

CONSTRUCTION: JOINING OF PIPES BY WELDING

Issued: 2-18-08 Revised: _____ Number: 5GH Page: _____

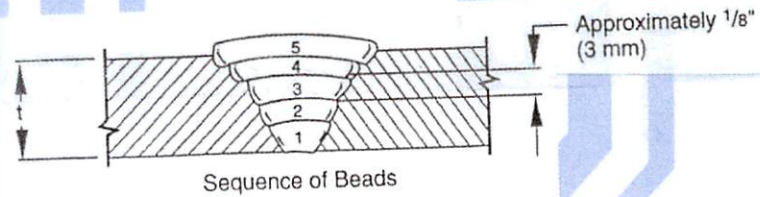
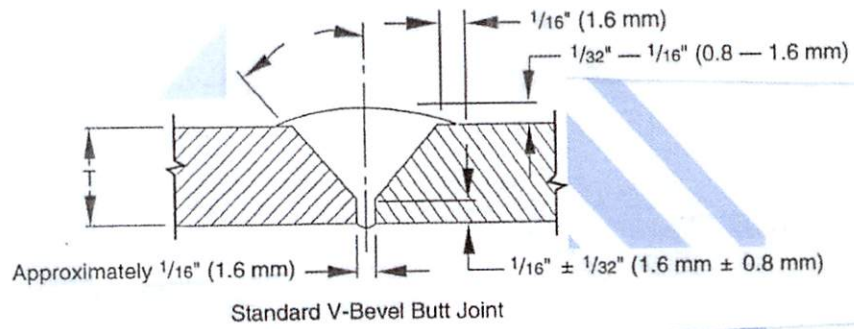
STANDARD WELDING PROCEDURE SPECIFICATION # 5GH

- A. Process: Manual Electric Arc
- B. Material: API-5L Grade A thru X42
- C. Diameter and Wall Thickness: 8" thru 12" and .188 WT thru .500 WT
- D. Joint Design: Standard Vee Groove 30 degrees
- E. Filler Metal and Number of Beads: Electrode Classification
Electrode E6010 & 8010 AWS Class A5.1-A5.5
- F. Electrical or Flame Characteristics: D.C. Reverse Polarity, Electrode Positive
- G. Position: Fixed Horizontal
- 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 10-12 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 | 1/8 | 100-125 | 28-35 | E6010 5P+ | |
| 2 | 1/8 | 85-110 | 25-35 | E8010 70+ | |
| 3 | 1/8 ** | 100-115 | 20-30 | E8010 70+ | |
| 4 | 5/32 | 105-135 | 20-35 | E8010 70+ | |
| 5 | * | | | | |

| Bead No. | Notes |
|----------|--|
| * | Additional passes may be made using 8010 70+ 3/16 at amperage Range 132-170 and 25-35 volt range |
| ** | Pass 3 may be made with 5/32 at same settings as pass #4 |
| | |
| | |

WELD TEST REPORT

(USE SEPARATE FORM FOR EACH WELDING PROCEDURE)

| | | | | |
|---|---|--|---|---|
| DATE <i>1-11-08</i> | WELDER'S NAME <i>Darrell Lawford</i> | | SOCIAL SECURITY NUMBER <i>2519</i> | |
| LOCATION <i>Sumner</i> | NAME OF CONTRACTOR OR COMPANY <i>West Texas Gas</i> | RIGHT HANDED <input checked="" type="checkbox"/> LEFT HANDED <input type="checkbox"/> | REQUALIFYING TEST <input checked="" type="checkbox"/> QUALIFYING TEST <input type="checkbox"/> | LINE TEST <input type="checkbox"/> |
| POSITION INCLINED <input type="checkbox"/> FIXED <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> HORIZONTAL | ELECTRIC ARC <input checked="" type="checkbox"/> INDOORS <input checked="" type="checkbox"/> OX-ACETYLENE <input type="checkbox"/> OUTDOORS <input type="checkbox"/> | WEATHER <i>CL</i> | TEMPERATURE <i>75</i> | TIME OF DAY <i>Morn</i> |
| PIPE SPECIFICATION <i>API-5L 60 x 42</i> | PIPE MANUFACTURER <i>Republic</i> | WALL THICKNESS <i>1.188</i> | DIAMETER (OD) <i>8 5/8</i> | WEIGHT PER FOOT <i>16.94</i> |
| MAKE OF WELDING MACHINE <i>Lin.</i> | SIZE <i>300</i> | MAKE OF OX-ACETYLENE APPARATUS <i>—</i> | WELDING NOZZLE SIZE <i>—</i> | OX-ACETYLENE PRESSURE FLOWING <i>—</i> |
| BRAND OF ELECTRODE <i>Lin.</i> | BRAND OF OX-ACETYLENE ROD AND SIZE <i>—</i> | NUMBER OF PASSES, OX-ACETYLENE WELD <i>—</i> | WELDING PROCEDURE NO. <i>5-6H</i> | |

