

Currently Recommended Illuminance Categories & Illuminance Values For Lighting Design—Target Maintained Levels

The tabulation that follows is a consolidated listing of current illuminance recommendations. This listing is intended to guide the lighting designer in selecting an appropriate illuminance for design and evaluation of lighting systems.

Guidance is provided in two forms: (1), in Parts I, II, and III as an Illuminance Category, representing a range of illuminances and (2), in parts IV, V and VI as an Illuminance Value. Illuminance Categories are represented by letter designations A through I. Illuminance Values are given in lux with an approximate equivalence in footcandles and as such are intended as target (nominal) values with deviations expected. These target values also represent maintained values.

This table has been divided into the six parts for ease of use. Part I provides a listing of both Illuminance Categories and Illuminance Values for generic types of interior activities and normally is to be used when Illuminance Categories for a specific Area/Activity cannot be found in Parts II and III. Parts IV, V and VI provide target maintained Illuminance Values for outdoor facilities, sports and recreational areas, and transportation vehicles where special considerations apply.

In all cases, the recommendations in this table are based on the assumption that the lighting will be properly designed to take into account the visual characteristics of the task.

I. Illuminance Categories and Illuminance Values for Generic Types of Activities in Interiors

TYPE OF ACTIVITY	CATEGORY	RANGES OF ILLUMINANCES		REFERENCE WORK-PLANE
		LUX	FOOTCANDLES	
Public spaces with dark surroundings	A	20-30-50	2-3-5	General lighting throughout spaces
Simple orientation for short temporary visits	B	50-75-100	5-7.5-10	
Working spaces where visual tasks are only occasionally performed	C	100-150-200	10-15-20	
Performance of visual tasks of high contrast or large size	D	200-300-500	20-30-50	
Performance of visual tasks of medium contrast or small size	E	500-750-1000	50-75-100	Illuminance on task
Performance of visual tasks of low contrast or very small size	F	1000-1500-2000	100-150-200	
Performance of visual tasks of low contrast and very small size over a prolonged period	G	2000-3000-5000	200-300-500	Illuminance on task, obtained by a combination of general and local (supplementary lighting)
Performance of very prolonged and exacting visual tasks	H	5000-7500-10000	500-750-1000	
Performance of very special visual tasks of extremely low contrast and small size	I	10000-15000-20000	1000-1500-2000	

