American Welding Society

Recommended Procedures for Conducting a SkillsUSA Welding Contest

RECOMMENDED PROCEDURES for CONDUCTING a SkillsUSA WELDING CONTEST

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INTRODUCTION

Vocational Education is a vital portion of the educational system in the United States. American Industry continues to need a steady supply of skilled craftsman and in particular, Welders. In spite of the need for skilled craftsman vocational technical education carries with it a stigma that those who are vocational students are simply there because they are not capable of higher academic education. The Vocational Industrial Clubs of America (now SkillsUSA) was formed to reverse that image. SkillsUSA recognizes that most vocational students have made a conscious decision to enter the trades to pursue a rewarding and satisfying career.

SkillsUSA established the *United States Skills Olympics* (now called SkillsUSA Championships) as a method of recognizing and rewarding vocational students for demonstrating trade skills. It serves as a challenge to vocational students to do their best. There are a great many individuals and organizations who believe in the SkillsUSA objectives and the impact of these objectives on the lives of the thousands of students SkillsUSA serves. They have done so because they want to improve the quality of the vocational programs and better prepare the students for gainful employment. The American Welding Society is among the largest supporters of SkillsUSA.

SkillsUSA contests begin at local vocational schools where contests are held to determine those who will advance to the regional level. The regional winners compete in state contests to determine those who will represent their states in national competition. There are two levels of competition, secondary and post secondary. Not all states have post secondary SkillsUSA programs but most do have secondary programs. The Education Committee strongly recommends **AMERICAN WELDING SOCIETY** Section involvement at every level of competition to provide quality contests.

This publication has been prepared using the experience gained in local, national and international SkillsUSA contests to provide a guide for those wishing to run a SkillsUSA welding skills contest at any level. To get involved in the SkillsUSA welding contests you need to know who is in charge of the SkillsUSA program in your area. National SkillsUSA will provide you with the name address, and telephone number of your State SkillsUSA Director, so you can determine when the Welding skills contest will be held, and to volunteer your Section's services. You can contact National SkillsUSA at:

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The Contest Committee

The local American Welding Society Section should be the center point of any welding contest. The successful administration of a welding contest depends on the selection of an active committee with an interest in vocational welding programs. The Committee will be required to:

- Devise a test.
- Select a contest site.
- Supply equipment and material.
- Supply judges.
- Set up the contest site.
- Arrange for awards and awards ceremonies.

The committee should consist of a variety of competencies. The individuals must be willing to dedicate some of their own time and should have an interest in working with students. Some sources for members may be found among the following disciplines:

- Engineers.
- Technicians.
- Superintendents.
- Foreman.
- Distributors.
- Welders.
- Welding Inspectors.
- Certified Welding Inspectors.

A contest chairman should be selected, who in turn names coordinators, who are responsible for different areas of the test (Judges, material, power supplies, etc.). It is recommended that Welding Instructors not be named to the Contest Committee to avoid conflicts.

Choosing the Contest Site

The contest site will be largely determined by the number of students involved, the complexity of the contest, and the availability of space. Local and regional contests are usually held at a local vocational school. There is a growing trend to hold state contests in public arenas. While arenas do maximize the public's exposure to skills contests it does require considerably more effort on the part of the committee to stage the contest, but it is usually worth the effort for the exposure the welding contest receives. The national contest, which consists of forty-eight testing stations, has been held in arenas around the country since 1979. The Committee should review available areas, looking for such things as:

- Sufficient room for contestants, judges, and support personnel.
- Adequate welding equipment and power for installation of additional equipment.
- Well lit, clean with adequate ventilation.
- Access to a room for briefing and debriefing of the contestants.
- An area away from the contest site for the contestants to spend their casual time, while awaiting their turn.
- Access to refreshments and sanitary facilities.
- A location accessible to all and easy to find.
- An area designated as a tool room for storage.

Since additional equipment and test project material will likely be arriving before the contest date, a secure storage area is needed.

If the contest is held at a local vocational school visitors are not encouraged. They can be disruptive to the contest and present a safety problem. If the contest is held in a public arena, visitors are definitely encouraged.

If you are using a public vocational school it is extremely important to get the complete support of the individual in charge of the institution for its use. A visit to the individual in charge, to secure their permission, confirmed by a written letter of agreement indicating their affirmative response is essential.

Scheduling the Contest

It is wise to schedule the events leading up to the contest. The actual date of the contest should be scheduled as far in advance as possible. It is best to have at least six months notice for planning. A check list should be made up, listing goals and dates for completion. Long lead time items, such as additional welding equipment, should be identified

and ample time allowed for procurement, delivery and installation.

When the test is developed, consideration must be given to the time allowed for welding the project. If you have fifteen contestants and five welding machines you must make sure that there is adequate time to allow each contestant to complete their project without making the overall contest time too lengthy. Start the contest as early in the day as practical to allow extra time in event of any trouble. Have the judges and helpers report at least a half hour before the test starts for orientation and placement. Judges meetings held in advance of the contest are usually poorly attended, and you will find you still have to conduct an orientation the day of the contest. Start the test promptly and allow time between contestant groups for orderly changes.

Developing the Test

The test project you give will determine the success of your contest. You should obtain a copy of the **SkillsUSA Championships, Technical Standards**. This is available from National SkillsUSA and lists the minimum competencies that are expected of a competitor at the national level (see Appendix I).

You must decide whether you will use destructive or nondestructive testing. Nondestructive testing may simply consist of visual examination or you may decide to use a more elaborate method. For example, liquid penetrant examination requires little time, and provides something that can be displayed. Availability of equipment and personnel will dictate what method you will choose.

Destructive testing is popular, since specimens are produced that may be put on display, however it is time consuming, and requires cutting and grinding, which presents a safety hazard.

The material for the test must be considered. Carbon steel is widely used and all schools have access to it. However this should not eliminate the use of other materials. The major portion of the project should be written for carbon steel with other materials included as available. You should limit your project materials to carbon steel, stainless steel, and aluminum (see Appendix II for examples of national welding contest projects).

When the requirements of the test are defined, it is time for the test project to be put on paper. A drawing of the project should be made using standard drawing room practices. Welding symbols, terms, and definitions should be in accordance with the latest American Welding Society standards. Welding Procedure Specifications (WPSs) should be written explaining how the project is to be assembled and welded. The WPSs should be included on the project drawing, or attached to it. Using the contest drawing, a judges rating sheet can be developed. A sufficient number of examination points should be made to provide a good evaluation of the project. Appendix III shows examples of judges rating sheets. Copies of the test project should be kept in a secure place. Advance copies of the contest project should be kept to a minimum.

Written tests are an integral part of the contest. Public vocational welding programs should include some welding theory to better prepare the student for employment. A test should be given to sample the students knowledge of welding and cutting safety, welding terms, and process theory. Appendix IV displays a typical general knowledge test.

Judges and Judging

Judges are important to a successful contest. Since they are a key component in the contest a coordinator should be assigned whose sole charge is to take care of the judges. It is essential to have fair and impartial judging. Judges that are selected should be familiar with the processes and materials they are judging. Sources of judges are engineers, foremen, inspectors superintendents, Certified Welding Inspectors, welders, technicians, and salesmen. Judges should be briefed thoroughly before the contest. At the Judges orientation the contest project is explained to them, along with judging points and criteria. It is desirable to have a welded test project available for examination and discussion (see Appendix V for Judges' instruction sheets).

Each contestant should be judged by a minimum of three judges, all of whom shall not know the contestant. SkillsUSA rules require each contestant be assigned a number known only to the contest chairman. The identity of contestants is revealed only after the contest is concluded, and the winners selected.

Judging of the welded projects should be in compliance with some welding standard, such as AWS D1.1.

Securing Materials, Equipment, and Personnel

The true value of an active Contest Committee will show itself when you begin to procure supplies and equipment for the contest. SkillsUSA contests are non-profit functions and supplies can be a problem. Industrial members on the committee should be solicited to provide base materials for the test project. Local distributors will usually supply filler metals and may be able to loan welding equipment as well. Another source of equipment can be temporary loan of equipment from other vocational institutions in the area.

Be sure to acknowledge, with letters of appreciation, the donation or loan of equipment and supplies. Be careful to preserve the condition of loaned equipment, and arrange for the prompt return of that equipment.

When you begin to look for people to serve as judges, tool room attendants, material handlers, etc. the local American Welding Society Section is an excellent resource. Also consider vocational students who are not participating in the contest and local Apprenticeship programs. Wherever you get them it is essential to have those people to keep the contest moving.

Briefing the Contestants

It is a good idea to get all the contestants together a few days before the contest to tell them what to expect. You do not want to tell them exactly what the contest will consist of, but you do want to cover the general areas. Tell them what time to report, what to bring, what the schedule will be and any other information regarding the contest. Remember that most of them are nervous and may not remember what you have told them. Provide them with a written hand-out covering the contest information items (see Appendix VI).

Contest Coordinators

Contest coordinators are essential to a well run contest. These individuals are crucial the day of the contest. A coordinator's duties will include:

- Seeing that all helpers, material handlers, and tool room attendants, are in attendance.
- Greeting the contestants and escorting them to the waiting area.
- Briefing contestants before the contest, handing out the project material, and answering general questions.
- Maintaining the time schedule.
- Directing helpers in event of a breakdown.
- Debriefing contestants, pointing out strong and weak areas.
- Collecting rating sheets and welded projects.
- Handing out filler metals.

Prizes and Award Ceremonies

All contestants should receive some recognition. This can be in the form of a certificate of participation, a cloth patch or some other memento. The winners should receive something additional to reward them for their success. Plaques, complimentary membership in the American Welding Society, welding safety products or small welding machine are some of the items that may be presented.

Official announcement of the winners is usually a responsibility of SkillsUSA at an awards ceremony. Contest results should not be released in advance of the official ceremony. After SkillsUSA announces the results, welding contest winners should be invited to local American Welding Society Section meetings where they can be recognized.

Keep in mind that the objectives of awards should be to reward those who have demonstrated trade excellence, not to see who can win the most prizes.

Evaluating the Contest

The primary reason for American Welding Society participation in SkillsUSA welding contests is to

improve the quality of vocational welding education in the United States and to set standards for excellence. At the awards ceremony the top three welding students are recognized while the rest have no indication of their performance. The student and his instructor need feedback on their performance so they can work on weak areas. Your do not want to provide the student with a rank order. It serves no good purpose to tell someone that they came in last. You can however, provide them with information that will allow them to measure their performance against specific tasks without telling them where they placed (see Appendix VII). This figure is derived from a computer analysis of the welding contest. Manual scoring will provide the same information.

APPENDIX I–SkillsUSA Welding Requirements

WELDING

Purpose

To evaluate each contestant's preparation for employment and to recognize outstanding students for excellence and professionalism in the field of welding.

First, refer to General Regulations.

Clothing Requirement

Official SkillsUSA khaki work shirt and pants, and black or brown leather work shoes should be worn. Safety glasses with side shields or goggles are required. (Prescription glasses can be used only if they are equipped with side shields. If not, they must be covered with goggles.) To purchase official work clothes, contact Midwest Trophy Manufacturing Co. Inc. by calling 1-800-324-5996 or order online at:

http://www.mtmrecognitiom.com/skillsusa.

