Cutting/ Welding Contest

Purpose
To evaluate each contestant’s ability to layout, cut a beam, cut an angle, and weld angles to a Beam according to drawing specifications.

Eligibility
The apprentice competing at the District Council level must be an apprentice during the year he or she is competing to go onto the International Competition. The apprentice may come from any year of apprenticeship. Apprentices may only compete at the International level once.

Clothing Requirement
Contestants must wear long pants, work boots (no tennis shoes), long sleeve shirt, hard hat, safety glasses with side shields, work gloves, personal protective equipment, and burning goggles (when burning). Prescription glasses can be used only if they are equipped with ANSI approved side shields (safety glasses and/or burning goggles must be at least a # 5 shade lens).

Equipment and Materials
The following equipment will be provided by the contest committee:
- Work gloves
- Personal protective equipment
- Torches, gauges, and tips
- Chipping hammers
- Scribes or awls
- Soapstone
- Center punches
- Tapes or rules
- Combination squares
- Framing squares 1’ and 2’
- Hammers
- Burning goggles
- Tip cleaners
- Compasses
- Clamps
- Vice grips
- Material for each contestant:
  - W10X30 Beam and a 3” X 3” X 3/8” angle
  - Materials are to be pre-stamped with the contestant’s number to avoid confusion
Safety glasses with side shields
Hard hats (worn during contest)
Ear protection
Welding hoods
Welding rods
Brushes
Required hand tools
Practice steel for adjusting the welding machine
Welding machines (all machines will be set at 0 prior to each contestant beginning their welding procedures)
Electrodes (1/8 Low Hydrogen)
1/4" Fillet gauge
3/8" Fillet gauge
Safety glasses with side shields
Ear protection

The contestant may provide the following:

- Work gloves
- Safety glasses with side shields *(safety glasses and/or burning goggles must be at least a # 5 shade lens)*
- Hard hat
- Burning goggles
- Tips for the Smith Equipment SC-229 Torch

**Contest Guidelines**

These guidelines will be followed during this contest:

1. Contestants will be randomly selected to determine the order in which they will demonstrate their ability to layout, cut and weld the project.

2. Contestants must wear their hard hat, safety glasses, gloves, and personal protective equipment at all times during the Cutting/Welding procedure.

3. The torch cutting test will consist of Field Fabrication of a Beam to specifications. Each contestant will have **180 minutes** to complete the contest. **60 mins** for Layout, **60 mins** for cutting and **60 mins** welding.

4. Each contestant’s Materials will be pre-stamped with the contestant number to avoid confusion.

5. The contestant will be expected to perform the following according to the drawing included in these guidelines:
Point Distribution

• Cut to a specific length Top Flange – (7) possible points
  ➢ Accuracy of layout and Cut (1)
  ➢ square cut (1)
  ➢ Average over all Smooth or rough cut (1-4)
  ➢ Cope of top Flange (1)

• Bottom Flange -(6) possible points
  ➢ Accurate lay out and cut (1)
  ➢ Square cut (1)
  ➢ Average over all Smooth or rough cut (1-4)

• Web – (6) possible points
  ➢ Accurate layout and cut (1)
  ➢ Square cut (1)
  ➢ Smooth or rough cut (1-4)

• Round bolt holes to accept ¾” inch bolt – (6) possible points
  ➢ accuracy of layout and cut hole #1 (1)
  ➢ Accuracy of layout and cut hole #2 (1)
  ➢ Accuracy of layout and cut hole # 3 (1)
  ➢ Bolt fits in hole #1 (1)
  ➢ Bolt fits in hole # 2 (1)
  ➢ Bolt fits in hole #3 (1)

• Layout of angle #1 and #2 to the Web of the W10X30 beam – (10) possible points
  ➢ Accurate layout and cutting of both angles (2)
  ➢ Average over all Smooth or rough cut of the four cuts (1-4)
  ➢ Accurate layout and placement of angle 1 on beam. (2)
  ➢ Accurate layout and placement of angle 2 on beam. (2)

• Welds of angles to web (40) Possible points
  5 points possible for weld # 1-8
  ➢ Weld size
  ➢ No porosity
  ➢ overlap, undercut not greater than 1/16”
  ➢ Uniform appearance
  ➢ Full complete welds at the ends
6. All tacks and welds will be performed with beam in upright position with top and flanges in the horizontal position. Verified by the Judge. Welds will be in the 2F, 3F, and 4F positions.

