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ASME B31.1 SECTION IX

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AWS QC-1

Certified Welding Inspector Certificate	B-14
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B-2

WELDING PROCEDURE SPECIFICATION (WPS) YES ☐
PREQUALIFIED _____ **QUALIFIED BY TESTING** _____
or PROCEDURE QUALIFICATION RECORDS (PQR) YES ☐

Company Name _____ Identification # _____
 Revision _____ Date _____ By _____
 Welding Process(es) _____ Authorized by _____ Date _____
 Supporting PQR No.(s) _____ Type - Manual ☐ Semi-Automatic ☐
 Machine ☐ Automatic ☐

JOINT DESIGN USED

Type: Single ☐ Double Weld ☐
 Backing Yes ☐ No ☐
 Backing Material _____
 Root Opening _____ Root Face Dimension _____
 Groove Angle _____ Radius (J-U) _____
 Backgouging Yes ☐ No ☐ Method _____

BASE METALS

Material Spec. _____
 Type or Grade _____
 Thickness: Groove _____ Fillet _____
 Diameter (Pipe) _____

FILLER METALS

AWS Specification _____
 AWS Classification _____

SHIELDING

Flux _____ Gas _____
 Composition _____
 Electrode-Flux (Class) _____ Flow Rate _____
 Gas Cup Size _____

PREHEAT

Preheat Temp. Min. _____
 Interpass Temp. Min. _____ Max. _____

POSITION

Position of Groove _____ Fillet _____
 Vertical Progression Up ☐ Down ☐

ELECTRICAL CHARACTERISTICS

Transfer Mode (GMAW)
 Short-Circuiting ☐ Globular ☐ Spray ☐
 Current: AC ☐ DCEP ☐ DCEN ☐ Pulsed ☐
 Other _____
 Tungsten Electrode (GTAW):
 Size _____
 Type _____

TECHNIQUE

Stringer or Weave Bead _____
 Multi-pass or Single Pass (per side) _____
 Number of electrodes _____
 Electrode Spacing: Longitudinal _____
 Lateral _____
 Angle _____
 Contact Tube to Work Distance _____
 Peening _____
 Interpass Cleaning _____

POSTWELD HEAT TREATMENT

Temp. _____
 Time _____

WELDING PROCEDURE

Pass or Weld Layer(s)	Process	Filler Metals		Current		Volts	Travel Speed	Joint Details
		Class	Diam.	Type & Polarity	Amps or Wire Feed Speed			

Form E-1 (Front)

(Source AWS D1.1-94)

PROCEDURE QUALIFICATION RECORD (PQR)# _____
TEST RESULTS

TENSILE TEST

Specimen no.	Width	Thickness	Area	Ultimate tensile load, lb.	Ultimate unit stress, psi	Character of failure and location

GUIDED BEND TEST

Specimen no.	Type of bend	Result	Remarks

VISUAL INSPECTION

Appearance _____
 Undercut _____
 Piping porosity _____
 Convexity _____
 Test date _____
 Witnessed by _____

Other Tests _____

Radiographic-ultrasonic examination

RT report no: _____ Result _____
 UT report no: _____ Result _____

FILLET WELD TEST RESULTS

Minimum size multiple pass _____ Maximum size single pass _____

Macroetch _____ Macroetch _____
 1. _____ 3. _____ 1. _____ 3. _____
 2. _____ 2. _____

All-weld-metal tension test

Tensile strength, psi _____

Yield point/strength, psi _____

Elongation in 2 in., % _____

Laboratory test no. _____

Welder's name _____ Clock no. _____ Stamp no. _____

Tests conducted _____ Laboratory _____

Test number _____

Per _____

We, the undersigned, certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of sections 5, Part B of ANSI/AWS D1.1, (_____) Structural Welding Code- Steel.

