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.

This year your team will be fabricating “dip tanks”. This is the standard project provided to all competitors to build. Your fabricated dip tanks 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. The dip tanks that you all build will be used to stain the long rail boards for the beds.

In addition, teams will still be required to brainstorm and design a project. A project theme will be provided with guidelines. 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.

The project your team will design is for the purpose of supporting a humanitarian cause. This project will be built and donated in a future contest.

As many of you may already know the SkillsUSA national conference will be moving to Atlanta, Georgia in 2021. Since this will be our first appearance there and because we still want to focus on projects that support a humanitarian cause, the national Welding Fabrication Committee would like to do a project to give back to the city of Atlanta.

An issue that Atlanta could use some assistance with is helping the homeless. Atlanta has a large number of homeless people that sleep in the streets and under overpasses. You can help this cause by designing a project that can be built in 2021 and donated to the homeless to give them some form of shelter and minimize the need to sleep on the streets.

Please research Atlanta homeless and design a project that will provide shelter and a place to sleep.
Please Note: Prints of your design must be ready to turn in at orientation. (See items supplied by teams)

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. If you are meticulously going through this update it will become clear what changes may be implemented, where stops points could 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:** Dip Tanks  
  *(All teams will be fabricating this in June 2020 – Bring 11x17 copies of the print for your team to work from)*

• **Material List Supplied by Committee:**
  - Qty. 1 – 3/16” plate sized to fit all parts
  - Qty. 1 – 20’ 1” x 1.5” x .120” tube
  - Qty. 1 – Sheet of 16ga SS sized to make a dip tank 7”deep x 8” wide x 84” long w/end caps  
    *(details of this design TBD and have purposely been left of the print for now)*

• **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” 308L Hobart Filler Rods
  - 3/32” EWCe-2 Electrode

• **Minimum Project Requirements:** *only (2) weld processes this year!*
  - 5 Individual GMAW Welds of 2” or greater (Two 3F vertical up welds required)
  - 5 Individual GTAW Welds of 2” or greater (Two 3F vertical up welds required)
  - 5 Individual OFC Cuts of 5” or greater

• **Project Theme for Prints:** Shelter for the homeless  
  *(Team prints will be graded on this concept)*

• **Guidelines for Design:**
  - Designed for outdoor use
  - Must allow for a roof to be added
  - Must allow for at least 1 person to lay down and off the ground
  - Max height 6’
  - Consider your design to be modular and could be connected to another teams shelter
  - Consider what a homeless person may need to use this structure for other than just shelter
  - Construction can be with or without a skeletal frame
  - Consider weather conditions in Atlanta
  - Consider materials that are commonly discarded or of low cost that could be incorporated into you design
  - Steel material can not be over $300

• **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 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 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

- **Proposal for Future Projects**
  - Propose a project that is worthy of being a national project
    - Prepare a hard copy of your proposal to be turned in with your prints with the following headings
      - “Proposal for Future Projects”
      - Sub-heading is to be whatever your project is
    - Think of projects that can improve communities in some way
    - Provide as much information as possible to describe the project
    - 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>100</td>
<td>Each safety infraction will be a 5pt deduction</td>
</tr>
<tr>
<td>GMAW</td>
<td>150</td>
<td>5 required welds will be judged on joint fit-up, size, contour and appearance</td>
</tr>
<tr>
<td>GTAW</td>
<td>150</td>
<td>5 required welds will be judged on joint fit-up, size, contour and appearance</td>
</tr>
<tr>
<td>WELDING PROCEDURE SPECIFICATION</td>
<td>50</td>
<td>Teams will be provided with a blank WPS during the competition and will be required to fill it out during their competition time</td>
</tr>
<tr>
<td>OFC</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>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>125</td>
<td>5 critical dimensions will be judged for accuracy. Overall appearance and functionality is also scored</td>
</tr>
<tr>
<td>ORAL EXPLANATION</td>
<td>65</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>
<tr>
<td>WELD DRAWINGS</td>
<td></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>35</td>
<td>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 (hard copy) with you to turn in with your prints – format is of your choice.</td>
</tr>
</tbody>
</table>
  - Labeled as “Proposal for Future Projects”
  - Include a sub-heading with what the project is
  - 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. |
| PROFESSIONAL DEVELOPMENT TEST                 | 25     | Based of SkillsUSA Framework. Will be questions on Personal Skills, Workplace skills and Technical skills                                     |
| WRITTEN TEST                                  | 100    | The 3 individual test scores will be averaged for your team’s total score                                                                  |
• **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 PowerMig 360MP used for GMAW
    - Miller Electric Dynasty 280 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>
• **Other tools:**
  - N/A for 2020

• **Safety:**
  - Face shields **must** be worn while grinding
  - Helmets or oxyacetylene goggles **must** be worn while cutting
  - **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
  - **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 may 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!
Possible changes AFTER 2020

- Some of your 6.5hrs may be spent working with mixed teams.
  - The focus will be on teamwork
  - As an entry-level fabricator chances are at your first job you will working with complete strangers and the idea of mixing teams is to expose you to this factor and evaluate your ability to work with people you do not already have a relationship with.

- You may be provided with a complete Welding Procedure Specification and graded on how well your team follows it.
  - This is being considered since following a WPS is often required at fabrication companies.

- Standard tool boards with supplied tools will likely be in place.
  - Personal tools may be prohibited
  - This is to reduce safety hazards in your competition area
  - This also reduces your burdens and costs of traveling to the competition
<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>QTY</th>
<th>SIZE</th>
<th>MILL</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>STAND SPREADER</td>
<td>2</td>
<td>1.0 X 1.5 X 0.125 WALL TUBE</td>
<td>1.0 X 1.5 TUBE</td>
<td>SPR</td>
</tr>
<tr>
<td>2</td>
<td>CENTER TUBE</td>
<td>2</td>
<td>1.0 X 1.5 X 0.125 WALL TUBE</td>
<td>1.0 X 1.5 TUBE</td>
<td>TYP</td>
</tr>
</tbody>
</table>

TOLERANCES ARE:
- DEGREES ± 1.0°
- TWO PLACE DECIMALS ±0.01
- THREE PLACE DECIMALS ±0.005
Stand Back Plate

2.25 (2X) 3.75

.179

8.25

5.56

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE INCHES
TOLERANCES ARE:
DEGREES ±1.0°
TWO PLACE DECIMALS ±0.02
THREE PLACE DECIMALS ±0.005

MATERIAL
ASTM A36
120-045

HEAT TREAT - - -

NATIONAL SKILLS USA WF

REV.
40510

DRAWN
DQ
H. Simpson

DATE
2/5/20

ENGINEER

NAME

SCALE
1/2

PRODUCED IN PRO/E
Unless otherwise specified, dimensions are inches. Tolerances are:

- Degrees ±1.0°
- Two place decimals ±0.02
- Three place decimals ±0.005

Stand Side Plate

Material: ASTM A36

Drawn by DQ

Endorsement: H. Simpson

Scale: 1/2

Produced in Pro/E
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE INCHES
TOLERANCES ARE:
DEGREES ±1.0°
TWO PLACE DECIMALS ±0.02
THREE PLACE DECIMALS ±0.005

MATERIAL
ASTM A36
120-045

HEAT TREAT
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NATIONAL SKILLS USA WF
STAND TOP PLATE

DATE 2/5/20
DRAWN DQ
ENG. APPROVAL H. Simpson

SCALE 1/2

PRODUCED IN PRO/E