SECTION 18: Welding Project
Thank you for again for taking the time to make tomorrow’s workforce more prepared.

<table>
<thead>
<tr>
<th>ID</th>
<th>Qty</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>0.25 x 8 x 8 Steel Plate</td>
</tr>
<tr>
<td>B</td>
<td>1</td>
<td>1/4 x 3 x 3.75 Plate</td>
</tr>
<tr>
<td>C</td>
<td>1</td>
<td>3 x 5.0# x 10 Steel Channel</td>
</tr>
<tr>
<td>D</td>
<td>1</td>
<td>0.25 x 6 x 10 Steel Plate</td>
</tr>
<tr>
<td>E</td>
<td>1</td>
<td>1/4 x 3 x 6 Plate</td>
</tr>
<tr>
<td>F</td>
<td>1</td>
<td>5/16 x 3 x 3 x 6 Steel Angle</td>
</tr>
</tbody>
</table>

ALL PROCESSES TO BE COMPLETED WITH THE MATERIALS PROVIDED
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

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
A’=YES it meets this criterion
‘B’ = NO it does NOT meet this criterion

**OFC FINAL**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Does the bevel angle stay within +/− 5 degrees in any location along? its entire length? (Use angle finder tool)</td>
</tr>
<tr>
<td>2</td>
<td>Does the cut quality of the BEVEL face display minimal undulations? that do not exceed an inconsistency greater than 1/32 in?</td>
</tr>
<tr>
<td>3</td>
<td>Does the cut quality of the LARGE SHAPE face display minimal undulations that do not exceed an inconsistency greater than 1/32 in?</td>
</tr>
<tr>
<td>4</td>
<td>Does the cut quality of the SMALL SHAPE face display minimal undulations that do not exceed an inconsistency greater than 1/32 in?</td>
</tr>
<tr>
<td>5</td>
<td>Does the cut quality of the THIRD SHAPE face display minimal undulations that do not exceed an inconsistency greater than 1/32 in?</td>
</tr>
<tr>
<td>6</td>
<td>Does the cut stay inside the diameter of the Go / no-go gauge for the? Large SHAPE?</td>
</tr>
<tr>
<td>7</td>
<td>Does the cut stay inside the diameter of the Go / no-go gauge for the? Small SHAPE?</td>
</tr>
<tr>
<td>8</td>
<td>Does the cut stay inside the diameter of the Go / no-go gauge for the? THIRD SHAPE?</td>
</tr>
<tr>
<td>9</td>
<td>Does the Go / no-go gauge fit inside of the Large Shape?</td>
</tr>
<tr>
<td>10</td>
<td>Does the Go / no-go gauge fit inside of the Small Shape?</td>
</tr>
<tr>
<td>11</td>
<td>Does the Go / no-go gauge fit inside of the THIRD SHAPE?</td>
</tr>
<tr>
<td>12</td>
<td>Is the Bevel accuracy along its length Straight to within no more than? a variation of 1/8 in.? (Set two parallel lines along the entire length of the bevel and no point should fall outside that window)</td>
</tr>
</tbody>
</table>

**Was there a safety infraction? BE SURE TO NOTE The Competitor Number and Explain the safety violation on the Safety Infraction Sheet.**
SkillsUSA State Welding Contest

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

SHEET 1 OF 1
‘A’=YES it meets this criterion
‘B’ = NO it does NOT meet these criteria

