Table 7-1
Minimum Lighting Requirements — Continued

Facility	Function	Foot-Candles	Lux
Toilets, Wash, and Dressing Rooms	Toilets, wash, and dressing rooms	10	108
Visitor Areas	Visitor areas	20	215
Warehouses and Storage Rooms/Areas	Indoor rack storage	25	269
Warehouses and Storage Rooms/Areas	Outdoor storage	3	32
Work areas – General (not listed above)	Work areas – General (not listed above)	30	323
Vessel – General Areas	Mess Halls, Dining Halls	30	323
Vessel – General Areas	Accessways	3	32
Vessel – General Areas	Exits	3	32
Vessel – General Areas	Gangways	3	32
Vessel – General Areas	Stairs	3	32
Vessel – General Areas	Walkways	3	32
Vessel – General Areas	All assigned work areas on any vessel or vessel section	5	54

Note:
Table 7-1 is provided as a limited reference of areas and requirements and is not all inclusive.

7-10. Checklists and Forms.
Not Applicable.

Chapter 8
Accident Prevention Signs, Tags, Labels, Signals, and Traffic Control

8-1. References.

a. American Society of Mechanical Engineers (ASME) A13.1, Scheme for the Identification of Piping Systems (https://webstore.ansi.org/) (8-1.a)

b. ANSI/National Electrical Manufacturers Association (NEMA) Z535, Safety Alerting Standards (https://webstore.ansi.org/) (8-1.b)

c. EP 310-1-6, Graphic Standards Manual (https://www.publications.usace.army.mil/USACE-Publications/Engineer-Pamphlets/) (8-1.c)

d. EP 310-1-6a, Sign Standards Manual, Vol 1 (https://www.publications.usace.army.mil/USACE-Publications/Engineer-Pamphlets/) (8-1.d)

e. EP 310-1-6b, Sign Standards Manual, Vol 2 (https://www.publications.usace.army.mil/USACE-Publications/Engineer-Pamphlets/) (8-1.e)

f. ER 1130-2-500, Partners and Support (Work Management Policies) - chapter 6: Sign Standards Program for Civil Works Projects (https://www.publications.usace.army.mil/USACE-Publications/Engineer-Regulations/) (8-1.f)

g. Department of Transportation (DOT), Federal Highway Administration's Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD) (https://mutcd.fhwa.dot.gov) (8-1.g)

h. 29 CFR 1910.145, Specifications for Accident Prevention Signs and Tags (https://www.govinfo.gov/content/pkg/CFR-2020-title29-vol5/pdf/CFR-2020-title29-vol5-sec1910-145.pdf) (8-1.h)

i. 29 CFR 1926.200, Accident Prevention Signs and Tags (https://www.govinfo.gov/content/pkg/CFR-2020-title29-vol8/pdf/CFR-2020-title29-vol8-sec1926-200.pdf) (8-1.i)

8-2. Definitions.
Not Applicable.

8-3. Personnel Required Qualification/Training.

a. General. All employees must be trained/informed on the meaning of the various signs, tags, and labels used throughout the workplace. (8-3.a)

b. Flaggers. Flaggers must be trained according to the MUTCD and applicable state DOT requirements. (8-3.b)

8-4. Roles and Responsibilities.

a. Supervisors. (8-4.a)

(1) Ensure proper signage is in place and employees are trained/informed on the meaning of the various signs, tags, and labels used throughout the workplace, and on any special precautions that may be required (see para 8-3.a).

(2) Provide, erect, maintain, and remove all traffic signs, barricades, and other traffic control devices necessary for maintenance of traffic.

(3) Use flaggers where required and ensure they are trained in flagging operations according to paragraph 8-3.b and have appropriate PPE before placing them in traffic.

