1) WELD IN ACCORDANCE WITH WPS #108
2) TACK COMPLETE ASSEMBLY IN ANY POSITION.
3) WELDING TO BE COMPLETED WITH PLATE "A" FLAT TO THE TABLE.
4) ALL VERTICAL WELDS TO BE UPHILL

<table>
<thead>
<tr>
<th>ITEM NO.</th>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
<th>QTY.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>FCAW_2018_A</td>
<td>0.25 X 8 X 8 STEEL PLATE</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>FCAW_2018_D</td>
<td>0.25 X 6.00 X 10.00 STEEL PLATE</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>FCAW_2018_C</td>
<td>3 X 5.0 X 10.00 CHANNEL</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>FCAW_2018_E</td>
<td>0.25 X 3.00 X 6.00 PLATE</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>FCAW_2018_B</td>
<td>0.250 X 3.00 X 3.75 PLATE</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>FCAW_2018_F</td>
<td>0.312 X 3.0 X 3.0 X 6.00 ANGLE</td>
<td>1</td>
</tr>
</tbody>
</table>

ALL PROCESS TO BE COMPLETED WITH PROVIDED MATERIALS
ALL PROCESS TO BE COMPLETED WITH PROVIDED MATERIALS

1) WELD #2 & #6 IN ACCORDANCE WITH WPS #110. ALL OTHER WELDS USE WPS #104
2) TACK COMPLETE ASSEMBLY IN ANY POSITION.
3) WELDING TO BE COMPLETED WITH PLATE "A" FLAT TO THE TABLE.
4) ALL VERTICAL WELDS TO BE DOWNHILL.
NOTE: WELD #3 WELD 4 PLC. TYP WRAP CORNERS

NOTE: WELD #2 WELD 4 SIDES TYP.

1) WELD IN ACCORDANCE WITH WPS#103
2) TACK COMPLETE ASSEMBLY IN ANY POSITION.
3) WELDING TO BE COMPLETED WITH PLATE "A" FLAT TO THE TABLE.
4) ALL VERTICAL WELDS TO BE UPHILL.
5) NOT POST CLEANING.

<table>
<thead>
<tr>
<th>ITEM NO.</th>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
<th>QTY.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>GTAW_A</td>
<td>.125 X 6.0 X 6.0</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>GTAW_B</td>
<td>.125 X 4.0 X 4.0</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>GTAW_C</td>
<td>.125 X 5.0 X 5.0</td>
<td>1</td>
</tr>
</tbody>
</table>
**30° BEVEL**

**ALL PROCESS TO BE COMPLETE WITH PROVIDED MATERIAL**

1) LAYOUT IN ANY POSITION
2) CUTTING TO BE COMPLETED WITH PLATE FLAT ON TABLE

<table>
<thead>
<tr>
<th>ITEM NO.</th>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
<th>QTY.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>OFC_2018</td>
<td>1/2 X 12 X 12 PLATE</td>
<td>1</td>
</tr>
</tbody>
</table>
ALL PROCESSES TO BE COMPLETED WITH PROVIDED MATERIALS.

1) TACK COMPLETE ASSEMBLY IN ANY POSITION.
2) WELDING TO BE COMPLETED WITH PLATE "A" FLAT ON TABLE.
## Skills Alabama 2018

### Welding procedure specification

**WPS No.** 101  |  **Revision** 3  |  **Date:** 04/19/2018  |  **By:** Ryan Green  
--- | --- | --- | ---  
**Authorized by:** RG  |  **Date:** 02/19/2018  |  **Pre-qualified**  
**Welding Process** SMAW  |  **Type:** Manual  |  **Machine**  |  Semi Auto  |  Auto  
**Supporting PQR(s)** prequalified

### Joint

- **Type:** T-Joint  
- **Backing:** Yes  |  No  |  Single weld  |  Double weld  
- **Backing 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 Metal

- **Material spec:** A36 to A36  
- **Type or Grade:** n/a to n/a  
- **Thicknes:** Groove (in) N/A  
- **Fillet (in):** Unlimited –  
- **Diameter (pipe):** N/A

### Filler Metals

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

### Shielding

- **Flux** n/a  
- **Gas composition** n/a  
- **Electrode-Flux (class)** n/a  
- **Flow rate** n/a

### Preheat Min 60° F min

- **Thickness Up to ¾” Temp** n/a  
- **¾”-1-1/2”** n/a  
- **1-1/2” – 2-1/2”** n/a  
- **Over 2-1/2”** n/a  
- **Interpass Temp Min.** Max.