II. Commercial, Institutional, Residential and Public Assembly Interiors

Area/Activity	Illuminance Category	Area/Activity	Illuminance Category	Area/Activity	Illuminance Category	Area/Activity	Illuminance Category
Air terminals (see Transportation terminals)		Food service facilities		Examination and treatment rooms ¹⁷		Post-anesthetic recovery room ¹⁷	
ArmoriesC ¹		Dining areas		GeneralD		General ¹⁸E	
Auditoriums		CashierD		LocalD		LocalH	
AssemblyC ¹		CleaningC		Eye surgery ¹⁷F		Pulmonary function laboratories ¹⁷E	
Social activityB		DiningB ⁸		Fracture room ¹⁷		Radiology suite ¹⁷	
Banks (also see Reading)		Food displays (see Merchandising spaces)		GeneralE		Diagnostic section	
Lobby		KitchenE		LocalF		General ¹⁸A	
GeneralC		Gasoline stations (see Service Stations)		Inhalation therapyD		Waiting areaA	
Writing areaD		Graphic design and material		Laboratories ¹⁷		Radiographic/fluoroscopic roomA	
Tellers stationsE ³		Color selectionF ¹¹		Specimen collectingE		Film sortingF	
Barber shops and beauty parlorsE		Charting and mappingF		Tissue laboratoriesF		Barium kitchenE	
Conference rooms		GraphsE		Microscopic reading roomD		Radiation therapy section	
ConferringD		KeyliningF		Gross specimen reviewF		General ¹⁸B	
Critical seeing (refer to individual task)		Layout and artworkF		Chemistry roomsE		Waiting areaB	
Depots, terminals and stations (see Transportation terminals)		Photographs, moderate detailE ¹³		Bacteriology rooms		Isotope kitchen, generalE	
Drafting		Health care facilities		GeneralE		Isotope kitchen, benchesE	
Mylar		Ambulance (local)E		Reading culture platesF		Computerized radiotomography section	
High contrast media; india ink, plastic leads, soft graphite leadsE ³		AnesthetizingE		HematologyE		Scanning roomB	
Low contrast media: hard graphite leadsF ³		Autopsy and morgue ^{17,18}		Linens		Equipment maintenance roomE	
Vellum		Autopsy, generalE		Sorting soiled linenD		Solarium	
High contrastE ³		Autopsy tableG		Central (clean) linen roomD		GeneralC	
Low contrastF ³		Morgue, generalD		Sewing room, generalD		Local for readingD	
Tracing paper		MuseumE		Sewing room, work areaE		StairwaysC	
High contrastE ³		Cardiac function labE		Linen closetB		Surgical suite ¹⁷	
Low contrastF ³		Central sterile supply		LobbyC		Operating room, general ¹⁸F	
Overlays ²		Inspection, generalE		Locker roomsC		Scrub room ¹⁸E	
Light tableC		InspectionF		Medical illustration studio ^{17,18}F		Instruments and sterile supply roomD	
Prints		At sinksE		Medical recordsE		Clean up room, instrumentsE	
Blue lineE		Work areas, generalD		Nurseries ¹⁷		Anesthesia storageC	
BlueprintsE		Processed storageD		General ¹⁸C		Substerilizing roomC	
Sepia printsF		Corridors ¹⁷		Observation and treatmentE		Surgical induction room ^{17,18}E	
Educational facilities		Nursing areas — dayC		Nursing stations ¹⁷		Surgical holding area ^{17,18}E	
Classrooms		Nursing areas — nightB		GeneralD		ToiletsC	
General (see Reading)		Operating areas, delivery, recovery, and laboratory suites and serviceE		DeskE		Utility roomD	
Drafting (see Drafting)		Critical care areas ¹⁷		Corridors dayC		Waiting areas ¹⁷	
Home economics		GeneralC		Corridors nightA		GeneralC	
Science laboratoriesE		ExaminationE		Medication stationE		Local for readingD	
Lecture rooms		Surgical task lightingH		Obstetric delivery suite ¹⁷		Hospitals (see Health care facilities)	
Audience (see Reading)		HandwashingF		Labor rooms		Kitchens (see Food service facilities)	
DemonstrationF		Cystoscopy room ^{17,18}E		GeneralC			
Music rooms (see Reading)		Dental suite ¹⁷		LocalE			
Shops (see Part III, Industrial Group)		GeneralD		Birthing roomF ⁷			
Sight saving roomsF		Instrument trayE		Delivery area			
Study halls (see Reading)		Oral cavityH		Scrub, generalG			
Typing (see Reading)		Prosthetic laboratory, generalD		GeneralG			
Sports facilities (see Part V, Sports and Recreational Areas)		Prosthetic laboratory, work benchE		ResuscitationG			
Cafeterias (see Food Service facilities)		Prosthetic laboratory, localF		Post-delivery recovery areaE			
Dormitories (see Residences)		Recovery room, generalC		Substerilizing roomB			
Elevators, freight and passengerC		Recovery room, emergency examinationE		Occupational therapy ¹⁷			
Exhibition hallsC ¹		Dialysis unit, medical ¹⁷F		Work area, generalD			
Fire halls (see Municipal buildings)		ElevatorsC		Work tables or benchesE			
		EKG and specimen room ¹⁷		Patients rooms ¹⁷			
		GeneralB		General ¹⁷B			
		On equipmentC		ObservationA			
		Emergency outpatient ¹⁷		Critical examinationE			
		GeneralE		ReadingD			
		LocalF		ToiletsD			
		Endoscopy rooms ^{17,18}		Pharmacy ¹⁷			
		GeneralE		GeneralE			
		PeritoneoscopyD		Alcohol vaultD			
		CuldoscopyD		Laminar flow benchF			
				Night lightA			
				Parenteral solution roomD			
				Physical therapy departments			
				GymnasiumsD			
				Tank roomsD			
				Treatment cubiclesD			

