The overall contest could be altered up to 25% per the National Technical Committee between now and contest day in Louisville. The Drawings and Procedures are as follows:

FCAW Drawing – Utilize WPS 108-71T1
GMAW Drawing – Utilize WPS 104-035 GMAW-S
GTAW Drawing – Utilize WPS 103-4043
SMAW Drawing – Utilize WPS’s 101-7018, 106-6010, and 107-7024
OFC Drawing High School – No WPS
OFC Drawing College/Post-Secondary – No WPS

Good Luck to you all!

5/14/19
SkillsUSA Welding Contest

FCAW-G

SkillsUSA

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES

SHEET 1 OF 1

ID | QTY | DESCRIPTION
--- | --- | -------------------
A  | 1   | 0.25 X 8 X 18.5 Steel Plate
B  | 3   | 5/16 x 3 x 3 x 10 Steel Angle
D  | 2   | 0.25 x 6 x 10 Steel Plate
E  | 1   | 0.25 x 3 x 10 Steel Plate

ALL PROCESSES TO BE COMPLETED WITH THE MATERIALS PROVIDED

1. WELD IN ACCORDANCE WITH WPS# WPS108-71T1
2. TACK ENTIRE ASSEMBLY AS INDICATED IN DRAWING VIEWS IN ANY POSITION PRIOR TO WELDING
3. WELD COMPLETE ASSEMBLY WITH PLATE A FLAT TO THE TABLE
4. ALL VERTICAL WELDS TO BE UPHILL
SkillsUSA
Welding Contest
GMAW

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES

ID  QTY  DESCRIPTION
---  ----  ---------------------------
A  1  10 ga. (0.1345) x 9.5 x 10.5
B  5  10 ga. (0.1345) x 2.75 x 6.5 Gusset
C  4  10 ga. (0.1345) x 6.5 x 7

ALL PROCESSES TO BE COMPLETED WITH THE MATERIALS PROVIDED

1. WELD IN ACCORDANCE WITH WPS# WPS104-035 GMAW-S
2. TACK ENTIRE ASSEMBLY AS INDICATED IN DRAWING VIEWS IN ANY POSITION PRIOR TO WELDING
3. WELD COMPLETE ASSEMBLY WITH PLATE A FLAT TO THE TABLE
4. ALL VERTICAL WELDS TO BE DOWNHILL
ALL PROCESSES TO BE COMPLETED WITH THE MATERIALS PROVIDED
1. WELD IN ACCORDANCE WITH WPS# 102
2. TACK ENTIRE ASSEMBLY AS INDICATED IN DRAWING VIEWS IN ANY POSITION PRIOR TO WELDING
3. WELD COMPLETE ASSEMBLY WITH PLATE A FLAT TO THE TABLE
4. ALL VERTICAL WELDS TO BE UPHILL
5. ALL OUTSIDE CORNER WELDS SHALL SHOW COMPLETE PENETRATION

---

SkillsUSA
Welding Contest

GTAW

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

<table>
<thead>
<tr>
<th>ID</th>
<th>QTY</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>2</td>
<td>0.125 x 4 x 4 Aluminum</td>
</tr>
<tr>
<td>B</td>
<td>3</td>
<td>0.125 x 1.875 x 4 Aluminum</td>
</tr>
<tr>
<td>C</td>
<td>1</td>
<td>0.125 x 2 x 5.657 Aluminum</td>
</tr>
<tr>
<td>D</td>
<td>1</td>
<td>0.125 x 4 x 4 Aluminum (Triangle)</td>
</tr>
</tbody>
</table>
SkillsUSA
Welding Contest
SMAW

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES

<table>
<thead>
<tr>
<th>ID</th>
<th>QTY</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>0.25 X 8 X 18.5 Steel Plate</td>
</tr>
<tr>
<td>D</td>
<td>2</td>
<td>0.25 x 6 x 10 Steel Plate</td>
</tr>
<tr>
<td>C</td>
<td>2</td>
<td>3 x 5.0# x 10 Steel Channel</td>
</tr>
<tr>
<td>B</td>
<td>1</td>
<td>5/16 x 3 x 3 x 10 Steel Angle</td>
</tr>
<tr>
<td>E</td>
<td>1</td>
<td>0.25 x 3 x 10 Steel Plate</td>
</tr>
</tbody>
</table>

