



## PURPOSE

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

## ELIGIBILITY

Open to active SkillsUSA members enrolled in programs with architectural drafting as an occupational objective.

## CLOTHING REQUIREMENT

### **Class E: Competition Specific — Business Casual**

- Official SkillsUSA white polo shirt
- Black dress slacks or black dress skirt (knee-length minimum)
- Black closed-toe dress shoes

*Note:* Wearing socks or hose is no longer required. If worn, socks must be black dress socks and hose must be either black or skin-tone and seamless/nonpattern.

These regulations refer to clothing items that are pictured and described at [www.skillsusastore.org](http://www.skillsusastore.org). If you have questions about clothing or other logo items, call 1-888-501-2183.

*Note:* Competitors must wear their official competition clothing to the competition orientation meeting.

## EQUIPMENT AND MATERIALS

1. Supplied by the technical committee:
  - a. Architectural drafting workstation, consisting of a table with a work area, space for reference material and a personal computer, and a chair.
  - b. Access to power
  - c. Output hardware: plotter or printer
  - d. Drafting paper/vellum
  - e. All necessary information and furnishings for judges and technical committees
2. Supplied by the competitor:
  - a. PC-type computer, monitor, and input devices. Computers may be obtained from any source. It is advisable to have active virus-protection software on the competitor's computer.
  - b. Removable data storage device (flash drive) or recordable CD
  - c. Architectural software of choice. Proof of licensing for every software program installed on the competitor's computer must be provided to the technical committee at the competitor orientation meeting. School-owned computers must be set up to operate the software of choice independent of the school's network.
  - d. Students may bring published reference books, tables, and software manuals. Reference materials must not take up more than one cubic foot of space and may not be shared between competitors. Legal PDF copies of textbooks may be allowed if resident to the student's computer hard drive and approved by the technical committee.
  - e. Typical personal drafting supplies desired for board drafting and freehand sketching subject to the approval of the technical committee
  - f. Battery-operated calculator
  - g. Multi-receptacle power strip
  - h. Competitors choosing to use board drafting equipment must bring their own drawing board, equipment, and drafting supplies.
  - i. All competitors must create a one-page resume. See "Resume Requirement" below for guidelines.

**Note:** The setup configuration and the tear-down of all competitor-provided equipment will be the responsibility of the competitor.

### RESUME REQUIREMENT

Competitors must create a one-page resume to submit online. SkillsUSA South Carolina competitors should submit their resume by the deadline published on the competition updates page of our website. Failure to submit a resume will result in a 10-point penalty.

Your resume must be saved as a PDF file type using file name format of "Last Name\_First Name." For example, "Amanda Smith" would save her resume as Smith\_Amanda. If you need assistance with saving your file as a PDF, visit the Adobe website for more information.

**Note:** Check the Competition Guidelines and/or the updates page on the state website.

## **PROHIBITED DEVICES**

Cellphones, electronic watches and/or other electronic devices not approved by a competition's national technical committee are **NOT** allowed in the competition area. Please follow the guidelines in each technical standard for approved exceptions. Technical committee members may also approve exceptions onsite during the SkillsUSA Championships if deemed appropriate.

### **Penalties for Prohibited Devices**

If a competitor's electronic device makes noise or if the competitor is seen using it at any time during the competition, an official report will be documented for review by the Director of the SkillsUSA Championships. If confirmed that the competitor used the device in a manner which compromised the integrity of the competition, the competitor's scores may be removed.

## **SCOPE OF THE COMPETITION**

### **KNOWLEDGE PERFORMANCE**

The competition will include a written test assessing general knowledge of architecture and drafting. Written portions may also exist during the skills portion of the competition. Knowledge of terms and principles used in the architecture profession will be required for the skill demonstration portion of the competition.

### **SKILL PERFORMANCE**

The competition will assess skill performance by providing a hand sketch and computer-generated problem that may be solved using either board drafting or CAD.