Eligibility

Open to active SkillsUSA members enrolled in programs with welding as the occupational objective.

Equipment and Materials

1. Supplied by the Contest Committee:
    a. All necessary welding equipment and materials.
    b. All instructions and procedure sheets with drawings.
    c. All necessary information and furnishings for judges and the technical committee.
2. Supplied by the contestant:
    a. Hearing and/or ear protection.
    b. Welding helmet with appropriate filter plate/lens and protective cover plate/lens in a flip or slide front. Auto darkening shields are permissible.
    c. Welding helmet with appropriate filter plate/lens and protective cover plate/lens in a flip or slide front for OFC, PAC. Auto darkening shields are permissible.
    d. Spare spatter and filter lenses/plates for arc welding, helmet, and oxyacetylene goggles.
    e. Pocket calculator.
    f. Lead pencil and/or ballpoint pen.
    g. Soap stone with holder.
    h. Scribe with magnet.
    i. Combination square set.
    j. 10-foot (3.1 meters) steel tape measure.
    k. Fillet weld gauge.
    l. 16-ounce (0.45 kilogram) ball peen hammer.
    m. Center punch.
    n. 10-inch (254 millimeters) vise grips.
    o. 6-inch (152 millimeters) side cutting pliers or diagonal cutting pliers.
    p. 6-inch (152 millimeters) needle nose pliers.
    q. Chipping hammer with or without wire brush.
    r. Stainless steel wire brush.

Specific Rules for Contest Participants

1. Contestants must correctly use the welding equipment during the contest. The contest chairman and contest coordinator may stop a contestant at any section of the contest if they deem a contestant's manner to be hazardous to either themselves or others. Such stoppage shall disqualify the participant for that section of the contest. If the contestant is warned a second time, he or she will be disqualified as a contest participant.
2. Contestants will be assigned a contest number for use during the welding contest. The contestants will be known to the contest judges by their assigned number only.
3. 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, contest coordinator or contest chair.

4. The welding contest will be of a performance nature.
5. All terms and definitions and welding symbols will be in accordance with the current editions of AWS A3.0, *Standard Welding Terms and Definitions*, and AWS A2.4, *Standard Symbols for Welding, Brazing, and Nondestructive Examination*.
6. Time limits will be established on the contest procedure sheets for all segments of the test.
7. Evaluation of the completed project will be by visual examination. Nondestructive and/or destructive tests may be used to complete the project evaluation.
8. Welding and cutting operation instructions will be specified in drawings and procedure sheets provided to the contestants.

Scope of the Contest

Contestants will demonstrate their ability to perform jobs and skills selected from the following list of competencies as determined by the SkillsUSA Championships technical committee.

*Note: The following items marked * should be considered essential.*

Safety

*1. Demonstrate personal safety.
*2. Demonstrate general shop safety.
*3. Demonstrate gas, electrical, and chemical safety.
*4. Demonstrate knowledge of proper actions to be taken in an emergency.

Measurements

1. Identify basic metal-working tools used in measuring.
*2. Use visual measuring tools to accuracy of 1/32 inch.
3. Employ the components of a combination square set.
*4. Use layout and marking tools as required.
*5. Determine wire feed speed as indicated on drawing.

Blueprint Reading

*1. Use information found in the information block of the drawing.
*2. Read and understand three-dimensional drawings.
3. Identify the basic views used in blueprints including assembly, detail, and fit-up drawings.
*4. Identify common types of lines, abbreviations, and symbols in accordance with national drawing standards—ANSI.
*5. Identify basic welding symbols and components of a symbol (such as arrow, reference line, tail, size, or length) in accordance with the national welding symbols standards—AWS.

Shielded Metal Arc Welding (SMAW)

*1. Demonstrate safety procedures for SMAW.
*2. Demonstrate ability to correctly set up SMAW power sources, related welding equipment, and do basic process and equipment troubleshooting.
3. Correctly identify base metal prior to welding.
*4. Set up and shut down equipment for welding of carbon steel and/or stainless steel.
5. Select correct type of filler metal size of electrode based on carbon steel and/or stainless steel plate (1/4 inch to 1/2 inch thickness).
*6. Prepare carbon steel and/or stainless steel for welding.
*7. Start, stop, and restart stringer beads on carbon steel and/or stainless steel in the flat, horizontal, vertical up and down, and overhead positions.
*8. Weld a pad with a multipass weld on carbon steel and stainless steel plate in the flat, horizontal, vertical up and down, and overhead positions.
*9. Weld a lap joint with a single pass, fillet weld on carbon steel and stainless steel sheet/plate in flat, horizontal, vertical up and down, and overhead positions.
10. Weld a lap joint with a multipass, fillet weld on carbon steel and stainless steel plate in the flat, horizontal, vertical up and down, and overhead positions.

*11. Weld a T-joint with a single-pass, fillet weld on carbon steel and stainless steel sheet/plate in the flat, horizontal, vertical up and down, and overhead positions.

12. Weld a T-joint with a multipass fillet weld on carbon steel and stainless steel plate in the flat, horizontal, vertical up and down, and overhead positions.

*13. Weld a butt joint with a single-pass, square groove weld on carbon steel, stainless steel sheet/plate in the flat, horizontal, vertical up and down, and overhead position.

*14. Weld a butt joint with a partial joint penetration, single pass, double V-groove weld on carbon steel and stainless steel plate in the flat, horizontal, vertical up and down, and overhead positions.

15. Weld a butt joint with a multipass, V-groove weld on carbon steel and stainless steel plate in the flat, horizontal, vertical up and down, and overhead positions.

16. Weld a butt joint with complete joint penetration, multipass, double V-groove weld on carbon steel and stainless steel plate in the flat, horizontal, vertical up and down, and overhead positions.

17. Weld 2-inch to 8-inch diameter schedule 40 to schedule 80 carbon steel and stainless steel pipe, single/multipass V-groove weld in the 2G, 5G, and 6G positions.

*18. Lay out, weld, cut, and prepare coupons for evaluation.

19. Test prepared coupons.

Gas Metal Arc Welding (GMAW)

*1. Demonstrate correct safety procedures for GMAW.

*2. Demonstrate ability to correctly set up GMAW power sources, related welding equipment and do basic process and equipment troubleshooting.

3. Correctly identify base metal prior to welding.

*4. Set up and shut down equipment for short circuiting, globular and spray, transfer, and pulsed welding of carbon steel, stainless steel, and/or aluminum.

5. Select correct type of filler metal size of electrode, type of shielding gas, wire feed speed, and voltage based on carbon steel, stainless steel, and/or aluminum sheet and/or plate (1/16 inch to 3/8 inch thickness).

*6. Prepare the carbon steel, stainless steel, and/or aluminum for welding.

*7. Start, stop, and restart stringer beads on carbon steel, stainless steel, and aluminum steel sheet/plate in the flat, horizontal, vertical up and down, and overhead positions.

8. Weld a pad with a multipass weld on carbon steel, stainless steel, and aluminum sheet/plate in the flat, horizontal, vertical up and down, and overhead positions.

*9. Weld a lap joint with a single-pass, fillet weld on carbon steel, stainless steel, and aluminum sheet/plate in flat, horizontal, vertical up and down, and overhead positions.

10. Weld a lap joint with a multipass, fillet weld on carbon steel, stainless steel, and aluminum plate in the flat, horizontal, vertical up and down, and overhead positions. Interrupt root pass at midpoint and restart arc.

*11. Weld a T-joint with a single-pass, fillet weld on carbon steel, stainless steel, and aluminum sheet/plate in the flat, horizontal, vertical up and down, and overhead positions.

12. Weld a T-joint with a multipass, fillet weld on carbon steel, stainless steel, and aluminum plate in the flat, horizontal, vertical up and down, and overhead positions.

*13. Weld a butt joint with a single-pass, square groove weld on carbon steel, stainless steel, and aluminum sheet/plate in the flat, horizontal, vertical up and down, and overhead positions.

*14. Weld a butt joint with a partial joint penetration, single-pass, double V-groove weld on carbon steel, stainless steel and aluminum plate in the flat, horizontal, vertical up and down, and overhead positions.

15. Weld a butt joint with a multipass, single V-groove weld on carbon steel, stainless steel, and aluminum plate in the flat, horizontal, vertical up and down, and overhead positions.

16. Weld a butt joint with complete joint penetration, multipass, double V-groove weld on carbon steel, stainless steel, and aluminum plate in the flat, horizontal, vertical up and down, and overhead positions.

17. Weld 6-inch (150 millimeter) or 8-inch (200 millimeter) diameter and smaller, schedule 40, carbon steel, stainless steel, and aluminum pipe, single/multipass V-groove weld in the 2G, 5G, and 6G positions.

*18. Lay out, weld, cut, and prepare coupons for evaluation.

19. Test prepared coupons.

Fluxed Cored Arc Welding (FCAW)

*1. Demonstrate correct safety procedures for FCAW.

*2. Demonstrate ability to correctly set up FCAW power sources, related welding equipment and do basic process and equipment troubleshooting.

3. Correctly identify base metal prior to welding.

*4. Set up and shut down equipment for welding of carbon steel and/or stainless steel.

5. Select correct type of filler metal, size of electrode, type of shielding gas (if needed), wire feed speed and voltage based upon carbon steel and/or stainless steel sheet and/or plate (1/16 inch to 3/8 inch thickness).

*6. Prepare carbon steel and/or stainless steel for welding.

*7. Start, stop, and restart stringer beads on carbon steel and stainless steel sheet/plate in the flat, horizontal, vertical up, and overhead positions.

8. Weld a pad with a multipass weld on carbon steel and stainless steel sheet/plate in the flat, horizontal, vertical up, and overhead positions.

*9. Weld a lap joint with a single-pass, fillet weld on carbon steel and stainless steel sheet/plate in flat, horizontal, vertical up, and overhead positions.

10. Weld a lap joint with a multipass, fillet weld on carbon steel and stainless steel plate in the flat, horizontal, vertical up, and overhead positions. Stop and restart in middle of joint.

*11. Weld a T-joint with a single-pass, fillet weld on carbon steel and stainless steel sheet/plate in the flat, horizontal, vertical up, and overhead positions.

12. Weld a T-joint with a multipass, fillet weld on carbon steel and stainless steel plate in the flat, horizontal, vertical up, and overhead positions.

*13. Weld a butt joint with a single-pass, square groove weld on carbon steel and stainless steel sheet/plate in the flat, horizontal, vertical up, and overhead positions.

*14. Weld a butt joint with a partial joint penetration, single pass, double V-groove weld on carbon steel and stainless steel plate in the flat, horizontal, vertical up, and overhead positions.

15. Weld a butt joint with a multipass, V-groove weld on carbon steel and stainless steel plate in the flat, horizontal, vertical up, and overhead positions.

16. Weld a butt joint with complete joint penetration, multipass, double V-groove weld on carbon steel and stainless steel plate in the flat, horizontal, vertical up, and overhead positions.

17. Weld 2-inch to 8-inch diameter schedule 40 to schedule 80 carbon steel and stainless steel pipe, single/multipass V-groove weld in the 2G, 5G, and 6G positions.

