Skills USA Welding Fabrication Competition Update – 2019

State Welding Fabrication Winners:
Congratulations on your accomplishments thus far. Please review these guidelines for the national competition in June. Now is the time to plan and practice your build. 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. Manage your time wisely.

The 2018 national contest was the first year fabricating a standard project while thinking ahead to brainstorm and design a concept based project for the 2019. This was a learning experience for all of us however we survived and many positive things came from this. Among the positive was an improved ability to maintain safety and provide every team with equal and objective evaluation; additionally we began thinking of how welding fabrication could support a greater humanitarian cause.

Together we are going to continue this effort! Below you will find the standard project you are building and the concept project you are to design.

1) The standard project is a Sneaker Donation Box. This is the project teams will fabricate this year. These boxes will be donated to WaterStep. Information is provided in advance so your team can start to prepare. For more information on their mission please visit www.WaterStep.org

2) The project you will brainstorm and design is a Dip Tank. These dip tanks will contain a solution of vinegar and steel wool which is used to submerge boards in to be stained. Guidelines for your design will be listed below. Prints for this project theme will be required this year and will be graded as they have been in the past as part of your overall grade.

Please Note: Prints of your design must be ready to turn in at orientation. (See items supplied by teams)

For the project you are designing Welding Fabrication will be supporting the efforts of Sleep in Heavenly Peace a non-profit whose mission is to provide less fortunate children with a bed to sleep on. This organization operates with volunteers who construct and deliver wooden bunk beds to those children and families in need.

Please explore this cause you will be supporting: https://www.shpbeds.org/

Below you will find information 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. If you are meticulously going through this update it will become clear what changes may be implemented, where stops points should be and what aspects of the build will impact your score the most.

You are strongly encouraged to prepare at least two checklists to ensure you are prepared.

1) a checklist for your clothing, PPE and hand tools you need to bring.
2) a build checklist to be used during the competition to ensure your team is on track.

Best of luck! – The Welding Fabrication Committee looks forward to another great competition with you.
**Standard Fabrication Project:**
(All teams will be fabricating this in June 2019 — *Bring 11x17 copies of the print for your team to work from*)

- Donation Box

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**Material List Supplied by Committee:**

- Qty. (6) 12’pcs 1.5” Sq Tubing .125” wall
- Qty. (1) .229” x 33” x 33”
- Qty. (1) .089” x 4’ x 8’
- Qty. (1) .089” x 4’ x 4’
- Qty. (1) 3’ Piano hinge
- Qty. (2) .179” x 1.50” x 4.50”
- Qty. (8) .229” x 1.50” x 4.50”
- Qty. (24) .119” x 1.50” x 4.50”
- Qty. (12) .31” x 1.00” x 14.00”
- Qty. (3) 4’ x 8’ Plywood as required
- Qty.

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**Welding Consumables Supplied by Committee:**

- .035 Quantum Arc 6 Solid Wire
- .045 Excel Arc 71 Flux-cored
- 3/32” Lincoln Excalibur E7018 SMAW Electrodes
- 1/8” Lincoln Excalibur E7018 SMAW Electrodes
- 3/32” Lincoln 5P+ E6010 SMAW Electrodes
- 1/8” Lincoln 5P+ E6010 SMAW Electrodes
- 3/32 Lincoln ER70S-2 GTAW Filler Rod
- 1/8” Lincoln ER70S-2 GTAW Filler Rod
- 3/32” EWCe-2 Electrode

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**Minimum Project Requirements:**

- 5 Individual SMAW Welds of 3” or greater (Two 3F vertical up welds required)
- 5 Individual GMAW Welds of 3” or greater (Two 3F vertical up welds required)
- 5 Individual GTAW Welds of 3” or greater (Two 3F vertical up welds required)
- 5 Individual FCAW Welds of 3” or greater (Two 3F vertical up welds required)
- 5 Individual OFC Cuts of 5” or greater
• **Project Theme for Prints:** *(Team prints will be graded on this concept)*
  - Dip Tanks

• **Guidelines for Design:**
  - Must be able to contain a solution of vinegar and steel wool
  - Allows for 2x4 / 2x6 with a length of 84” (one board at a time)
    - 7” deep
    - 8” wide
    - Easy to load and unload
  - Support legs (32” floor to bottom of tank)
  - Carry handles
  - Tool rack (paint brush, sponge, squeegee, etc…)
  - Ability to drain
  - Tank can be steel or any other material (consider what it will be used for)

