



Department of the Air Force  
HQ AEDC (AFMC)  
Arnold AFB, TN 37389

## **Safety, Health, and Environmental Standard**

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**Title:** CONTROL OF HAZARDOUS AREAS  
USING SAFETY SIGNS, TAGS, AND BARRICADES

**Standard No.:** B3

**Effective Date:** 12/07/2012

**Releasability:** There are no releasability restrictions on this publication.

The provisions and requirements of this standard are mandatory for use by all personnel engaged in work tasks necessary to fulfill the AEDC mission. Please contact your safety, industrial health and/or environmental representative for clarification or questions regarding this standard.

Approved:

Contractor ATA Director  
Safety, Health, and Environmental

Air Force Functional Chief

## SHE Standard B3 Control of Hazardous Areas Using Safety Signs, Tags and Barricades

### Record of Review/Revision

(Current revisions are highlighted in yellow and marked with a vertical line in the right margin.)

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## Safety, Health, and Environmental Standard

### CONTROL OF HAZARDOUS AREAS USING SAFETY SIGNS, TAGS, AND BARRICADES

#### 1.0 INTRODUCTION/SCOPE/APPLICABILITY

- 1.1 **Introduction** - This standard outlines requirements for controlling personnel access to equipment and/or areas that are hazardous or potentially hazardous.
- 1.2 **Scope** - When there are any conflicts noted between this standard and industry or national codes, standards or regulatory requirements, the operating contractor shall notify the government. The ANSI Z535 series of standards were revised in 2006 and 2007. Neither OSHA, AFOSH Standard 91-501, nor the Operating Contractor Performance Work Statement requires compliance with the 2006-07 series; however, safety signs, tags, etc., which comply with the new standards are acceptable.
- 1.3 **Applicability** - This standard applies to all personnel at the AEDC Tennessee location. Requirements unique to NFAC are addressed in NFAC Supplement A321-0801-XPS attached to this standard. Tunnel 9 has its own requirements for safety signs, tags, and barricades.
- 1.3.1 Requirements in this standard are specific to signs, tags, or physical/visible barricades sufficient to restrict personnel access with the following exceptions:
- 1.3.1.1 Vehicle traffic signs shall comply with the Federal Highway Administration's Manual on Uniform Traffic Control Devices for Streets and Highways.
- 1.3.1.2 Signs and symbols on railway cars and motor vehicles transporting explosives shall comply with current Department of Transportation Regulations (CFR, Title 49).
- 1.3.1.3 Arc flash and shock hazard warning labels are specified in Safety, Health, and Environmental Standard (SHE Std) B4, High-Voltage Electrical Work, and B6, Low-Voltage Electrical Safety Related Work Practices.
- 1.3.1.4 Chemical labeling is covered in SHE Std B9, Container Labeling.
- 1.3.1.5 Color legends for identifying piping systems and tanks are covered in SHE Std D3, Identification of Piping Systems.
- 1.3.1.6 Color coding of compressed gas cylinders is covered in SHE Std D4, Compressed Gas Cylinders.

#### 2.0 BASIC HAZARDS/HUMAN FACTORS

Personnel hazards are created by maintenance, construction, and test operations such as opening manholes or trenches, pressure system testing, concurrent work at different elevations, and tests that include hazardous or explosive materials. Exposure of people to the hazards inherent in such operations is minimized when using signs and barricades. Signs, tags, and/or barricades shall be used to alert personnel of existing or potential hazards. Signs and tags provide awareness and/or instructions. Barricades limit or prevent access. These controls are used to supplement, rather than replace, proper guarding or elimination of hazardous conditions.

#### 3.0 DEFINITIONS

Authorized Person – A person whose presence is required inside a hazardous area as determined by the hazardous area point of contact.

Barricade/Barrier – Any physical obstruction that deters the passage of unauthorized persons or vehicles. Throughout this standard, the term barricade will be used. Barricades may be temporary or permanent, flexible or rigid.

- Flexible Barricades – May include colored rope, colored ribbon. (Annex A.)
- Rigid Barricades – May include fences, building walls, earthen berms, and stationary equipment (Annex B.)

**Barricade Sign** – Instructions posted at the entry to the barricaded area(s) at a minimum to control personnel access. Signs indicate the degree of the hazard (danger or caution), briefly describing the hazard (i.e., men working above, high voltage, etc.) or indicating action to be taken (i.e., keep clear, do not enter, etc.) and identify the name and phone number of the point of contact in charge of the operation. (Annex C.)

**Base Operating Contractor** – A long-term contractor directly accountable to the Air Force for the AEDC mission; term used to identify the AEDC Operation, Maintenance, Information Management and Support Contractor.

**Controlled Access** – An entrance at a barricade perimeter that allows access into a hazardous area.

**Hazardous Area** – An area considered dangerous or potentially dangerous to personnel because of the nature of work in progress or the environmental conditions within the area.

**Label** – Reproduction of a sign, usually miniaturized and often adhesive-backed, and used instead of a sign because of convenience and ease of attachment to small equipment.

**Outside Contractor/Subcontractor** – An organization employed by a contractor or the Air Force to do construction, maintenance, repair or other work at AEDC. There is no employment relationship, control or supervision of the subcontractor's employees by AEDC contractors. Also referred to as the construction contractor.

**Point of Contact (POC)** – The person designated by name on the Job Safety Analysis for the controlled area as being authorized to grant entry into an area that has been secured with a barricade. This is typically a supervisor, project manager or designee who has immediate control of the area or hazard.

**Sign** – Letters, words, symbols, or markings temporarily or permanently affixed or placed at locations where hazards exist. (See Annex C for additional details.)