ALL PROCESSES TO BE COMPLETED WITH THE MATERIALS PROVIDED

1. WELD IN ACCORDANCE WITH WPS# 101,106,107
2. TACK ENTIRE ASSEMBLY AS INDICATED IN DRAWING VIEWS IN ANY POSITION PRIOR TO WELDING
3. WELD COMPLETE ASSEMBLY WITH PLATE A FLAT TO THE TABLE
4. ALL VERTICAL WELDS TO BE UPHILL

SkillsUSA Welding Contest
TITLE
SMAW

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES

SHEET 1 OF 1
ALL PROCESSES TO BE COMPLETED WITH THE MATERIALS PROVIDED

1. LAYOUT IN ANY POSITION

2. CUTTING TO BE COMPLETED WITH PLATE FLAT ON TABLE
**Welding Procedure Specification**

**WPS No.** WPS 101  
**Revision** 4  
**Date** 5/10/2019  
**By** NP

**Authorized By** EN/BG  
**Prequalified**  
**Welding Process(es)** SMAW  
**Supporting PQR(s)** Prequalified

### JOINT

- **Type**: Butt / T-Joint
- **Back Facing**: Yes  
- **Back Opening**: 1/8” ±1/16”  
- **Root Face Dimension**: 0” - 1/8”  
- **Groove Angle**: 45°  
- **Radius (J-U)**: N/A  
- **Back Gouge**: Yes  
- **Method**: N/A

### BASE METALS

- **Material Spec.** A-36  
- **Type or Grade**:  
- **Thickness**:  
  - Groove (in): 1/8  
  - Fillet (in): Unlimited  
- **Diameter (Pipe, in)**: 4

### FILLER METALS

- **AWS Specification** A5.1  
- **AWS Classification**: E-7018

### SHIELDING

- **Flux**: N/A  
- **Composition**: N/A  
- **Electrode-Flux (Class)**: N/A  
- **Gas Cup Size**: N/A

### PREHEAT

- **Preheat Temp., Min.**: 60 Deg.F  
- **Thickness**:  
  - Up to 3/4” Temperature: N/A  
  - Over 3/4” to 1-1/2” Temperature: N/A  
  - Over 1-1/2” to 2-1/2” Temperature: N/A  
  - Over 2-1/2” Temperature: N/A  
- **Interpass Temp., Min.** N/A  
- **Max. Temperature** N/A

### POSITION

- **Position of Groove**: 1G,2G,3G,4G  
- **Fillet**: 1F,2F,3F,4F  
- **Vertical Progression**: Up  
- **Common**: Down

### ELECTRICAL CHARACTERISTICS

- **Transfer Mode (GMAW)**:  
  - Short-Circuiting  
  - Globular  
  - Spray  
- **Current**:  
  - AC  
  - DCEP  
  - DCEN  
  - Pulsed
- **Other**: N/A  
- **Tungsten Electrode (GTAW)**:  
  - Size: N/A  
  - Type: N/A

### TECHNIQUE

- **Stringer or Weave Bead**: Both  
- **Multi-pass or Single Pass (per side)**: Single / Multiple  
- **Number of Electrodes**: 1  
- **Electrode Spacing**:  
  - Longitudinal: N/A  
  - Lateral: N/A  
  - Angle: N/A  
- **Contact Tube to Work Distance**: N/A  
- **Peening**: N/A  
- **Interpass Cleaning**: Chip slag and wire brush