### Position

- **Position of Groove:** Fillet 1F, 2F, 3G  
- **Vertical Progression:** UP  |  DOWN

### Electrical Characteristics

- **Transfer mode (GMAW):** Short circuiting  |  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 of 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  
- **Interpass Cleaning:** Chip slag & Wire Brush

### Post Weld Treatment

- **PWHT Required**  
- **Temp** n/a  
- **Time** n/a

<table>
<thead>
<tr>
<th>Layer</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>1/8”</td>
<td>DCEP</td>
<td>100-130</td>
<td>N/A</td>
<td>4-10 ipm</td>
<td>n/a</td>
</tr>
</tbody>
</table>
**Skills Alabama 2018**

**Welding procedure specification**

WPS No. 103  Revision 2  Date: 04/19/2018  By: Ryan Green

Authorized by: RG  Date: 02/19/2018  Pre-qualified  

Welding Process GTAW  Type: Manual □  Machine □  Semi Auto □  Auto □  

Supporting PQR(s) prequalified

---

### Joint

- **Type**: Butt, T-Joint  
- Backing: Yes □ No □ Single weld □ Double weld □  
- Backing material: N/A  
- Root opening: 0  
- Root face dimension: 0  
- Groove Angle 30-90°  
- Back Gouge: Yes □ No □  
- Method: n/a

### Base Metal

- Material spec: 3003-3003  
- Type or Grade: n/a to n/a  
- Thickness: Groove (in): N/A  
- Diameter (pipe): 4” - Unlimited

### Filler Metals

- AWS Specification: A5.10  
- AWS Classification: ER4043

### Shielding

- Flux: n/a  
- Gas composition: 100% Argon  
- Flow rate: 15-25 CFH  
- Gas cup size: 3/8” min #6

### Preheat Min 60° F min

- Thickness Up to 3/8” Temp: n/a  
- 3/8”-1-1/2” Temp: n/a  
- 1-1/2” - 2-1/2” Temp: n/a  
- Over 2-1/2 Temp: n/a  
- Interpass Temp Min.  
- Interpass Temp Max.

### Position

- Position of Groove: ALL  
- Vertical Progression: UP □ DOWN □

### Electrical Characteristics

- Transfer mode (GMAW): Short circuiting □ Globular □ Spray □  
- Current: AC □ DCEP □ DCEN □ Pulsed □  
- Other: n/a

### Technique

- Tungsten Electrode (GTAW): 
  - Size: 3/32”  
  - Type: EWCe2

### Post Weld Treatment

- PWHT Required □  
- Temp: n/a  
- Time: n/a

---

<table>
<thead>
<tr>
<th>Layer</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”</td>
<td>AC</td>
<td>110-175</td>
<td>N/A</td>
<td>4-8 ipm</td>
<td>AC bal 65-75%EN AC Hz 60-120</td>
</tr>
</tbody>
</table>
**Skills Alabama 2018**

**Welding procedure specification**

WPS No. 104  Revision 2    Date: 04/19/2018 By: Ryan Green
Authorized by: RG  Date: 02/19/2018

