Chapter 7
Lighting

7-1. References.

a. American Bureau of Shipping (ABS), Guide for Crew Habitability on Ships (https://ww2.eagle.org/en/rules-and-resources/rules-and-guides.html) (7-1.a)

b. ANSI/Illuminating Engineering Society (IES), The Lighting Library (https:\\store.ies.org/product/ies-lighting-library-collection-subscription/) (7-1.b)

c. ANSI Workplace Lighting Standards (https://webstore.ansi.org/industry/workplace-lighting?source=blog) (7.1.c)

d. NFPA 101, Life Safety Code (https://www.nfpa.org/Codes-and-Standards) (7-1.d)

e. United Facilities Criteria (UFC) 3-530-01, Interior and Exterior Lighting Systems and Controls (https://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc) (7-1.e)

f. 29 CFR 1926.56, Illumination (https://www.govinfo.gov/content/pkg/CFR-2020-title29-vol8/pdf/CFR-2020-title29-vol8-sec1926-56.pdf) (7-1.f)

7-2. Definitions.

a. Foot Candle. The English and American traditional measurement unit of light (illuminance) as perceived by the human eye, and is roughly equal to 10.7 Lux. (7-2.a)

b. Lux. The International System of Units measurement of light (illuminance) as perceived by the human eye. (7-2.b)

7-3. Personnel Required Training/Qualification.
Not Applicable.

7-4. Roles and Responsibilities.
Not Applicable.

7-5. Inspection Requirements.
Conduct and document a survey of the area to be lighted by generator-powered lighting units to ensure overhead power lines do not pose a hazard.

7-6. Activity Hazard Analysis (AHA) Requirements.
Develop AHAs according to paragraphs 1-6 or 2-6, as applicable. Review the lighting requirements for specific tasks or operations as part of AHA development.

7-7. Minimum Plan Requirements.

Night Operations Lighting Plan. If work is to be performed at night, a Night Operations Lighting Plan must be developed to ensure all activities, areas, and operations are adequately illuminated to perform work safely. The plan must be submitted to the USACE supervisor for approval or to the KO or COR for acceptance and include the following:

a. A map of the work area to be illuminated. (7-7.a)

b. Locations of all lighting units used to meet minimum lighting levels. (7-7.b)

c. Identification of required lighting level by area. (7-7.c)

d. Identification of onsite personnel responsible for verifying lighting plan is effective and does not present a glare hazard for nearby roadways and other public transportation. (7-7.d)

7-8. General Requirements.

a. Lighting Levels. While work is in progress, facilities, accessways, working areas, roads, etc., must be illuminated to not less than the minimum intensities specified below (see table 7-1 for limited reference and requirements). Areas not specified below must be illuminated according to the minimum intensities specified in the applicable ANSI Workplace Lighting Standards. (7-8.a)

(1) For construction work sites, see 29 CFR 1926.56.

(2) Design DoD facilities, according to UFC 3-530-01.

(3) For marine lighting, see ABS, Guide for Crew Habitability on Ships.

(4) For illumination of means of egress and emergency lighting, see NFPA 101.

(a) Provide emergency lighting for buildings under construction when the progress of construction or environmental conditions limits the ability of natural lighting to provide safe egress (average of 1 foot candle or 10.7 Lux) during a power outage.

(b) The illumination must be arranged so that the failure of any single lighting unit, including the burning out of an electric bulb, will not leave any area darkened to the point of impeding the means of egress.

(5) Take and record illumination readings, with a calibrated light meter, when the minimum lighting requirements of an area is in question.

b. Lighting Fixtures. (7-8.b)

(1) Guard and secure lamps and lighting fixtures to preclude injury to personnel. Light fixtures used for general illumination must be provided with protection to prevent accidental contact or breakage.

(a) Provide lighting fixtures within 7 feet (2.1 m) of a normal working surface with suitable fixtures or lamp holder with a guard.

(b) Open fixtures must have wire guards, lenses, tube guards and locks, or safety sockets that require force in the horizontal axis to remove the lamp, or other means to prevent damage to the bulb.

(2) When buildings are equipped with overhead sprinkler systems, lighting fixtures must be no closer than 18 inches (45.7 cm) to an overhead sprinkler.

c. Temporary lighting. (7-8.c)

(1) Temporary lighting will be installed according to chapter 11.

(2) Generator-powered portable lighting units must be grounded according to the manufacturer's instructions. Conduct overhead power line survey according to paragraph 7-5.

7-9. Figures and Tables.

Table 7-1
Minimum Lighting Requirements

Facility	Function	Foot-Candles	Lux
Accessways	General indoor	5	54
Accessways	General outdoor	3	32
Accessways	Exit ways, walkways, ladders, stairs	10	108
Administrative Areas	Offices, drafting and meeting rooms, etc.	50	538
Chemical Laboratories	Chemical laboratories	50	538
Construction Areas	General indoor	5	54
Construction Areas	General outdoor	3	32
Construction Areas	Tunnels and general underground work areas (min 110 lux required at tunnel/shaft heading during drilling, mucking, and scaling)	5	54
Conveyor Routes	Conveyor routes	10	108
Dam Operating Areas (Interior)	Tunnels and underground work areas	5	54

Table 7-1
Minimum Lighting Requirements — Continued

Facility	Function	Foot-Candles	Lux
Dam Operating Areas (Interior)	Control stations	15	161
Docks and Loading Platforms	Docks and loading platforms	3	32
Elevators, Freight, and Passenger	Elevators, freight, and passenger	5	54
Temporary Electrical Panels	Interior	30	325
Temporary Electrical Panels	Exterior	10	108
First-Aid Stations and Infirmaries	First-aid stations and infirmaries	30	323
Maintenance/Operating Areas/Shops	Vehicle maintenance shop	30	323
Maintenance/Operating Areas/Shops	Carpentry shop	10	108
Maintenance/Operating Areas/Shops	Refueling area, outdoors	5	54
Maintenance/Operating Areas/Shops	Shops, fine detail work	50	538
Maintenance/Operating Areas/Shops	Shops, medium detail work	30	323
Maintenance/Operating Areas/Shops	Welding shop	30	323
Maintenance/Operating Areas/Shops	Machine shop	30	323
Maintenance/Operating Areas/Shops	Lofts	10	108
Maintenance/Operating Areas/Shops	Tool room	10	108
Maintenance/Operating Areas/Shops	General construction plant and shops	10	108
Maintenance/Operating Areas/Shops	Batch plants	10	108
Maintenance/Operating Areas/Shops	Screening plants	10	108
Maintenance/Operating Areas/Shops	Rigging lofts	10	108
Mechanical/Electrical Equipment Rooms	Mechanical/electrical equipment rooms	10	108
Outdoor Parking Areas	Outdoor parking areas	3	32