*18. Lay out, cut, and prepare coupons for evaluation.

19. Test prepared coupons.

Gas Tungsten Arc Welding (GTAW)

*1. Demonstrate safety procedures for GTAW.

*2. Demonstrate ability to correctly set up GTAW power sources, related welding equipment and do basic process and equipment troubleshooting.

3. Correctly identify base metal prior to welding.

*4. Set up and shut down equipment for regular and pulsed welding of aluminum, stainless steel, and/or carbon steel.

*5. Select the correct size and type of tungsten and filler metal based on aluminum, stainless steel

or carbon steel sheet, and/or plate (1/16 inch to 1/4 inch thickness).

*6. Prepare aluminum, stainless steel, and/or carbon steel for welding.

*7. Start, stop and restart stringer beads on aluminum, stainless steel, and carbon steel sheet/plate in the flat, horizontal, vertical up and down, and overhead positions.

8. Weld a pad with multipass weld on aluminum, stainless steel, and carbon steel sheet/plate in the flat, horizontal, vertical up and down, and overhead positions.

*9. Weld a lap joint with a single-pass, fillet weld on aluminum, stainless steel, and carbon steel sheet/plate in flat, horizontal, vertical up and down, and overhead positions.

10. Weld a lap joint with a multipass, fillet weld on aluminum, stainless steel, and carbon steel plate in the flat, horizontal, vertical up and down, and overhead positions.

*11. Weld a T-joint with a single-pass fillet weld on aluminum, stainless steel, and carbon steel sheet/plate in the flat, horizontal, vertical up and down, and overhead positions.

12. Weld a T-joint with a multipass, fillet weld on aluminum, stainless steel, and carbon steel plate in the flat, horizontal, vertical up and down, and overhead positions.

*13. Weld a butt joint with a single-pass, square groove weld on aluminum, stainless steel, and carbon steel sheet/plate in the flat, horizontal, vertical up and down, and overhead positions.

*14. Weld a butt joint with a partial joint penetration, single-pass, double V-groove weld on aluminum, stainless steel, and carbon steel plate in the flat, horizontal, vertical up and down, and overhead positions.

15. Weld a butt joint with a multipass, V-groove weld on aluminum, stainless steel, and carbon steel plate in the flat, horizontal, vertical up and down, and overhead positions.

16. Weld a butt joint with complete joint penetration, multipass, double V-groove weld on aluminum, stainless steel, and carbon steel plate in the flat, horizontal, vertical up and down, and overhead positions.

17. Weld 6-inch (150 millimeter) or 8-inch (200 millimeter) diameter and smaller, schedule 40, aluminum, stainless steel, carbon steel pipe, single/multipass V-groove weld in the 2G, 5G, and 6G positions.

*18. Lay out, weld, cut, and prepare coupons for evaluation.

19. Test prepared coupons.

Oxygen Fuel Cutting (OFC)

*1. Demonstrate safety procedures for OFC.

*2. Demonstrate ability to correctly set up the OAC equipment for cutting and do basic process troubleshooting.

3. Correctly identify base metal prior to cutting.

*4. Set up and shut down equipment for cutting carbon steel plate.

*5. Select correct tip size and gas pressure for severing carbon steel plate (1/4 inch to 1/2 inch thickness).

6. Prepare carbon steel for cutting.

*7. Cutting operations will be specified in drawings and procedure sheets provided to the contestants.

*8. Properly light, adjust the flame, and shut down the oxygen fuel equipment.

*9. Use a straight edge and soap stone laying out the prescribed pattern.

*10. Make a square cut on carbon steel in flat, horizontal, vertical, and overhead positions.

11. Make a bevel cut (45-degree angle) on carbon steel plate in the flat, horizontal, vertical, and overhead positions.

*12. Pierce a hole on carbon steel in the flat, horizontal, vertical, and overhead position.

*13. Make a pipe and tubing cut on carbon steel pipe in flat, horizontal, vertical, and overhead positions.

14. Make a gouge and groove cut on carbon steel in flat, horizontal, vertical, and overhead positions.

*15. Lay out, weld, cut, and prepare coupons for evaluation.

16. Test prepared coupons.

Plasma Arc Cutting (PAC)

*1. Demonstrate safety procedures for PAC.

*2. Demonstrate ability to correctly set up the PAC power sources, related cutting equipment and perform basic process and equipment troubleshooting.

3. Correctly identify base metal prior to cutting.

*4. Set up and shut down equipment for cutting carbon steel, stainless steel, and/or aluminum.

*5. Select correct cutting head and gas pressure for severing carbon steel, stainless steel, or aluminum plate and/or sheet (1/16 inch to 1/4 inch thickness).

6. Prepare carbon steel, stainless steel, and/or aluminum for cutting.

*7. Cutting operations will be specified in drawings and procedure sheets provided to the contestants.

*8. Properly adjust and use the plasma arc equipment.

*9. Use a straight edge and soap stone laying out the prescribed pattern.

*10. Make a square cut on carbon steel, stainless steel, and aluminum sheet/plate in flat, horizontal, vertical, and overhead positions.

11. Make a bevel cut (45-degree angle) on carbon steel, stainless steel, and aluminum sheet/plate in the flat, horizontal, vertical, and overhead positions.

*12. Pierce a hole on carbon steel, stainless steel, and aluminum sheet/plate in the flat, horizontal, vertical, and overhead position.

*13. Make a pipe and tubing cut on carbon steel, stainless steel, and aluminum pipe in the horizontal position.

*14. Make a gouge and groove cut on carbon steel, stainless steel, and aluminum sheet/plate in the flat position.

*15. Lay out, cut and prepare coupons for evaluation.

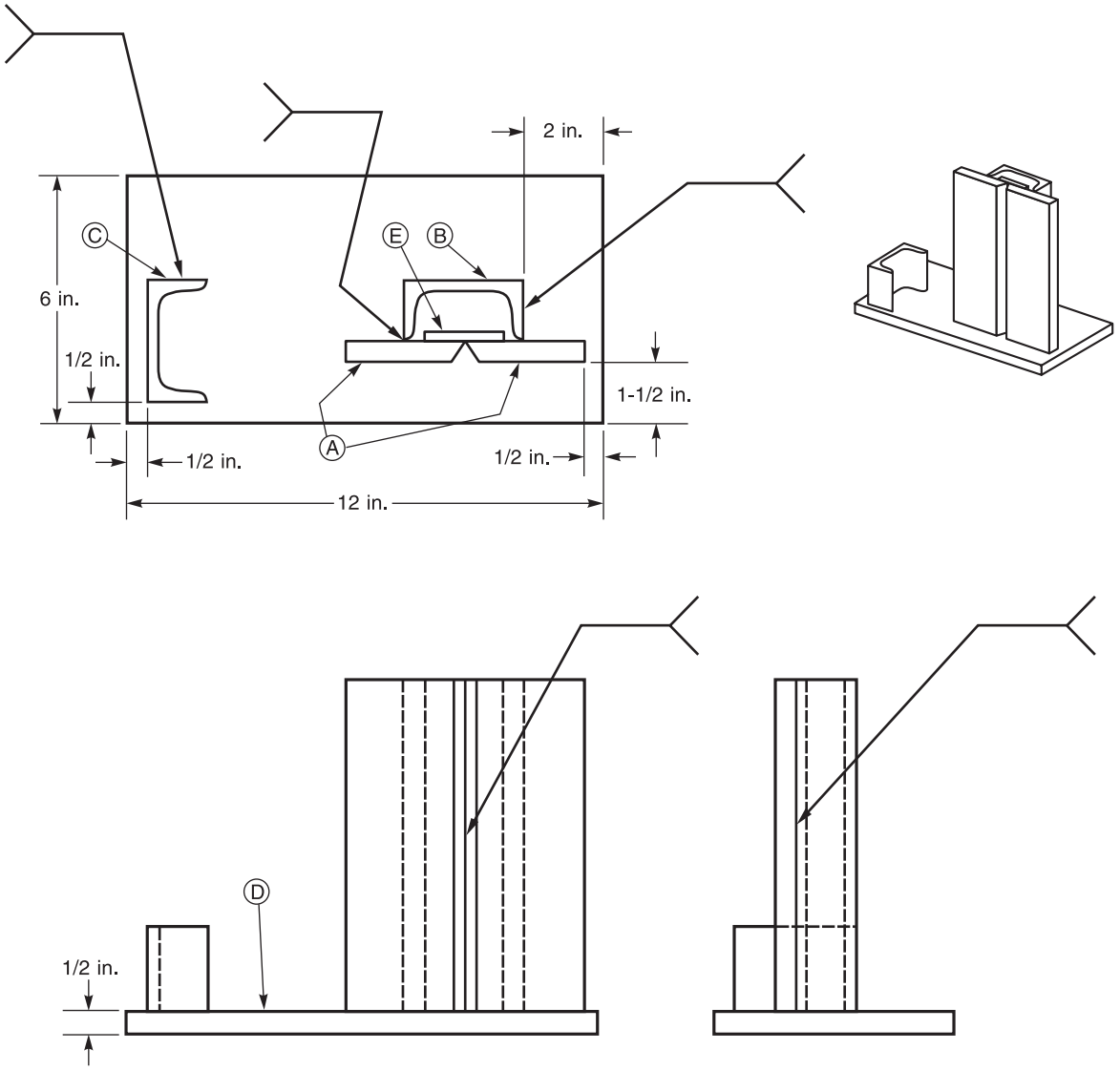
16. Test prepared coupon.

Judging Criteria

The contest will be evaluated on the competencies based on the following rating system. Point values for each item will be established by the technical committee according to the difficulty of the assigned task. Final judging of the welded projects will be evaluated using the following Visual Inspection criteria:

1. Dimensional accuracy, including distortion.
2. Conformity to drawing requirements, including determination of whether all welds have been completed and whether the finished welds conform to the required size and contour.
3. Visual examination of the welds for:
   a. Cracks.
   b. Undercut.
   c. Overlap.
   d. Crater fill.
   e. Spatter.
   f. Arc strikes.
   g. Porosity.
   h. Convexity and reinforcement.
4. Welding equipment may be obtained from a variety of manufacturers and may include transformers, rectifiers, and/or inverters.
5. Filler metals will be compatible with the metals being welded and will be detailed on the contest procedure sheet. Instructions to the contestants will define more specifically the filler metals that may be used.