- **Danger** signs identify an immediate or potentially serious hazard.
- **Caution** signs shall be used only to warn against potential hazards, or hazards of low potential severity, or to caution against unsafe practices.
- **Safety information** signs shall be used anywhere there is a need for general safety information, suggestions, or reminders.
- **Safety instruction** signs shall be used to indicate general instructions relative to safe work practices, to indicate the location of safety equipment, or to record required inspections.

**Tags** – Temporary signs securely attached to a piece of equipment or part of a structure or system to warn of existing or immediate hazards and communicate appropriate information. (See Annex D for examples.)

## **4.0 REQUIREMENTS/RESPONSIBILITIES**

### **4.1 REQUIREMENTS**

#### **4.1.1 Design Features** (See Annex C for additional details.)

4.1.1.1 Color, size, proportion, and shape of signs and tags shall be as specified in the annexes to this standard. The general rule for use of color shall be as follows:

- Red – **DANGER**
- Yellow – **CAUTION**
- Blue – **INFORMATION**
- Green – **INSTRUCTIONS**

Green signs and tags may also be used to show location of equipment, or document inspections.

4.1.1.2 Signs must be of material and markings appropriate to environmental conditions for the work being performed.

4.1.1.3 Specialized types of hazard signs, including lasers, explosives, and radioactivity shall employ a specific emblem or symbol; there shall be no variation in the type of design of such signs and symbols.

4.1.1.4 When rigid signs are used, such signs shall have rounded or blunt corners and be free of sharp edges, burrs, splinters, or other sharp projections-including the fastening devices.

#### **4.1.2 Location**

- 4.1.2.1 Barricades shall be installed before the hazard is created, removed when the hazard is eliminated, and maintained at all times by the organization that created the hazard. The hazardous area shall be completely barricaded sufficient to control or restrict access.
- 4.1.2.2 The physical protection offered by the barricade shall be consistent with the hazard created. Selected examples are identified below.

#### **4.1.3 Caution Areas**

- 4.1.3.1 Areas with a potential for low severity hazard(s) (i.e., tripping, stumbling, falling on the same level, perimeter of construction and maintenance areas, etc.) typically shall be designated as caution areas.
- 4.1.3.2 Flexible barricades shall be erected with rope, ribbon, fencing, tape, or other suitable material with yellow or yellow and black coloring.
- 4.1.3.3 The POC in charge of the operation shall be allowed to grant access into a barricaded area.
- 4.1.3.4 Signage shall be posted at the entry to the area(s) at a minimum to control access. Signs shall define the hazard that exists or convey the caution information and identify the name and phone number of the POC.
- 4.1.3.5 Construction work lasting 30 days or more shall use construction fencing to control area access. Access to construction areas shall be coordinated through the POC.

#### **4.1.4 Danger Areas**

- 4.1.4.1 Areas used to specify the existence of an immediate or potentially serious hazard; evacuation zone; or to convey the message **STOP DO NOT ENTER** shall be designated as danger areas.
- 4.1.4.2 Barricades shall be chain, railing, rope, ribbon (see photo at right), fencing, earthen berms, concrete, building walls or other physical barricades sufficient to restrict access.
- 4.1.4.3 When rope or ribbon is used, it shall be solid red or red-and-white combination, at least two inches in width, and secured to withstand force of normal wind speeds.
- 4.1.4.4 Rigid barricades shall surround fall hazards to a lower level or into hazardous equipment/machinery. Falling object hazards (working above or below); pits, excavations or crushing hazards shall be offset at minimum of six feet from the hazard. Rigid barricades shall be between 34 inches and 39 inches above the walking surface. Guard rails systems for rigid barricades shall **NOT** be made of thin chain, tape, rope, metal/plastic banding or ribbon.
- 4.1.4.5 Signs shall be placed where personnel approaching from any point on the danger area perimeter can read them. These signs shall define the hazard(s) (i.e., **OVERHEAD WORK IN PROGRESS, FALL HAZARD, WORK IN PROGRESS BELOW, CRUSHING HAZARD FROM CRANE TURNTABLE, CRANE SWING RADIUS**) and identify the name and phone number of the POC for the job being performed.  
  
**NOTE:** Short duration (i.e., same shift) overhead hoisting operations shall be exempt from barricade and signage requirements as long as a sentry (or sentries) is posted to restrict area access during the operation. This requirement shall be specified on the Job Safety Analysis (JSA), **Job Safety Review (JSR)**, or equivalent.
- 4.1.4.6 The POC in charge of the operation shall be allowed to grant access into a barricaded area.
- 4.1.4.7 Tools, materials, and equipment shall not be allowed to accumulate on elevated work locations, near pits, or above work areas on lower levels. Smaller objects (i.e., nuts, bolts, small tools, etc.) shall be kept in suitable containers and properly stored.
- 4.1.4.8 Where personnel are exposed to a hazard during hours of darkness, general illumination or some combination of lanterns, fluorescent paint, or warning lights shall be provided.



#### **4.1.5 Radiation Areas**

- 4.1.5.1 Radiation areas shall be barricaded and marked as required by AEDC SHE Std. D11 Ionizing Radiation.
- 4.1.5.2 Barricades shall be chain, railing, rope, ribbon, fencing, earthen berms, concrete, building walls or other physical barricades sufficient to restrict access. If rope or ribbon is used, it shall be yellow and magenta (reddish purple) or magenta in color.
- 4.1.5.3 Signs shall be placed where personnel approaching from any point on the radiation area perimeter can read them prior to entering the radiation area. The signs shall define the hazard(s) and identify the name and phone number of the radiographer or POC.
- 4.1.5.4 Where a hazard exists and personnel are exposed during hours of darkness, general illumination or some combination of lanterns, fluorescent paint, or warning lights shall be provided.
- 4.1.5.5 Signs shall be of sufficient size to allow ample time for anyone coming in view of the sign to heed the warning before encountering the hazard (See Annex C, Paragraph 6).