GTAW FINAL

<table>
<thead>
<tr>
<th>Assembly Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Is the Project Assembled in Accordance to the Drawing?</td>
</tr>
<tr>
<td>2 Was the order of operations followed?</td>
</tr>
<tr>
<td>3 The GTAW Project should show no post weld wire brushing, does this project display no post weld wire brushing?</td>
</tr>
<tr>
<td>4 Weld #_____Placed in the proper Location?</td>
</tr>
<tr>
<td>5 Weld #_____Proper Size and Length?</td>
</tr>
<tr>
<td>6 Weld #_____Overall bead width not to exceed 1/32 in. variation in width (from max to min) for any weld face. Does the weld meet this requirement?</td>
</tr>
<tr>
<td>7 Are all present welds free from porosity? No visible porosity is acceptable, Do the Welds Meet this Requirement?</td>
</tr>
<tr>
<td>8 Weld #_____Crater Cross Section. All craters should be filled to provide the specified weld size, except for the end of intermittent fillet welds outside of their effective length. Are the weld craters filled to the weld size?</td>
</tr>
<tr>
<td>9 Did Welder complete________Number of welds or more?</td>
</tr>
<tr>
<td>10 Did Welder complete________Number of welds or more?</td>
</tr>
<tr>
<td>11 Did Welder complete________Number of welds or more?</td>
</tr>
<tr>
<td>12 FOR PROJECTS THAT HAVE_________OR MORE WELDS COMPLETED (For projects with less weld, or it has been wire-brushed, the answer is NO. &quot;Touchdowns&quot; are when the tungsten is touched to the workpiece or the filler metal and an indication can be visible as long as no post wire-brushing is performed. Is the project free from any &quot;touchdowns&quot;?)</td>
</tr>
</tbody>
</table>

Was there a safety infraction? BE SURE TO NOTE The Competitor Number and Explain the safety violation on the Safety Infraction Sheet.
ALL PROCESSES TO BE COMPLETED WITH THE MATERIALS PROVIDED

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. NO POST CLEANING

State SkillsUSA Welding Contest

GTAW

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES

SHEET 1 OF 1
<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>110-175</td>
<td>N/A</td>
<td>4-8 ipm</td>
<td>AC Bal. 65-75% EN</td>
</tr>
</tbody>
</table>

**SHIELDING**
- Flux: N/A
- Gas: 100% Argon
- Electrode-Flux (Class): N/A
- Flow Rate: 15-25 CFH
- Gas Cup Size: 3/8" Min. (#6)

**BASE METALS**
- Material Spec.: 3003 to 3003
- Type or Grade: N/A

**JOINT**
- Type: T-Joint / Corner
- Backing: Yes, No
- Backing Material: N/A
- Root Opening: 0
- Root Face Dimension: 0
- Groove Angle: 30-90
- Radius (J-U): N/A
- Back Gouge: Yes, No
- Method: N/A

**FILLER METALS**
- AWS Specification: A5.10
- AWS Classification: ER4043

**ELECTRICAL CHARACTERISTICS**
- Transfer Mode (GMAW):
  - Short-Circuiting
  - Spray
  - Current: AC DCEP DCEN Pulsed
- Other: N/A
- Tungsten Electrode (GTAW):
  - Size: 3/32"
  - Type: EWCo2

**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

**POSTWELD HEAT TREATMENT**
- PWHT Required: N/A

**TECHNIQUE**
- Stringer or Weave Bead: Stringer
  - 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: N/A

**WELDING PROCEDURE**
| 1 | Has surface slag, spatter, and smoke been removed from all the joints and surrounding areas? |
| 2 | Is the Project Assembled in Accordance to the Drawing? |
| 3 | Does the overall workmanship display consistency among all welds? (ALL WELDS MUST BE GENERALLY CONSISTENT WITH NO SIGNIFICANT DISCONTUNITIES) |
| 4 | Weld #______Crack Propagation. Any crack is unacceptable. Are there no visible cracks? (Yes= "Yes, there are no visible cracks) |
| 5 | Weld #______Crater Cross Section. All craters should be filled to provide the specified weld size, except for the end of intermittent fillet welds outside of their effective length. Are the weld craters filled to the weld size? |
| 6 | Weld #______Overall bead width not to exceed 1/16 in. variation in width (from max to min) for any weld face. Does the weld meet this requirement? |
| 7 | Weld #______Porosity. No visible porosity is acceptable, Does the Weld Meet this Requirement? |
| 8 | Weld #______Undercut. Not to exceed 1/32 in depth for a total accumulated length of 1/2in. Does the weld meet this requirement? |
| 9 | Weld #______Undersized Welds. Weld Size not to be larger by anything greater than 1/16 in. anywhere along the weld length and no smaller than specified on the drawing. Does the weld size meet this requirement? |
| 10 | Weld #______Weld Profiles. Fillet welds can be slightly concave, flat, or slightly convex with the crown not to exceed 3/32 in. above flush. Groove Welds can be flush with an even crown not to exceed 3/32 in. Does this weld meet this requirement? |
| 11 | Weld #______Weld/Base metal Fusion. Complete fusion shall exist between base and weld metal. Does the weld display complete fusion with no cold lap? |
| 12 | Weld #______There shall be no Arc Marks outside the weld area. Does the weld meet this requirement? |