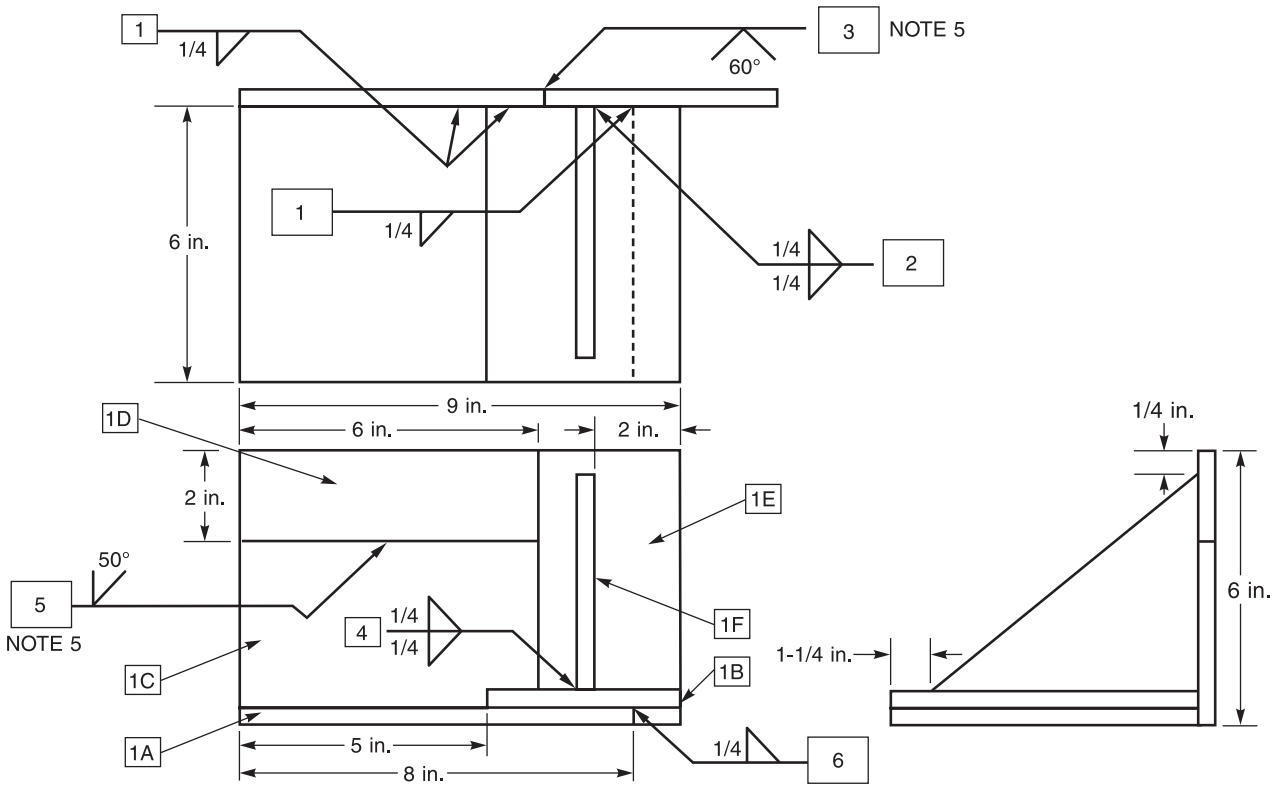
APPENDIX II—Figures for SkillsUSA Competition—2003



NOTES:
Item A: 1/2 in. × 3 in. × 8 in. plate.
Item B: 3 in. OD × 8 in. channel.
Item C: 3 in. × 2 in. channel.
Item D: 1/2 in. × 6 in. × 12 in. plate.
Item E: 2 in. × 8 in. × 1/4 in. plate.

Tack

APPENDIX II—Figures for SkillsUSA Competition—2003 (Continued)

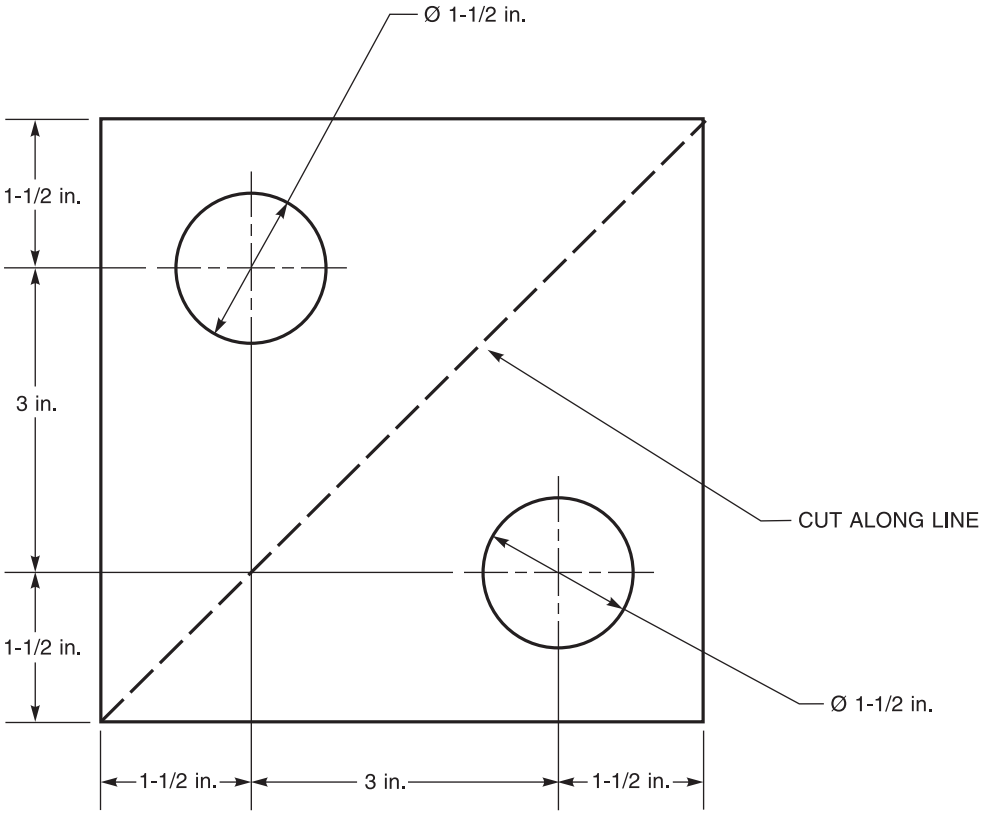


NOTES:
1. All dimensions U.S. Customary Units. DRAWING IS NOT TO SCALE.
2. Fit and tack the assembly on bench before attaching to the assembly arm.
3. ALL WELDING DONE IN POSITION TO DRAWING ORIENTATION.
4. Employ boxing where applicable.
5. Melt thru not required.
6. Visual examination in accordance with the requirements of AWS QC-10, Table 1.

Part	Number Required	Welding Procedure
1A	1	0.045 in. E71T-1 electrode
1B	1	180–200 Amperes DCEP
1C	1	24–25 Volts
1D	1	200–275 imp wire feed speed
1E	1	75% Ar 25% CO_2 @ 35–40 CFH
1F	1	All vertical welds to be done uphill

Entry Level Welder—FCAW—Carbon Steel Workmanship Qualification

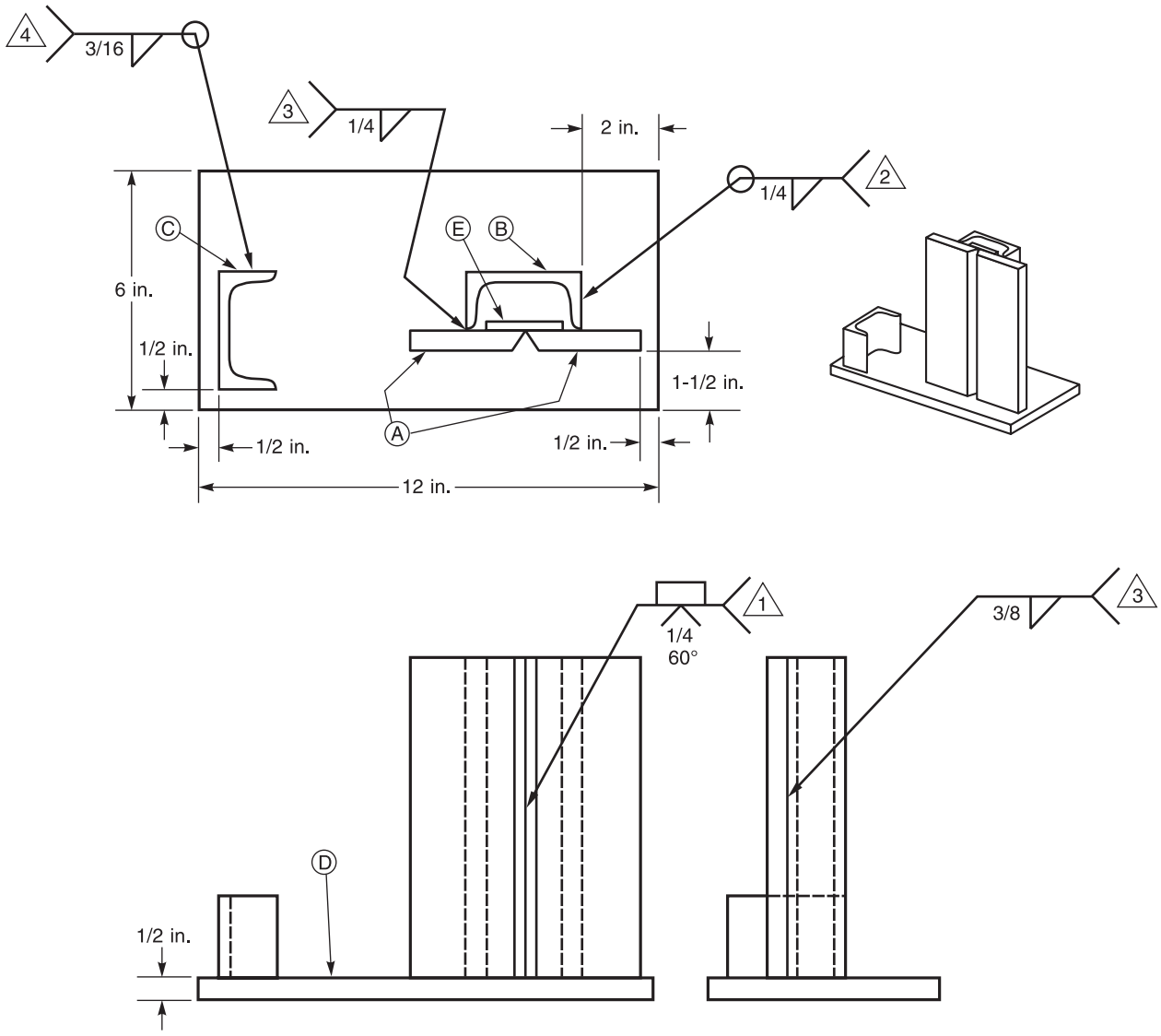
APPENDIX II—Figures for SkillsUSA Competition—2003 (Continued)



NOTES:
Item A: Committee supplied 6 in. × 6 in. × 1/4 in. plate.
Step 1: Layout and cut 2 each 1-1/2 in. diameter holes.
Step 2: Layout and cut along diagonal line.

