to consistently supply products meeting specification requirements. This is defined as three rejections of components, by department inspections, or field engineer, in a three-month period.
- Lack of maintenance and submittal of required records, including: certified mill test reports, shop drawings for each structure, updates to the QMP/QCP, WPSs, welder certifications, welder continuity records, test results required by the applicable sections of the standard specifications and CMM.
- Failure to produce accurate material traceability documentation, including chemical and mechanical testing.
- Failure to follow contract plans, special provisions, and specifications.
- Improper documentation of shipments.
- Not maintaining an acceptable quality control program.

If any of the conditions listed above occur, the fabricator is given written notice of the department's intent to remove the fabrication shop from the [APL](#). The fabricator has the opportunity to provide a corrective action plan to the department for review by SFU. Proposed corrective actions must take effect immediately. If additional nonconformances occur the fabricator is removed from the [APL](#).

#### 875.4.6 Fabricator Qualification for Re-approval

A fabricator who has lost approved status and seeks to be re-approved, must comply with the following:

1. Fulfill all parts of [CMM 875.4.3](#).
2. Submit documentation to the Structural Metals and Fabrication Quality Assurance Inspection Unit Supervisor identifying the corrective actions taken to resolve the problems.

#### 875.4.7 Acceptance of Products From Shops Not on the Approved List

Fabricated bridge components from shop not on the approved list are not accepted. To be added to the approved fabricator list, follow the procedures outlined in [CMM 875.4.3](#).

#### 875.4.8 Fabricator Certification of Shipments and Documentation

Each shipment of fabricated bridge components must include a certification statement from a fabrication shop providing a loading document or shipping invoice, date, project information, and contractor identification that lists the products in the shipment by description and number. The certification statement must be on the fabricating company's letterhead, with signature and title of a person responsible for certifying the product to bind the fabricator, and be worded essentially as follows:

"The products covered by this fabrication statement were manufactured in compliance with (list applicable specifications) and comply with the "Buy America Provisions" of WisDOT contracts. Copies of certified mill test reports are on file and available for review at the plant from which the products were fabricated. Representative samples of finished products have been inspected for conformance with the requirements of (list applicable specifications)."

These documents must be submitted to the engineer at the time of delivery of products to a project. The documents must be retained with the project records.

The engineer must conduct a visual inspection at the job site when delivery of products is made. The engineer may accept secondary fabrication products at the job site for shipments that include a loading document, fabricator certification statement and an acceptable visual inspection.

#### **875.5 Pile Driving Data, DT1924**

Provide a driving log for the first piling at each unit of structure using [DT1924](#). The driving log and associated data is required for informational and comparative purposes only. Record the following information

- All applicable data including type, length, size, location of the pile tested and description of the hammer.
- The "Fall H" column the height of fall (stroke) of ram or striking parts of the hammer for each foot of penetration of the pile.
- The "Penetration Resistance" column the number of blows of the hammer for each foot of penetration of the pile and the set (inches per 10 blows).
- The "Bearing" column the corresponding Nominal resistance values of the pile as computed in tons for each foot of penetration of the pile.
- Any unusual conditions encountered in driving the pile should be noted on the back of the report.

The log is a valuable tool for assessing reasonableness of piling requirements shown on the plan. If the driving record for the first pile deviates significantly from that which was anticipated, the project manager should promptly discuss findings with the region PDS supervisor.

An example of a completed report is shown in figure 875-1. You should be aware the form provides, on the reverse side, a record for piling depths of 160 feet. The reverse side is not shown in this manual for the sake of brevity.

Electronic copies (PDFs) of [DT1924](#) and [DT1315](#) are to be submitted, with Project Manager concurrence, for all structures to BOS by email at: [DOTDTSDDStructuresPiling@dot.wi.gov](mailto:DOTDTSDDStructuresPiling@dot.wi.gov) and to the BTS, Geotechnical Unit at: [DOTDTSDDGeotechnicalPiling@dot.wi.gov](mailto:DOTDTSDDGeotechnicalPiling@dot.wi.gov)

Include the structure number (B, C, S, or etc.) in the subject field of the email.