Was there a safety infraction? BE SURE TO NOTE The Competitor Number and Explain the safety violation on the Safety Infraction Sheet.
ALL PROCESSES TO BE COMPLETED WITH THE MATERIALS PROVIDED

1. WELD IN ACCORDANCE WITH WPS# 101 UNLESS NOTED
2. TACK COMPLETE ASSEMBLY IN ANY POSITION
3. WELD COMPLETE ASSEMBLY WITH PLATE A FLAT TO THE TABLE
4. ALL VERTICAL WELDS TO BE UPHILL

SkillsUSA State Welding Contest
SMAW

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

SkillsUSA

American Welding Society

Sheet 1 of 1
# Welding Procedure Specification

**WPS No.** WPS 101  
**Revision** 3  
**Date** 4/21/2013  
**By** NP

**Authorized by** GH  
**Date** 5/15/2011  
**Prequalified** □

**Welding Process(es)** SMAW  
**Type** Manual Machine □ Semi-Auto □ Auto □

**Supporting PQR(s)** Prequalified

**JOINT**

Type Butt / T-Joint  
Backc Groove to A-36  
Backc Groove opening 1/8" ±1/16"  
Root Face Dimension: 0" - 1/8"  
Groove Angle 45 Deg.  
Back gouge Yes, □ No □

**BASE METALS**

Material Spec. to A-36  
Type or Grade to  
Thickness: Groove (in ) 1/8 - 3/4  
Fillet ( ) Unlimited  
Diameter (Pipe, in ) 4 - Unlimited

**FILLER METALS**

AWS Specification A5.1  
AWS Classification E-7018  
Tungsten Electrode (GTAW): Size N/A  
Type N/A

**SHIELDING**

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

**PREHEAT**

Preheat Temp., Min. 60 Deg.F  
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

**POSTWELD HEAT TREATMENT**

PWHT Required □

**ELECTRICAL CHARACTERISTICS**

Transfer Mode (GMAW): Short-Circuiting □ Spray □  
Other □

**TECHNIQUE**

Stringer or Weave Bead Both □ Multi-pass or Single Pass (per side)  
Number of Electrodes 1  
Electrode Spacing: Longitudinal N/A  
Lateral N/A

**WELDING PROCEDURE**

Layer/Pass Process Filler Metal Class Diameter Cur. Type Amps Volts Travel Speed Other Notes  
All SMAW E-7018 3/32 DCEP 70-110 N/A 4-10 ipm  
All SMAW E-7018 1/8 DCEP 90-150 N/A 4-10 ipm

**POSITION**

Position of Groove 1G,2G,3G,4G Fillet 1F,2F,3F,4F  
Vertical Progression: Up □ Down □
Welding Procedure Specification

<table>
<thead>
<tr>
<th>WPS No.</th>
<th>WPS 106</th>
<th>Revision</th>
<th>2</th>
<th>Date</th>
<th>4/20/2012</th>
<th>By</th>
<th>NP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Authorized by</td>
<td>GH</td>
<td>Date</td>
<td>5/15/2011</td>
<td>Prequalified</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Welding Process(es)**

- **Type**: Manual
- **Machine**: 
- **Semi-Auto**: 
- **Auto**: 

**Supporting PQR(s)**

- Prequalified

## JOINT

- **Type**: T-Joint

<table>
<thead>
<tr>
<th>Backing</th>
<th>Yes</th>
<th>No</th>
<th>Single Weld</th>
<th>Double Weld</th>
</tr>
</thead>
<tbody>
<tr>
<td>Backing Material</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Root Opening</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Root Face Dimension</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groove Angle</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radius (J-U)</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Back Gouge</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## BASE METALS