OFC

APPENDIX II—Figures for SkillsUSA Competition—2003 (Continued)

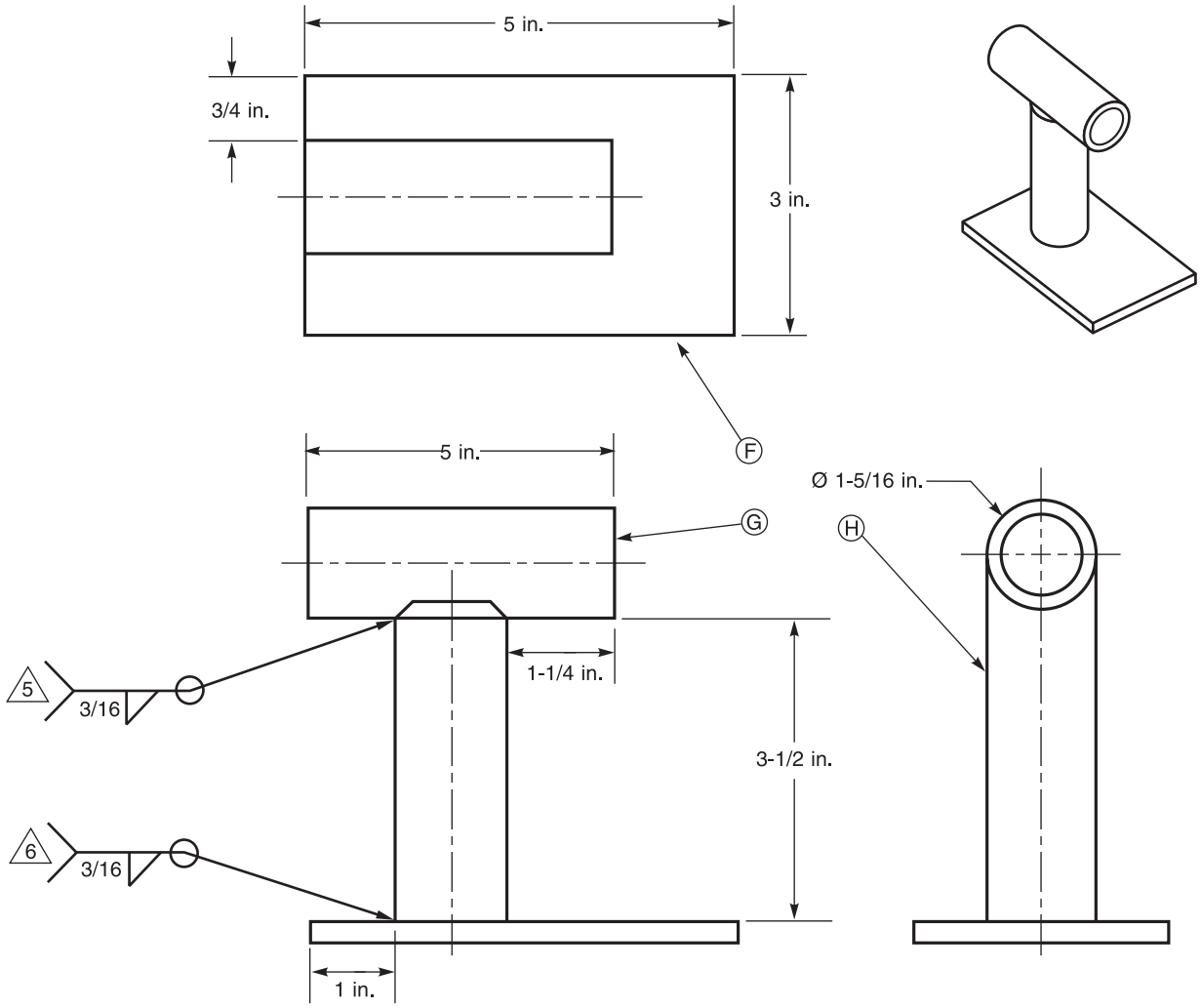


NOTES:
FCAW:
Make all welds with base plate (D) parallel to work table.
Weld #1: V-groove weld with backing—3G position—weld progression uphill.
Weld #2: Fillet weld—2F position.
DCEP 0.045 in. E71T-1 wire.
75% Ar 25% CO_2 @ 35–45 CFH.
22–26 Volts.
150–210 Amperes.

Item A: 1/2 in. × 3 in. × 8 in. plate.
Item B: 3 in. OD × 8 in. channel.
Item C: 3 in. × 2 in. channel.
Item D: 1/2 in. × 6 in. × 12 in. plate.
Item E: 2 in. × 8 in. × 1/4 in. plate.

SMAW:
Make all welds with base plate (D) parallel to work table.
Weld #3: Fillet welds—3F position—weld progression uphill.
1/8 in. E-7018.
DCEP 90–130 Amperes.
Weld #4: Fillet weld—2F position.
1/8 in. E-7014.
DCEP 120–140 Amperes.

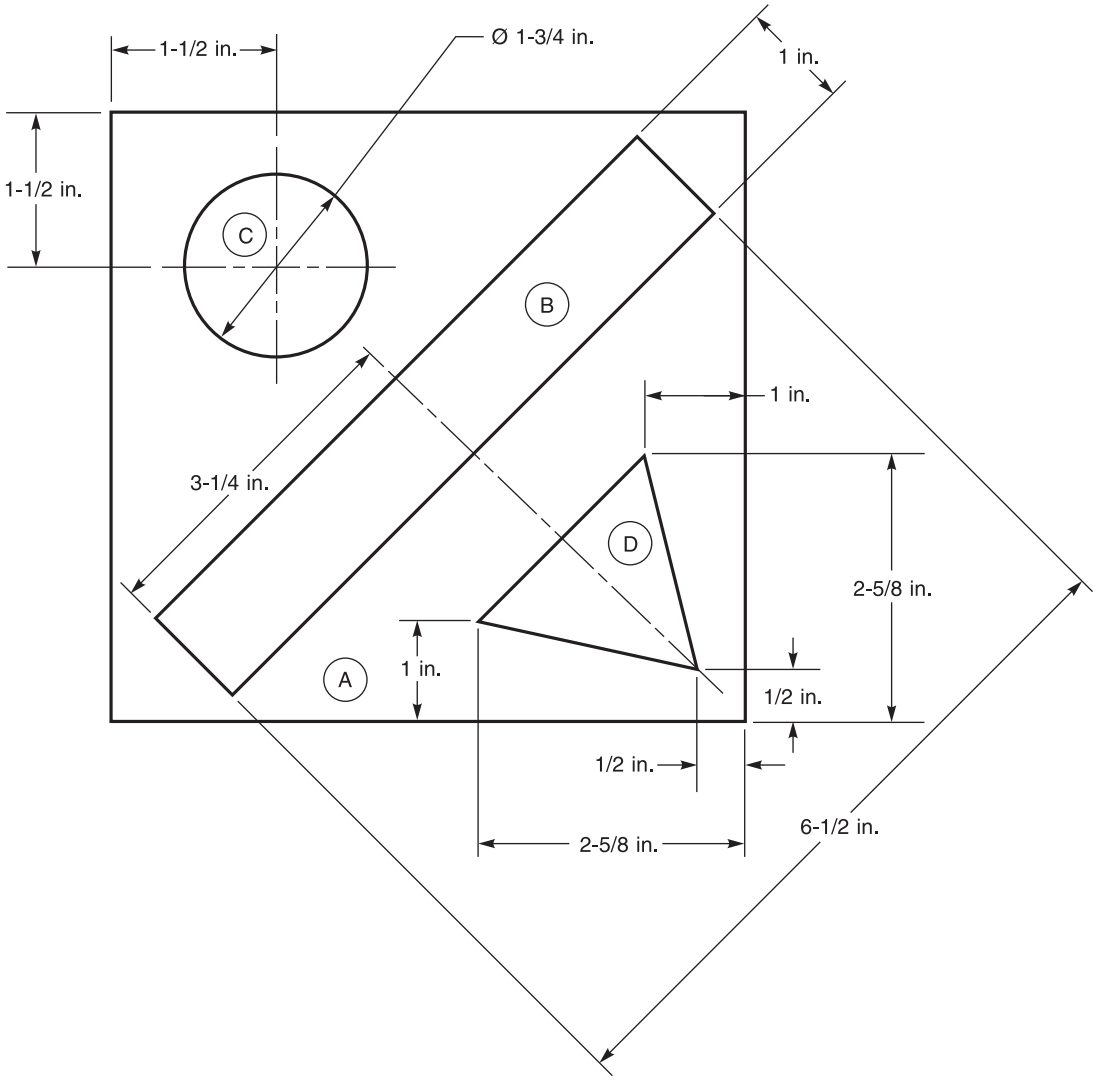
APPENDIX II—Figures for SkillsUSA Competition—2002



NOTES:
GTAW: Make all welds with base plate (F) parallel to work table
Weld #5: Fillet weld—4F position
Weld #6: Fillet weld—2F position
AC continuous high frequency
3/32 in. ER-4043 filler
Ar 10–15 CFH
3/32 EWP
100–160 Amperes

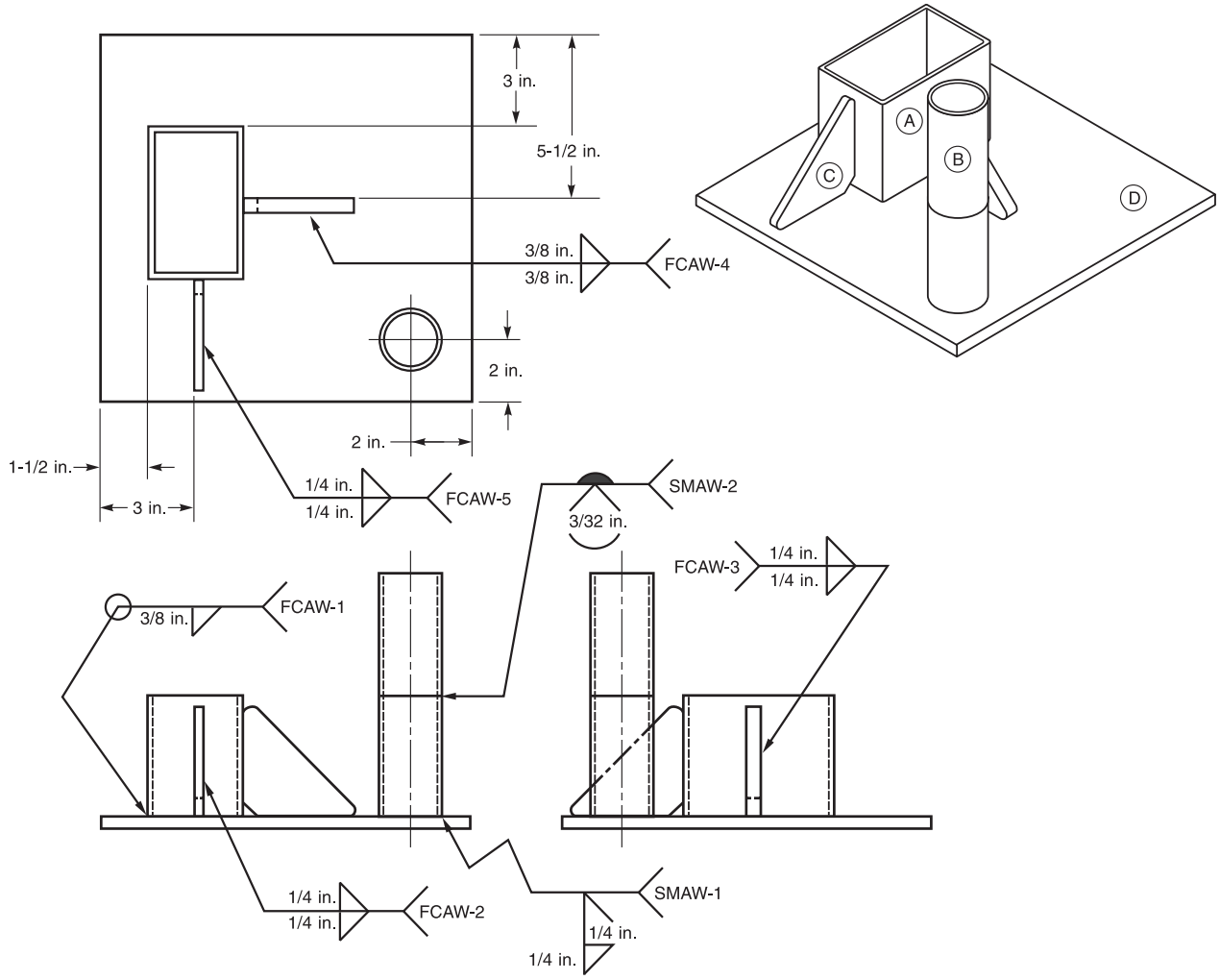
GTAW

APPENDIX II—Figures for SkillsUSA Competition—2002 (Continued)



NOTES:
Item A: Committee supplied 6 in. × 6 in. × 1/4 in. plate.
Step 1: Layout plate per the dimensions provided.
Step 2: Oxyfuel cut one each Item B, C, and D from Item A per drawing.