(4) USACE-ONLY. Appoint a USACE Sign Program Manager according to ER 1130-2-500.

b. Employees. All employees must follow signage directives and inform their supervisors of missing, damaged, or obscured signs. (8-4.b)

c. Flaggers. All flaggers must wear appropriate PPE according to chapter 5 and OSHA, to include high-visibility apparel, safety-toed footwear, and hard hats. Flaggers must also communicate with each other and with the foreman, and effectively signal and direct the affected public. (8-4.c)

d. USACE Sign Program Manager (USACE ONLY). The USACE Sign Program Manager is responsible for ensuring compliance with the Sign Standards Program according to ER 1130-2-500, to include approving all orders for signs at civil works projects. (8-4.d)

8-5. Inspection Requirements.
Inspect signage according to the applicable USACE, federal, state, and local requirements.

a. When signage deficiencies are identified, make timely corrections as required or as directed by this manual, applicable federal, state, and local requirements. (8-5.a)

b. Document all inspections according to this manual, applicable federal, state, and local requirements. (8-5.b)

8-6. Activity Hazard Analysis (AHA) Requirements.
Develop AHAs according to paragraphs 1-6 or 2-6, as applicable. Include any required signage, flagging, warning tape, barricade, etc., or other elements as required by this manual, applicable federal, state, and local requirements.

8-7. Minimum Plan Requirements.
A Traffic Control Plan is required when USACE mission (including contractors) affects the normal function of a public or private road. The Traffic Control Plan must be developed by a person knowledgeable in performing temporary traffic control specific to the work being done according to the requirements of the MUTCD and applicable state DOT requirements. The Traffic Control Plan must be developed prior to the commencement of work and include the following:

a. Detailed description of the activity being performed. (8-7.a)

b. Description of anticipated hazards or concerns and the control measure that will be implemented to control to an acceptable level. (8-7.b)

c. Assignment of personnel and their roles and responsibilities. Include necessary information/documentation to support qualification/training of such persons. (See para 8-3) (8-7.c)

d. The complete details of the proposed plan for the maintenance of traffic and access through the contract work area with consideration for the least possible obstruction to the safe and satisfactory movement of traffic. Include details of all required traffic control signage and devices that will provide safety for all road and work area users (for example, contractors, government personnel, motorists, bicyclists, and pedestrians within the highway or on public roads open to public travel). (8-7.d)

e. Any required coordination with adjacent projects, potentially affected stakeholders, and external agencies (for example, law enforcement, highway agencies, businesses). (8-7.e)

f. Proposed placement of signage. (8-7.f)

g. The number of flag and/or signal persons that will be used to control traffic within the work area. (8-7.g)

h. Minimum PPE requirements for all personnel on the work site (see chapter 5). (8-7.h)

i. Procedures for coordination requirements for road closings with appropriate local authorities. (8-7.i)

j. Inspection and oversight methods to ensure adherence to the plan. (8-7.j)

8-8. General Requirements.

a. General Sign, Tag, and Label Requirements. (8-8.a)

(1) All signs, tags, and labels must meet this manual, applicable federal, state, and local requirements (for example, OSHA, ANSI, NFPA, MUTCD). It is the responsibility of the employer to meet the correct safety standard for the type of facility or job they are working on.

Note. Temporary use of signs, tags, and labels on a USACE project may meet OSHA or ANSI standards.

Note. USACE facilities must use signs according to EP 310-1-6a.

(2) Provide signs, tags, and labels to give adequate warning and caution of hazards. They are provided to instruct and direct workers and the public.

(3) All signs, tags, and labels must be visible at all times when the hazard or problem exists. Remove or cover them when the hazard or problem no longer exists.

(4) Locate signs, tags, and labels as close as safely possible to their respective hazards. Affix tags by a positive means (such as wire, string, or adhesive) that prevents their loss or unintentional removal.

(5) Signs, tags, and labels must be legible and in English.

(a) In areas where a significant percentage of the workforce or the visiting population speaks primarily in a foreign language, the use of symbol signs is strongly encouraged.

(b) When no symbols exist or where words are essential, two signs, one in English and one in the foreign language, should be placed side by side with the English sign placed on the left side. Each of the two signs must follow the same format (that is, same overall size, letter size and style, color, and mounting). More than one language should never appear on the same sign.

(c) Legends for non-English signs, because of variations in dialect, must be developed at the local level.

b. Sign Requirements. (8-8.b)

(1) Place safety signs to alert and inform the viewer within a sufficient timeframe to take appropriate evasive actions and to avoid potential harm from the hazard according to this manual, applicable federal, state, and local requirements. Signs must be legible, intuitive, and non-distracting to the viewer. Placement of signs should not create additional hazards. Signs must be fabricated with retro-reflective sheeting, as appropriate for adequate visibility under normal and emergency operating conditions.

(2) Safety sign finishes must be of durable materials with colors according to the USACE Sign Standards Manual (that is, EP 310-1-6a and EP 310-1-6b) or ANSI Z535.1.

