

# CONSTRUCTION: JOINING OF PIPES BY WELDING

Issued: 8-14-07 Revised: \_\_\_\_\_ Number: 6 Page: \_\_\_\_\_

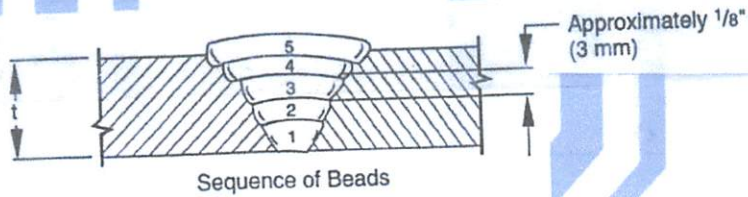
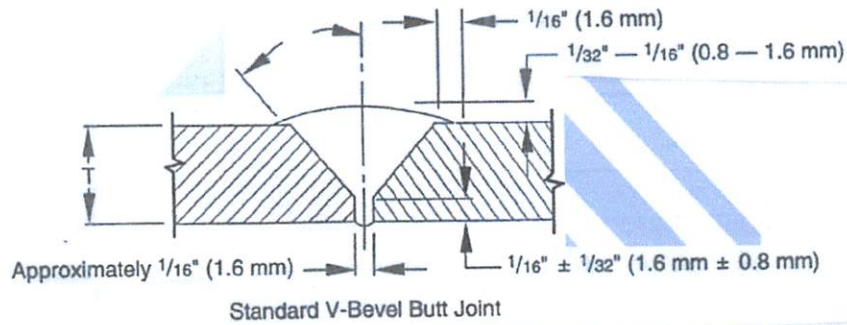
## STANDARD WELDING PROCEDURE SPECIFICATION # 6

- A. Process: Manual Electric Arc
- B. Material: API 5L Grade A thru X42
- C. Diameter and Wall Thickness: Greater than 12" and .188 thru .500 wall thickness
- D. Joint Design: Standard Vee Groove, 30 Degree Bevel
- E. Filler Metal and Number of Beads: Electrode Classification:  
Electrode E6010 and E8010, AWS Class A5.1—A5.5, Minimum of 4 Passes
- F. Electrical or Flame Characteristics: Reverse Polarity, Electrode Positive
- G. Position: Inclined 45 degrees
- H. Direction of Welding: Vertical Down
- I. Number of Welders: 1
- J. Time Lapse Between Passes: Maximum of 5 minutes between stringer and hot pass;  
3 minutes maximum when temperature is below 35° F.
- K. Type of Line-Up Clamp: External
- L. Removal of Line-Up Clamp: After 50% completion of stringer bead.
- M. Cleaning: Taper grind starts and craters and flatten crown by grinding stringer bead,  
power buff all remaining passes.
- N. Speed of Travel: String bead 10 to 12 inches per minute maximum.
- O. \*Preheat, Stress Relief: Maximum of 300°F. Minimum of 150°F. Preheating shall  
be done with device or equipment which will heat entire circumference(s) in single  
application 2" back from pipe ends.
- P. Notes: Welded pipe strings shall be temporarily capped to prevent air draft cooling  
of stringer beads. Weld shall be completely protected from moisture until it has  
cooled to ambient temperature. Weld zone shall be protected so that the wind  
velocity near it does not exceed 8 miles per hour.

\*X-Rated pipe must be stress relief if the carbon content exceeds 32% or C+1/4 Mn  
exceeds 65%. Heating of X-Rated pipe is limited to 600°F.

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Note: Dimensions are for example only.

Bead No.	Electrode Diameter	Amperage Range	Voltage Range	Type Rod	Notes
1	5/32	110-130	22-30	E6010 5P+	
2	5/32	120-155	24-35	E8010 70+	
3	5/32	125-160	24-32	E8010 70+	
4	3/16	135-175	27-37	E8010 70+	
5					

Bead No.	Notes
	If necessary more passes may be made at bead #4 amperage and Voltage settings.

**WELD TEST REPORT**

(USE SEPARATE FORM FOR EACH WELDING PROCEDURE)