APPENDIX II—Figures for SkillsUSA Competition—2002 (Continued)



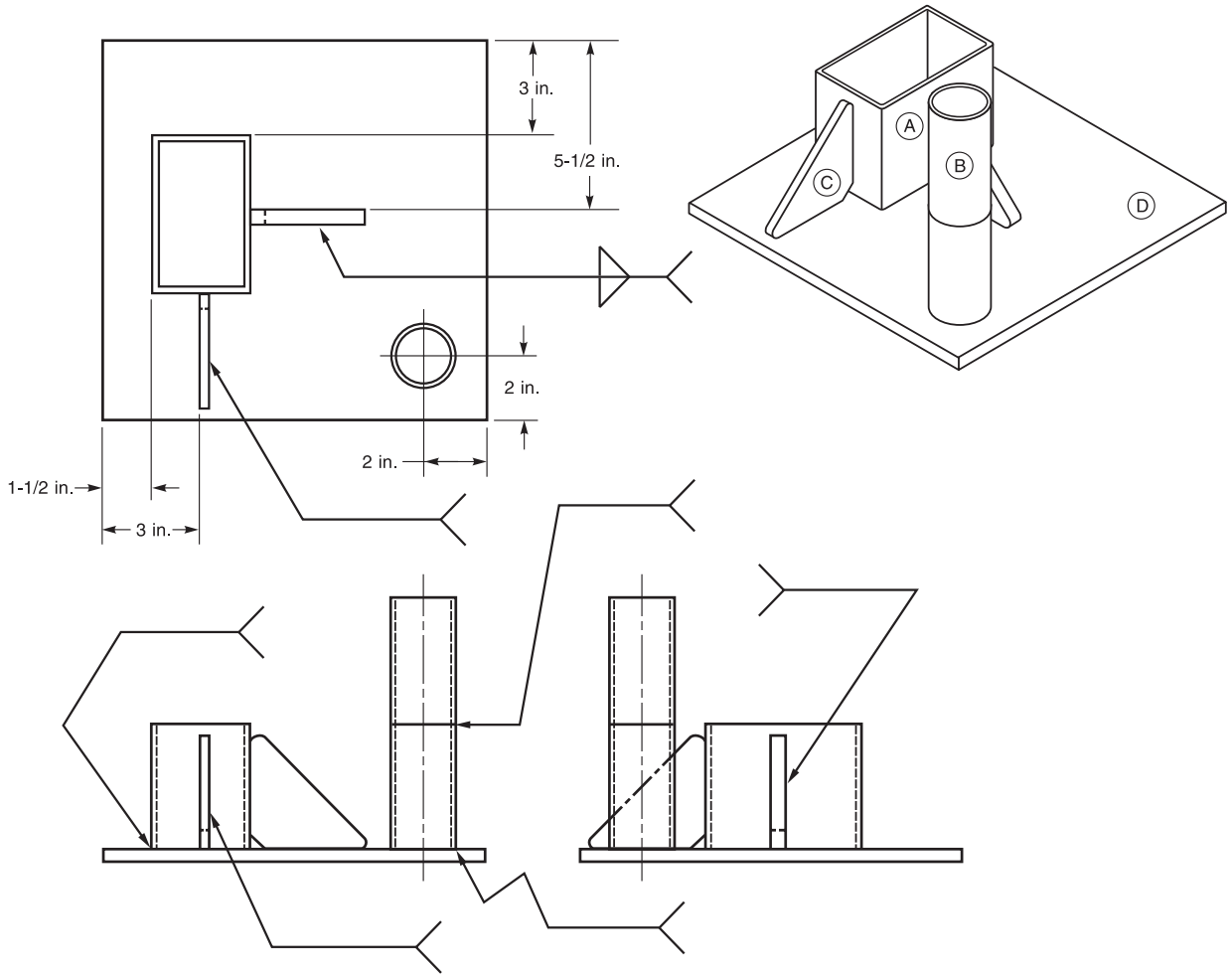
NOTES:
Item A: 3 in. × 5 in. × 4 in. rectangular tubing.
Item B: 2 in. Schedule 80 4 in. long bevel ends.
Item C: 3/8 in. × 4 in. × 4 in. angle plate.
Item D: 3/8 in. × 12 in. × 12 in. plate.

SMAW Welds 1 & 2:
Root pass: 3/32 in. E-6010, 40–75 Amperes
Cover pass: 3/32 in. E7018, 70–100 Amperes

FCAW Welds 1–5:
0.045 in. E71T-1
75% Ar, 25T CO_2 @ 40–45 CFH
180–200 Amperes
24–25 Volts

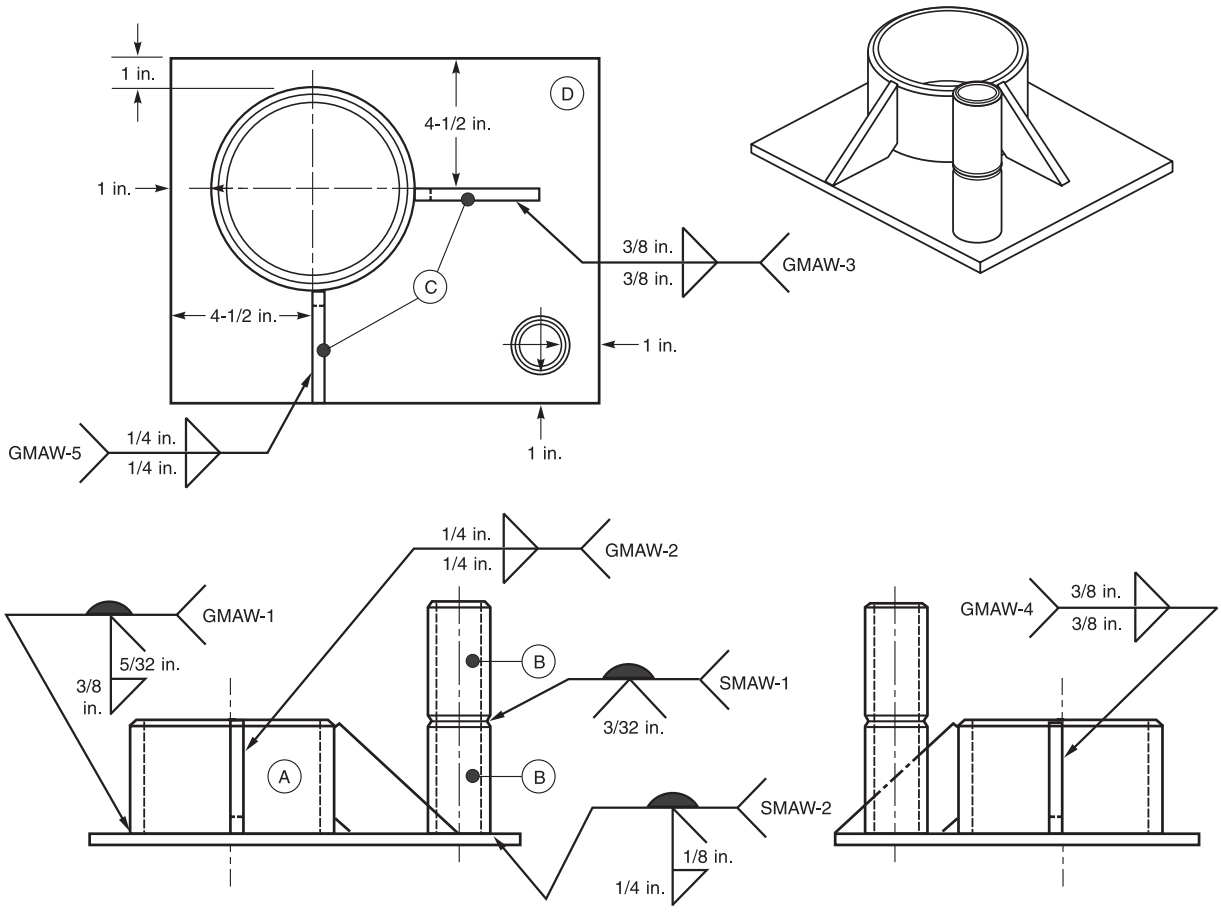
All vertical welds to be vertical up.

APPENDIX II—Figures for SkillsUSA Competition—2001



NOTES:
Item A: 3 in. × 5 in. × 4 in. rectangular tubing.
Item B: 2 in. Schedule 80 4 in. long bevel ends.
Item C: 3/8 in. × 4 in. × 4 in. angle plate.
Item D: 3/8 in. × 12 in. × 12 in. plate.