### POSTWELD HEAT TREATMENT

- **PWHT Required**:  
- **Temp.**: N/A  
- **Time**: N/A

### WELDING PROCEDURE

<table>
<thead>
<tr>
<th>Layer/Pass</th>
<th>Process</th>
<th>Filler Metal Class</th>
<th>Diameter</th>
<th>Cur. Type</th>
<th>Amps</th>
<th>Volts</th>
<th>Travel Speed</th>
<th>Other Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>SMAW</td>
<td>E-7018</td>
<td>3/32</td>
<td>DCEP</td>
<td>70-110</td>
<td>N/A</td>
<td>4-10 ipm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>SMAW</td>
<td>E-7018</td>
<td>1/8</td>
<td>DCEP</td>
<td>90-150</td>
<td>N/A</td>
<td>4-10 ipm</td>
<td></td>
</tr>
</tbody>
</table>
WPS No. | WPS 103 | Revision | 4 | Date | 5/10/2019 | By NP |
---|---|---|---|---|---|---|
Authorized By | EN/BG | Date | 5/10/2019 | Prequalified | | |
Welding Process(es) | GTAW | Type: | Manual | Machine | Semi-Auto | Auto |
Supporting PQR(s) | Prequalified | | | | | |

### JOINT

<table>
<thead>
<tr>
<th>Type</th>
<th>T-Joint / Corner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Backing</td>
<td>Yes</td>
</tr>
<tr>
<td>Backing Material</td>
<td>N/A</td>
</tr>
<tr>
<td>Root Opening</td>
<td>0</td>
</tr>
<tr>
<td>Root Face Dimension</td>
<td>0</td>
</tr>
<tr>
<td>Groove Angle</td>
<td>30-90</td>
</tr>
<tr>
<td>Radius (J-U)</td>
<td>N/A</td>
</tr>
<tr>
<td>Back Gouge</td>
<td>Yes</td>
</tr>
<tr>
<td>Method</td>
<td>N/A</td>
</tr>
</tbody>
</table>

### BASE METALS

<table>
<thead>
<tr>
<th>Material Spec.</th>
<th>6061 to 6061</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type or Grade</td>
<td>6061 to 6061</td>
</tr>
<tr>
<td>Thickness: Groove</td>
<td>Unlimited</td>
</tr>
<tr>
<td>Fillet (in)</td>
<td>Unlimited</td>
</tr>
<tr>
<td>Diameter (Pipe, )</td>
<td>N/A</td>
</tr>
</tbody>
</table>

### FILLER METALS

<table>
<thead>
<tr>
<th>AWS Specification</th>
<th>A5.10</th>
</tr>
</thead>
<tbody>
<tr>
<td>AWS Classification</td>
<td>ER4043</td>
</tr>
</tbody>
</table>

### SHIELDING

<table>
<thead>
<tr>
<th>Flux</th>
<th>Gas 100%Argon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrode-Flux (Class)</td>
<td>N/A</td>
</tr>
<tr>
<td>Flow Rate</td>
<td>15-25 CFH</td>
</tr>
<tr>
<td>Gas Cup Size</td>
<td>3/8&quot; Min. (#6)</td>
</tr>
</tbody>
</table>

### PREHEAT

<table>
<thead>
<tr>
<th>Preheat Temp., Min.</th>
<th>60 Deg.F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thickness Up to 3/4&quot;</td>
<td>N/A</td>
</tr>
<tr>
<td>Temperature</td>
<td>N/A</td>
</tr>
<tr>
<td>Over 3/4&quot; to 1-1/2&quot;</td>
<td>N/A</td>
</tr>
<tr>
<td>Over 1-1/2&quot; to 2-1/2&quot;</td>
<td>N/A</td>
</tr>
<tr>
<td>Over 2-1/2&quot;</td>
<td>N/A</td>
</tr>
<tr>
<td>Interpass Temp., Min.</td>
<td>N/A</td>
</tr>
</tbody>
</table>

### POSITION

<table>
<thead>
<tr>
<th>Position of Groove</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fillet</td>
<td>All</td>
</tr>
<tr>
<td>Vertical Progression:</td>
<td>Up</td>
</tr>
</tbody>
</table>

### ELECTRICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Transfer Mode (GMAW):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short-Circuiting</td>
</tr>
<tr>
<td>Current:</td>
</tr>
<tr>
<td>Other</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tungsten Electrode (GTAW):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
</tr>
<tr>
<td>Type</td>
</tr>
</tbody>
</table>

### TECHNIQUE

<table>
<thead>
<tr>
<th>Stringer or Weave Bead</th>
<th>Stringer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multi-pass or Single Pass (per side)</td>
<td>Multiple/Single</td>
</tr>
<tr>
<td>Number of Electrodes</td>
<td>1</td>
</tr>
<tr>
<td>Electrode Spacing: Longitudinal</td>
<td>N/A</td>
</tr>
<tr>
<td>Lateral</td>
<td>N/A</td>
</tr>
<tr>
<td>Angle</td>
<td>N/A</td>
</tr>
<tr>
<td>Contact Tube to Work Distance</td>
<td>N/A</td>
</tr>
<tr>
<td>Peening</td>
<td>N/A</td>
</tr>
<tr>
<td>Interpass Cleaning</td>
<td></td>
</tr>
</tbody>
</table>

### POSTWELD HEAT TREATMENT

| PWHT Required | | |
|---|---|
| Temp. | N/A |
| Time | N/A |

### WELDING PROCEDURE

<table>
<thead>
<tr>
<th>Layer/Pass</th>
<th>Process</th>
<th>Filler Metal Class</th>
<th>Diameter</th>
<th>Cur. Type</th>
<th>Amps</th>
<th>Volts</th>
<th>Travel Speed</th>
<th>Other Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>GTAW</td>
<td>ER4043</td>
<td>3/32&quot;</td>
<td>AC</td>
<td>0-175</td>
<td>N/A</td>
<td>4-8 ipm</td>
<td>AC Bal. 65-75%EN</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>AC Hz. 60 - 120</td>
</tr>
</tbody>
</table>
### Welding Procedure Specification

#### WPS 104

**WPS No.:** WPS 104  
**Revision:** 4  
**Date:** 5/10/2019  
**By:** NP  
**Prequalified:** Yes

#### Welding Process(es)
- **GMAW-S**  
- **Type:** Manual  
- **Supporting PQR(s):** Prequalified

### JOINT
- **Type:** T-Joint
- **Back Gouge:** Single Weld  
- **Method:** N/A

### BASE METALS
- **Material Spec.:** A 36  
- **Thickness:** Groove (N/A)  
- **Type or Grade:** N/A  
- **Diameter (Pipe):** N/A  
- **Root Opening:** N/A  
- **Root Face Dimension:** N/A

### FILLER METALS
- **AWS Specification:** A5.18  
- **AWS Classification:** ER70S-6

### SHIELDING
- **Flux:** M75-ArC-25  
- **Composition:** 75% Argon/25% CO₂

### ELECTRICAL CHARACTERISTICS
- **Transfer Mode (GMAW):** Short-Circuiting  
- **Current:** AC  
- **Other:** N/A

### TECHNIQUE
- **Stringer or Weave Bead:** Stringer  
- **Multi-pass or Single Pass (per side):** Single  
- **Number of Electrodes:** 1  
- **Electrode Spacing:** Longitudinal N/A  
- **Contact Tube to Work Distance:** 1/4" to 3/8"

### PREHEAT
- **Preheat Temp., Min.:** 60 Deg.F  
- **Thickness:** Up to 3/4"  
- **Temperature:** N/A  
- **Over 3/4" to 1-1/2":** N/A  
- **Over 1-1/2" to 2-1/2":** N/A

### POSTWELD HEAT TREATMENT
- **PWHT Required:** No

### WELDING PROCEDURE

<table>
<thead>
<tr>
<th>Layer/Pass</th>
<th>Process</th>
<th>Filler Metal Class</th>
<th>Diameter</th>
<th>Cur. Type</th>
<th>Amps</th>
<th>Volts</th>
<th>Travel Speed</th>
<th>Other Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>GMAW</td>
<td>ER70S-6</td>
<td>0.035&quot;</td>
<td>DCEP</td>
<td>90-150</td>
<td>16-20</td>
<td>6-8 ipm</td>
<td>WFS 140-350 ipm</td>
</tr>
</tbody>
</table>