Area/Activity	Illuminance Category	Area/Activity	Illuminance Category	Area/Activity	Illuminance Category	Area/Activity	Illuminance Category
Libraries		Handwritten carbon copiesE		Cutting, punching, stitching . .E		steamingE	
Reading areas (see Reading)		Non-photographically reproducible colorsF		Embossing and inspectionF		Inspection and spotting.G	
Book stacks (vertical 760 millimeters [30 inches] above floor)		ChalkboardsE ³		Breweries		PresidingF	
Active stacksD		Printed tasks		Brew houseD		Repair and alterationF	
Inactive stacksB		6 point typeE ³		Boiling and keg washingD		Cloth products	
Book repair and bindingD		8 and 10 point typeD ³		Filling (bottles, cans, kegs) . . .D		Cloth inspectionI	
CatalogingD ³		Glossy magazinesD ¹³		Building construction (see Part IV, Outdoor Facilities)		CuttingG	
Card filesE		MapsE		Building exteriors (see Part IV, Outdoor Facilities)		SewingG	
Carrels, individual study areas (see Reading)		NewsprintD				PressingF	
Circulation desksD		Typed originalsD				Clothing manufacture (men's)	
Map, picture and print rooms (see Graphic design and material)		Typed 2nd carbon and laterE				Receiving, opening, storing, shippingD	
Audiovisual areasD		Telephone booksE				Examining (perching)I	
Audio listening areasD		Safety		Candy making		Sponging, decating, winding, measuringD	
Microform areas (see Reading)		Schools (see Educational facilities)		Box departmentD		Piling up and markingE	
Locker roomsC		Service spaces (see also Storage rooms)		Chocolate department		CuttingG	
Municipal buildings—fire and police		Stairways, corridorsC		Husking, winnowing, fat extraction, crushing and refining, feedingD		Pattern making, preparation of trimming, piping, canvas and shoulder pads.E	
Police		Elevators, freight and passengerC		Bean cleaning, sorting, dipping, packing, wrappingD		Fitting bundling shading, stitchingD	
Identification recordsF		Toilets and wash roomsC		MillingE		ShopsF	
Jail cells and interrogation rooms . . .D		Service stations		Cream making		InspectionG	
Fire hallD		Service bays (see Part III, Industrial Group)		Mixing, cooking, molding . .D		PressingF	
Offices		Sales room (see Merchandising spaces)		Gum drops and jellied formsD		Sewing.G	
Accounting (see Reading)		Stairways (see Service spaces)		Hand decoratingD		Control rooms (see Electric generating stations — interior)	
Conference areas (see Conference rooms)		Storage rooms (see Part III, Industrial Group)		Hard candy		Corridors (see Service spaces)	
Drafting (see Drafting)		Stores (see Merchandising spaces and Show windows)		Mixing, cooking, molding . .D			
General and private offices (see Reading)		Toilets and washroomsC		Die cutting and sorting . . .E		Cotton gin industry	
