

PILE WELDING QUALITY CONTROL PLAN

of

CONTRACTOR	MDOT ID	Structural Fabrication Unit Approval Block
LOCATION	JOB NUMBER	
PREPARED BY	DATE	
CHECKED BY	DATE	

SPECIFICATIONS

A pile welding quality control plan (QCP) is required for piling not defined to be a main member in the contract. The contractor will comply with the current frequently used provisions [FUSP 20SP705(A) - Quality Control Plan for Welding Pile Splices and FUSP 20SP707(A) - Structural Steel and Aluminum Construction] and other contract requirements. See Section 705 of the 2020 MDOT Standard Specifications for Construction for main member piling requirements.

CONTRACTOR RESPONSIBILITIES

The contractor will provide and maintain a QCP for welding non-main member pile splices to produce welds that meet the specifications stated above. The contractor will submit the QCP to the Engineer for review a minimum of 10 working days before the start of pile driving and will not begin welding pile splices before approval of the QCP by the Engineer. The contractor will provide the Engineer with the opportunity to witness all welding and QC inspection. The contractor will maintain proper QC documents for pile welding (see Pile Welding Records below). The contractor will provide product data sheets for mechanical splicer sleeves, etc. The contractor will provide welder's endorsements (MDOT certification or MDOT qualification record).

PILE WELDING RECORDS

The contractor must maintain complete QC records documenting the required acceptance criteria have been met including: pre-welding, during welding, post-welding, correction, and final acceptance. These records must indicate what action was taken to correct deficient welds when inspection indicates defects. The QC records must be furnished to the Engineer within 24 hours after the date covered by the record in portable document format (PDF). The contractor is required to submit pile welding records using the following MDOT Forms: Pile Welding Splice Record (Form 5628) and Pile Welding Correction Record (Form 5629).

PRE-WELDING MEETING

The Contractor must hold a pre-welding meeting to discuss the QCP in detail including roles and responsibilities of all QC staff. All Contractor staff (QC and production) listed on the QCP must attend the meeting and record their name in a sign in sheet. The Contractor must notify the Engineer of the meeting date, time, location, and provide a call in number for MDOT personnel not able to attend the meeting. This information must be provided to the Engineer a minimum of 10 working days prior to the meeting date.

NON-DESTRUCTIVE TESTING

All welds must be visual test (VT) inspected and accepted by the contractor's QC Manager in accordance with the required specifications. The welder is allowed to perform the QC inspection after each weld pass (see During Welding Inspection below). However, if correction is required, the QC Manager must VT and accept the repaired weld. Penetrant testing (PT) inspection is required for H-pile CJP welds with a cope hole detail in addition to VT.

ATMOSPHERIC CONDITIONS

Do not perform pile welding when the ambient temperature is below 0 degrees F or during periods of precipitation (rain, snow, or heavy fog), unless heating and housing the area as approved by the Engineer. When the ambient temperature is below 32 degrees F, preheat the pile metal a minimum distance of 3 inches in all directions from the weld joint to a minimum of 70 degrees F and maintain the temperature during welding.

STORAGE OF ELECTRODES

Storage and use of electrodes must be in accordance with AWS requirements. Dry all electrodes in an oven at a minimum of 500 degrees F for a minimum of 2 hours before use unless from a hermetically sealed container. Store the electrodes in a hot box at a minimum of 250 degrees F after drying. Use electrodes within 2 hours of exposure to the atmosphere or redry as described above. Do not redry electrodes more than one time. Do not use electrodes that have been wet or contaminated.

WELD PROCEDURE SPECIFICATIONS (WPS)

The contractor has included all necessary weld procedure specification's (WPS) for approval at the end of this pile welding QCP.

TOOLS AND EQUIPMENT

SCOPE OF WORK

PILE TYPE AND SIZE		NUMBER OF PILES	
ANTICIPATED DRIVEN PILE LENGTH		ANTICIPATED # OF SPLICES PER PILE	
PILE SPLICING POSITION		PILE SPLICE DETAIL	
FIELD OR SHOP WELDING?			
COMMENTS			

CONTRACTOR QUALITY CONTROL STAFF

NAME	NAME
POSITION	POSITION
Quality Control Manager	Backup Quality Control Manager
QUALIFICATION	QUALIFICATION
QC MANAGER RESPONSIBILITIES	

Will welder perform VT during welding (if yes, complete Welder's QC Responsibilities below)?

WELDER'S QC RESPONSIBILITIES

WELDER NAME

WELDER'S CREDENTIALS

**TEST EXPIRATION
DATE**

WELDING POSITION(S)

PRE-WELDING QC MANAGER CHECKLIST

Have SMAW E70XX electrodes been exposed to the atmosphere within the allowable time (see above)?