Signed _____ year

Manufacturer or Contractor

By _____

Title _____

Date _____

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WELDING PROCEDURE QUALIFICATION TEST RECORD FOR ELECTROSLAG AND ELECTROGAS WELDING

PROCEDURE SPECIFICATION

Material specification _____
 Welding process _____
 Position of welding _____
 Filler metal specification _____
 Fillet metal classification _____
 Filler metal _____
 Flux _____
 Shielding gas _____ Flow rate _____
 Gas dew point _____
 Thickness range this test qualifies _____
 Single or multiple pass _____
 Single or multiple arc _____
 Welding current _____
 Preheat temperature _____
 Postheat temperature _____
 Welder's name _____

VISUAL INSPECTION (9.25.1)

Appearance _____
 Undercut _____
 Piping porosity _____
 Test date _____
 Witnessed by _____

TEST RESULTS

Reduced-section tensile test

Tensile strength, psi

1. _____
 2. _____

All-weld-metal tension test

Tensile strength, psi _____
 Yield point/strength, psi _____

Side-bend tests

1. _____ 3. _____
 2. _____ 4. _____

Radiographic-ultrasonic examination

RT report no. _____
 UT report no. _____

Impact tests

Size of specimen _____ Test temp _____
 Ft-lb: 1. _____ 2. _____ 3. _____ 4. _____
 5. _____ 6. _____ Avg. _____
 High _____ Low _____
 Laboratory test no. _____

WELDING PROCEDURE

Pass no.	Electrode size	Welding current		Joint detail
		Amperes	Volts	
Guide tube flux _____ Guide tube composition _____ Guide tube diameter _____ Vertical rise speed _____ Traverse length _____ Traverse speed _____ Dwell _____ Type of molding shoe _____				

We, the undersigned, certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of section 4, Part E, and section 5, Part B of ANSI/AWS D1.1 (_____) Structural Welding Code- Steel.

_____ year
 Procedure no. _____
 Revision no. _____

Manufacturer or contractor _____
 Authorized by _____
 Date _____

Form E-3

(Source: AWS D1.1-94)

WELDER, WELDING OPERATOR OR TACK WELDER QUALIFICATION TEST RECORD

Type of Welder _____	Identification No. _____
Name _____	_____
Welding Procedure Specification No. _____	Rev _____ Date _____
	Record Actual Values Used in Qualification
Variables	Qualification Range
Process/Type (5.16.2)	_____
Electrode (single or multiple)	_____
Current/Polarity	_____
Position (5.16.5)	_____
Weld Progression (5.16.7)	_____
Backing (YES or NO) (5.16.18)	_____
Material/Spec. (5.16.1)	_____ to _____
Base Metal	_____
Thickness: (Plate)	_____
Groove	_____
Fillet	_____
Thickness: (Pipe/tube)	_____
Groove	_____
Fillet	_____
Diameter: (Pipe)	_____
Groove	_____
Fillet	_____
Filler Metal (5.16.3)	_____
Spec. No.	_____
Class	_____
F-No.	_____
Gas/Flux Type (5.16.4)	_____
Other	_____

VISUAL INSPECTION (5.12.6 or 5.12.7)			
Acceptable YES or NO _____			
Guided Bend Test Results (5.28.1/5.29.1)			
Type	Result	Type	Result
_____	_____	_____	_____
Fillet Test Results (5.28.2/5.28.3; 5.39.3/5.29.4)			
Appearance _____	Fillet Size _____		
Fracture Test Root Penetration _____	Macroetch _____		
(Describe the location, nature, and size of any crack or tearing of the specimen.)			

Inspected by _____ Test Number _____
 Organization _____ Date _____

RADIOGRAPHIC TEST RESULTS (5.28.4/5.39.2)					
Film	Result	Remarks	Film	Result	Remarks
Identification			Identification		
Number			Number		
_____			_____		

Interpreted by _____ Test Number _____
 Organization _____ Date _____

We, the undersigned, certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of Section 5, Part C or D of ANSI/AWS D1.1, (_____) Structural Welding Code- Steel. _____ year

Manufacturer or Contractor _____

Authorized by _____

Date _____

Form E-4

(Source: AWS D1.1-94)

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QW-483 (Back)**Tensile Test (QW-150)**

PQR No. _____

Specification No.	Width	Thickness	Area	Ultimate Total Load lb	Ultimate Unit Stress psi	Type of Failure & Location

Guided-Bend Tests (QW-160)

Type and Figure No.	