Libraries (see Libraries)		Transportation terminals		Kiss making and wrapping . .E		Overhead equipment — separators, dryers, grid cleaners stick machines, conveyers, feeders and catwalksD	
Lobbies, lounges and reception areasC		Waiting room and lounge . . .C				Gin standD	
Mail sortingE		Ticket countersE		Canning and preserving		Control consoleD	
Off-set printing and duplicating areaD		Baggage checkingD		Initial grading raw material samplesD		Lint cleanerD	
Reading		Rest roomsC		TomatoesE		Bale pressD	
Copied tasks		ConcourseB		Color grading and cuffing roomsF			
Ditto copyE ³		Boarding areaC		Preparation		Dairy farms (see Farms)	
Micro-fiche readerB ^{12,13}		III. INDUSTRIAL GROUP		Preliminary sorting		Dairy products	
MimeographD		Assembly		Apricots and peaches . . .D		Fluid milk industry	
Photographs, moderate detailE ¹³		SimpleD		TomatoesE		Boiler roomD	
Thermal copy, poor copy . .F ³		Moderately difficultE		OlivesF		Bottle storageD	
XerographD		DifficultF		Cutting and pittingE		Bottle sortingE	
Xerography, 3rd generation and greaterE		Very difficultG		Final sortingE		Bottle washersE ²²	
Electronic data processing tasks		ExactingH		Canning		Can washersD	
CRT screensB ^{12,13}		Bakeries		Continuous-belt canning . .E		Cooling equipment.D	
Impact printer		Mixing roomD		Sink canningE		Filling inspectionE	
good ribbonD		Face of shelvesD		Hand packingD		Gauges (on face)E	
poor ribbonE		Inside of mixing bowl . . .D		OlivesE		LaboratoriesE	
2nd carbon and greaterE		Fermentation roomD		Examination of canned samplesF		Meter panels (on face) . . .E	
Ink jet printerD		Make up room		Container handling		PasteurizersD	
Keyboard readingD		Bread		InspectionF		SeparatorsD	
Machine rooms		Sweet yeast-raised productsD		Can unscramblersE		Storage refrigeratorD	
Active operationsD		Proofing roomD		Labeling and cartooning . .D		Tanks, vats	
Tape storageD		Oven roomD				Light interiorsC	
Machine areaC		Fillings and other ingredients.D		Clay and concrete products		Dark interiorsE	
Equipment serviceE ¹⁰		Decorating and icing		Grinding, filter presses, kiln roomsC		Thermometer (on face) . . .E	
Thermal printE		MechanicalD		Molding, pressing, cleaning, trimmingD		Weighing roomD	
Handwritten tasks		HandE		EnamelingE		ScalesE	
#3 pencil and softer leadsE ³		Scales and thermometers . .D		Color and glazing — rough workE		Dispatch boards (see Electric generating stations — interior)	
#4 pencil and harder leadsF ³		WrappingD		Color and glazing — fine workF		Dredging (see Part IV, Outdoor Facilities)	
Boll-point penD ³		Book binding				Electrical equipment manufacturing	
Felt-tip penD		Folding, assembling pasting. .D		Cleaning and pressing industry		ImpregnatingD	
				Checking and sortingE		Insulating: coil windingE	
				Dry and wet cleaning and			