#### **4.1.6 SIZE**

Suggested minimum letter heights, as a function of normal seeing distance, are provided below:

<b>LETTER HEIGHT (INCHES)</b>	5	4.5	4	3.5	3	2.5
<b>VIEWING DISTANCE (FEET)</b>	200-250	150-200	120-150	105-120	90-105	75-90
<b>LETTER HEIGHT (INCHES)</b>	2	1.5	1	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$
<b>VIEWING DISTANCE (FEET)</b>	60-75	40-60	30-40	20-30	10-20	<10

#### **4.1.7 WORDING**

Wording shall be factually accurate, concise, easily read, easily understood, and require positive action. Examples of suggested wording for specific hazards are shown in Annex C of this standard.

#### **4.1.8 LIGHTING**

- 4.1.8.1 Where natural light is insufficient to permit easy and correct interpretation of the warning data, artificial light shall be provided. The recommended illumination value for critical signs (such as EXIT signs) is five foot-candles at the sign surface.
- 4.1.8.2 Where the hazard exists and personnel are exposed during hours of darkness, either general illumination or some combination of lanterns, fluorescent paint, or warning lights shall be provided.

#### **4.1.9 REPLACEMENT**

Damaged, deteriorated, or illegible signs shall be promptly replaced. Inspection of the signs shall be included in contractor safety and housekeeping inspections.

#### **4.1.10 REMOVAL**

Signs that convey information which is no longer correct, or which warn of a hazard that no longer exists, shall be promptly removed.

#### **4.1.11 MISCELLANEOUS SYMBOLS**

Special symbols (other than the standard symbols shown in Annex C) and other pictorial configurations may be used only as supplementary signs, and only when such use clarifies or emphasizes the specific message contained in the basic sign.

#### **4.1.12 MARKING GUIDELINES FOR UNDERGROUND UTILITIES**

Areas to be excavated shall be surveyed and marked prior to any digging, groundbreaking and or excavating. Surface markings shall follow American Public Works Association *Recommended Markings for Underground Utilities*. Refer to Annex E of this safety standard (B3) for guidance in color codes and samples of markings.

## **4.2 RESPONSIBILITIES**

### **4.2.1 Points of Contact (POCs) shall:**

- 4.2.1.1 Ensure hazardous areas are identified in their area of control and proper signage is posted.
- 4.2.1.2 Ensure barricades under their control are properly installed, maintained through duration of the hazard, and removed upon completion of work or elimination of the hazardous condition.
- 4.2.1.3 Designate personnel authorized to enter a **DANGER AREA** on the appropriate JSA and ensure that those personnel have reviewed and signed the JSA **or JSR**.
- 4.2.1.4 Verify that a Form GC-82 Safety Information tag is placed when use of materials, equipment, machines or systems could present a hazard if the information on the tag is not followed.
- 4.2.1.5 Complete annual inspection of permanent or long-term-use safety signs and barricades in their custodial areas are inspected periodically and that damaged, deteriorated, or illegible signs or barricades are identified and replaced as needed.
- 4.2.1.6 Ensure that safety tags are placed by the organizational unit having jurisdiction over the equipment, machines or systems involved and are affixed and removed only by the person placing the tag.  
**NOTE:** The organizational unit having jurisdiction over the equipment shall have emergency measures in place to remove the tag in the event that the person placing the tag is unable to remove it due to extenuating circumstances (i.e., illness, disability).
- 4.2.1.7 Arrange for replacement of damaged, deteriorated, or illegible signs and barricades reported through inspections or by employees.
- 4.2.1.8 Arrange for removal of signs and barricades when no longer valid.

### **4.2.2 Authorized Employees shall:**

- 4.2.2.1 Ensure a JSA **or JSR** has been completed and reviewed prior to entering a hazardous area.
- 4.2.2.2 Follow the **specific** instructions and procedures and employ all safety precautions required for entering the hazardous area, **including but not limited to Master Work Permit**.
- 4.2.2.3 Ensure the barricade(s) and posting(s) are maintained during their entry into the hazardous area.
- 4.2.2.4 Communicate to the POC and supervision any problems encountered in the hazardous area.

### **4.2.3 Base Operating Contractor Safety, Health, and Environmental shall:**

- 4.2.3.1 Assist in the classification of hazardous areas
- 4.2.3.2 Monitor the correct applications of control measures (i.e., hazard communication information, barricade installation and maintenance, and posting of signage, etc.).
- 4.2.3.3 Ensure placement of Form GC-82 Safety Information tags on equipment, machines or systems that could present a hazard if information on the tag is not followed.

## **5.0 TRAINING**

Employees shall be instructed that safety signs indicate presence of a hazard or potential hazard and that special precautions and/or instructions apply. **This instruction may be accomplished via JSA, MWP, classroom or other training, verbal instruction from supervision or leads, or other appropriate means.**

## **6.0 INSPECTION/AUDITS**

**Base** operating contractor Safety, Health, and **Environmental** shall conduct spot and annual inspections which include verifying proper use of safety signs, tags, and barricades.

## **7.0 REFERENCES**

### **49 CFR, Transportation**

Federal Highway Administration Manual on Uniform Traffic Control Devices for Streets and Highways

### **AEDC Engineering Standard**

T-3 Engineering Design and Drafting Practices

**AEDC Government Contractor (GC) Forms**

GC-18 Danger Tag  
GC-82 Safety Information Tag  
GC-200 Caution Tag

**AEDC Safety, Health, and Environmental Standards**

B1 Master Work Permit  
B4 High-Voltage Electrical Work  
B6 Low-Voltage Electrical Safety Related Work Practices  
B9 Container Labeling  
C6 Excavations, Trenching, and Shoring  
D3 Identification of Piping Systems  
D4 Compressed Gas Cylinders  
D11 Ionizing Radiation  
D12 Lasers