APPENDIX II—Figures for SkillsUSA Competition—2001 (Continued)

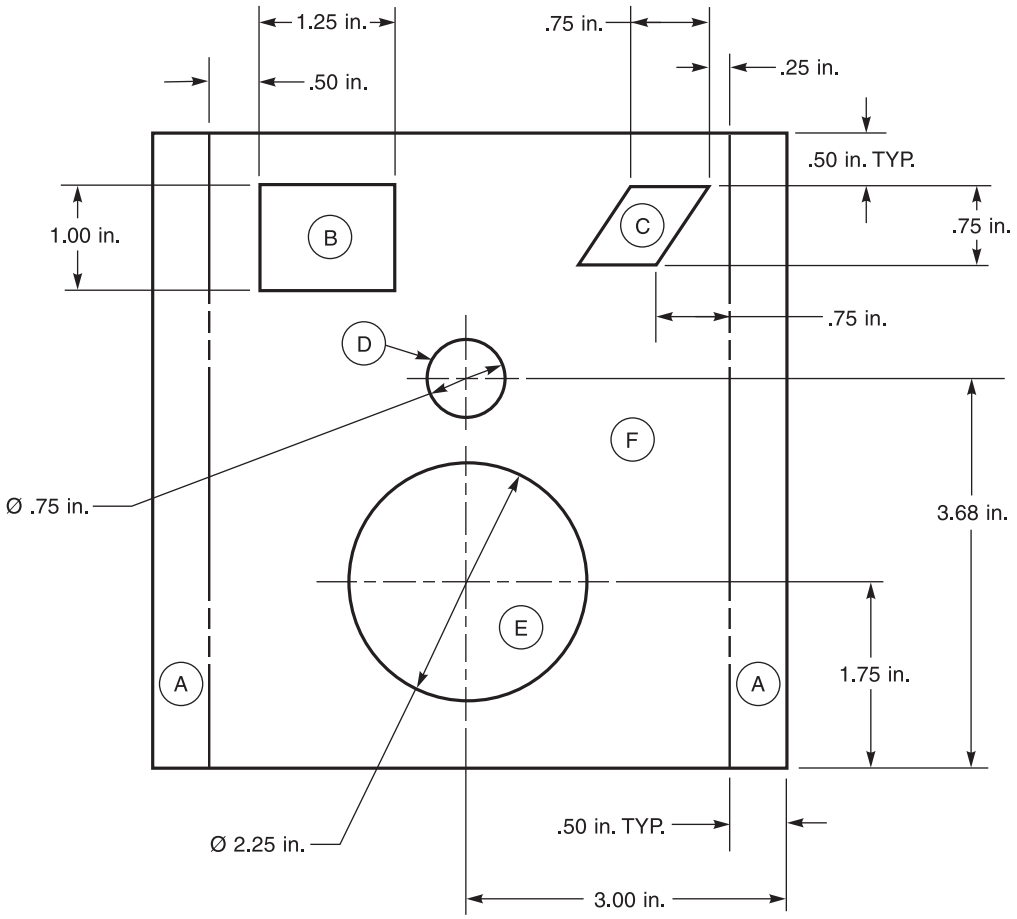


NOTES:
Item A: 6 in. Schedule 80 4 in. long bevel ends.
Item B: 2 in. Schedule 80 4 in. long bevel ends.
Item C: 3/8 in. × 4 in. × 4 in. angle plate.
Item D: 3/8 in. × 12 in. × 14 in. carbon steel.

SMAW-1 & SMAW-2:
Root pass: 3/32 in. E-6010 Electrode, DCEP, 40–70 Amperes
Fill pass: 3/32 E-7018 electrode, DCEP, 70–100 Amperes

GMAW-1 through GMAW-5:
0.035 in. E70S-6 wire
130–160 Amperes
200–270 ipm wire feed
18–20 Volts
75% Ar, 25% CO_2 @ 35–45 CFH

APPENDIX II—Figures for SkillsUSA Competition—2001 (Continued)



NOTES:
Item A: Committee supplied 6 in. × 6 in. × 1/4 in. plate.
Step 1: Layout plate per the dimensions provided.
Step 2: Oxyfuel cut two Item A and one each Item B, C, D, and E from Item F.

APPENDIX III—Judges Rating Sheet

Contest #	Contest Description	Weight	Total Possible Points	Total Contest Points
1	OFC Layout	2	30	60
2	Quality of Circle Cut	1	30	30
3	Size of Circle Cut	2	30	60
4	Quality of Triangle Cut	1	30	30
5	Size of Triangle Cut	2	30	60
6	Quality of Rectangular Cut	1	30	30
7	Size of Rectangular Cut	2	30	60
8	FCAW Appearance Weld #1, 2F	4	30	120
9	FCAW Appearance Weld #2, 3F	2	30	60
10	FCAW Appearance Weld #3, 3F	2	30	60
11	FCAW Appearance Weld #4, 2F	1	30	30
12	FCAW Appearance Weld #5, 2F	1	30	30
13	SMAW Appearance Weld #1, 2G	4	30	120
14	SMAW Appearance Weld #2, 2G	3	30	90
15	GTAW Appearance Flat Butt 1G	2	30	60
16	GTAW Appearance Flat Butt 1G	3	30	90
17	F.I. SMAW/FCAW Project Assembly	5	30	150
18	F.I. FCAW Weld #1, Size Groove Weld w/ 3/8 in. Fillet	2	30	60
19	F.I. FCAW Weld #2, Size 1/4 in. Fillet	2	30	60
20	F.I. SMAW Weld #1, Size Groove Weld w/ 1/4 in. Fillet	2	30	60
21	F.I. SMAW Weld #2, Butt Weld 1/8 in. Max Reinforcement	1	30	30
22	F.I. Penetrant Test FCAW	10	30	300
23	F.I. Penetrant Test SMAW	10	30	300
24	F.I. GTAW Project Assembly	2	30	60
25	F.I. GTAW Weld Flat Butt 1/8 in. Max Reinforcement	2	30	60
26	F.I. GTAW Weld Size 3/16 in. Fillets	1	30	30
27	Visual Inspection Station	15	20	300
28	Quiz	6	50	300
29	Interview (Length 6 points/Presentation 24 points)	10	30	300
	Total Points for Contest			**3000**
	Minus Safety Violations—OFC	3	30	90
	Minus Safety Violations—FCAW	3	30	90
	Minus Safety Violations— SMAW	3	30	90
	Minus Clothing Violations	3	10	30
	Total Points Available for Violations			**300**

Contest	Total Contest Points
OFC Contest (1–7)	330
FCAW Contest (8–12, 18, 19)	420
SMAW Contest (13, 14, 20, 21)	300
GTAW Contest (15, 16, 25, 26, 26)	300
Visual Insp. (27)	300
Quiz (28)	300
Project Assembly FCAW/SMAW (178)	150
Penetrant Inspection FCAW (22)	300
Penetrant Inspection SMAW (23)	300
Interview (29)	300
Total Possible Points	**3000**
Minus Violations	300

Total Possible Points = 3 judges at 10 points per contest scoreable unit, except for Visual Inspection (20 Points Total), Quiz (50 Points Total)

APPENDIX IV—General Knowledge Test

WELDING QUIZ

DO NOT WRITE ON THESE SHEETS! RECORD ALL ANSWERS ON THE SCANTRON CARD PROVIDED.

SECTION 1—OFC

1. What gas provides the hottest flame when burned with oxygen?
   a. Natural gas
   b. propane
   c. acetylene
   d. MAPP
2. What flame type has excess oxygen?
   a. reducing
   b. neutral
   c. carburizing
   d. oxidizing
3. What is the maximum safe working pressure when using acetylene?
   a. 15 lbs
   b. 10 lbs
   c. 20 lbs
   d. 30 lbs
4. Oxygen hoses are
   a. blue
   b. green
   c. red
   d. red and green striped
5. Devices that prevent the gases from mixing in the hoses are called
   a. back stoppers
   b. one way valves
   c. reverse flow check valves
   d. gas valves
6. The gap created by the cut is called the
   a. gap
   b. width
   c. kerf
   d. opening
7. The vertical lines on the face of the cut are called
   a. drag lines
   b. cutting lines
   c. sever lines
   d. heat lines
8. Oxyfuel torches can cut
   a. carbon steel
   b. aluminum
   c. copper nickel
   d. all of the above
9. The flames used to bring the metal up to cutting temperature are called the
   a. warming flames
   b. cutting flames
   c. preheat flames
   d. reducing flames
10. A condition that exists when the flame burns back in the torch is called a
    a. burnback
    b. explosion
    c. reverse flow
    d. flashback

Section 2—GMAW

11. GMAW uses for shielding, gases that are
    a. inert
    b. active
    c. exotic
    d. a and b above
12. GMAW uses the following current
    a. DCEP
    b. DCEN
    c. AC
    d. ACHF
13. In GMAW the current is determined by the
    a. voltage
    b. shielding gas
    c. wire feed speed
    d. machine type
14. What is not a type of metal transfer?
    a. short circuiting
    b. spray
    c. droplet
    d. pulsed
15. What gas would you choose for spray transfer welding?
    a. 75% Ar 25% CO_2
    b. 100% He
    c. 98% O_2 2% Ar
    d. 98% Ar 2% O_2

16. What type of transfer requires a special machine?
    a. pulsed
    b. spray
    c. globular
    d. short circuiting

17. The welding current is transferred to the wire via the
    a. conduit
    b. feed rolls
    c. contact tip
    d. liner

18. What type of metal transfer would produce the least spatter?
    a. short circuiting
    b. spray
    c. droplet
    d. globular

19. Short circuiting transfer can be used in what position?
    a. vertical down and flat only
    b. flat and horizontal only
    c. all positions
    d. flat only

20. The point where spray metal transfer begins is called the
    a. short circuit point
    b. spray transfer point
    c. upslope point
    d. transition current

Section 3—SMAW

21. For an E-7018 electrode the 70 stands for the
    a. tensile strength times 10,000 lbs
    b. flux coating
    c. position the electrode can be used in
    d. core wire composition

22. The SMAW process uses what type of power supply?
    a. constant potential
    b. constant voltage
    c. high voltage
    d. constant current

23. An E-11018 electrode
    a. is a low hydrogen electrode
    b. has a tensile strength of 110,000 PSI
    c. can be used in all positions
    d. is all of the above

24. When adjusting a SMAW power supply you set the
    a. voltage
    b. wire feed speed
    c. amperage
    d. flow rate

25. Opened containers of low hydrogen electrodes should be stored
    a. in a dry storeroom
    b. in a refrigerator with a light bulb
    c. in a vented electric oven
    d. require no special storage

26. An E-7024 electrode can be used in what positions?
    a. flat and horizontal only
    b. vertical down and flat only
    c. all positions
    d. flat only

27. Using a side to side motion while welding is called
    a. stringing
    b. weaving
    c. whipping
    d. figure eight

28. Filler metal specifications are written by
    a. ASME
    b. ASNT
    c. AWS
    d. ABS

29. A 308L-16 electrode would be used to weld
    a. copper nickel
    b. stainless steel
    c. carbon steel
    d. monel

30. Weld puddle shielding in SMAW is achieved by
    a. an auxiliary gas
    b. decomposition of the core wire
    c. an arc plasma
    d. decomposition of the flux coating

Section 4—GTAW

31. GTAW uses what type of gases for shielding?
    a. active
    b. inert
    c. a combination of active and inert
    d. volatile

32. An EWTh-2 electrode is
    a. 1% thoriated

b. 2% thoriated
c. 2% zirconiated
d. striped

33. What current do you use to weld aluminum?
a. DCEP
b. DCEN
c. ACEN
d. AC

34. What flow rate would be proper when using argon shielding gas?
a. 10–20 CFH
b. 40–50 CFH
c. 10–20 lbs
d. 40–50 lbs

35. What current causes the most heat at the electrode?
a. DCEN
b. ACEP
c. AC
d. DCEP

36. The shape of the electrode when using DCEN should be
a. blunt
b. balled
c. tapered
d. squared

37. A red stripe electrode is
a. EWP
b. EWTh-1
c. EWTh-2
d. EWTh-3

38. The recommended tungsten for welding aluminum is
a. EWTh-1
b. EWTh-2
c. EWTh-3
d. EWP

39. High frequency units serve to
a. balance the AC sine wave
b. allow the arc to jump the gap
c. cool the tungsten
d. provide additional amperage