DATE <i>Aug 14, 2007</i>		WELDER'S NAME <i>Jimmie Moore</i>			SOCIAL SECURITY NUMBER <i>###-##-1536</i>			
LOCATION <i>Summit</i>		NAME OF CONTRACTOR OR COMPANY <i>W.T.G.</i>		RIGHT HANDED <input checked="" type="checkbox"/>	LEFT HANDED <input type="checkbox"/>	REQUALIFYING TEST <input checked="" type="checkbox"/>	QUALIFYING TEST <input checked="" type="checkbox"/>	LINE TEST <input type="checkbox"/>
POSITION INCLINED <input type="checkbox"/>	FIXED <input checked="" type="checkbox"/>	ELECTRIC ARC <input checked="" type="checkbox"/>	INDOORS <input type="checkbox"/>	WEATHER <i>CL</i>	TEMPERATURE <i>100</i>	TIME OF DAY <i>Mid</i>	WIND BREAK USED <i>No</i>	
PIPE SPECIFICATION <i>API 5L X 60</i>		PIPE MANUFACTURER <i>Republic</i>		WALL THICKNESS <i>.281</i>		DIAMETER (OD) <i>20"</i>		WEIGHT PER FOOT <i>59.18</i>
MAKE OF WELDING MACHINE <i>Lin.</i>		SIZE <i>300</i>	MAKE OF OX-ACETYLENE APPARATUS <i>N/A</i>	WELDING NOZZLE SIZE <i>N/A</i>		OX-ACETYLENE PRESSURE FLOWING <i>N/A</i>		
BRAND OF ELECTRODE <i>Lin</i>		BRAND OF OX-ACETYLENE ROD AND SIZE <i>N/A</i>		NUMBER OF PASSES - OX-ACETYLENE WELD <i>N/A</i>			WELDING PROCEDURE NO. <i># 6</i>	

PIPE WELD	ELECTRODE TYPE AND SIZE	MACHINE SETTINGS		AMPERAGE RG.	VOLTAGE RG.
		COARSE	FINE		
STRINGER	<i>Lin 5/32 5P+</i>	<i>120-190</i>	<i>55</i>	<i>110-130</i>	<i>22-30</i>
HOT PASS	<i>Lin 5/32 70+</i>	<i>160-240</i>	<i>70</i>	<i>120-155</i>	<i>24-30</i>
FILLER (S)	<i>Lin 5/32 70+</i>	<i>160-240</i>	<i>70</i>	<i>125-160</i>	<i>24-32</i>
CAP PASS	<i>Lin 3/16 70+</i>	<i>160-240</i>	<i>80</i>	<i>135-175</i>	<i>27-37</i>

*API-1104  
Sunderlin-5  
20th Edition*

TENSILE TESTS	COUPON			CROSS SEC. AREA SQ. IN.	LOAD	% ELONG.	COMPUTED TENSILE PSI	REMARKS	AC-CEPTED	RE-JECTED
	LOCATION	LENGTH	WIDTH							
1	<i>TR</i>	<i>8"</i>	<i>1"</i>	<i>.290</i>	<i>20,000</i>	<i>25%</i>	<i>68,965</i>	<i>Break in punch mt.</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	<i>TL</i>	<i>"</i>	<i>"</i>	<i>"</i>	<i>"</i>	<i>"</i>	<i>"</i>	<i>SAME</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	<i>TBR</i>	<i>"</i>	<i>"</i>	<i>"</i>	<i>"</i>	<i>"</i>	<i>"</i>	<i>SAME</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	<i>TBL</i>	<i>"</i>	<i>"</i>	<i>"</i>	<i>"</i>	<i>"</i>	<i>"</i>	<i>SAME</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

BEND TESTS	COUPON LOCATION	TYPE OF BEND	REMARKS	AC-CEPTED	RE-JECTED
	<i>R 2</i>	<i>ROOT</i>	<i>No Defect</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	<i>R 3</i>	<i>ROOT</i>	<i>No Defect</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	<i>R 4</i>	<i>ROOT</i>	<i>No Defect</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	<i>F 1</i>	<i>FACE</i>	<i>No Defect</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	<i>F 2</i>	<i>FACE</i>	<i>No Defect</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	<i>F 3</i>	<i>FACE</i>	<i>No Defect</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	<i>F 4</i>	<i>FACE</i>	<i>No Defect</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

NICK-BREAK TESTS	COUPON LOCATION	REMARKS	AC-CEPTED	RE-JECTED
	<i>TL 1</i>	<i>Small slag inclusion near root 1/32 x 1/64</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	<i>BR 2</i>	<i>No Defect Clean Gray Metal</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	<i>BL 2</i>	<i>No Defect Clean Gray Metal</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

SIZE AND WALL THICKNESS OF MAIN		GAS PRESSURE ON MAIN PSIG		LOCATION OF FRACTURE WELD <input type="checkbox"/>		NIPPLE <input type="checkbox"/>		MAIN <input type="checkbox"/>	
DID WELD CONTAIN: PINHOLES		COLDROLL		UNDERCUT		DEPTH OF UNDERCUT		LENGTH OF UNDERCUT	
REMARKS ON TEE WELD									

*This weld has been visually and destructively tested in accordance with API-1104*

PIPE WELD	QUALIFIED <input checked="" type="checkbox"/>	NOT QUALIFIED <input type="checkbox"/>	ELECTRIC ARC <input checked="" type="checkbox"/>	OX-ACETYLENE <input type="checkbox"/>	TEE WELD	QUALIFIED <input type="checkbox"/>	NOT QUALIFIED <input type="checkbox"/>	ELECTRIC ARC <input type="checkbox"/>	OX-ACETYLENE <input type="checkbox"/>
TESTED BY	SIGNATURE <i>Ed Maschke</i>				TITLE <i>Welding Inspector</i>				