---

**Approved By:** 
**Date:** 5/10/2019  
**Revision:** N/A  
**Number:** N/A

---
## WPS 106

### SkillsUSA

#### Welding Procedure Specification

**WPS No.**  WPS 106  
**Revision**  3  
**Date**  5/10/2019  
**Author**  NP  

**Welding Process(es)**  
- SMAW  
**Supporting PQR(s)**  
- Prequalified

### JOINT

- **Type:** T-Joint
- **Backgouge:** Yes
- **Backing Material:** N/A
- **Root Opening:** N/A
- **Root Face Dimension:** N/A
- **Groove Angle:** N/A
- **Back Gouge:** Yes
- **Method:** N/A

### BASE METALS

- **Material Spec.:** A-36 to A-36
- **Type or Grade:**
  - **Thickness:**
    - Groove: N/A
    - Fillet: Unlimited
  - Diameter (Pipe): N/A

### FILLER METALS

- **AWS Specification:** A5.1
- **AWS Classification:** E-6010

### SHIELDING

- **Flux:** N/A
- **Electrode-Flux (Class):** N/A
- **Gas:** N/A
- **Composition:** N/A
- **Flow Rate:** N/A
- **Gas Cup Size:** N/A

### PREHEAT

- **Preheat Temp., Min.:** 60 Deg.F
- **Thickness:**
  - Up to 3/4”
  - Over 3/4” to 1-1/2”
  - Over 1-1/2” to 2-1/2”
  - Over 2-1/2”
  - Interpass Temp., Min.
  - Max.

### POSITION

- **Position of Groove:** All
- **Fillet:** All
- **Vertical Progression:** Up
- **Electrical Characteristics**
  - **Transfer Mode (GMAW):**
    - Short-Circuiting
    - Globular
    - Spray
  - **Current:** AC
  - **Other:** N/A
- **Tungsten Electrode (GTAW):**
  - Size: N/A
  - Type: N/A

### TECHNIQUE

- **Stringer or Weave Bead:** Both
- **Multi-pass or Single Pass (per side):** Multiple/Single
- **Number of Electrodes:** 1
- **Electrode Spacing:**
  - Longitudinal: N/A
  - Lateral: N/A
  - Angle: N/A
- **Contact Tube to Work Distance:** N/A
- **Peening:** N/A
- **Interpass Cleaning:** Chip slag and wire brush

### POSTWELD HEAT TREATMENT

**PWHT Required:** No

<table>
<thead>
<tr>
<th>Layer/Pass</th>
<th>Process</th>
<th>Filler Metal Class</th>
<th>Diameter</th>
<th>Cur. Type</th>
<th>Amps</th>
<th>Volts</th>
<th>Travel Speed</th>
<th>Other Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>SMAW</td>
<td>E-6010</td>
<td>1/8</td>
<td>DCEP</td>
<td>90-115</td>
<td>N/A</td>
<td>4-10 ipm</td>
<td></td>
</tr>
</tbody>
</table>
WPS 107

SkillsUSA

Welding Procedure Specification

WPS No. | WPS 107 | Revision | Date | By | Prequalified
---|---|---|---|---|---
2 | 5/10/2019 | NP

Authorized By | EN/BG | Date | 5/10/2019
---|---|---|---
Welding Process(es) | SMAW | Type: | Manual [ ] Machine [ ] Semi-Auto [ ] Auto [ ]
---|---|---|---
Supporting PQR(s) | Prequalified | | | |
---|---|---|---|---

**JOINT**

**T-Joint**

Type | Backing | Yes [ ] No [ ] Single Weld [ ] Double Weld [ ]
---|---|---|---
Backin Material | N/A