FIGURE 875-1 Pile Driving Data, DT1924

| PILE DRIVING DATA   |  |  | Wisconsin Department of Transportation |                       |  |  |
|---|--|--|--|-----------------------|--|--|
| DT1924 5/2013 (Replaces EC68)   |  |  | page 1 of 2                            |                       |  |  |
| Project Number<br>9225-00-70  |  |  |  |                       |  |  |
| Name of Road<br>STH 102   |  |  |  |                       |  |  |
| Name of Structure<br>STH 102 Over Tributary to Rib Lake   |  |  |  |                       |  |  |
| Structure Number<br>B-60-112  |  | County<br>Taylor                           |  |                       |  |  |
| Highway<br>STH 102  |  | Contract Number<br>20111213036             |  |                       |  |  |
| Contractor<br>Lundra Construction Company   |  |  |  |                       |  |  |
| Required Bearing<br>120 Tons per Pile   |  | Plan Length<br>70'-0"                      |  |                       |  |  |
| Pile Number<br>1  |  | In (Abut. Or Pier Number)<br>East Abutment |  |                       |  |  |
| Location  |  | Stationing<br>368+88.00                    |  | Offset<br>27.25' Left |  |  |
| Footing Elevation<br>1559.26  |  |  |  |                       |  |  |
| <input checked="" type="checkbox"/> Service Pile  |  | <input type="checkbox"/> Test Pile         |  |                       |  |  |
| Date Driven<br>August 20, 2012  |  | Ordered Length from Test Pile<br>60.3'     |  |                       |  |  |
| <b>TYPE</b>   |  |  |  |                       |  |  |
| Timber  | Untreated  |  | Treated                                |                       |  |  |
| Steel   | H Sections (Give size and wt.)                                   |  |  |                       |  |  |
| Concrete  | Cast-in-place (Give Shell Thickness)                             |  | Diameter                               |                       |  |  |
|   | 0.219 - Inch   |  | 10.75 - Inch                           |                       |  |  |
|   | Precast  |  |  |                       |  |  |
| Others  | Describe fully   |  |  |                       |  |  |
| Diameter  | Butt   |  | Tip                                    |                       |  |  |
|   | ---  |  | ---                                    |                       |  |  |
| Length  | --- ft.  |  | --- in.                                |                       |  |  |
| Mandrel (if used)   | Description  |  |  |                       |  |  |
| Length  | --- ft.  |  | --- in.                                |                       |  |  |
| Follower (if used)  | Description  |  |  |                       |  |  |
| Length  | --- ft.  |  | --- in.                                |                       |  |  |
| HAMMER  | Make and Model<br>APE D12-42                                     |  |  |                       |  |  |
| (Check one)   | <input type="checkbox"/> Gravity                                 |  |  |                       |  |  |
|   | <input checked="" type="checkbox"/> Single-Acting (Steam or Air) |  |  |                       |  |  |
|   | <input type="checkbox"/> Double-Acting (Steam, Air or Diesel)    |  |  |                       |  |  |
| <b>For Gravity or Single-Acting Hammer</b>  |  |  |  |                       |  |  |
| Weight of Striking Part of Hammer   |  | Height of Fall                             |  |                       |  |  |
| 2,646 lbs.  |  | 6-feet to 11.25-feet                       |  |                       |  |  |
| <b>For Double-Acting Hammer</b>   |  |  |  |                       |  |  |
| Area of Piston  | Steam or Air Pressure at Hammer                                  |  | --- Psi                                |                       |  |  |
| Manufacturers Rated Energy  |  | 11.25 ft. 2,646 lbs.                       |  |                       |  |  |
| Driving Cap, Anvil, Helmet, etc.  |  |  |  |                       |  |  |
| Weight  | Description  |  |  |                       |  |  |
| 2,025 lbs.  | Sinker Plate, Hammer Cushion, Helmet<br>(Make Sketch on back)    |  |  |                       |  |  |
| Inspector   |  |  |  |                       |  |  |
| *Note any falling off in rated speed and height of fall during driving  |  |  |  |                       |  |  |
| This driving record shall be kept for all test piling. It shall be kept for the first service piling in each pier or abutment when there is no test piling item. Show any delays to the driving operation. Show all auguring through fills. Show all jetting. The driving record may be continued on the back of this report along with any remarks, or on additional sheets. |  |  |  |                       |  |  |
| Submit an electronic copy to the Bureau of Structures at: <a href="mailto:DOTDOTS@StructuresPiling@dot.wi.gov">DOTDOTS@StructuresPiling@dot.wi.gov</a> and to the Bureau of Technical Services, Geotechnical Unit at: <a href="mailto:DOTDOTS@GeotechnicalPiling@dot.wi.gov">DOTDOTS@GeotechnicalPiling@dot.wi.gov</a>  |  |  |  |                       |  |  |
| Also submit a copy to the Regional Office.  |  |  |  |                       |  |  |