### **COMPETITION GUIDELINES**

1. Preparation of drawings will include proper dimensions and line type selection according to current drafting standards.
2. During the competition, the competitors will work independently; no assistance from other competitors, instructors, or observers is allowed.
3. Limited technical assistance for computer or software malfunction may be given by appropriate manufacturers' representatives or members of the technical committee.
4. Competitors will each be given the same amount of time to accomplish the problem. Everyone will begin at the same time and take the required lunch break, and no one will be allowed to work past the competition conclusion. (Additional time may be granted for equipment malfunction.)
5. Each competitor will be responsible for establishing plotting procedures at the computer and for plotting his or her work to a plot file on a USB flash drive. Competitors must have a program on their computer to allow them to plot to a PDF if the program of choice does not allow this plotting option.
6. Criteria to evaluate skill performance are general in nature and will be done from plotted drawings, manual drawings and sketches. Specific criteria will be based on the demonstration of competency in those elements of accuracy and productivity included in the competition problem.

7. Competencies to be demonstrated may be selected from the Standards and Competencies below.

## **STANDARDS AND COMPETENCIES**

### **AD 1.0 — Demonstrate understanding of terms and principles used in the architectural profession**

- 1.1. Define and use terms commonly used in the architectural profession.
- 1.2. Explain the application of geometric objects to building materials.
  - 1.2.1. Define the characteristics of an equilateral triangle and its application to architecture.
  - 1.2.2. Define the characteristics of an isosceles triangle and its application to architecture.
  - 1.2.3. Define the characteristics of a square and its application to architecture.
  - 1.2.4. Define the characteristics of a parallelogram and its application to architecture.
  - 1.2.5. Define the characteristics of an equilateral triangle and its application to architecture.
  - 1.2.6. Define the characteristics of a hexagon and its application to architecture.
  - 1.2.7. Define the characteristics of an octagon and its application to architecture.
  - 1.2.8. Define the characteristics of a circle and its application to architecture.

### **AD 2.0 — Interpret and apply conventional General Drafting Standards to architectural drafting situations**

- 2.1. Define function of each line in the Alphabet of Lines.
- 2.2. Explain the graphical characteristics of each line.
  - 2.2.1. Visible/Object Lines: Thick solid lines that represent visible edges or contours of the part. Visible lines of floor plans are medium thickness (0.6 mm).
  - 2.2.2. Hidden Lines: Hidden lines should always touch where the visible feature starts or ends (0.3mm). Hidden lines may be omitted from drawings for clarity purposes.
  - 2.2.3. Section Lines: Section lines represent the area of the part that would be cut in a section view (0.3 mm).
- 2.3. Explain orthographic elevation projection.
  - 2.3.1. Architecturally, views are referred to as elevations.
  - 2.3.2. Roof plan is the top view and front elevation is the front view, etc.
  - 2.3.3. Elevations are oriented on site with reference to true north or building north.
- 2.4. Explain the terms and definitions used in detail drawings, working drawings and drafting.
- 2.5. Define and describe the components that comprise architectural drawings.
  - 2.5.1. Necessary multi-views
  - 2.5.2. Dimensional information
  - 2.5.3. Specified materials
  - 2.5.4. Revision block, title block and sheet size
  - 2.5.5. Drafter/reviewer names
  - 2.5.6. Enlarged views and sections showing detail
  - 2.5.7. General notes with construction information
  - 2.5.8. Schedules: doors, windows and room finishes

- 2.6. Define and describe the components that comprise architectural construction (working) drawings.

**AD 3.0 — Develop a set of working drawings from a provided scenario with provided materials using competencies identified for drafting certification by the American Design Drafting Association**

- 3.1. Produce multiview drawings with lines, curves, surfaces, holes, fillets, rounds, chamfers, run outs and ellipses.
- 3.2. Use standard drafting techniques to create section views to improve the visualization of new designs.
- 3.3. Clarify multiview drawings and facilitate the dimensioning of drawings.
- 3.4. Summarize and apply the principles and procedures for adding size information to a drawing according to standard dimensioning practices.
- 3.5. Draw and label site plans, floor plans, foundation plans, plumbing plans, mechanical plans, electrical plans and landscaping plans with elevations, sections, details, schedules and necessary multiviews.

**AD 4.0 — SkillsUSA Framework**

The SkillsUSA Framework is used to pinpoint the Essential Elements found in Personal Skills, Workplace Skills and Technical Skills Grounded in Academics. Students will be expected to display or explain how they used some of these Essential Elements. Please reference the graphic, as you may be scored on specific elements applied to your project. For more, visit: [www.skillsusa.org/who-we-are/skillsusa-framework/](http://www.skillsusa.org/who-we-are/skillsusa-framework/).



**COMMITTEE IDENTIFIED ACADEMIC SKILLS**

The technical committee has identified that the following academic skills are embedded in this competition.