Root Opening | N/A | Root Face Dimension | N/A
---|---|---|---

Groove Angle | N/A | Radius (J-U) | N/A
---|---|---|---

Back Gouge | Yes [ ] No [ ]
---|---

Method | N/A
---|---

**BASE METALS**

Material Spec. | From A-36 to A-36
---|---
Type or Grade | Thickness: Groove (in) N/A to N/A
---|---

Fillet (Unlimited) to N/A

Diameter (Pipe, in) N/A to N/A

**FILLER METALS**

AWS Specification | A5.1 | AWS Classification | E-7024
---|---|---|---

**SHIELDING**

Flux | Gas | N/A
---|---|---

N/A | Composition | N/A
---|---|---

Electrode-Flux (Class) | Flow Rate | N/A
---|---|---

N/A | Gas Cup Size | N/A
---|---|---

**PREHEAT**

Preheat Temp., Min. | 60 Deg.F
---|---

Thickness | Up to 3/4" Temperature | N/A
---|---

Over 3/4" to 1-1/2" | N/A
---|---

Over 1-1/2" to 2-1/2" | N/A
---|---

Over 2-1/2" | N/A
---|---

Interpass Temp., Min. | N/A Max. | N/A
---|---|---

**POSITION**

Position of Groove | Fillet 1F,2F
---|---

Vertical Progression: | Up | Down
---|---|---

**ELECTRICAL CHARACTERISTICS**

Transfer Mode (GMAW):

Short-Circuiting | DCEP | Spray [ ]
---|---|---

Current | AC [ ] DCEP [ ] DCEN [ ] Pulsed [ ]
---|---|---|---

Other | N/A
---|---

Tungsten Electrode (GTAW):

Size | N/A | Type | N/A
---|---|---|---

**TECHNIQUE**

Stringer or Weave Bead | Both
---|---

Multi-pass or Single Pass (per side) | Multiple/Single
---|---

Number of Electrodes | 1
---|---

Electrode Spacing: Longitudinal | N/A
---|---

Lateral | N/A
---|---

Angle | N/A
---|---

Contact Tube to Work Distance | N/A
---|---

Peening | N/A
---|---

Interpass Cleaning | Chip slag and wire brush
---|---

**POSTWELD HEAT TREATMENT**

PWHT Required | N/A
---|---

Temp. | Time | N/A
---|---|---

**WELDING PROCEDURE**

Layer/Pass | Process | Filler Metal Class | Diameter | Cur. Type | Amps | Volts | Travel Speed | Other Notes
---|---|---|---|---|---|---|---|---

All | SMAW | E-7024 | 1/8 | DCEP | 130-150 | N/A | 4-10 ipm
---|---|---|---|---|---|---|---|---


**Welding Procedure Specification**

<table>
<thead>
<tr>
<th>JOINT</th>
<th>T-Joint, Butt, Flanged</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td></td>
</tr>
<tr>
<td>Backing</td>
<td>Yes □ No ■ Single Weld □ Double Weld ■</td>
</tr>
<tr>
<td>Backing Material</td>
<td>N/A</td>
</tr>
<tr>
<td>Root Opening</td>
<td>0</td>
</tr>
<tr>
<td>Root Face Dimension</td>
<td>N/A</td>
</tr>
<tr>
<td>Groove Angle</td>
<td>N/A</td>
</tr>
<tr>
<td>Radius (J-U)</td>
<td>N/A</td>
</tr>
<tr>
<td>Back Gouge</td>
<td>Yes □ No ■</td>
</tr>
<tr>
<td>Method</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**BASE METALS**

<table>
<thead>
<tr>
<th>Material Spec.</th>
<th>A-36 to A-36</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type or Grade</td>
<td></td>
</tr>
<tr>
<td>Thickness: Groove ( ) Unlimited - N/A</td>
<td></td>
</tr>
<tr>
<td>Fillet ( ) Unlimited - N/A</td>
<td></td>
</tr>
<tr>
<td>Diameter (Pipe, ) N/A - N/A</td>
<td></td>
</tr>
</tbody>
</table>