Toughness Tests (QW-170)

Specimen No.	Notch Location	Notch Type	Test Temp.	Impact Values	Lateral Exp.		Drop Weight	
					% Shear	Mils	Break	No Break

Fillet-Weld Test (QW-180)

Result - Satisfactory: Yes _____ No _____ Penetration into Parent Metal: Yes _____ No _____

Macro - Results _____

Other Tests
 Type of Test _____
 Deposit Analysis _____
 Other _____

Welder's Name _____ Clock No. _____ Stamp No. _____

Tests Conducted by: _____ Laboratory Test No. _____

We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of Section IX of the ASME Code.

Manufacturer _____

Date _____ By _____

(Detail of record of tests are illustrative only and may be modified to conform to the type and number of tests required by the Code.)

Source ASME B31.1, SEC IX)

(Source ASME B31.1, SEC IX)

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QW-483 SUGGESTED FORMAT FOR PROCEDURE QUALIFICATION RECORD (pqr)
(See QW-200.2, Section IX, ASME Boiler and Pressure Vessel Code)
Record Actual Conditions Used to Weld Test Coupon.

Company Name _____
 Procedure Qualification Record No. _____ Date _____
 WPS No. _____
 Welding Process(es) _____
 Types (Manual, Automatic, Semi-Auto.) _____

JOINTS (QW-402)

Groove Design of Test Coupon

(For combination qualifications, the deposited weld metal thickness shall be recorded for each filler metal or process used.)

BASE METALS (QW-403)

Material Spec. _____
 Type or Grade _____
 P-No. _____ to P-No. _____
 Thickness of Test Coupon _____
 Diameter of Test Coupon _____
 Other _____

FILLER METALS (QW-404)

SFA Specification _____
 AWS Classification _____
 Filler Metal F-No. _____
 Weld Metal Analysis A-No. _____
 Size of Filler Metal _____
 Other _____
 Weld Metal Thickness _____

POSITION (QW-405)

Position of Groove _____
 Weld Progression (Uphill, Downhill) _____
 Other _____

PREHEAT (QW-406)

Preheat Temp. _____
 Interpass Temp. _____
 Other _____

POSTWELD HEAT TREATMENT (QW-407)

Temperature _____
 Time _____
 Other _____

GAS (QW-408)

	Percent Composition		Flow Rate
	Gas(es)	(Mixture)	
Shielding	_____	_____	_____
Trailing	_____	_____	_____
Backing	_____	_____	_____

ELECTRICAL CHARACTERISTICS (QW-409)

Current _____
 Polarity _____
 Amps _____ Volts _____
 Tungsten Electrode Size _____
 Other _____

TECHNIQUE (QW-410)

Travel speed _____
 String or Weave Bead _____
 Oscillation _____
 Multipass or Single Pass (per side) _____
 Single or Multiple Electrodes _____
 Other _____

This form (E00007) may be obtained from the Order Dept., ASME, 22 Law Drive, Box 2300, Fairfield, NJ 07007-2300

(Source: ASME B31.1, SEC IX)

QW-483 (Back)**Tensile Test (QW-150)**

PQR No. _____

Specification No.	Width	Thickness	Area	Ultimate Total Load lb	Ultimate Unit Stress psi	Type of Failure & Location

Guided-Bend Tests (QW-160)

Type and Figure No.	

Toughness Tests (QW-170)

Specimen No.	Notch Location	Notch Type	Test Temp.	Impact Values	Lateral Exp.		Drop Weight	
					% Shear	Mils	Break	No Break

Fillet-Weld Test (QW-180)

Result - Satisfactory: Yes _____ No _____ Penetration into Parent Metal: Yes _____ No _____

Macro - Results _____

Other Tests

Type of Test _____

Deposit Analysis _____

Other _____

Welder's Name _____ Clock No. _____ Stamp No. _____

Tests Conducted by: _____ Laboratory Test No. _____

We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of Section IX of the ASME Code.

Manufacturer _____

Date _____ By _____

(Detail of record of tests are illustrative only and may be modified to conform to the type and number of tests required by the Code.)