**Air Force Manual**

91-201 Explosives Safety Standard

**Air Force Occupational Safety and Health Standard**

91-501 Air force Consolidated Occupational and Health Safety Standard

**American National Standards Institute (ANSI) Standards**

Z535.1 American National Standard for Safety Colors  
Z535.2 American National Standard for Environmental and Facility Safety Signs  
Z535.3 American National Standard for Criteria for Safety Symbols  
Z535.4 American National Standard for Product Safety Signs and Labels  
Z535.5 American National Standard for Safety Tags and Barricade Tapes (for Temporary Hazards)  
Z535.6 American National Standard for Product Safety Information in Product Manuals, Instructions, and Other Collateral Materials

**American Public Works Association**

Recommended Marking Guidelines for Underground Utilities

**National Fire Protection Association (NFPA)**

50 Standard for Bulk Oxygen Systems at Consumer Sites  
50A Standard for Gaseous Hydrogen Systems at Consumer Sites  
50B Standard for Liquid Hydrogen Systems at Consumer  
70 National Electric Code (NEC) Sites

**OSHA 29 CFR**

1910.145 Specification for Accident Prevention Signs and Tags  
1926.203 Signs, Signals and Barricades  
1926 Subpart M, Fall Protection

**8.0 ANNEXES**

A Color Markings for Physical Hazards  
B Recommended Rigid Barricades for Restricting Entry  
C Sign Specifications  
D Safety Tag Examples  
E Recommended Marking Guidelines for Underground Utilities



**9.0 SUPPLEMENT**

NFAC A321-0801-XSP B3 Control of Hazardous Areas Using Safety Signs, Tags, and Barricades



**SHE Standard B3 Control of Hazardous Areas  
Using Safety Signs, Tags and Barricades**

**ANNEX A  
COLOR MARKINGS FOR PHYSICAL HAZARDS**

<b>Color</b>	<b>Designation</b>	<b>Application and Example</b>
Red, red and white	1. DANGER  2. STOP	1. Barricades (with a sign denoting the specific danger).  2. Emergency top bars, buttons, and switches for stopping of hazardous machinery.  
Yellow, yellow and black	CAUTION, PHYSICAL HAZARDS	Heavy construction equipment, coverings or guards for guy wires, exposed edges of platforms and pits, fixtures which extend into normal operating areas, horizontal lips of vertical sliding elevator doors, top and bottom treads of stairways where caution is needed, lower pulley blocks and cranes, markings for projections, traveling conveyors, low beams and pipes, material handling equipment, along sides of freight car loading plates or runways, rope barricades (with sign denoting condition requiring caution).  

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**ANNEX B  
RECOMMENDED RIGID BARRICADES FOR RESTRICTING ENTRY**



Earthen Berm



Fencing



Sand/Water-Ballasted Jersey Barricade



Concrete Jersey Barricade



Traffic Barrel



Portable Barricade

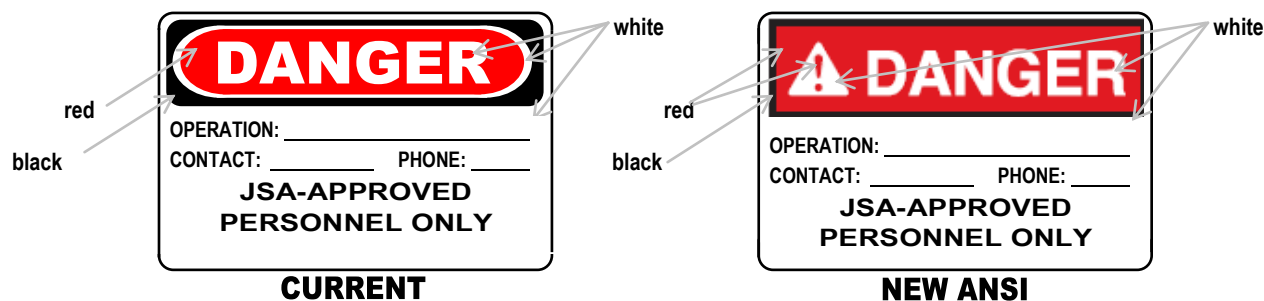
## ANNEX C SIGN SPECIFICATIONS

The ANSI Z535 series of standards were revised in 2006 and 2007. Neither OSHA, AFOSH Standard 91-501, nor the Operating Contractor Performance Work Statement requires compliance with the 2006-07 series; however, safety signs, tags, etc., which comply with the new standards are acceptable.

### 1. Type of Sign – DANGER

1a. Use – This sign will be used to warn of a specific danger and only where an immediate, and potentially serious hazard exists.

1b. Designs –



1c. Dimensions – The standard, commercially available sizes of DANGER signs are: 7 × 10, 10 × 14, 14 × 20, and 20 × 28 inches. However, exceptions to these sizes are permissible provided that: upper and lower panels are equal in width; the lower panel height is not less than, nor more than double, the upper panel height; and the ratio of width to height of the upper panel falls within the range from 2:1 to 5:1.

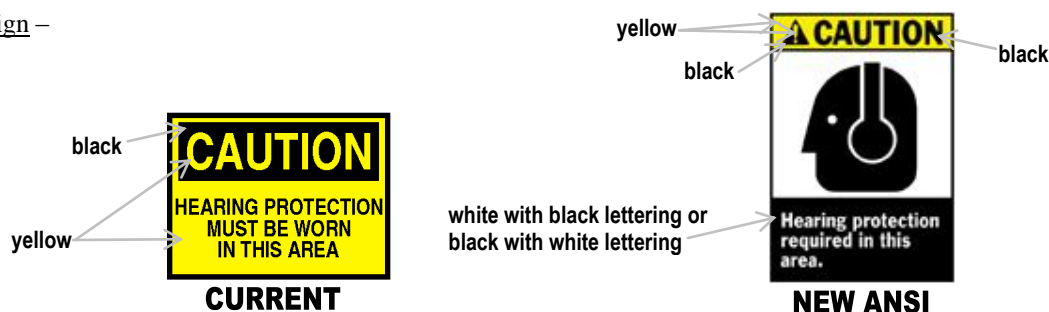
1d. Wording – Wording below the DANGER panel will be either black lettering on a white background as shown above or white lettering on a black background based on which is more legible.