- **Material Spec.**: A-36 to A-36

| Thickness: Groove (in ) | N/A | - | N/A |
| Diameter (Pipe, in ) | Unlimted | - | N/A |

## FILLER METALS

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

## PREHEAT

- **Preheat Temp., Min.**: 60 Deg.F

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

## SHIELDING

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

## ELECTRICAL CHARACTERISTICS

- **Transfer Mode (GMAW)**
  - Short-Circuiting
  - Globular
  - Spray
  - Current: DCEP
  - 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 |

<table>
<thead>
<tr>
<th>Interpass Cleaning</th>
<th>Chip slag and wire brush</th>
</tr>
</thead>
</table>

## POSTWELD HEAT TREATMENT

- **PWHT Required**: |

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

## WELDING PROCEDURE

<table>
<thead>
<tr>
<th>Layer/Pass Process</th>
<th>Filler Metal Class</th>
<th>Diameter Cur.</th>
<th>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>DCEN</td>
<td>90-115</td>
<td>N/A</td>
<td>4-10 ipm</td>
</tr>
</tbody>
</table>
## Welding Procedure Specification

**WPS No.** WPS 107  
**Revision** 2  
**Date** 4/20/2012  
**By** NP  
**Authorized by** GH  
**Date** 5/15/2011  
**Prequalified**

### Welding Process(es)
- **SMAW**  
  **Type:** Manual  
  Machine ☐  Semi-Auto ☐  Auto ☐

### Supporting PQR(s)
- Prequalified

### JOINT
- **Type:** T-Joint
- **Backin**g Yes, ☐ No Single Weld Double Weld ☐
- **Backin**g 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.** A-36 to A-36
- **Type or Grade to**
- **Thickness:**
  - Groove (in ) N/A
  - Fillet ( ) Unlimited
  - Diameter (Pipe, in ) N/A

### FILLER METALS
- **AWS Specification** A5.1
- **AWS Classification** E-7024

### SHIELDING
- **Flux** N/A
- **Gas** N/A
- **Composition** N/A

### 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
- **Both**
- **Multiple/Single**
- **Number of Electrodes** 1
- **Electrode Spacing:**
  - Longitudinal N/A
  - Lateral N/A
- **Contact Tube to Work Distance** N/A
- **Angle** N/A
- **Interpass Cleaning** Chip slag and wire brush

### POSTWELD HEAT TREATMENT
- **PWHT Required** ☐

### 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 CLEANING
- **Interpass Temp., Min.** N/A  
  **Max.** N/A  
  **Temp.** N/A  
  **Time** N/A

### WELDING PROCEDURE
- **Layer/Pass Process**
- **Filler Metal Class**
- **Diameter Cur. Type**
- **Amps**
- **Volts**
- **Travel Speed**
- **Other Notes**

<table>
<thead>
<tr>
<th>Layer/Pass Process</th>
<th>Filler Metal Class</th>
<th>Diameter Cur. Type</th>
<th>Amps</th>
<th>Volts</th>
<th>Travel Speed</th>
<th>Other Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>All SM</td>
<td>A W</td>
<td>E-7024</td>
<td>1/8</td>
<td>DCEP</td>
<td>130-150</td>
<td>N/A</td>
</tr>
</tbody>
</table>
‘A’=YES it meets these criteria  
‘B’ = NO it does NOT meet these criteria