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**QW-484 SUGGESTED FORMAT FOR MANUFACTURER'S RECORD OF WELDER OR
WELDING OPERATOR QUALIFICATION TESTS (WPQ)
See QW-301, Section IX, ASME Boiler and Pressure Vessel Code**

Welder's name _____ Clock number _____ Stamp no. _____
 Welding process(es) used _____ Type _____
 Identification of WPS followed by welder during welding of test coupon _____
 Base material(s) welded _____ Thickness _____

Manual or Semiautomatic Variables for Each Process (QW-350)	Actual Values	Range Qualified
Backing (metal, weld metal, welded from both sides, flux etc.) (QW-402)	_____	_____
ASME P-No. _____ to ASME p-No. (QW-404)	_____	_____
() Plate () Pipe (enter diameter, if pipe)	_____	_____
Filler metal specification (SFA): _____ Classification (QW-404)	_____	_____
Filler Metal F-No. _____	_____	_____
Consumable insert for GTAW or PAW	_____	_____
Weld deposit thickness for each welding process	_____	_____
Welding position (1G, 5G, etc.) (QW-405)	_____	_____
Progression (uphill/downhill)	_____	_____
Backing gas for GTAW, PAW, GMAW; fuel gas for OFW (QW-408)	_____	_____
GMAW transfer mode (QW-409)	_____	_____
GTAW welding current type/polarity	_____	_____

Machine Welding Variables for the Process Used (QW-360)	Actual Values	Range Qualified
Direct/remote visual control	_____	_____
Automatic voltage control (GTAW)	_____	_____
Automatic joint tracking	_____	_____
Welding position (1G, 5G, etc.)	_____	_____
Consumable insert	_____	_____
Backing (metal, weld metal, welded from both sides, flux, etc.)	_____	_____

Guided Bend Test Results

Guided Bend Test Type () QW-462.2 (Side) Results () QW-462.3(a) (Trans. R & F) Type () QW-462.3(b) (Long, R & F) Results

Visual examination results (QW-302.4) _____

Radiographic test results (QW-304 and Qw-305) _____

(For alternative qualification of groove welds by radiography)

Fillet Weld - Fracture test _____ Length and percent of defects _____ in.

Macro test fusion _____ Fillet leg size _____ in. x _____ in. Concavity/covexity _____ in.

Welding test conducted by _____

Mechanical tests conducted by _____

We certify that the statements in this record are correct and that the test coupons were prepared, welded, and tested in accordance with the requirements of Section IX of the ASME Code.

Organization _____

Date _____

By _____

This form (E00008) may be obtained from the Order Dept., ASME, 22 Law Drive, Box 2300, Fairfield NJ 07007-2300

(Source ASME B31.1, SEC IX)

Reference: API Standard 1104, 2.2

PROCEDURE SPECIFICATION NO. _____

For _____ Welding of _____ Pipe and Fittings

Process _____

Material _____

Diameter and wall thickness _____

Joint design _____

Filler metal and no. of beads _____

Electrical or flame characteristics _____

Position _____

Direction of welding _____

No. of welders _____

Time lapse between passes _____

Type and removal of lineup clamp _____

Cleaning and/or grinding _____

Preheat stress relief _____

Shielding gas and flow rate _____

Shielding flux _____

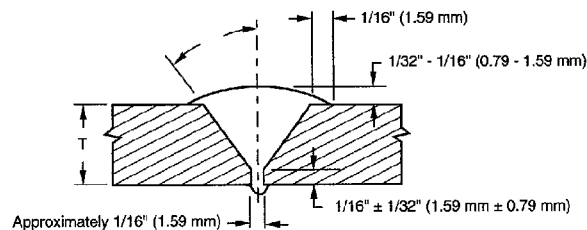
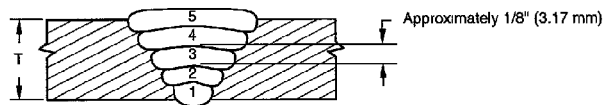
Speed of travel _____