### 2. Type of Sign – CAUTION

2a. Use – This sign will be used to warn of potential hazards of expected low severity, or to caution against unsafe practices.

**NOTE:** In some cases, it will be difficult to determine whether a CAUTION or DANGER sign should be posted. If the distinction is not clear, the DANGER sign should be used.

2b. Design –



2c. Dimensions – The standard, commercially available sizes of CAUTION signs are the same as for DANGER signs, with the same exceptions. (See Section 1 above).

2d. Wording – On older signs, the wording below the CAUTION panel may be black on a yellow background. On new signs, wording below the CAUTION panel will be either black lettering on a white background or white lettering on a black background based on which is more legible.

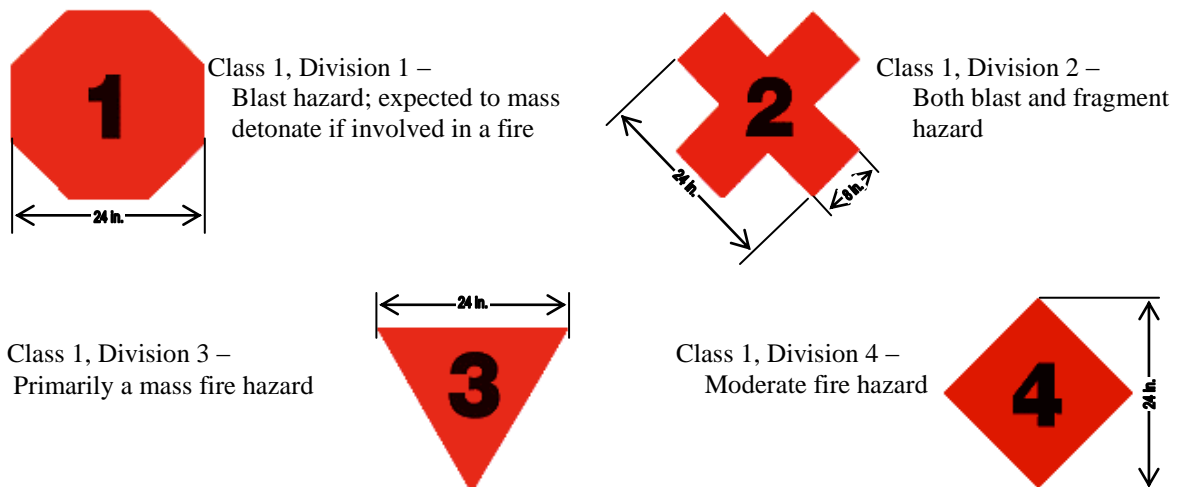
### 3. Type of Sign – FIRE and EMERGENCY

- 3a. Use – These signs will be used only to label, or point the way to, fire-extinguishing equipment, shutoff valves, sprinkler drains, emergency/first aid equipment/facilities, and exits, as well as doors or passageways which might be mistaken for (but are not) exit routes.
- 3b. Design – There is no specific requirement as to size and form except for EXIT signs, which will have the word EXIT in plainly legible letters, not less than six inches high and letter strokes not less than 3/4-inch wide. Where appropriate, directional arrows may be included in the sign as part of the action message.
- 3c. Wording – Exit signs will use red lettering on a white background, except for internally illuminated types which may be white on red. All other fire/emergency signs should be red on white, although combinations of black and white are permitted. Typical examples are shown below.



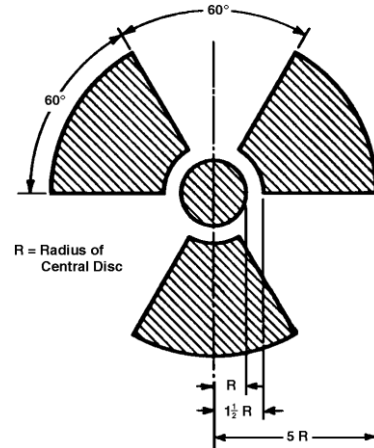
### 4. Type of Sign – DOD HAZARD CLASS FIRE SYMBOLS

- 4a. Use – These symbols are used to denote the presence of explosives and to classify the hazard potential, per DOD criteria, when and if the explosives are involved in a fire.
- 4b. Dimension and Color – All numbers will be 10 inches high, of 2-inch-thick letter stroke, and will be painted black on an orange background.
- 4c. Design – Typical designs are shown below:



## 5. Type of Sign – RADIATION

- 5a. Use – Radiation specific caution signs, incorporating the radiation symbol, will be used to warn against hazards of ionizing radiation, from whatever source they emanate (machine or material). See AEDC SHE Std. D11, Ionizing Radiation, for detailed usage requirements.
- 5b. Design – Unless otherwise authorized by the AEDC SHE Std. D11, the standard radiation symbol shall use on radiation caution signs. The crosshatched area shall be magenta, purple or black. The background shall be yellow.
- 5c. Dimensions – The standard, commercially available sizes of radiation signs are 7 × 10, 10 × 14, 10 × 20, and 20 × 28 inches. However, exceptions to these sizes are permissible provided that: upper and lower panels are equal in width; the lower panel height is not less than, nor more than double, the upper panel height; and the ratio of width to height of the upper panel falls within the range from 2:1 to 5:1.
- 5d. Wording – Wording shall be consistent with the requirements of AEDC SHE Std. D11 and the TN Division of Radiological Health rules. Lettering shall be magenta, or purple or black on a yellow background. Some typical examples are shown. Informational wording may be black and white as shown. Small adhesive-backed labels (similar in form and color) are available for use on machines, equipment, and packages, but shall not be used when signs are specifically required due to size and durability.