<table>
<thead>
<tr>
<th>Assembly Questions</th>
<th>1 Has surface slag, spatter, and smoke been removed from all the joints and surrounding areas?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2 Is the Project Assembled in Accordance to the Drawing?</td>
</tr>
<tr>
<td></td>
<td>3 Does the overall workmanship display consistency among all welds? (ALL WELDS MUST BE GENERALLY CONSISTENT WITH NO SIGNIFICANT DISCONTUNITIES)</td>
</tr>
<tr>
<td>Weld #_____</td>
<td>Crater Cross Section. All craters should be filled to provide the specified weld size, except for the end of intermittent fillet welds outside of their effective length. Are the weld craters filled to the weld size?</td>
</tr>
<tr>
<td>Weld #_____</td>
<td>Overall bead width not to exceed 1/16 in. variation in width (from max to min) for any weld face. Does the weld meet this requirement?</td>
</tr>
<tr>
<td>Weld #_____</td>
<td>Porosity. No visible porosity is acceptable, Does the Weld Meet this Requirement?</td>
</tr>
<tr>
<td>Weld #_____</td>
<td>Undercut. Not to exceed 1/32 in depth for a total accumulated length of 1/2in. Does the weld meet this requirement?</td>
</tr>
<tr>
<td>Weld #_____</td>
<td>Undersized Welds. Weld Size not to be larger by anything greater than 1/16 in. anywhere along the weld length and no smaller than specified on the drawing. Does the weld size meet this requirement?</td>
</tr>
<tr>
<td>Weld #_____</td>
<td>Weld Profiles. Fillet welds can be slightly concave, flat, or slightly convex with the crown not to exceed 3/32 in. above flat. Groove Welds can be flush with an even crown not to exceed 3/32 in. Does this weld meet this requirement?</td>
</tr>
<tr>
<td>Weld #_____</td>
<td>Weld/Base metal Fusion. Complete fusion shall exist between base and weld metal. Does the weld display complete fusion with no cold lap?</td>
</tr>
<tr>
<td>Weld #_____</td>
<td>There shall be no Arc Marks outside the weld area. Does the weld meet this requirement?</td>
</tr>
<tr>
<td>Weld #_____</td>
<td>All other Fillet Welds Undersized Welds. Weld Size not to be larger by anything greater than 1/16 in. anywhere along the weld length and no smaller than specified on the drawing. Do all remaining fillet welds meet this requirement?</td>
</tr>
</tbody>
</table>

Was there a safety infraction? BE SURE TO NOTE The Competitor Number and Explain the safety violation on the Safety Infraction Sheet.
ALL PROCESSES TO BE COMPLETED WITH THE MATERIALS PROVIDED

1. WELD IN ACCORDANCE WITH WPS# 104-035
2. TACK COMPLETE ASSEMBLY IN ANY POSITION
3. WELD COMPLETE ASSEMBLY WITH PLATE D FLAT TO THE TABLE
4. ALL VERTICAL WELDS TO BE DOWNHILL

SkillsUSA Welding Contest

GMAW

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
WPS No. WPS 104  Revision 2  Date 06/20/2015  By NP

Authorized by EN  Date 6/20/2015  Prequalified □

Welding Process(es)  GMAW-S  Type: Manual □  Machine □  Semi-Auto ■  Auto □

Supporting PQR(s)  Prequalified

JOINT
Type T-Joint ■ ■ ■
Backing Yes, □ no Single Weld Double Weld ■
Back Gouge Yes, □ No ■

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

FILLER METALS
AWS Specification A5.18
AWS Classification ER70S-6

SHIELDING
Flux Gas M20-ArC-10
N/A Composition 90%Argon/10%CO2
Electrode-Flux (Class) Flow Rate 35-45 CFH
N/A Gas Cup Size 1/2" - 3/4"

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

WELDING PROCEDURE
Layer/Pass Process Filler Metal Class Diameter Cur. Type Amps Volts Travel Speed Other Notes
All GMAW ER70S-6 0.035" DCEP 90-150 16-20 6-8 ipm WFS 140-35 0 ipm

POSITION
Position of Groove All  Fillet All
Vertical Progression: Up ■ Down □

ELECTRICAL CHARACTERISTICS
Transfer Mode (GMAW):
Short-Circuiting □ Gobular □ 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 or Single Pass (per side) Single
Number of Electrodes 1
Electrode Spacing: Longitudinal N/A
Lateral N/A
Angle N/A
Contact Tube to Work Distance 1/4" to 3/8"
Peening N/A Interpass Cleaning Chip slag and wire brush