Sketches and tabulations attaches _____

Tested _____ Welder _____

Approved _____ Welding supervisor _____

Adopted _____ Chief engineer _____

**Standard V-Bevel Butt Joint****Sequence of Beads**

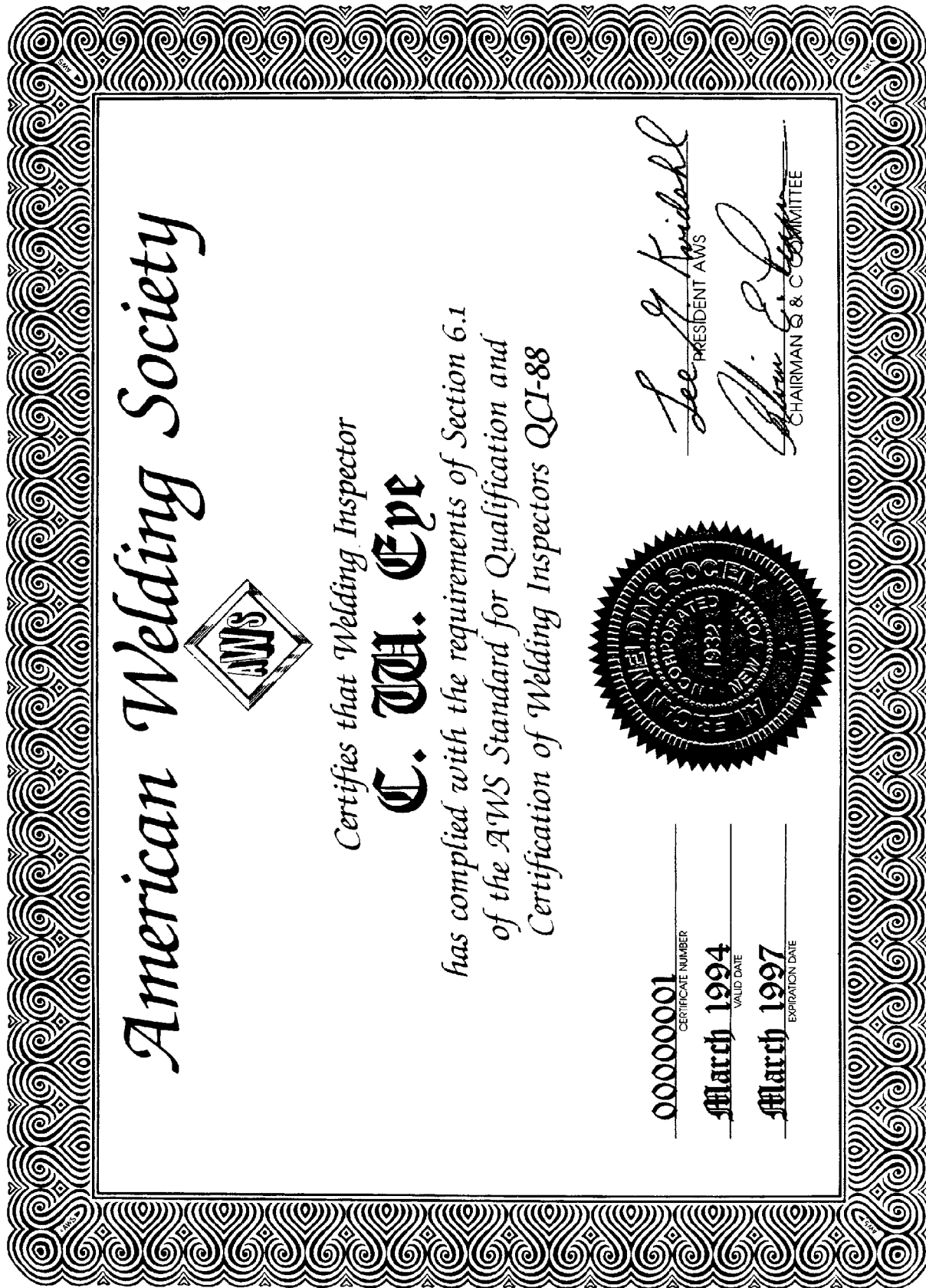
Note: Dimensions are for reference only.

ELECTRODE SIZE AND NUMBER OF BEADS

Bead Number	Electrode Size and Type	Voltage	Amperage and Polarity	Speed

(Source API Standard 1104)

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