## 6. Type of Sign – LASER LIGHT

- 6a. Use – The signs and/or symbols described in this section will be used to warn of laser light hazards, actual or potential, both from direct beams and from reflections.

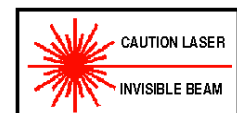
**NOTE:** See SHE Std D12, Lasers, for detailed requirements for use of laser light signs.

- 6b. Design –



- 6c. Dimensions – There is no standard size established for this class of sign. Several temporary signs of various sizes are stocked by Contractor Safety, including a small, adhesive-backed label for use on machines, equipment, and packages.

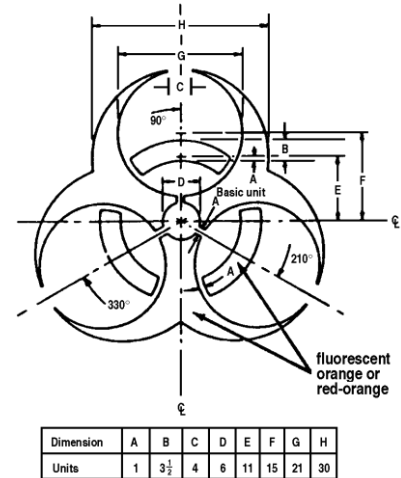
- 6d. Wording – Appropriate warning information should be included on the sign, depending upon the extent of hazard of the particular laser in use. Standard Danger and Caution signs may also be used. Some typical examples are provided at right.



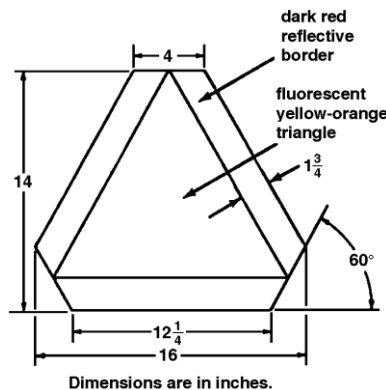


## 7. Type of Sign – MISCELLANEOUS HAZARD SYMBOLS

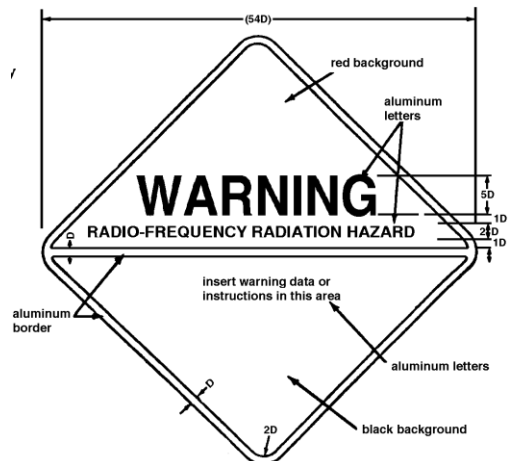
- 7a. Biological Hazard – This emblem signifies actual or potential presence of infectious agents presenting risk or potential risk to the well-being of personnel. Appropriate wording should be used next to the symbol to indicate the nature of the hazard or precautionary measures required.



- 7b. Slow-Moving Vehicle – This emblem is a unique identification and will be used only on vehicles which, by design, move at 25 mph or less on public roads. In most cases, it shows up as a solid orange triangle by day and a hollow red triangle at night.



- 7c. Radio Frequency Warning – The warning symbol for radio frequency radiation hazards will be as shown here. The inclusion and choice of warning information or precautionary instructions will be at the discretion of the user with any such specific information appearing in the lower triangle portion of the sign.



## 8. Type of Sign – GENERAL INFORMATION

- 8a. Use – This sign will be used to convey general information not specifically related to any type of hazard.
- 8b. Design – These signs may be in any convenient size and shape. Blue is the standard color, as either background or lettering or in the upper panel of the Notice signs; alternately, any color combination may be used, except red or yellow.
- 8c. Wording – There are no restrictions as to wording. Typical examples are given at right.



## 9. Type of Sign – PICTORIAL SYMBOLS AND CONFIGURATIONS

9a. Use – These pictorial symbols (sometimes referred to as pictograms) will be used only as follows:

- As a supplement to the action/emphasis message in the lower panel of a standard sign
- As a supplementary sign or panel placed next to the basic sign.

9b. Design – These are no specific standardized pictorial symbols other than commonly accepted ones such as a skull and crossbones for poisons, or a zigzag lightning bolt for electrical hazards. If a separate supplementary panel is used, it should be of square shape and equal in height to the adjacent basic sign.

9c. Examples – Here are some typical examples of pictorial symbols and configurations:



## 10. Type of Sign – SAFETY INSTRUCTION

10a. Use – This sign will be used to convey general instructions, suggestions, or reminders relative to safety and health measures.

10b. Design – The words **THINK** and **BE CAREFUL** given in the examples at right are only illustrations. Other wording may be used.



10c. Dimensions – The standard, commercially available sizes of Safety Instruction signs are usually 7 × 10, 10 × 14, 14 × 20, and 20 × 28 inches; however, any size and shape is acceptable.

10d. Wording – The wording on the lower panel will be either black or green on a white background. If a signal word (white on green) is not used in the upper panel, the entire sign may consist of white letters on green background. Examples:



**SHE Standard B3 Control of Hazardous Areas  
Using Safety Signs, Tags and Barricades**

**ANNEX D  
SAFETY TAG EXAMPLES**

Form GC-18 Danger Tag	Form GC-200 Caution Tag	Form GC-82 Safety Information Tag
 <p>Warns against operation of systems or equipment due to immediate hazards to personnel who may be working on those systems or equipment. Tag shown above is red-and-white striped with black type; DANGER is in white.</p>	 <p>Warns of a potential hazard that could exist under certain conditions. This tag is not used for personnel protection. Tag shown above is yellow with black type.</p>	 <p>Communicates general safety information. Tag shown above is blue with black type.</p>

**Scaffolding Tag**




Green with white type →

Yellow with black type →

Green with white type →

White with green type →

**Emergency Shower and Eyewash Inspection Tag**



Green with white type →

Tag shown above is primarily white with green type.