| PIPE WELD | ELECTRODE TYPE AND SIZE | MACHINE SETTINGS | | AMPERAGE RG. | VOLTAGE RG. |
|------------|-------------------------|------------------|-----------|----------------|--------------|
| | | COARSE | FINE | | |
| STRINGER | <i>Lin. 1/8 5P+</i> | <i>120-190</i> | <i>45</i> | <i>100-125</i> | <i>28-35</i> |
| HOT PASS | <i>Lin. 1/8 70+</i> | <i>120-190</i> | <i>55</i> | <i>85-110</i> | <i>25-35</i> |
| FILLER (S) | <i>Lin. 1/8 70+</i> | <i>120-190</i> | <i>55</i> | <i>100-115</i> | <i>20-30</i> |
| CAP PASS | <i>Lin. 5/32 70+</i> | <i>120-190</i> | <i>65</i> | <i>105-135</i> | <i>20-35</i> |

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

| TENSILE TESTS | COUPON | | | CROSS SEC. AREA SQ. IN. | LOAD | % ELONG. | COMPUTED TENSIL PSI | REMARKS | AC-CEPTED | RE-JECTED |
|---------------|-----------|-----------|-----------|-------------------------|---------------|------------|---------------------|------------------|-------------------------------------|--------------------------|
| | LOCATION | LENGTH | WIDTH | | | | | | | |
| 1 | <i>T1</i> | <i>8"</i> | <i>1"</i> | <i>.190</i> | <i>12,500</i> | <i>15%</i> | <i>65,789</i> | <i>No defect</i> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2 | <i>T2</i> | <i>8"</i> | <i>1"</i> | <i>.190</i> | <i>12,200</i> | <i>15%</i> | <i>63,157</i> | <i>" "</i> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |

| BEND TESTS | COUPON LOCATION | TYPE OF BEND | REMARKS | AC-CEPTED | RE-JECTED |
|------------|-----------------|--------------|------------------------------|-------------------------------------|-------------------------------------|
| | 1 | <i>R1</i> | <i>Root</i> | <i>No defect</i> | <input checked="" type="checkbox"/> |
| 2 | <i>R2</i> | <i>Root</i> | <i>Small opening on edge</i> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3 | <i>F1</i> | <i>Face</i> | <i>No defect</i> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 4 | <i>F2</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 |
|------------------|-----------------|-------------------------------------|-------------------------------------|-------------------------------------|
| | 1 | <i>TN</i> | <i>Clean Gray Metal</i> | <input checked="" type="checkbox"/> |
| 2 | <i>BN</i> | <i>Small gas pocket - edge 1/4"</i> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3 | | | | |
| 4 | | | | |

| | | |
|--|---------------------------|---|
| 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 <input type="checkbox"/> COLDROLL <input type="checkbox"/> UNDERCUT <input type="checkbox"/> | DEPTH OF UNDERCUT | LENGTH OF UNDERCUT |
| REMARKS ON TEE WELD | | |

| | | | | | |
|-----------|---|---|-----------------------------------|--|--|
| 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> | | |