• **Blue Print Requirements:**
  - 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 will 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 10 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

• **Judging Overview:**

<table>
<thead>
<tr>
<th>Category</th>
<th>Points</th>
<th>Judging Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAFETY</td>
<td>100</td>
<td>Each safety infraction will be a 5pt deduction</td>
</tr>
<tr>
<td>SMAW</td>
<td>100</td>
<td>5 required welds will be judged on joint fit-up, size, contour and appearance</td>
</tr>
<tr>
<td>GMAW</td>
<td>100</td>
<td>5 required welds will be judged on joint fit-up, size, contour and appearance</td>
</tr>
<tr>
<td>GTAW</td>
<td>100</td>
<td>5 required welds will be judged on joint fit-up, size, contour and appearance</td>
</tr>
<tr>
<td>FCAW</td>
<td>100</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>OFC</td>
<td>100</td>
<td>Students will be judged on equal participation, team communication and ability to work together</td>
</tr>
<tr>
<td>TEAMWORK</td>
<td>100</td>
<td>10 critical dimensions will be judged for accuracy. Overall appearance and functionality is also scored</td>
</tr>
<tr>
<td>FABRICATION</td>
<td>150</td>
<td>5 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>
</tbody>
</table>
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

Your team is to submit (1) proposal for a project that is worthy of being fabricated at national’s. It must support humanity in some way. Bring your proposal with you to turn in with your prints – format is of your choice.

- Provide as much information as possible to describe the project
- Explain how this project would support humanity
- Explain why there is a need
- IF you have contact information for someone with direct experience with this need and that person wants to be contacted please provide that. Their information will only be used by the Welding Fabrication committee to make contact.
- Label as “Proposal for Future Projects”

The 3 individual test scores are averaged for your team’s total score

- **Items that must be supplied by Teams:**
  - All Personal Protective Equipment
  - 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 “Blueprint requirements”
  - Résumé
  - Teams may bring own 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
    - Millermatic 350P used for GMAW/FCAW
    - Lincoln Aspect 375 for SMAW/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>
</tbody>
</table>

- **Proposal** 10
- **WRITTEN TEST** 100
<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<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>

- **Other tools:**
  - N/A for 2019

- **Safety:**
  - Face shields must be worn while grinding
  - Helmets or oxyacetylene goggles must be worn while cutting
  - Welding jackets must be worn while welding
  - Safety glasses must be worn at all times
  - Hearing protection must be worn at all times
  - 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.
  - Grinding sparks on the welding equipment and/or other people will result in a deduction in points
  - Environmental equipment must be used at all times when welding. Points will be deducted for improper use.

- **Other Information:**
  - When fabricating, sometimes parts and/or steel pieces are not supplied with 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.
  - The oral interview will be conducted randomly during the 6-1/2 hour fabrication part of the competition.
  - A team picture will be taken during your competition
    - Pictures will be posted in Contest Updates on the SkillsUSA website.
  - All projects will be donated
  - Teams are not permitted to bring any power tools, templates or additional material.
    - Decimal / Fraction conversion cards are permitted
  - Possession or use of any electronic communication devices are not allowed in the contest area at any time.
  - A collection box will be available to hold cell phones labeled with painters tape and team #
  - Cell phones may not be substituted for calculators!
LOCATE PLYWOOD PANELS INTO POSITION. THEN SNAP THRU HOLES IN PLYWOOD FOR 4/8 ATTACHING HARDWARE.

ALTERNATE PART NUMBER FOR HINGE IS GORDEN P58288810-84.

-008, -017 & -088 TASS ARE TO BE MODIFIED BY COMPETITORS FROM RAYMOND SUPPLIED SCRAP STEEL PUNCHED COUPONS.

DO NOT WELD -009 TASS ON SIDE FACING PLYWOOD PANELS.
When fabricating S402, S403, & S404 frames, use 0.10 bar as Tack bars. Check all around for squareness prior to welding. Place remaining 0.080 bars in S40 frame.

Locate 1 inch chain on door side.

S401 Bottom View
S401 Top View