  

| DRIVING RECORD |                        |    |                        |         |
|----------------|------------------------|----|------------------------|---------|
| Fall H         | Depth Below Fig. Elev. |    | Penetration Resistance | Bearing |
|                | From                   | To |                        |         |
| 0              | 0                      | 1  | 0                      | 0       |
| 6              | 1                      | 2  | 1                      | 0       |
| 6              | 2                      | 3  | 0.11                   | 0       |
| 6              | 3                      | 4  | 0.11                   | 0       |
| 6              | 4                      | 5  | 0.11                   | 0       |
| 6              | 5                      | 6  | 0.11                   | 0       |
| 6              | 6                      | 7  | 0.11                   | 0       |
| 6              | 7                      | 8  | 0.11                   | 0       |
| 6              | 8                      | 9  | 0.11                   | 0       |
| 6              | 9                      | 10 | 0.11                   | 0       |
| 6              | 10                     | 11 | 0.11                   | 0       |
| 6              | 11                     | 12 | 2                      | 0       |
| 6              | 12                     | 13 | 10                     | 52      |
| 6              | 13                     | 14 | 10                     | 52      |
| 6              | 14                     | 15 | 10                     | 52      |
| 6              | 15                     | 16 | 10                     | 52      |
| 6.5            | 16                     | 17 | 10                     | 56      |
| 6.5            | 17                     | 18 | 10                     | 56      |
| 6.5            | 18                     | 19 | 10                     | 56      |
| 6.5            | 19                     | 20 | 10                     | 56      |
| 6.5            | 20                     | 21 | 10                     | 56      |
| 6.5            | 21                     | 22 | 10                     | 56      |
| 6.5            | 22                     | 23 | 11                     | 60      |
| 6.5            | 23                     | 24 | 10                     | 56      |
| 6.5            | 24                     | 25 | 10                     | 56      |
| 6.5            | 25                     | 26 | 10                     | 56      |
| 6.5            | 26                     | 27 | 8                      | 45      |
| 6.5            | 27                     | 28 | 9                      | 50      |
| 6.5            | 28                     | 29 | 9                      | 50      |
| 6.5            | 29                     | 30 | 9                      | 50      |
| 6.5            | 30                     | 31 | 11                     | 60      |
| 6.5            | 31                     | 32 | 12                     | 65      |
| 6.5            | 32                     | 33 | 13                     | 69      |
| 6.5            | 33                     | 34 | 12                     | 65      |
| 7.0            | 34                     | 35 | 14                     | 77      |
| 7.0            | 35                     | 36 | 13                     | 73      |
| 7.0            | 36                     | 37 | 13                     | 73      |
| 7.0            | 37                     | 38 | 13                     | 73      |
| 7.0            | 38                     | 39 | 13                     | 73      |
| 7.0            | 39                     | 40 | 14                     | 77      |
| 7.0            | 40                     | 41 | 13                     | 73      |
| 7.0            | 41                     | 42 | 14                     | 77      |
| 7.0            | 42                     | 43 | 17                     | 87      |
| 7.0            | 43                     | 44 | 22                     | 100     |
| 7.0            | 44                     | 45 | 21                     | 96      |
| 7.0            | 45                     | 46 | 22                     | 100     |
| 7.0            | 46                     | 47 | 21                     | 96      |
| 7.0            | 47                     | 48 | 20                     | 96      |
| 7.0            | 48                     | 49 | 21                     | 96      |
| 7.0            | 49                     | 50 | 20                     | 96      |
|                | 50                     | 51 |                        |         |
|                | 51                     | 52 |                        |         |
|                | 52                     | 53 |                        |         |
|                | 53                     | 54 |                        |         |
|                | 54                     | 55 |                        |         |

**875.6 Piling Record, DT1315**

[DT1315](#), Piling Record provides a summary record of all piling driven, except for test piling. Test piling data is reported on [DT1924](#).

