

SECTION 7

LIGHTING

07.A GENERAL

07.A.01 Proper illumination of work spaces, project sites, roadways and vessels is imperative to a safe working environment. It is of significant importance in safe vehicular operation and the prevention of slips and falls. USACE operations and projects shall conform to the illumination standards detailed herein.

07.A.02 While work is in progress, offices, facilities, accessways, working areas, construction roads, etc., shall be lighted by at least the minimum light intensities specified in Table 7-1. Safety and Occupational Health Offices (SOHOs) shall maintain a calibrated light meter and train their personnel in its use. Illumination readings shall be taken and recorded whenever proper lighting of an area is in question. This also applies to accident investigations when illumination is a suspected contributing factor.

07.A.03 Office lighting shall be in accordance with Illuminating Engineering Society of North America (IESNA) Handbook.

07.A.04 Roadway lighting shall be in accordance with IESNA RP-8.

07.A.05 Marine lighting shall be in accordance with American Bureau of Shipping, "Guide for Crew Habitability on Ships".

07.A.06 Means of egress.

a. Means of egress shall be illuminated, with emergency and non-emergency lighting, to provide a minimum of 50 footcandle (fc), [1 lumen per square foot (lm/ft²)], (5 lux (lx), measured at the floor. > **Refer to IESNA Handbook**.

b. The illumination shall be arranged so that the failure of any

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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.

07.A.07 Lamps and fixtures will be guarded and secured to preclude injury to personnel. Open fluorescent fixtures will be provided with wire guards, lenses, tube guards and locks, or safety sockets that require force in the horizontal axis to remove the lamp.

07.A.08 Lamps for general illumination shall be protected from accidental contact or breakage. Protection shall be provided by elevation of at least 7 ft (2.1 m) from normal working surface, suitable fixture or lamp holder with a guard. Additionally, fixtures may be no closer than 18 in (0.5 m) to overhead sprinkler systems, if the building is so equipped, per NFPA Standards.

07.A.09 If work is to be performed at night, a night operations' lighting plan shall be developed to ensure that all activities, areas and operations are adequately illuminated to perform work safely. On-task lighting shall be in conformance with Table 7-1. Lighting near roadways and other public transportation areas shall be positioned as to avoid creating a glare hazard.

07.A.10 Generator-powered portable lighting units shall be grounded in accordance with manufacturer's instructions. In addition, a survey of the area to be lighted will be conducted and documented to ensure overhead power lines do not pose a hazard.

07.A.11 For temporary lighting, see Section 11.E.06.

TABLE 7-1

MINIMUM LIGHTING REQUIREMENTS

Facility or Function	Lux	Foot Candles (lm/ft ²)
Accessways		
- general indoor	<u>150</u>	<u>15</u>
- general outdoor	<u>50</u>	<u>5</u>
- exitways, walkways, ladders, stairs	<u>50</u>	<u>5</u>
Administrative areas (offices, drafting and meeting rooms, etc.)	<u>500</u>	50
Chemical laboratories	540	50
Construction areas		
- general indoor	<u>110</u>	<u>10</u>
- general outdoor	<u>50</u>	<u>5</u>
- tunnels and general underground work areas (minimum 110 lux required at tunnel and shaft heading during drilling, mucking, and scaling)	<u>110</u>	<u>10</u>
Conveyor routes	110	10
Dam Operating Areas (Interior)		
- tunnels and underground work areas	<u>110</u>	<u>10</u>
-Control Stations	<u>150</u>	<u>15</u>
Docks and loading platforms	<u>200</u>	<u>20</u>
Elevators, freight and passenger	<u>50</u>	<u>5</u>
Electrical (Interior Stations)	<u>300</u>	<u>30</u>
Electrical (Exterior Stations)	<u>50</u>	<u>10</u>
First-aid stations and infirmaries	<u>300</u>	<u>30</u>
Maintenance/operating areas/shops		
- vehicle maintenance shop	<u>300</u>	<u>30</u>
- carpentry shop	<u>150</u>	<u>15</u>
- outdoors field maintenance area	<u>150</u>	<u>15</u>
- refueling area, outdoors	<u>150</u>	<u>15</u>
- shops, fine detail work	<u>3000*</u>	<u>300*</u>
- shops, medium detail work	<u>500</u>	<u>50</u>
- welding shop	<u>300</u>	<u>30</u>
Mechanical/electrical equipment rooms	110	10
Outdoor parking areas	<u>50</u>	<u>5</u>
Toilets, wash, and dressing rooms	110	10
Visitor areas	215	20
Warehouses and storage rooms/areas		
- indoor stockroom, active/bulk storage	110	10
- indoor stockroom, inactive	50	5
- indoor rack storage	270	25

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- outdoor storage	50	5
Work areas – general (not listed above)	<u>300</u>	<u>30</u>

NOTE: The Illuminating Engineering Society Handbook provides thousands of detailed and specific lighting recommendations for multiple tasks, structures and settings. In some cases, exact standards were not listed in the manual, so the closest possible task was used. Table 7-1 above lists a number of common tasks associated with the construction industry and USACE Operations. Readings are measured vertically at 30 inches above the floor. If more specific illumination guidelines are necessary, the IES handbook should be used as a reference. Complex illumination studies are beyond the scope of this manual and should be requested from a Certified Industrial Hygienist or a Qualified Person.

***Denotes illumination on task.**