<table>
<thead>
<tr>
<th>Joint</th>
<th>Type T-Joint</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Backing Yes □ No ☑ Single weld ☑ Double weld ☑</td>
</tr>
<tr>
<td></td>
<td>Backing material: N/A</td>
</tr>
<tr>
<td></td>
<td>Root opening: n/a Root face dimension n/a</td>
</tr>
<tr>
<td></td>
<td>Groove Angle n/a Radius (J-U) n/a</td>
</tr>
<tr>
<td></td>
<td>Back Gouge Yes ☑ No ☑</td>
</tr>
<tr>
<td></td>
<td>Method n/a</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Base Metal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material spec A36 to A36</td>
</tr>
<tr>
<td>Type or Grade n/a to n/a</td>
</tr>
<tr>
<td>Thickness: Groove( ) n/a - n/a Fillet ( ) Unlimited -</td>
</tr>
<tr>
<td>Diameter (pipe) n/a – n/a</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Filler Metals</th>
</tr>
</thead>
<tbody>
<tr>
<td>AWS Specification A5.18</td>
</tr>
<tr>
<td>AWS Classification ER70S-6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Shielding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flux n/a</td>
</tr>
<tr>
<td>Gas composition</td>
</tr>
<tr>
<td>75%Argon, 25%CO2</td>
</tr>
<tr>
<td>Electrode-Flux (class) n/a Flow rate 35-45CFH</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Preheat Min 60°F min</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thickness Up to ¾“ Temp n/a</td>
</tr>
<tr>
<td>¾”-1-1/2” n/a</td>
</tr>
<tr>
<td>1-1/2” – 2-1/2” n/a</td>
</tr>
<tr>
<td>Over 2-1/2 n/a</td>
</tr>
<tr>
<td>Interpass Temp Min. Max.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Electrical Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transfer mode (GMAW) 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 N/A</td>
</tr>
<tr>
<td>Size n/a Type n/a</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Technique</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stringer or Weave bead: Stringer</td>
</tr>
<tr>
<td>Multi pass of single pass per side multiple/single</td>
</tr>
<tr>
<td>Number of electrodes 1</td>
</tr>
<tr>
<td>Electrode Spacing Longitudinal n/a</td>
</tr>
<tr>
<td>Lateral n/a</td>
</tr>
<tr>
<td>Angle n/a</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Post Weld Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>PWHT Required ☑</td>
</tr>
<tr>
<td>Temp n/a Time n/a</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Layer</th>
<th>Process</th>
<th>Filler Metal class</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>GMAW</td>
<td>ER70S-6 .035”</td>
</tr>
<tr>
<td></td>
<td>DCEP</td>
<td>90-150</td>
</tr>
<tr>
<td></td>
<td>Cur. Type</td>
<td>Amps</td>
</tr>
<tr>
<td></td>
<td>16-20</td>
<td>6-8 ipm</td>
</tr>
</tbody>
</table>
Skills Alabama 2018
Welding procedure specification

WPS No. 106  Revision 2  Date: 04/19/2018  By: Ryan Green
Authorized by: RG  Date: 02/19/2018  Pre-qualified ☑
Welding Process SMAW  Type: Manual ☑  Machine ☐  Semi Auto ☐  Auto ☐
Supporting PQR(s) prequalified

Joint
Type T-Joint
Backinmg Yes ☐  No ☑  Single weld ☑  Double weld ☐
Backinmg 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 Metal
Material spec A36 to A36
Type or Grade n/a to n/a
Thickness: Groove( ) n/a - n/a
Fillet ( in) Unlimited –
Diameter (pipe) n/a – n/a

Filler Metals
AWS Specification A5.1
AWS Classification E6010

Shielding
Flux n/a  Gas composition N/A
Electrode-Flux (class) N/A  Flow rate N/A

Preheat Min 60° F min
Thickness Up to ¾” Temp n/a
¾”-1-1/2” n/a
1-1/2” – 2-1/2” n/a
Over 2-1/2 n/a
Interpass Temp Min. _______  Max. ______

Position
Position of Groove vertical  Fillet All
Vertical Progression Up Vertical

Electrical Characteristics
Transfer mode
Short circuiting ☐  Globular ☑  Spray ☐
Current AC ☐  DCEP ☑  DCEN ☐  Pulsed ☐
Other N/A
Tungsten Electrode N/A
Size N/A  Type N/A

Technique
Stringer or Weave bead: Stringer
Multi pass of 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 ¼ to 3/8”

Post Weld Treatment PWHT Required ☐

Temp n/a  Time n/a

Layer  Process  Filler Metal class  Diameter  Cur. Type  Amps  Volts  Travel speed
All  SMAW  E6010  .125”  DCEP  70-110  16-20  6-8 ipm
**Skills Alabama 2018**