(3) Furnish signs with rounded or blunt corners that are free from sharp edges, burrs, splinters, or other sharp projections. The ends or heads of bolts or other fastening devices must be installed and maintained so that they do not present a hazard.

(4) The type of sign or tag used in a particular situation must be appropriate for the degree of hazard or intent of message.

(5) Place Warning signs on unattended government-owned floating plant and land-based heavy equipment accessible to the public. The Warning sign must read “No Trespassing – U.S. Government Property.”

(6) Place a slow-moving vehicle emblem/sign on vehicles or equipment that, by design, move at 25 mph (40 km/h) or less that travel on public roads.

Note. USACE employees must follow the USACE Sign Standards Manual. If a sign with a unique legend for Danger, Warning, or Caution is needed, follow the USACE Sign Standards Manual instruction to request approval for a nonstandard safety sign. The sign legend must be concise, easy to read, and contain enough information to be easily understood. Text for custom (that is, other than Danger, Warning, or Caution) signs must be approved by the local USACE Sign Manager.

(7) Signs required to be seen at night must be retroreflective.

c. Sign Types. (8-8.c)

(1) DANGER Signs. Use Danger signs when the circumstances indicate an imminently hazardous situation that, if not avoided, will result in death or serious injury.

(2) WARNING Signs. Use Warning signs when the circumstances indicate a potentially hazardous situation that, if not avoided, could result in death or serious injury. The hazards may be the same as those associated with Danger signs but are of significantly less magnitude.

(3) CAUTION Signs. Use Caution signs when circumstances indicate a potentially hazardous situation that, if not avoided, may result in a minor or moderate injury. It may also be used to alert against unsafe practices that may result in property damage. The hazards may be the same as those associated with Danger signs but are of significantly less magnitude.

(4) NOTICE Signs. Use Notice signs to indicate a statement of company/ organizational (for example, USACE offices, contractors) policy directly or indirectly related to the safety of personnel or protection of property. The signal word should not be associated directly with a hazard or hazardous situation, and must not be used in place of Danger, Warning, or Caution. These signs are used to control or define access and circulation. They are used primarily for information and are not placed to identify a hazard.

(5) SAFETY Signs. Use general safety signs to indicate general instructions relative to safe work practices, remind of proper safety procedures, or indicate the location of safety equipment. These signs identify rules and facilities relating to health, first aid, medical equipment, sanitation, housekeeping practice, and general safety information.

(6) Fire safety signs must conform to applicable NFPA requirements.

(7) Use RF radiation hazard warning signs according to ANSI Z535.2.

(8) Use ionizing radiation warning signs, labels, and signals according to the applicable ANSI and Institute of Electrical and Electronic Engineers (IEEE) standards.

d. Tags and Labels. (8-8.d)

(1) Label, tag, or mark each container of hazardous material (see chapter 6).

(2) Use accident prevention tags only as a temporary means of warning employees of an existing hazard (for example, defective tools, equipment, caution orders, tags for HEC).

(3) Tags must contain a signal word (that is, Danger, Warning, Caution) and a major message (presented in either pictographs, written text, or both) to indicate the specific hazardous condition or the instruction to be communicated to the employee. The signal word must be readable at a minimum distance of 5 feet (1.5 m), or such greater distance as warranted by the hazard.

(4) Identify piping systems (for example, pipes, fittings, valves, and pipe coverings) according to ASME A13.1 color scheme and directional flow requirements.

e. Traffic Control. Traffic control is extremely important on highways, in residential areas and at construction sites. When traffic may pose a hazard to operations, public roads must be closed. If passing traffic will likely be affected by a USACE mission/contract, a Traffic Control Plan appropriate to the complexity of the work must be prepared according to paragraph 8-7. (8-8.e)

(1) Coordinate road closings with the USACE supervisor/KO or COR and appropriate local agencies, and obtain, in writing, approval and required permits prior to closing or restricting any roads. Contractors must keep the KO or COR appraised of any such closing as early as possible.

(2) Conduct traffic control, traffic flagging, and signage procedures according to the MUTCD.

(3) All barricades, warning signs, lights, temporary signals, other devices, flagmen, and signaling devices must meet or exceed the minimum requirements of this manual, applicable federal, state, and local requirements.

(4) In construction areas, post legible traffic signs in advance of and/or at points of hazard according to the MUTCD.