**SHE Standard B3 Control of Hazardous Areas  
Using Safety Signs, Tags and Barricades**

**ANNEX E  
RECOMMENDED MARKING GUIDELINES  
FOR UNDERGROUND UTILITIES**

“Utility” lines will be indicated by markings using current American Public Works Association (APWA) color codes. (Additional details are provided at the end of this annex.) Markings should be 18” – 19” in length and 2” in width.

The owner of the facility should be indicated by initials or by name in letters 6” in height at the beginning and end of the locate. On long locates the facility owner should be indicated every 100’.

When known, the total number of lines within the ground will be indicated. The number of lines indicated should be based on the physical lines “that you could place your hands on. Multiple cables twisted together to form a single facility, as in the case of electric lines, would be considered one cable for locate purpose.

If a facility is known to be present but the total number of lines for a facility cannot be determined a corridor marker may be used. The corridor marker should indicate the approximate width of the facility. A marking resembling the letter “H” lying on its side will indicate the corridor marker.

When known, the size of the line being located will be indicated. Line size will indicate outside diameter of the pipe or structure. Oversized utility marking should indicate the approximate size of the pipe or structure. A mark resembling the letter “H” lying on its side, bisected by a line extending along its length will indicate the oversized utility marking.

Duct structures, whether single or multiple ducts, will be indicated by duct symbol indicating approximate width of the structure. The duct marker will be indicated by a marking resembling a diamond bracketed by two parallel lines.

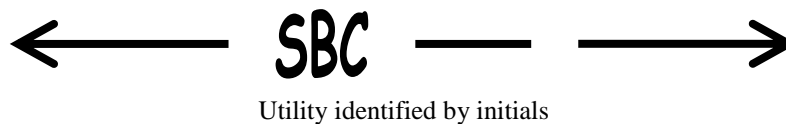
When known, the pressures of a gas facility will be indicated. Gas pressure will be indicated as either low pressure, intermediate high pressure, or high pressure and marked with the utility’s pressure.

When known, termination points, dead ends and stub outs should be indicated with the letter “T” with drop downs.

When there is a strong likelihood that marks maybe destroyed offsets should be used. Offsets are indicated on a permanent surface and are placed parallel to the running line of the facility. The offset should indicate the distance from the offset to the facility and should identify the owner and if necessary size of the facility.

The following are samples of how the above suggestions would look:

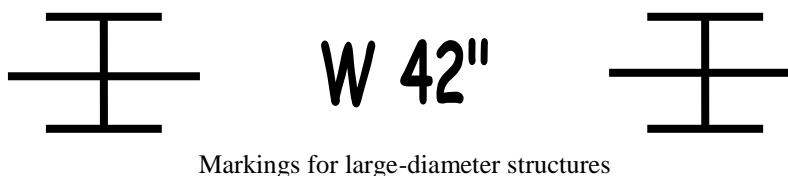
**Line Markings:**



**Corridor Markings:**



**Oversized Utility Markings:**



**Conduit Markings:**



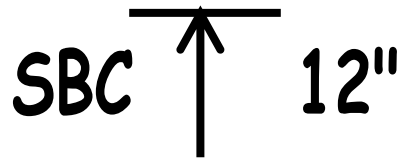
**Marking Gas Lines – High Pressure:**



**Marking Termination Point, Dead End, Stub Outs:**



**Marking Offsets:**



Indicate facility owner, direction to utility, and distance to facility

**No Conflict** (No utilities within the requested area):



Proposed Markings (Consensus not reached by committee)


**Electronic Marker:**



**Marking Buried Splices, Valves, Manholes**



APWS Pocket Guide for Guidelines for Uniform Temporary Marking of Underground

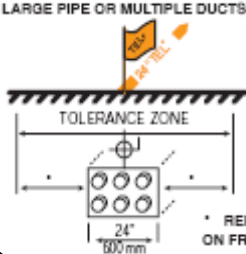


### UNIFORM COLOR CODE

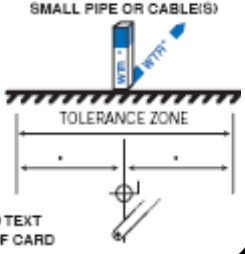
	<b>WHITE</b> - Proposed Excavation
	<b>PINK</b> - Temporary Survey Markings
	<b>RED</b> - Electric Power Lines, Cables, Conduit and Lighting Cables
	<b>YELLOW</b> - Gas, Oil, Steam, Petroleum or Gaseous Materials
	<b>ORANGE</b> - Communication, Alarm or Signal Lines, Cables or Conduit
	<b>BLUE</b> - Potable Water
	<b>PURPLE</b> - Reclaimed Water, Irrigation and Slurry Lines
	<b>GREEN</b> - Sewers and Drain Lines

### TYPICAL MARKING

**LARGE PIPE OR MULTIPLE DUCTS**



**SMALL PIPE OR CABLE(S)**



\* REFER TO TEXT ON FRONT OF CARD

### GUIDELINES FOR UNIFORM TEMPORARY MARKING OF UNDERGROUND FACILITIES

This marking guide provides for universal use and understanding of the temporary marking of subsurface facilities to prevent accidents and damage or service interruption by contractors, excavators, utility companies, municipalities or any others working on or near underground facilities.