The inspector must complete a separate DT1315 for each unit of a structure containing piling. A sketch is made of the unit, with the location of each pile noted on the sketch. When a test pile is left in place to become a bearing pile, the location should be noted on the sketch with an "X" and the words "Test Pile."



### **875.7 Bridge Inventory Report, DT 2006 and Bridge Inspection Report, DT 2007 and DT 2008**

These forms must be completed whenever work is done on a bridge. The bridge maintenance engineer should be notified by the engineer in a timely manner, so the bridge can be inspected after completion, but before the contractor has left the site and the bridge is open to traffic.

Inspection is done by the bridge maintenance engineer, with assistance provided by the engineer or designee.

A copy of [DT2006](#), [DT2007](#) and [DT2008](#) must be filed in the region maintenance section. A copy of DT2006 must be sent to BOS for their statewide bridge inventory file. If a local road is involved, a copy of DT2006 is sent to the county highway commissioner.

## Attachment 875-1 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  
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

**Attachment 875-2 Schedule of Tests**

| TEST   | TEST DESIGNATION      | FABRICATOR'S MINIMUM QUALITY CONTROL (QC) |   | WISDOT'S MINIMUM QUALITY VERIFICATION (QV) |                      |
|--|-----------------------|---|---|--|----------------------|
|  |                       | TEST BY                                   | FREQUENCY   | TEST BY                                    | FREQUENCY            |
| <b>CONCRETE INGREDIENT MATERIALS</b>                           |                       |   |   |  |                      |
| Aggregate Quality (Fine & Coarse)                              |                       |   | Must be from a WisDOT approved source <sup>[1]</sup>                          | WisDOT Central Lab                         |                      |
| Aggregate Sieve Analysis (Fine & Coarse)                       | WTM T27               | QC  | One/source/week (for each aggregate)  |  |                      |
| Water  | WTP C001              | QC  | One/source/year   | WisDOT Central Lab                         | One/Source/Yr        |
| Cement   |                       | Mfr's Cert.                               | Must be according to WisDOT Method of Certification Acceptance <sup>[2]</sup> |  |                      |
| Fly Ash  | ASTM C311             | Mfr's Cert.                               | Must be according to WisDOT standard spec 501.3.7 <sup>[3]</sup>              | WisDOT Central Lab                         | One/400 Tons(364 Mg) |
| Additives  |                       |   | Must be from WisDOT approved list of products <sup>[4]</sup>                  |  |                      |
| <b>STEEL MATERIALS <sup>[5]</sup></b>                          |                       |   |   |  |                      |
| Bar Steel (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<br>QC                          | One/Heat  | WisDOT Central Lab                         | One/Heat             |
| <b>CONCRETE MIXTURES</b>                                       |                       |   |   |  |                      |
| Aggregate Moisture   | WTM T255              | QC  | One/Day   |  |                      |
| Slump  | WTM T119              | QC  | Four/Line   |  |                      |
| Air <sup>[6]</sup>   | WTM T152              | QC  | One/Line  |  |                      |
| Cylinders <sup>[7]</sup> :<br>Release 28-Day Strength          | WTM T22               | QC<br>QC                                  | Two/Line<br>Three/Line  | WisDOT Central Lab                         | One/3 Month          |

<sup>[1]</sup> 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).

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

<sup>[3]</sup> 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.

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

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

<sup>[6]</sup> Air testing must be required only when air-entrainment is used.

<sup>[7]</sup> 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) <sup>[1]</sup>
- Log of tests for neoprene cylinder caps
- Proof loading date records

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

### **Attachment 875-3 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