Skills USA Welding Fabrication Competition Update – 2022

State Welding Fabrication Winners:  
Congratulations on your accomplishments thus far. Please review these guidelines for the national competition in June. Your team will have 6.5 hours to complete your project. Keep in mind your team & project will be judged throughout your 6.5 hours.

The following information is intended to help you prepare for the contest. Be prepared for changes; these are common in the fabrication environment. Plan for stop points during your build; judges will need to inspect welds and other fabrication factors.

Refer to the drawing – 1st stop point will be the base plate w/ all internal components (no sides, front, or back). Competitors will need to ask a judge to inspect their build at this point!

Due to multiple factors concerning the execution of the 2022 contest the Welding Fab committee has decided to choose a project that will be used to benefit the fabrication contests. The committee has also decided to focus on one project each year and will no longer require competitors to practice for the upcoming fab project as well as designing another project for an unrelated project theme.

The project that you will be building in June is a mobile/modular weld curtain post. You will be provided with committee designed prints for this project. Teams will also be required to design their vision of this weld curtain post and those prints will be collected at orientation.

For Reference Only!

Drawings have been provided as of 5/16. This year’s project should be a good baseline of what is expected from entry-level fabricators. If teams are developing basic blueprint reading skills (including weld symbols), and practicing basic welds on material listed in this update then they should do well at the contest.

Best of luck! – The Welding Fabrication Committee looks forward to another great competition with you.
• **Fabrication Project:** Mobile/Modular Weld Curtain Post  
  *All teams will be fabricating this in June 2022*

• **Material List Supplied by Committee:**
  - Qty. 1 – 4’ x 4’, 3/16” HRS
  - Qty. 1 – 12’ of 3.5” square tubing
  - Qty. 1 – 3.5” polyurethane casters

• **Welding Consumables Supplied by Committee:**
  - .035 Lincoln SuperArc L-56 GMAW Consumable (ER70S-6)
  - 3/32” Hobart ER70S-2 GTAW Filler Rods
  - 1/8” Hobart ER70S-2 GTAW Filler Rods
  - 3/32” EWCe-2 Electrode

• **Minimum Project Requirements: only (2) weld processes this year!**
  - 13 GMAW welds will be designated for grading (Two 3F vertical up welds required – contestants’ choice for location)
  - 13 GTAW welds will be designated for grading (Two 3F vertical up welds required – contestants’ choice for location)
  - 5 OFC cuts of 6” or greater

• **Theme for Prints:** Mobile/Modular Weld Curtain Post

• **Guidelines for Design:**
  - Max footprint 24” square
  - Max height 8’
  - Allows for retractable curtains to be placed on at least 3 sides of the post.
  - Design to be mobile
  - Consider your design to be modular and could be connected to another team’s project.
  - Designed to be secured into a returnable/reusable metal skid for easy storage.
  - Steel material cannot be over $300

• **Blue Print Requirements:**
  - **Prints of your design must be ready to turn in at orientation.**
  - One set of prints on 11” x 17” paper printed in the Landscape mode (for grading)
    - In addition, a USB type drive containing prints in PDF format is required
      - USB drive will not be returned
      - Drives must only contain prints for project theme
  - No bindings or covers
  - Title block in lower right-hand corner with space titled Team ###.
    - **Your team number will be recorded** by the SkillsUSA staff when you turn in your prints.
  - No school name or identifying marks on the print
  - Max of 15 pages – You must have overall dimensions of the finished product included within the drawings you submit.
  - All Welds **MUST** have appropriate weld symbols included to show where the required welds and weld processes will be used on the parts
  - All vertical welds shall be noted
  - A blueprint can be neatly hand drawn if the team does not have access to design software.
    - An electronically scanned pdf copy is still required for all prints.
  - All prints **MUST** be created by the team.
  - Do NOT roll up paper copies
• Proposal for Future Projects
  o Propose a project that is worthy of being a national project
    ▪ Prepare any relevant information so that the committee can assess your project proposal.
    ▪ Labeled
      • “Proposal for Future Projects”
      • Sub-heading is to be whatever your project is
    ▪ Think of projects that can improve communities or can be used for the Welding Fab contests.
    ▪ No guarantees your project will be chosen

• Judging Overview:

<table>
<thead>
<tr>
<th>Category</th>
<th>Points</th>
<th>Judging Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety</td>
<td>30</td>
<td>Each safety infraction will be a 10pt deduction</td>
</tr>
<tr>
<td>GMAW</td>
<td>150</td>
<td>13 required welds will be judged on joint fit-up, size, contour and appearance</td>
</tr>
<tr>
<td>GTAW</td>
<td>150</td>
<td>13 required welds will be judged on joint fit-up, size, contour and appearance</td>
</tr>
<tr>
<td>OFC</td>
<td>150</td>
<td>5 required cuts will be judged on angle, appearance, dimension, bottom edges slag free and cuts free of chipping marks (Cuts must be judged prior to any cleaning, grinding, etc)</td>
</tr>
<tr>
<td>TEAMWORK</td>
<td>100</td>
<td>Students will be judged on equal participation, team communication and ability to work together</td>
</tr>
<tr>
<td>FABRICATION</td>
<td>150</td>
<td>5 critical dimensions will be judged for accuracy. Overall appearance and functionality are also scored</td>
</tr>
<tr>
<td>ORAL EXPLANATION</td>
<td>100</td>
<td>10 minute oral explanation of the project design and team's preparation. This will be conducted randomly during the 6-1/2 hour fabrication part of the competition</td>
</tr>
<tr>
<td>WELD DRAWINGS</td>
<td>100</td>
<td>Minimum requirements for Blueprint: Title Block, Proper Critical Dimensions, No Tolerances, Proper Welding Symbols, Proper Finishing Symbols, Proper Views to Fabricate the project, Proper Sub Assembly Drawings</td>
</tr>
<tr>
<td>PROPOSAL</td>
<td>45</td>
<td>Your team is to submit (1) proposal for a project that is worthy of being fabricated at national’s. Bring your proposal (hard copy) with you to turn in with your prints – format is of your choice.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▪ Labeled as “Proposal for Future Projects”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▪ Include a sub-heading with what the project is</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▪ Provide as much information as possible to describe the project</td>
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<td></td>
<td></td>
<td>▪ IF you have contact information for someone with direct experience with this project and that person wants to be contacted, please provide that. Their information will only be used by the Welding Fabrication committee to make contact.</td>
</tr>
<tr>
<td>PROFESSIONAL DEVELOPMENT TEST</td>
<td>25</td>
<td>Based of SkillsUSA Framework. Will be questions on Personal Skills, Workplace skills and technical skills</td>
</tr>
<tr>
<td>WRITTEN TEST</td>
<td>100</td>
<td>The 3 individual test scores will be averaged for your team's total score</td>
</tr>
</tbody>
</table>
• **Items that must be supplied by Teams:**
  - All Personal Protective Equipment
  - Full welding jackets or half jackets w/ bib are REQUIRED! - Sleeves only or uniform shirts are NOT ACCEPTABLE as a jacket
  - Hearing and/or ear protection
  - Welding helmet with appropriate filter plate/lens and protective cover plate/lens in a flip or slide front. Auto darkening shields are permissible
  - Spare spatter and filter lenses/plates for arc welding helmet and oxyacetylene goggles
  - Blueprints – See “Blue print requirements”
  - Résumé
  - Teams may bring personal hand tools but are not needed to complete the project.
    - See Welding Fabrication National Standards for more information

• **Tools Supplied by Committee to each team:**
  - Welding Machines
    - Lincoln Electric Powerwave 300 used for GMAW
    - Miller Multimatic 255 for GTAW
  - Environmental Equipment
    - 1 Environmental Extraction Unit per team (Miller Electric or Lincoln Electric)
  - Harris Calorific OFC Pipeliner Kit
  - Tungsten Electrodes
  - Materials from Bill of Materials
  - Two 4 ½” Metabo grinders
  - 3 cutting disks, 3 grinding disks and 3 sanding disks per team
  - Oxyacetylene goggles
  - Grinding face shields
  - Tool boxes consisting of the following tools:

<table>
<thead>
<tr>
<th>Tool</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calculator</td>
<td>1</td>
</tr>
<tr>
<td>Clamp - 12” Bar Type</td>
<td>1</td>
</tr>
<tr>
<td>Clamp - 24” Bar Type</td>
<td>1</td>
</tr>
<tr>
<td>Hammer - 3# (Short Handle)</td>
<td>1</td>
</tr>
<tr>
<td>Hammer – Chipping</td>
<td>2</td>
</tr>
<tr>
<td>Level - 24” Bubble Type</td>
<td>1</td>
</tr>
<tr>
<td>Measuring Tape - 25’</td>
<td>3</td>
</tr>
<tr>
<td>Pliers - Channel Lock (Large)</td>
<td>1</td>
</tr>
<tr>
<td>Pliers - Channel Lock (Small)</td>
<td>1</td>
</tr>
<tr>
<td>Pliers - Diagonal Wire Cutters</td>
<td>1</td>
</tr>
<tr>
<td>Pliers - Lineman's (Large)</td>
<td>1</td>
</tr>
<tr>
<td>Pliers - Needle Nose (Large)</td>
<td>1</td>
</tr>
<tr>
<td>Pliers - Slip Joint (large)</td>
<td>1</td>
</tr>
<tr>
<td>Pliers - Slip Joint (Small)</td>
<td>1</td>
</tr>
<tr>
<td>Screwdrivers - Flat Blade (Various Sizes)</td>
<td>5</td>
</tr>
<tr>
<td>Screwdrivers - Phillips Head (Various Sizes)</td>
<td>3</td>
</tr>
<tr>
<td>Square – Framing</td>
<td>1</td>
</tr>
<tr>
<td>Tin Snips</td>
<td>1</td>
</tr>
<tr>
<td>Vise Grips - 10WR (Regular Type)</td>
<td>1</td>
</tr>
<tr>
<td>Vise Grips - 11R (Short C-Clamp Type/Without feet)</td>
<td>2</td>
</tr>
<tr>
<td>Vise Grips - 11SP (Short C-Clamp Type/With feet)</td>
<td>2</td>
</tr>
<tr>
<td>Vise Grips - 18SP (Long C-Clamp Type/With feet)</td>
<td>2</td>
</tr>
<tr>
<td>Wrench - 8” Adjustable</td>
<td>1</td>
</tr>
<tr>
<td>Wrench - Set - Combination 1/4” to 7/8” (10 pcs)</td>
<td>1</td>
</tr>
</tbody>
</table>
• **Safety:**  
  o Face shields must be worn while grinding  
  o Helmets or oxyacetylene goggles must be worn while cutting  
  o **Welding jackets must be worn while welding**  
    ▪ (Full welding jackets or half jackets w/ bib are REQUIRED! - Sleeves only or your uniform shirt are NOT ACCEPTABLE as a jacket)  
    ▪ Competitors may remove their long sleeve uniform shirt while wearing a welding jacket  
    ▪ While not welding competitors must have long sleeves on and rolled down at all times  
      • You will be working in tight quarters and by the nature of your work you are constantly exposed to sharp material and hot parts – long sleeves minimize the risk of injury  
  o **Safety glasses must be worn at all times**  
  o **Hearing protection must be worn at all times**  
  o Only one welding machine may be used at time as there is only one piece of environmental equipment. Two grinders may be used in conjunction with the use of the one welding machine.  
  o Grinding sparks on the welding equipment and/or other people will result in a deduction in points  
  o Environmental equipment must be used at all times when welding. Points will be deducted for improper use.

• **Other Information:**  
  o When fabricating, supplied parts and/or steel pieces may not have the correct dimensions. If the dimensions are different than your prints, “on the job” corrections must be made. Notify the judges if materials are not the correct dimensions prior to any material prep. The judges will take that into consideration when judging.  
  o The oral interview will be conducted randomly during the 6-1/2 hour fabrication part of the competition.  
  o A team picture may be taken during your competition  
  o All projects will be donated  
  o **Teams are not permitted to bring any power tools, templates or additional material.**  
    ▪ Decimal / Fraction conversion cards are permitted  
  o **Possession or use of any electronic communication devices are not allowed in the contest area at any time.**  
  o **A collection box will be available to hold cell phones labeled with painters’ tape and team #**  
  o **Cell phones may not be substituted for calculators!**

• **Possible changes AFTER 2022**  
  o Some of the 6.5hr competition may be spent working with mixed teams.  
    ▪ The focus will be on teamwork  
    ▪ As entry-level fabricators, chances are while at their first job they will be working with people they are unfamiliar with. The idea of mixing teams is to expose them to this factor and evaluate their ability to work with people.  
  o Teams may be provided with a Welding Procedure Specification (WPS) and graded on how well they follow it.  
    ▪ This is being considered as a WPS is often required at fabrication companies.  
  o Standard tool boards with supplied tools will likely be in place.  
    ▪ Personal tools may be prohibited  
    ▪ This is to reduce safety hazards in the competition area  
    ▪ This also reduces teams’ burdens and costs of traveling to the competition