7. Contestants shall use only those tools listed in these guidelines (including their own tips).

8. The use of any circular or square objects such as, but not limited to, washers or test plugs will not be permitted to perform the layout of the beam or angles.

9. Lay out of the task must be exactly like the drawing included with these guidelines.

10. Contestants must use the torch, gauges, and hoses supplied by the contest committee.

11. The contestant must demonstrate correct safety practices at all times. The contest judges may stop a competitor at any time if they deem the contestant’s manner to be hazardous to either themselves or others. Such stoppage will disqualify the contestant from that section of the contest. If the contestant is warned a second time, he or she will be disqualified as a contest participant.

12. While the contest is in progress, there shall be no communication between the contestants or between the contestants and anyone else except as directed by a judge or contest official.

**Contest Scorecard**

This contest will be scored as follows:

1. The Burning/Welding contest is worth over all Thirty (30) points.

2. The judges will use the AWS C4.1-77 Surface Roughness Guide for Oxygen cutting and score each test.

3. The Judges will use the AWS D1.1 2020 Structural Welding Code for Visual Acceptability of Fillet welds. See Clause 6.9

4. Each contestant’s score is the number correct out of 75 multiplied by .40

Example: If a contestant gets 66 points out of 75 possible the score will be… 66 X .40 = 26.4
5. Point assignments will be as follows:

<table>
<thead>
<tr>
<th></th>
<th>POINTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>75</td>
<td>30</td>
</tr>
<tr>
<td>74</td>
<td>29.6</td>
</tr>
<tr>
<td>73</td>
<td>29.2</td>
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<tr>
<td>72</td>
<td>28.8</td>
</tr>
<tr>
<td>71</td>
<td>28.4</td>
</tr>
<tr>
<td>70</td>
<td>28.0</td>
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<tr>
<td>69</td>
<td>27.6</td>
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<td>67</td>
<td>26.8</td>
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<tr>
<td>66</td>
<td>26.4</td>
</tr>
<tr>
<td>65</td>
<td>26.0</td>
</tr>
<tr>
<td>Etc.</td>
<td></td>
</tr>
</tbody>
</table>

6. Contest judges should use the scoring sheet on the following page to record each contestant’s scores and then determine the points earned by each contestant.

7. These results will be submitted to the contest officials responsible for compiling the overall competition results.
Contest Scorecard

This contest will be scored as follows:

1. The cutting/welding contest is worth seventy-one (71) points with points earned for each of the following:
   2. Total points earned will be divided by total possible to give final score

   • Top flange
   • Bottom flange
   • Web of beam
   • Bolt holes to accept ¾” bolt
   • Angles #1 and #2 accurate lay out
   • Size of fillet welds #1 - #7

3. 1/8” accuracy for all cuts, holes and angle placement
   Cuts and placement of angles must be within 1/8 of square
   Holes must fit a ¾ bolt but cannot be more than 1/8 larger than the bolt

4. Cuts will be judged to the AWS C4.1-77 Surface Roughness Guide for Oxygen Cutting. The average of the cut will be scored, cut within 1/8” of square.

5. Welds will be judged to AWS D1.1. Points will be awarded using the 5 criteria listed of overall welds. 1 point per acceptable weld condition. 0 points for unacceptable weld condition per criteria.

6. Contest judges shall use the scoring sheet on the following page to record each contestant’s points for each task and then determine the total points earned by each contestant.

7. These results will be submitted to the contest officials responsible for compiling the overall competition results.

8. The head judge will have final say on any scoring discrepancies.
# Burning Contest Scoring Sheet

Layout start time: _______  Burn start time: ________  Weld start time: ___________

Judges: _____________________________________________________________

<table>
<thead>
<tr>
<th>Contestant Number</th>
<th>Top Flange Points</th>
<th>Bottom Flange Points</th>
<th>Web Points</th>
<th>Bolt Holes Points</th>
<th>Angle Points</th>
<th>Welding Points</th>
<th>Total Points</th>
<th>Total score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7 possible points</td>
<td>6 possible points</td>
<td>6 possible points</td>
<td>6 possible points</td>
<td>10 possible points</td>
<td>40 possible points</td>
<td>75 possible points</td>
<td></td>
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</table>