COMMENTS

DURING WELDING QC MANAGER CHECKLIST

Does weld meet VT requirements (see above)?

Is slag completely removed after each pass of welding?

Is back gouging correctly performed (as applicable)?

Are atmospheric conditions (see above) acceptable for welding?

Are electrodes being handled and stored correctly (see above)?

Does welder have the correct type and size of welding electrode (rod) per approved WPS?

Have SMAW E70XX electrodes been exposed to the atmosphere within the allowable time (see above)?

Is correction being performed to repair defects or discontinuities discovered from VT?

Is MDOT Pile Welding Correction Record (Form 5629) being completed?

COMMENTS

POST-WELDING QC MANAGER CHECKLIST

Does weld meet VT requirements (see above)?

Is slag completely removed after each pass of welding?

Have all arc strikes and tack welds been completely ground?

Has the weld been verified to meet all required dimensions (size and length)?

Are the cope holes (if applicable) 1 inch in diameter and are they ground smooth and free of notches, nicks, gouges, or other discontinuities?

Are stop-start areas of weld smoothly transitioned and free from irregularities?

Has the hardened edge on the cope holes (if applicable) been completely removed?

Do the cope holes (if applicable) pass PT inspection?

Is correction being performed to repair defects or discontinuities discovered from VT?

Is MDOT Pile Welding Correction Record (Form 5629) being completed?

Is MDOT Pile Welding Splice Record (Form 5628) being completed?

COMMENTS

CORRECTION

Correction must be documented on the MDOT Pile Welding Correction Record (Form 5629). Weld overlap or excessive convexity must be removed. Excessive concavity of weld or crater, undersize welds, and undercutting must be prepared and additional weld metal deposited. Excessive weld porosity, excessive slag inclusions, and incomplete fusion requires portions of weld to be removed and rewelded. Cracks in weld or base metal must be ascertained by use of acid etching, magnetic particle (MT), PT, or other equally positive means; the crack must be removed for the full crack length plus 2 inches beyond each end of the crack and rewelded.

CORRECTION (*Continued*)

COMMENTS

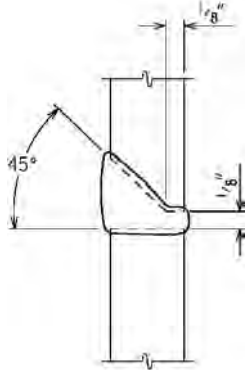
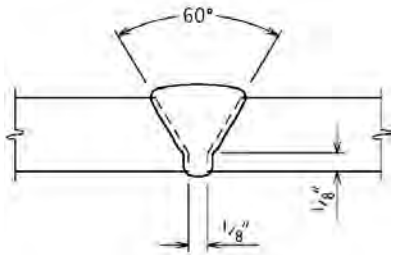
CONTRACTOR DISCIPLINE POLICY

NAME OF INDIVIDUAL RESPONSIBLE FOR DISCIPLINE POLICY:

COMMENTS

Welding Procedure Specification (WPS) H-Pile Complete Joint Penetration (CJP)

Material Specification		MDOT ID	
Welding Process	SMAW	Job Number	
Welding Variables	Manual, Multi-Pass, Single Arc	Structural Fabrication Unit Approval Block	
Position of Welding	1G, 2G, 3G, 4G		
Electrode Classification	E-7018		
Welding Current	Direct Current (DC)		
Polarity	Electrode Positive (EP)		
Welding Progression	Flat, Horizontal, Vertical Up, Overhead		
Root Treatment	See Joint Detail		
Preheat Temperature			
Interpass Temperature	650° F Max		

Pass Number	Electrode Diameter	Welding Current		Travel Speed	Joint Detail
		Amperes	Volts		
			Volts will be determined by the amperage setting on constant current welding machines.		Back gouge and grind edge preparation smooth.  Vertical Pile  Horizontal Pile