**Welding procedure specification**

WPS No. 108  Revision 1   Date: 04/19/2018   By: Ryan Green

Authorized by: RG  Date: 02/19/2018  Pre-qualified ✓

Welding Process FCAW-G  Type:  Manual ☐  Machine ☐  Semi Auto ☑  Auto ☑

Supporting PQR(s) prequalified

---

**Joint**

Type T-Joint, Butt, Flanged

Backing Yes ☐  No ☑  Single weld ☑  Double weld ☑

Backing material: n/a

Root opening: 0-3/16”  Root face dimension n/a

Groove Angle n/a  Radius (J-U) n/a

Back Gouge Yes ☐  No ☑

Method n/a

---

**Base Metal**

Material spec A36 to A36

Type or Grade n/a to n/a

Thickness: Groove( ) n/a - n/a

Fillet (in) Unlimited – n/a

Diameter (pipe) n/a – n/a

---

**Filler Metals**

AWS Specification A5.20

AWS Classification E71T-1

---

**Shielding**

Flux n/a  Gas composition 75% Argon, 25% CO2

Electrode-Flux (class) n/a  Flow rate 35-45CFH

Gas Cup size ½ - ¾ “

---

**Preheat Min 60° F min**

Thickness Up to ¾” Temp n/a

¾” - 1-1/2” n/a

1-1/2” - 2-1/2” n/a

Over 2-1/2 n/a

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 ☐  DCEP ☑  DCEN ☐  Pulsed ☑

Other n/a

Tungsten Electrode (GTAW)

Size n/a  Type n/a

---

**Technique**

Stringer or Weave bead: Both

Multi pass of 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 ½ to ¾ “

**Post Weld Treatment** PWHT Required ☐

Temp n/a  Time n/a

---

**Layer**  **Process**  **Filler Metal class**  **Diameter**  **Cur. Type**  **Amps**  **Volts**  **Travel speed**  **Other notes**

All  FCAW-G  E71T-1M  .045”  DCEP  200-300  22.5-26  5-12 ipm  WFS 340-500 ipm

Recommend setting

1F & 2F

260  26  500 ipm

4F

220  24  380 ipm

3F

200  24  340 ipm
## Skills Alabama 2018

**Welding procedure specification**

**WPS No. 110  Revision 2  Date: 04/19/2018  By: Ryan Green**

**Authorized by: RG  Date: 02/19/2018  Pre-qualified ☑**

- **Welding Process GMAW-S**
  - Type: Manual ☐  Machine ☐  Semi Auto ☑  Auto ☑
  - Supporting PQR(s) prequalified

### Joint
- **Type:** T-Joint
- **Backing:** Yes ☐  No ☑ Single weld ☑  Double weld ☑
- **Backing 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 Metal
- **Material spec:** A36 to A36
- **Type or Grade:** n/a to n/a
- **Thickness:** Groove ( ) n/a - n/a
- **Fillet ( in):** Unlimited –
- **Diameter (pipe):** n/a – n/a

### Filler Metals
- **AWS Specification:** A5.18
- **AWS Classification:** ER70S-6

### Shielding
- **Flux:** n/a  **Gas composition:** 75%Argon, 25%CO2
- **Electrode-Flux (class):** n/a  **Flow rate:** 35-45CFH

### Preheat Min 60° F min
- **Thickness Up to ¾” Temp:** n/a
- **¾”-1-1/2” Temp:** n/a
- **1-1/2” – 2-1/2” Temp:** n/a
- **Over 2-1/2 Temp:** n/a
- **Interpass Temp Min. Max.**

### 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:** Stringer
- **Multi pass of single pass per side:** multiple/single
- **Number of electrodes:** 1
- **Electrode Spacing Longitudinal:** n/a
- **Lateral:** n/a
- **Angle:** n/a

### Post Weld Treatment
- **PWHT Required:** ☑

<table>
<thead>
<tr>
<th>Layer</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>.035”</td>
<td>DCEP</td>
<td>90-150</td>
<td>16-20</td>
<td>6-8 ipm</td>
<td>WFS 140-250 ipm</td>
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</tbody>
</table>