POSTWELD HEAT TREATMENT
PWHT Required □
<table>
<thead>
<tr>
<th>Assembly Questions</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Has surface slag, spatter, and smoke been removed from all the joints and surrounding areas?</td>
</tr>
<tr>
<td>2</td>
<td>Is the Project Assembled in Accordance to the Drawing?</td>
</tr>
<tr>
<td>3</td>
<td>Does the overall workmanship display consistency among all welds? (ALL WELDS MUST BE GENERALLY CONSISTENT WITH NO SIGNIFICANT DISCONTUNITIES)</td>
</tr>
<tr>
<td>4</td>
<td>Weld # Crater Cross Section. All craters should be filled to provide the specified weld size, except for the end of intermittent fillet welds outside of their effective length. Are the weld craters filled to the weld size?</td>
</tr>
<tr>
<td>5</td>
<td>Weld # Overall bead width not to exceed 1/16 in. variation in width (from max to min) for any weld face. Does the weld meet this requirement?</td>
</tr>
<tr>
<td>6</td>
<td>Weld # Porosity. No visible porosity is acceptable, Does the Weld Meet this Requirement?</td>
</tr>
<tr>
<td>7</td>
<td>Weld # Undercut. Not to exceed 1/32 in depth for a total accumulated length of 1/2in. Does the weld meet this requirement?</td>
</tr>
<tr>
<td>8</td>
<td>Weld # Undersized Welds. Weld Size not to be larger by anything greater than 1/16 in. anywhere along the weld length and no smaller than specified on the drawing. Does the weld size meet this requirement?</td>
</tr>
<tr>
<td>9</td>
<td>Weld # Weld Profiles. Fillet welds can be slightly concave, flat, or slightly convex with the crown not to exceed 3/32 in. above flat Groove Welds can be flush with an even crown not to exceed 3/32 in. Does this weld meet this requirement?</td>
</tr>
<tr>
<td>10</td>
<td>Weld # Weld/Base metal Fusion. Complete fusion shall exist between base and weld metal. Does the weld display complete fusion with no cold lap?</td>
</tr>
<tr>
<td>11</td>
<td>Weld # There shall be no Arc Marks outside the weld area. Does the weld meet this requirement?</td>
</tr>
<tr>
<td>12</td>
<td>All other Fillet Welds Undersized Welds. Weld Size not to be larger by anything greater than 1/16 in. anywhere along the weld length and no smaller than specified on the drawing. Do all remaining fillet welds meet this requirement?</td>
</tr>
</tbody>
</table>

**Was there a safety infraction? BE SURE TO NOTE The Competitor Number and Explain the safety violation on the Safety Infraction Sheet.**
ALL PROCESSES TO BE COMPLETED WITH THE MATERIALS PROVIDED

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

SkillsUSA 1/2 Hour Welding Contest

FCAW-G

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
Welding Process(es) FCAW-G
Supporting PQR(s) Prequalified

JOINT
Type T-Joint, Butt, Flanged
Backoint Yes, No Single Weld Double Weld
Backoint Material N/A
Root Opening 0 Root Face Dimension N/A
Groove Angle N/A Radius (J-U) N/A
Back Gouge Yes, No 1/8" ±1/16"
Method N/A

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

FILLER METALS
AWS Specification A5.20
AWS Classification E71T-1

SHIELDING
FluxGas N/A Composition 75%Argon/25%CO2
Electrode-Flux (Class) Flow Rate 35-45 CFH
N/A Gas Cup Size 1/2" - 3/4"

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

POSTWELD HEAT TREATMENT PWHT Required
Temp. N/A Time N/A

<table>
<thead>
<tr>
<th>Layer/Pass</th>
<th>Process</th>
<th>Filler Metal Class</th>
<th>Diameter (in)</th>
<th>Cur. (amps)</th>
<th>Amps</th>
<th>Volts</th>
<th>Travel (ips)</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>

RECOMENDED SETTNGS:
1F&2F FCAW-G E71T-1M 0.045 DCEP 260 26 5-12 WFS:500ipm
4F FCAW-G E71T-1M 0.045 DCEP 220 24 5-12 WFS:380ipm
3F FCAW-G E71T-1M 0.045 DCEP 200 24 5-12 WFS:340ipm

This Project is a past national version and can be modified based on time, resources and materials. So, we advise that your Technical Committee and tech Chair review and decide what will work and adjust accordingly.