40. Safety considerations must be given when using argon because
a. Argon will displace air
b. Argon is heavier than air
c. Argon does not support life
d. all the above

Section 5—General Knowledge

41. The wasting away of metal due to atmospheric elements is due to
a. crystalline changes
b. corrosion
c. carburization
d. the heat-affected zone (HAZ)

42. The property of metal that resists forces acting to pull it apart is its _____ strength
a. ductility
b. compressive
c. tensile
d. impact

43. The basic element of a welding symbol is the
a. tail
b. arrow
c. reference line
d. joint symbol

44. A nondestructive test method used to detect surface or near surface discontinuities in magnetic materials is
a. penetrant testing
b. magnetic particle testing
c. radiography
d. visual testing

45. A nondestructive test method used to detect discontinuities well below the surface is
a. visual
b. penetrant
c. magnetic particle
d. radiography

46. The failure of a weld bead to fuse to the groove walls or to another bead is called
a. lack of penetration
b. undercut
c. slag entrapment
d. lack of fusion

47. Burning away the base metal at the toe of the weld is called
a. undercut
b. lack of fusion
c. lack of penetration
d. overlap

48. The kind of electricity that reverses the direction of current flow regularly is called
a. pulsed
b. direct
c. alternating
d. reversed

49. The tendency of the arc to wander away from its path is caused by
    a. strong drafts
    b. magnetic fields
    c. short arcs
    d. low currents

50. A groove weld in the overhead position is
    a. 1G
    b. 2G
    c. 3G
    d. 4G

Answers

1. c	11. d	21. a	31. b	41. b
2. d	12. a	22. d	32. b	42. c
3. a	13. c	23. d	33. d	43. c
4. b	14. c	24. c	34. a	44. b
5. c	15. d	25. c	35. d	45. d
6. c	16. a	26. a	36. c	46. d
7. a	17. c	27. b	37. c	47. a
8. a	18. b	28. c	38. d	48. c
9. c	19. c	29. b	39. b	49. b
10. d	20. d			

APPENDIX V—Instructions for Judges

2004 Welding Contest

Thank you for participating in the 2004 SkillsUSA Welding Championships. I am sure you will find your day here rewarding. The Welding Technical Committee, the students, and SkillsUSA sincerely appreciate your time and efforts for participating in today's events.

A quick note about safety… you are in an industrial area, please recognize this and wear the appropriate clothing. Safety glasses are a must. We will have a large audience, and we must take the appropriate safety measures in order to set a professional and safe example to the students and their instructors.

You will be assigned with two other judges to judge a group of five or six contestants in one of four Judging Areas: SMAW, GMAW, OFC/AWS Inspection, and Final Judging. The contestants have three one hour stations, GMAW, SMAW, and the OFC/Inspection stations. In the OFC/Inspection Station, their hour will be split between the AWS Inspection contest and the OFC contest, they will spend 30 minutes in each of those contest areas. When one hour has passed, there will be a ten minute changeover period to move the contestants to the next station. During the ten minute changeover, someone will approach you to take your score sheet and provide you with a new one, and another person will bring you a new group of contestants.

The contestants are identified by a numbered badge, pinned on their back. You will be given a score sheet each time a group of students moves into your area. You will judge a number of points as identified on the score sheet for your area. The scoring sheets are preprinted, and the contestant number is at the left side of the sheet. Place your Initials in the Lower Left Corner of the Sheet to Identify yourself should any questions arise during data entry.

The contestants will have been told to weld all the projects with the base plate flat. The drawing calls for the position of the welds. All vertical welds are to be uphill. ***If you find anyone welding in the wrong position, welding with the wrong process, or if the weld is incomplete, inform the other judges in your group, and they are to receive no points for that weld.***

In the burning area, you will observe the contestants layout and make some cuts. A go, no go gauge will be provided to you to determine if the hole is correctly cut. A template will allow you to determine if the hole location is correct.

Observe the contestants as they make the welds: take note of their technique, how they handle themselves, and how they set up the equipment. When they complete the weld, examine the weld visually, using AWS D1.1 Table 6.1 visual acceptance criteria (attached) and a checklist from AWS QC11-96 Specification for Qualification and Certification for Level II—Advanced Welders (attached) give them a score. ***Again, If you find anyone welding in the wrong position, welding with the wrong process, or if the weld is incomplete, inform the other judges in your group, and they are to receive no points for that weld.*** Give them a score between 1 and 10. DO NOT USE FRACTIONS OR DECIMALS, USE WHOLE NUMBERS ONLY. **GIVE THEM THE SCORE BASED ON YOUR OBSERVATIONS. DO NOT CONFER WITH ANY OTHER JUDGES TO COME UP WITH A SCORE.**

If you observe a safety violation, enter a number in the safety violation box. Each infraction should deduct 1 point ***THE NUMBER IN THE SAFETY BOX IS A NEGATIVE VALUE***. Please make every effort to complete the scoring before they leave your area if possible.

The contestants are not to talk to you regarding the contest. They may talk to you if they have equipment problems. If that occurs please get one of the manufacturer's representatives that will be patrolling the area.

If you are in the front area of the contest, where the projects are put on display, ***please be cautious about any comments you make to any spectators***. Often the contestant's teachers or contestants who have finished are there and will try to get an opinion from you regarding the project. Some times they will use these comments in arguments against us if their students do not win a medal. ***If you make any comments be very general, and offer no specific opinions on how good or bad the project looks.***

Lunch will be provided for you by SkillsUSA. I sincerely hope that you have a rewarding experience volunteering your time and expertise to help shape the future of our industry.

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APPENDIX VI—Contestant Instructions

2002 Welding Contest

Welcome to the 2002 SkillsUSA Championships. This year as in the past we are running a pretest contest on Wednesday. If your instructions are printed on green paper, you must report to Lobby 400 at 7:45 A.M. If your instructions are printed on blue paper you must report to Lobby 400 at 10:00 A.M. and if your instructions are printed on yellow paper you must report to Lobby 400 at 12:15. You will weld projects that have been taken from the American Welding Society "Guide for the Training and Qualification of Welding Personnel" "Entry Level". You will weld three projects. One with the GTAW process, one with the FCAW process, and one with the SMAW process. You will have a half hour for each project. You will be judged at all stations. The GTAW project will count in your final score. At the FCAW station you have a one half hour wait. You will be given the pieces for your steel project for Thursday's test and a drawing. Use the half hour to tack up your project. You may tack it in any position. **Make sure the smoke extractors are directly over the arc so they can properly extract the fumes.** They are attached to a holder with a magnetic clamp and can be moved. All drawings must be returned to one of the escorts before you leave. You will be judged on your performance and the results compared to your performance on Thursday.

On Thursday all Secondary contestants are to report to the contest area at 8:00 A.M. Secondary contestants will begin the contest at 8:30 A.M. prompt. Post Secondary contestants are to report to the contest area no later than 12:00 noon and will begin the contest at 12:15 P.M. prompt. Secondary contestants will eat after they complete the contest. Post Secondary contestants should come to the contest area before 12:00 for their lunch. **Contestants must wear the official SkillsUSA uniform. Failure to do so will result in a clothing penalty.**

You will be divided into three groups. One group will start at the OFC/Visual Inspection area, another will start in the SMAW area, and the third will start in the FCAW area. Every hour you will be rotated to a new station. Three judges will be at each station and will judge you as you go through their station. You are not allowed to ask the judges any questions related to the contest. Should you have any equipment problems notify a judge who will contact one of the equipment manufacturers' representatives.

When you are in the OFC area, lay out and cut your project. The correct tip pressures will be set at each station. There is no need for you to make any adjustments. At the SMAW area use the time to complete the SMAW project. At the FCAW area complete that portion of the test. The carbon steel project is to be welded with the base plate flat. Do not turn the project to weld flat. Welds made in the wrong position will receive no points. **Again, make sure the smoke extractors are directly over the arc so they can properly extract the fumes. If the fumes are not being captured you will stopped and told to reposition the vent duct.**

When you have finished the contest make sure you stop at the scoring table (the table with the sign on it) to turn in your badge, and receive some materials from us.

There will be a critique of the contest Friday morning at 8:30 A.M. This will be immediately followed by a workshop. Please make every effort to attend.

You will now take a job related quiz. Upon completion of the quiz, you are to take the quiz and the pencil (if we have loaned one to you) to the table to my right if you are a secondary student, to my left if you are a post secondary student. Each table where you are to give your oral presentation is staffed by three ladies. The presentation will be scored and will count in your final score.

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APPENDIX VII—Performance Evaluation

2002 SkillsUSA Welding Competition—Secondary Rating Sheet for Contestant

NO. 01 **NAME:** John Doe **STATE:** AZ

Contest Points (CP)	Your Score	Total Possible
1. OFC Layout	48	60
2. Quality of Circle Cut	15	30
3. Size of Circle Cut	18	60
4. Quality of Triangle Cut	15	30
5. Size of Triangle Cut	16	60
6. Quality of Rectangle Cut	16	30
7. Size of Rectangle Cut	34	60
8. FCAW Weld #1 (2F) Appearance	104	120
9. FCAW Weld #2 (3F) Appearance	46	60
10. FCAW Weld#3 (3F) Appearance	48	30
11. FCAW Weld#4 (2F) Appearance	26	60
12. FCAW Weld#5 (2F) Appearance	25	30
13. SMAW Weld #1 (2G) Appearance	100	120
14. SMAW Weld #2 (2G) Appearance	75	90
15. GTAW Flat Butt (1G) Appearance	28	60
16. GTAW Horizontal Fillet (2F) Appearance	42	90

FINAL INSPECTION POINTS (FI))	Your Score	Total Possible
1. SMAW/FCAW Project Assembly	140	150
2. FCAW Weld #1 Groove Weld with 3/8 in. Fillet		
3. FCAW Weld #2 Size 1/4 in. Fillet		
4. SMAW Weld #1 Groove Weld with 1/4 in. Fillet		
5. SMAW Weld #2 Butt Weld 1/8 in. Max Reinforcement		
6. FCAW Penetrant Inspection		
7. SMAW Penetrant Inspection		
8. GTAW Project Assembly		
9. GTAW Weld Flat Butt 1/8 in. Max Reinforcement		
10. GTAW Weld Size 3/16 in. Fillets		

TOTALS	Your Score	Total Possible
OFC CONTEST (CP 1–7)	162	330
FCAW CONTEST (CP 8–12, FI 2–3)	351	420
SMAW CONTEST (CP 13–14, FI 4–5)	252	300
GTAW CONTEST (CP 15–16, FI 8–10)	171	300
VISUAL INSPECTION STATION	150	300
QUIZ	204	300
PROJECT ASSEMBLY (FI 6) (FCAW/SMAW)	140	150
PENETRANT INSPECTION FCAW (FI 6)	300	300
PENETRANT INSPECTION SMAW (FI 7)	300	300
INTERVIEW	240	300

TOTAL POINTS FOR CONTEST	**2270**	**3000**
Minus Safety Violations—OFC	12	90
Minus Safety Violations—FCAW	0	90
Minus Safety Violations—SMAW	0	90
Minus Clothing Violations	0	30
MINUS TOTAL VIOLATIONS	12	
TOTAL SCORE	**2258**	