

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
QUALITY CONTROL PLAN FOR WELDING FOUNDATION PILING SPLICES

BFS:MJC

1 of 5

APPR:MJF:POJ:10-25-12
FHWA:APPR:11-30-12

a. Description. This work consists of providing and maintaining quality control (QC) for foundation pile weld splices to produce welds that meet American Welding Society (AWS) D1.1:2010, Structural Welding Code - Steel (as modified by the current FUSP 12SP707(A), *Structural Steel and Aluminum Construction*), hereafter called AWS D1.1. Perform QC inspection in accordance with the QC plan during all phases of the welding. The QC plan must conform to the Special Provision for Pile Splicing, and section 705 of the Standard Specifications for Construction.

b. Quality Control Plan. Provide and maintain a QC plan, listing all methods, procedures, personnel, equipment, supplies, and facilities necessary to control quality of the pile welded splice to meet the contract, and AWS D1.1. The pile welded splice QC plan must be administered by a qualified full time employee or consultant engaged by the Contractor (see requirements below). The individual must have clearly defined authority and responsibility to take all actions necessary for the successful implementation of the QC plan, including but not limited to the Contractor's QC acceptance and rejection of welds, and prescription of corrective measures. Provide a list describing the responsibilities for all others involved in the pile welded splicing operations.

Submit the QC plan to the Engineer for review a minimum 10 working days before the start of pile driving for project records. A copy of the QC plan must also be sent to Bridge Field Services for review. The Engineer must be provided the opportunity to witness all welding and QC inspection. Do not begin welding of pile splices before approval of the QC plan by the Engineer. The Engineer will notify the Contractor of any objections, changes or revisions to the proposed QC plan within 5 working days of the receipt of the QC plan.

All QC test reports and other records must include the pile number (based off the project plans) and pile location (substructure unit). Failure of the Contractor to provide proper documents for QC will be justification for withholding acceptance for the pile welds, or as a basis for non-payment.

c. Pre-weld Meeting. The Contractor must hold an onsite meeting to discuss the scope of work, chosen method(s) to splice the piles, and the QC plan. All Contractor staff listed on the QC plan must attend the meeting and sign the sign in sheet. The Contractor must notify the Engineer of the meeting time, date, and location a minimum of 10 working days prior to the meeting.

d. Quality Control Plan Contents. At a minimum, include the following items in the QC plan:

- The scope of work for foundation piles on the project (number of piles, anticipated lengths, number of pile splices per pile, etc).
- Weld procedure for approval, or pre-approved welding procedure.
- A list of the Contractor's staff involved in the splicing of piles (name and position) and their

responsibilities. This list must be updated throughout the project, and must reflect all current roles and responsibilities of the Contractor's staff.

- A pre-weld splice meeting to be held for all Contractors' staff involved in splicing with an invite to the Engineer.
- Pre-welding checklist:
 - Cleanliness of the pile in the area of the weld.
 - Alignment and pile fit up.
 - Proper root opening.
 - Acceptable atmospheric conditions for welding.
 - Type and size of welding electrode (rod).
 - Handling, storage (rod ovens) and care of the electrodes according to AWS D1.1.
 - Welding positions.
- During welding:
 - Slag removal procedures after each pass of welding and visual inspection by the welder.
 - Corrective action plan for repair of defects or discontinuities discovered from visual inspection.
 - Back gouging procedure (when applicable).
- Determination of final weld acceptable quality:
 - Meets visual requirements per AWS D1.1, and the MDOT Field Manual for Pile Welding.
 - Measurements using fillet weld gauge.
 - Verification of all weld dimensions.
- Contractor's discipline policy for dealing with individuals who do not adhere to the QC Plan.

e. Qualifications. The individual administering the QC plan must be a Certified Weld Inspector (CWI) or a field welder qualified by a MDOT approved agency. The Contractor must provide the names, qualifications, and welder certifications of the QC staff to the Engineer prior to pile welding.

f. Visual Inspection. All welds must be visually inspected and signed off by the Contractor's QC Manager. If corrective action is required, a follow up visual inspection must take place upon completion of the corrective action. The Contractor must maintain complete records of all visual inspections and corrective action taken. These records must indicate what action was taken to correct deficient welds when visual inspection tests indicate that the welds were not in compliance with specifications and the provisions of the MDOT Field Manual for Pile Welding. The original and

one copy of these records must be furnished to the Engineer within 24 hours after the date covered by the record. Reports must be in a portable document format (PDF) unless an alternative method is approved by the Engineer.

g. Quality Assurance Testing. The Engineer will periodically visually inspect welded splices, and may perform or require the Contractor to perform non destructive testing on any welds not following the QC plan in accordance to AWS D1.1 and the Special Provision for Pile Splicing. If the additional testing identifies defects warranting rejection, then the performance of repairs, retesting of welds, and additional inspection will be done at no additional cost to the Department. Repair welds according to AWS D1.1. If the Contractor fails to follow the QC plan or certifies failing welds, the Contractor will be required to provide a CWI at no cost to the Department. The CWI will then be responsible to visually inspect all welded pile splices for the remainder of the project, or until such time that the Contractors procedures return to full compliance with the QC plan.

h. Measurement and Payment. Separate payment will not be made for providing and maintaining an effective QC program, and all costs associated will be included in the piling pay items.

SAMPLE PILE WELDING QUALITY CONTROL PLAN

a. Description. *(Insert company name)* will comply with the Standard Specifications for Construction, AWS D1.1 and the contract documents for pile welding.

b. Welding. *(Insert company name)* will perform the welding according to the Standard Specifications for Construction and the contract documents. Pile welding will be in conformance to the approved weld procedure, and details as shown as shown on the plans.

c. Welding Quality Control Plan. *(Insert company name)* staff will visually inspect the welds. The welding QC plan manager will be *(Insert name)* and will be responsible for visually inspecting and acceptable quality determination on all pile welds. This person is also responsible for all documentation of weld acceptance and corrective actions taken.

Removal of slag after each weld pass will be performed by *(Insert name or names)* using *(Insert method)*.

Backgouging for full penetration butt welds will be performed by *(Insert name or names)* using *(Insert method)*.

Removal of other weld discontinuities such as arc strikes, cracks, porosity, undercut and overlap will be performed by *(Insert name or names)* using *(Insert method)*.

d. Welders. The following welders will be performing pile welding on this project in the following positions with welder certifications expiring on:

Name	Qualified Weld Position(s)	Welder Certificate Expiration Date

e. Weld Procedure. *(Insert company name)* will submit a weld procedure for approval, or a pre-approved weld procedure. *(Include approved weld procedure in QC plan)*

f. Weld Rod. *(Insert company name)* will use *(Insert rod type and size)*. Opened weld rods will be stored in a hot box and kept dry. Prior to use, the weld rods will be heated to the proper temperature and stored according to 707.03.D.8.b of the Standard Specifications for Construction.

g. Weld Preparation and Fit Up. *(Insert company name)* will take the following action to ensure welds are prepared, and the pile sections are aligned with the proper root opening according to the contract. *(List proposed actions)*

h. Verification of Meeting Specifications. *(Insert company name)* will take the following action to ensure the proper weld procedure is performed, and the final weld meets specifications. *(List proposed actions)*

i. **Discipline Procedure.** *(Insert company name)* will take the following disciplinary actions against employees who do not perform welded splices to the level of acceptance per the welding QC plan, or for improper implementation of the welding QC plan. *(List proposed actions)*

j. **Records.** *(Insert company name)* will maintain a copy of all visual inspections, acceptance documentation, and corrective actions performed, and provide them to the Department prior to driving the spliced pile.