**ONE-CALL SYSTEMS**  
The One-Call damage prevention system shall be contacted prior to excavation.

**PROPOSED EXCAVATION**  
Use white marks to show the location, route or boundary of proposed excavation. Surface marks on roadways do not exceed 1.5" by 18" (40 mm by 450 mm). The facility color and facility owner identity may be added to white flags or stakes.

**USE OF TEMPORARY MARKING**  
Use color-coded surface marks (i.e., paint or chalk) to indicate the location or route of active and out-of-service buried lines. To increase visibility, color coded vertical markers (i.e., stakes or flags) should supplement surface marks. Marks and markers indicate the name, initials or logo of the company that owns or operates the line, and width of the facility if it is greater than 2" (50 mm). Marks placed by other than line owner/operator or its agent indicate the identity of the designating firm. Multiple lines in joint trench are marked in tandem. If the surface over the buried line is to be removed, supplementary offset markings are used. Offset markings are on a uniform alignment and clearly indicate the actual facility is a specific distance away.

**TOLERANCE ZONE**  
Any excavation within the tolerance zone is performed with non-powered hand tools or non-invasive method until the marked facility is exposed. The width of the tolerance zone may be specified in law or code. If not, a tolerance zone including the width of the facility plus 18" (450 mm) measured horizontally from each side of the facility is recommended.

**ADOPT UNIFORM COLOR CODE**  
The American Public Works Association encourages public agencies, utilities, contractors, other associations, manufacturers and all others involved in excavation to adopt the APWA Uniform Color Code, using ANSI standard Z535.1 Safety Colors for temporary marking and facility identification.

Rev. 4/99

# A321-0801-XSP B3 Control of Hazardous Areas Using Safety Signs, Tags, and Barricades Supplement

This supplement has been approved for the NFAC Site.

**Review:** This supplement will be reviewed and updated using the same cycle as AEDC Safety, Health, and Environmental (SHE) Standard B3 Control of Hazardous Areas Using Safety Signs, Tags, and Barricades.

**References:** AEDC SHE Standard B3 Control of Hazardous Areas Using Safety Signs, Tags, and Barricades

**Scope:**

This supplement outlines requirements for controlling personnel access to equipment and/or areas that are hazardous or potentially hazardous.

Personnel hazards are created by maintenance, construction, and test operations such as opening manholes or trenches, pressure system testing, concurrent work at different elevations, and tests that include hazardous or explosive materials. Exposure of people to the hazards inherent in such operations is minimized when using signs and barricades. Signs, tags, and/or barricades shall be used to alert personnel of existing or potential hazards. Signs and tags provide awareness and/or instructions. Barricades limit or prevent access. These controls are used to supplement, rather than replace, proper guarding or elimination of hazardous conditions.

This supplement applies to all personnel conducting operations, maintenance, testing and support at NFAC, NASA AMES.

**NFAC Worksite Application:**

The supplement covers the following:

1. Facilities Signage (both permanent and temporary)
2. Equipment
3. Walkways
4. Ladders
5. Emergency Equipment
6. Barricade Tape
7. Illuminated Signage
8. Equipment Tags

This supplement does not apply to the following:

1. Vehicle traffic signs (see Federal Highway Administration's Manual on Uniform Traffic Control Devices for Streets and Highways)
2. Color coding of compressed gas cylinders (see NFAC A321-0801-XSP-D4 Compress Gas Cylinders Supplement)
3. Chemical labeling (see Ames Procedural Requirement APR 1700.1 Chapter 24 Chemical Hazard Communication)
4. Color legends for pipe (see NFAC A321-0801-XSP-D3 Identification of Piping Systems Supplement)

# A321-0801-XSP B3 Control of Hazardous Areas Using Safety Signs, Tags, and Barricades Supplement

General Rule for color should be as follows:

- **DANGER (Red):** Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.
- **WARNING (Orange):** Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
- **CAUTION (Yellow):** Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
- **NOTICE (Blue):** Is the preferred signal word to address practices not related to personal injury. The safety alert symbol shall not be used with this signal word. Notice or Caution without the safety alert symbol is appropriate for properly-only hazards.
- **Green – Instructions**
- **Safety information** signs shall be used anywhere there is a need for general safety information, suggestions, or reminders.
- **Safety instruction** signs shall be used to indicate general instructions relative to safe work practices, to indicate the location of safety equipment, or to record required inspections.

ANSI Z535.2 Examples:



Currently in both ANSI Z535.2 2011 and ANSI Z535.4 2011



Currently in both ANSI Z535.2 2011 and ANSI Z535.4 2011



Currently in both ANSI Z535.2 2011 and ANSI Z535.4 2011



Currently in both ANSI Z535.2 2011 and ANSI Z535.4 2011



Currently in both ANSI Z535.2 2011 and ANSI Z535.4 2011

- I. NFAC Site Management shall follow this supplement.
- II. NFAC Supervisors and Test Directors shall
  1. Follow this supplement.
  2. Ensure signage
    - a. Is correct for the hazard.
    - b. Is maintained and clearly marked.
    - c. Is removed when hazard has been eliminated.
  3. Ensure staff, customers, and vendors follow all signage.

## **A321-0801-XSP B3 Control of Hazardous Areas Using Safety Signs, Tags, and Barricades Supplement**

### **III. NFAC Safety Engineer shall**

1. Assist in the classification of hazardous areas.
2. Ensure signage follows the correct format for the hazard.
3. Monitor the correct application of control measures.
4. Ensure placement of safety information, tags on equipment, machines or systems that could present a hazard if information on tag is not followed.
5. Conduct inspections on signage and barricades.

### **IV. NFAC Staff shall**

1. Follow this supplement.
2. Comply with all signage:
  - a. Danger.
  - b. Warning.
  - c. Caution.
  - d. Notice.
  - e. Instructions.
3. Notify Supervisor or Safety when a sign is damaged or instructions are not correct.
4. Not block or alter any signage.