**FILLER METALS**

<table>
<thead>
<tr>
<th>AWS Specification</th>
<th>A5.20</th>
</tr>
</thead>
<tbody>
<tr>
<td>AWS Classification</td>
<td>E71T-1</td>
</tr>
</tbody>
</table>

**SHIELDING**

<table>
<thead>
<tr>
<th>Flux</th>
<th>Gas</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>Composition 75% Argon/25% CO2</td>
</tr>
<tr>
<td>Electrode-Flux (Class)</td>
<td>Flow Rate 35-45 CFH</td>
</tr>
<tr>
<td>N/A</td>
<td>Gas Cup Size 1/2&quot; - 3/4&quot;</td>
</tr>
</tbody>
</table>

**PREHEAT**

<table>
<thead>
<tr>
<th>Preheat Temp., Min.</th>
<th>60 Deg.F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thickness</td>
<td>Up to 3/4&quot; Temperature</td>
</tr>
<tr>
<td>Over 3/4&quot; to 1-1/2&quot;</td>
<td>N/A</td>
</tr>
<tr>
<td>Over 1-1/2&quot; to 2-1/2&quot;</td>
<td>N/A</td>
</tr>
<tr>
<td>Over 2-1/2&quot;</td>
<td>N/A</td>
</tr>
<tr>
<td>Interpass Temp., Min.</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**WELDING PROCEDURE**

<table>
<thead>
<tr>
<th>Layer/Pass</th>
<th>Process</th>
<th>Filler Metal Class</th>
<th>Diameter</th>
<th>Cur. Type</th>
<th>Amps</th>
<th>Volts</th>
<th>Travel Speed</th>
<th>Other Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>FCAW-G</td>
<td>E71T-1M</td>
<td>0.045</td>
<td>DCEP</td>
<td>200-260</td>
<td>24-26</td>
<td>5-12</td>
<td>WFS:340-500ipm</td>
</tr>
</tbody>
</table>

**POSITION**

<table>
<thead>
<tr>
<th>Position of Groove</th>
<th>All</th>
<th>Fillet</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical Progression:</td>
<td>□ Up</td>
<td>□ Down</td>
<td></td>
</tr>
</tbody>
</table>

**ELECTRICAL CHARACTERISTICS**

<table>
<thead>
<tr>
<th>Transfer Mode (GMAW):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short-Circuiting □ Globular □ Spray □</td>
</tr>
<tr>
<td>Current: AC □ DCEP □ DCEN □ Pulsed □</td>
</tr>
<tr>
<td>Other N/A</td>
</tr>
<tr>
<td>Tungsten Electrode (GTAW):</td>
</tr>
<tr>
<td>Size N/A Type N/A</td>
</tr>
</tbody>
</table>

**TECHNIQUE**

<table>
<thead>
<tr>
<th>Stringer or Weave Bead</th>
<th>Both</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multi-pass or Single Pass (per side)</td>
<td>Multiple/Single</td>
</tr>
<tr>
<td>Number of Electrodes</td>
<td>1</td>
</tr>
<tr>
<td>Electrode Spacing: Longitudinal</td>
<td>N/A</td>
</tr>
<tr>
<td>Lateral</td>
<td>N/A</td>
</tr>
<tr>
<td>Angle</td>
<td>N/A</td>
</tr>
<tr>
<td>Contact Tube to Work Distance</td>
<td>1/2&quot; to 3/4&quot;</td>
</tr>
<tr>
<td>Peening</td>
<td>N/A</td>
</tr>
<tr>
<td>Interpass Cleaning</td>
<td>Chip slag and wire brush</td>
</tr>
</tbody>
</table>

**POSTWELD HEAT TREATMENT**

| PWHT Required | □ |
| Temp. | N/A |
| Time | N/A |

**PWHT Required**

| □ |

**Contact Tube to Work Distance**

| 1/2" to 3/4" |

**Interpass Cleaning**

| Chip slag and wire brush |

**Welding Notes**

| N/A |

**Authorized By EN/BG**

| Date 5/10/2019 |

**Prequalified Yes**

**WPS No. WPS 108**

**Revision 2**

**By NP**