Contractor: _____

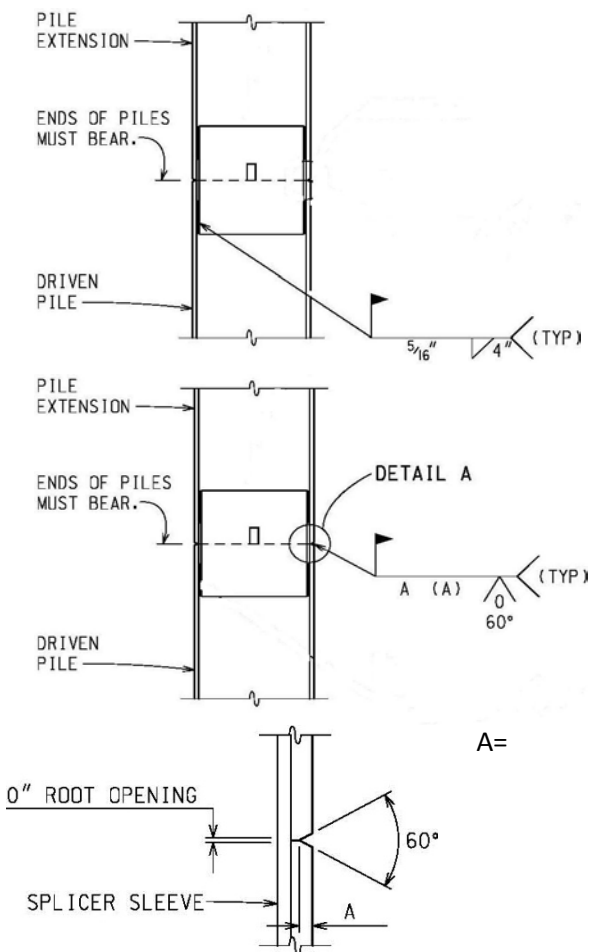
Authorized by: _____

Procedure #: MDOT H-Pile CJP-1 _____

Date: _____

- Notes:
- This WPS must be completed by the Contractor and submitted to the Project Engineer for approval.
 - The welding operator must have the approved WPS in-hand prior to welding.
 - H-pile splice detail with cope holes must be penetrant tested (PT) per ASTM E 165 by a Level II or III ASNT SNT-TC-1A inspector. Surface of the 1 inch diameter cope holes must be ground smooth and free of notches, nicks, gouges, or other discontinuities. Hardened edges must be removed.

Welding Procedure Specification (WPS) H-Pile Partial Joint Penetration (PJP)

Material Specification				MDOT ID _____	
Welding Process				Job Number _____	
Welding Variables				Joint Detail 	
Position of Welding					
Electrode Classification					
Welding Current					
Polarity					
Welding Progression					
Root Treatment					
Preheat Temperature					
Interpass Temperature					
650° F Max					

Pass Number	Electrode Diameter	Welding Current		Travel Speed
		Amperes	Volts	
			Volts will be determined by the amperage setting on constant current welding machines.	
Structural Fabrication Unit Approval Block				

Contractor: _____

Authorized by: _____

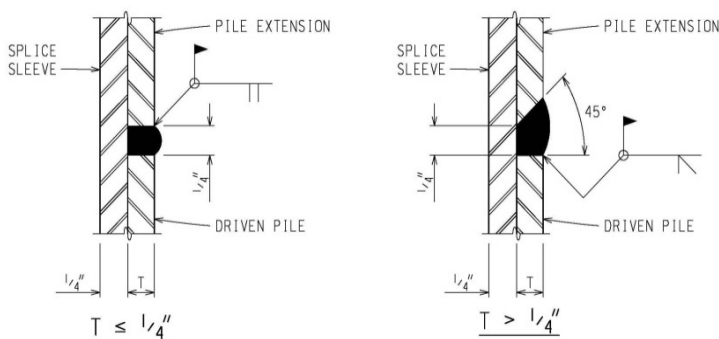
Procedure #: MDOT H-Pile PJP-1 _____

Date: _____

- Notes:
- This WPS must be completed by the Contractor and submitted to the Project Engineer for approval.
 - The welding operator must have the approved WPS in-hand prior to welding.

Welding Procedure Specification (WPS) Pipe Pile Complete Joint Penetration (CJP)

Material Specification	MDOT ID _____	
Welding Process	SMAW	
Welding Variables	Manual, Multi-Pass, Single Arc	
Position of Welding	Structural Fabrication Unit Approval Block	
Electrode Classification		E-7018
Welding Current		Direct Current (DC)
Polarity		Electrode Positive (EP)
Welding Progression		Horizontal
Root Treatment		See Joint Detail
Preheat Temperature		
Interpass Temperature	650° F Max	

Pass Number	Electrode Diameter	Welding Current		Travel Speed	Joint Detail
		Amperes	Volts		
			Volts will be determined by the amperage setting on constant current welding machines.		

Contractor: _____ Authorized by: _____

Procedure #: MDOT Pipe Pile CJP-1 Date: _____

- Notes:
- This WPS must be completed by the Contractor and submitted to the Project Engineer for approval.
 - The welding operator must have the approved WPS in-hand prior to welding.