**Math Skills**

- Use fractions to solve practical problems.
- Use proportions and ratios to solve practical problems.
- Simplify numerical expressions.
- Solve practical problems involving percentages.
- Solve single variable algebraic expressions.
- Solve multiple variable algebraic expressions.
- Measure angles.
- Find surface area and perimeter of two-dimensional objects.
- Find volume and surface area of three-dimensional objects.
- Construct three-dimensional models.
- Apply Pythagorean Theorem.
- Make predictions using knowledge of probability.
- Make comparisons, predictions and inferences using graphs and charts.
- Organize and describe data using matrices.

- Graph linear equations.
- Solve problems using proportions, formulas and functions.
- Find slope of a line.
- Solve practical problems involving complementary, supplementary and congruent angles.
- Solve problems involving symmetry and transformation.
- Use measures of interior and exterior angles of polygons to solve problems.

### **Science Skills**

- Describe and recognize solids, liquids and gasses.
- Describe characteristics of types of matter based on physical and chemical properties.
- Use knowledge of physical properties (shape, density, solubility, odor, melting point, boiling point, color).
- Use knowledge of classification of elements as metals, metalloids and nonmetals.
- Use knowledge of mechanical, chemical and electrical energy.
- Use knowledge of heat, light and sound energy.
- Use knowledge of temperature scales, heat and heat transfer.
- Use knowledge of sound and technological applications of sound waves.
- Use knowledge of simple machines, compound machines, powered vehicles, rockets and restraining devices.
- Use knowledge of principles of electricity and magnetism.
- Use knowledge of static electricity, current electricity and circuits.
- Use knowledge of motors and generators.

### **Language Arts Skills**

- Provide information in conversations and in group discussions.
- Demonstrate use of such verbal communication skills as word choice, pitch, feeling, tone and voice.
- Demonstrate use of such nonverbal communication skills as eye contact, posture and gestures using interviewing techniques to gain information.
- Analyze mass media messages.
- Demonstrate comprehension of a variety of informational texts.
- Use text structures to aid comprehension.
- Identify words and phrases that signal an author's organizational pattern to aid comprehension.
- Understand source, viewpoint and purpose of texts.
- Organize and synthesize information for use in written and oral presentations.
- Demonstrate knowledge of appropriate reference materials.
- Use print, electronic databases and online resources to access information in books and articles.
- Demonstrate narrative writing.
- Demonstrate expository writing.
- Demonstrate persuasive writing.
- Demonstrate informational writing.

- Edit writing for correct grammar, capitalization, punctuation, spelling, sentence structure and paragraphing.

## **CONNECTIONS TO NATIONAL STANDARDS**

State-level academic curriculum specialists identified the following connections to national academic standards.

### **Math Standards**

- Numbers and operations
- Algebra
- Geometry
- Measurement
- Problem solving
- Communication
- Connections
- Representation

*Source: NCTM Principles and Standards for School Mathematics. For more information, visit: <http://www.nctm.org>.*

### **Science Standards**

- Understands forces and motion
- Understands the nature of scientific inquiry

*Source: McREL Compendium of National Science Standards. To view and search the compendium, visit: <http://www2.mcrel.org/compendium/>.*

### **Language Arts Standards**

- Students adjust their use of spoken, written and visual language (e.g., conventions, style, vocabulary) to communicate effectively with a variety of audiences and for different purposes.
- Students employ a wide range of strategies as they write and use different writing process elements appropriately to communicate with different audiences for a variety of purposes.
- Students apply knowledge of language structure, language conventions (e.g., spelling and punctuation), media techniques, figurative language and genre to create, critique and discuss print and nonprint texts.
- Students conduct research on issues and interests by generating ideas and questions and by posing problems. They gather, evaluate and synthesize data from a variety of sources (e.g., print and nonprint texts, artifacts, people) to communicate their discoveries in ways that suit their purpose and audience.
- Students use a variety of technological and information resources (e.g., libraries, databases, computer networks, video) to gather and synthesize information and to create and communicate knowledge.
- Students use spoken, written and visual language to accomplish their own purposes (e.g., for learning, enjoyment, persuasion, and the exchange of information).

**Source:** *IRA/NCTE Standards for the English Language Arts. To view the standards, visit: [www.ncte.org/standards](http://www.ncte.org/standards).*