**SkillsUSA State Welding Fabrication Competition Project– 2020**

***Welding Fabrication Teams:***

Please review these guidelines for the national competition in June. Now is the time to plan and practice your build. Your team will have 4.5 hours to complete your project. Keep in mind your team & project will be judged throughout your 4.5 hours. Manage your time wisely.

**Below you will find the standard project you are building and the concept project you are to design.**

1. **The 2020 NC Skills USA project is a Removable Leg Welding Joint, Process and Position Display Table Including Pipe Welds**. This is the project teams will fabricate this year. Information is provided in advance so your team can start to prepare. Each team please be creative.
2. The project will require you to brainstorm and design a functioning tool. This table must have attached to the top of the table 3 types of common welding joints completed by each process of welding (SMAW, GMAW, GTAW, FCAW). OFC will be required of 20” of cutting. Guidelines for your design will be listed below. Prints for this project theme will be required and will be graded and count as part of your overall grade.

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

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.

* ***Standard Fabrication Project:***

*(Welding Fabrication Project –* ***Bring 3 - 11x17 copies of the print for your team to work from****)*

* + **Removable Leg Welding Joint, Process and Position Display Table Including Pipe Welds**

Best of luck! – The Welding Fabrication Committee looks forward to another great competition with you.

* ***Material List Supplied by Each Team:*** 
  + Qty. (1) 16” x 48” 11ga Flat plate, Mild Steel
  + Qty. (1) 12’-1” Square Tubing, Mild Steel
  + Qty. (1) 18”- ¾” Square Tubing, Mild Steel
  + Qty. (1) 24”-2” x 11ga Flat Bar, Mild Steel
  + Qty. (1) 24”-2” x 3/16” Flat Bar, Mild Steel
  + Qty. (1) 24”-2” x ¼” Flat Bar, Mild Steel
  + Qty. (1) 12”- 2” sch.40 Mild Steel Pipe
  + Qty. (1) 6’- 3/8” Mild Steel Round Stock
  + Qty. (1) 24”-2” x ¼” Aluminum Flat Bar
  + Qty. (1) 12”- 1 ½” sch. 40 Aluminum Pipe
  + Qty. (6) 5/16” x 1 ½” bolts and Nuts (Washers Optional)
* ***Welding Consumables Supplied by Committee:*** 
  + .035 ER70S-6 Solid Core wire
  + .035 Flux-cored SF-71
  + 3/32” E7018 SMAW Electrodes
  + 1/8” E7018 SMAW Electrodes
  + 3/32” E6010 SMAW Electrodes
  + 1/8” E6010 SMAW Electrodes
  + 3/32 ER70S-2 GTAW Filler Rod
  + 1/8” ER70S-2 GTAW Filler Rod
  + 3/32” EWCe-2 Electrode
  + 3/32” EWTH-2
  + 3/32” EWP
  + 3/32” 4043 Aluminum Wire
  + 1/8” 4043 Aluminum Wire
* ***Minimum Project Scored Required Welds:***
  + 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)
  + 20” of OFC Cuts
  + All other project welds are of each team’s design and choosing and **will not be scored**
* ***Project Theme for Prints:*** ***(Team prints will be graded on this concept)***
* **Removable Leg Welding Joint, Process and Position Display Table Including Pipe Welds**
* ***Guidelines for Design:*** 
  + Table Design must have removable legs
  + All joints and Welding processes must be attached to the table top
  + Each Joint and Process must be a minimum of 6” in length per process and joint design (Minimum of 3 Joint selections for each process in 2 positions)
  + Table must have handles
  + Table Height must be a Min. of 32”
  + **All materials must be cut prior to the contest EXCEPT for the 20” OFC Cutting**
  + **All holes must be drilled prior to contest**
  + All other welds on the project may be at the team’s choice and will not be scored
  + Required Welds must be labeled by each team and completed in the position stated using the proper welding symbol (Location is team choice)
* **Blue Print Requirements:**
  + Three sets 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 3 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:***

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| **Category** | **Points** | **Judging Detail** |
| SAFETY | -5 | Each safety infraction will be a 5pt deduction |
| SMAW | 100 | 5 required welds will be judged on joint fit-up, size, contour and appearance |
| GMAW | 100 | 5 required welds will be judged on joint fit-up, size, contour and appearance |
| GTAW | 100 | 5 required welds will be judged on joint fit-up, size, contour and appearance |
| FCAW | 100 | 5 required welds will be judged on joint fit-up, size, contour and appearance |
| OFC | 100 | 5 required cuts will be judged on angle, appearance, dimension, bottom edges slag free and cuts free of chipping marks (Grinding of OFC is not permitted) |
| TEAMWORK | 100 | Students will be judged on equal participation, team communication and ability to work together |
| FABRICATION | 100 | 10 critical dimensions will be judged for accuracy. Overall appearance and functionality is also scored |
| ORAL EXPLANATION | 50 Each | 5-minute oral explanation of the project design and team's preparation. This will be conducted randomly during the 4-1/2 hour fabrication part of the competition |
| WELD DRAWINGS | 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 |
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* ***Items that must be supplied by Teams:***
  + **All Metal Required for the Project stated above**
  + 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 “Blue print requirements”
  + Résumé
  + Teams must bring own grinders and discs with guards, and hand tools but unsafe equipment will not be allowed
    - See Welding Fabrication National Standards for more information
* ***Tools Supplied by Committee to each team:***
  + All Welding Machines are Lincoln Electric
* Aspect 375
* Precision TIG 225
* 350MP Power MIG
* Flextec 350
* Flextec 500
* S350 Powerwave
* C300 Powerwave
  + Environmental Equipment
  + Tungsten Electrodes
* ***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**
  + 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.
  + More rules will be discussed at the site.
* ***Other Information:***
  + The oral interview will be conducted randomly during the 4-1/2-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.
  + **Teams are not permitted to bring 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!**