Area/Activity	Illuminance Category	Area/Activity	Illuminance Category	Area/Activity	Illuminance Category	Area/Activity	Illuminance Category
Electric generating stations — interior (see also Nuclear power plants)		Feed storage area — storage		Fine grinding, beveling.		Materials handling	
Air-conditioning equipment, air pre-heater and fan floor, ash sluicing	B	Haymow	A	polishing	E	Wrapping, packing, labeling	D
Auxiliaries, pumps, tanks, compressors, gauge area	C	Hay inspection area	C	Inspection, etching and decorating	F	Picking stock, classifying	D
Battery rooms	D	Ladders and stairs	C			Loading, inside truck bodies and freight cars	C
Boiler platforms	B	Silo	A	Glove manufacturing		Meat packing	
Burner platforms	C	Silo room	C	Pressing.	G	Slaughtering	D
Cable room	B	Feed storage area — grain and concentrate		Knitting	F	Cleaning, cutting, cooking, grinding, canning, packing	D
Coal handling systems	B	Grain bin	A	Sorting.	F		
Coal pulverizer	C	Concentrate storage area	B	Cuffing	G		
Condensers, deaerator floor, evaporator floor, heater floors	B	Feed processing area	B	Sewing and inspection.	G		
Control rooms		Livestock housing area (community, maternity, individual calf pens, and loose housing holding and resting areas)	B			Nuclear power plants (see also Electric Generating Stations)	
Main control boards	D ²³	Machine storage area (garage and machine shed)	B	Hangars (see Aircraft manufacturing)		Auxiliary building, uncontrolled access areas	C
Auxiliary control panels	D ²³	Farm shop area				Controlled access areas	
Operator's station	E ²³	Active storage area	B	Hat manufacturing		Count room	E ²³
Maintenance and wiring areas	D	General shop area (machinery repair rough sawing)	D	Dyeing, stiffening, braiding, cleaning, refining	E	Laboratory	E
Emergency operating lighting	C	Rough bench and machine work (painting, fine storage, ordinary sheet metal work, welding, medium benchwork)	D	Forming, sizing, pouncing, flanging, finishing, ironing	F	Health physics office	F
Gauge reading	D	Medium bench and machine work (fine woodworking, drill press, metal lathe, grinder)	E	Sewing	G	Medical aid room	F
Hydrogen and carbon dioxide manifold area	C	Miscellaneous areas		Inspection		Hot laundry	D
Laboratory	E	Farm office (see Reading)		Simple.	D	Storage room	C
Precipitators	B	Restrooms (see Service spaces)		Moderately difficult	E	Engineered safety features equipment	D
Screen house	C	Pumphouse	C	Difficult	F	Diesel generator building	D
Soot or slag blower platform	C			Very difficult.	G	Fuel handling building	
Steam headers and throttles	B			Exacting.	H	Operating floor	D
Switchgear and motor control centers	D					Below operating floor	C
Telephone and communication equipment rooms	D			Jewelry and watch manufacturing	G	Oil gas building	C
Tunnels or galleries, piping and electrical	B					Radwaste building	D
Turbine building				Laundries		Reactor building	
Operating floor	D	Farms — poultry (see Poultry Industry)		Washing	D	Operating floor	D
Below operating floor	C			Flat work ironing, weighing, listing, marking	D	Below operating floor	C
Visitors gallery	C	Flour mills		Machine and press finishing, sorting	E		
Water treating area	D	Rolling, sifting, purifying	E	Fine hand ironing	E	Packing and boxing (see Materials handling)	
		Packing	D				
Electric generating stations — exterior (see Part IV, Outdoor Facilities)		Product control	F	Leather manufacturing		Paint manufacturing	
		Cleaning, screens, man lifts, aisleways and walkways, bin checking. . . .	D	Cleaning tanning and stretching, vats	D	Processing	D
Elevators (see Service spaces)				Cutting, fleshing and stuffing	D	Mix comparison	F
Explosives manufacturing		Forge shops	E	Finishing and scarfing	E		
Hand furnaces, boiling tanks, stationary dryers, stationary and gravity crystallizers	D					Paint shops	
Mechanical furnace, generators and stills, mechanical dryers, evaporators, filtration, mechanical crystallizers	D	Foundries		Leather working		Dipping, simple spraying, firing	D
Tanks for cooking, extractors, percolators, nitratators	D	Annealing (furnaces)	D	Pressing, winding, glazing	F	Rubbing, ordinary hand painting and finishing art, stencil and special spraying	D
		Cleaning	D	Grading, matching, cuffing, scarfing, sewing	G	Fine hand painting and finishing	E
Farms — dairy		Core making				Extra-fine hand painting and finishing	G
Milking operation area (milking parlor and stall barn)		Fine.	F	Loading and unloading platforms (see Part IV, Outdoor Facilities)			
General	C	Medium	E			Paper-box manufacturing	E
Cow's udder	D	Grinding and chipping	F	Locker rooms	C		
Milk handling equipment and storage area (milk house or milk room)		Inspection				Paper manufacturing	
General	C	Fine.	G	Logging (see Part IV, Outdoor Facilities)		Beaters, grinding, calendering	D
Washing area	E	Medium	F			Finishing, cuffing, trimming, papermaking machines	E
Bulk tank interior	E	Molding		Lumber yards (see Part IV, Outdoor Facilities)		Hand counting, wet end of paper machine	E
Loading platform	C	Medium	F			Paper machine reel, paper inspection, and laboratories	F
Feeding area (stall barn feed alley, pens, loose housing feed area).	C	Large.	E	Machine shops		Rewinder	F
		Pouring	E	Rough bench or machine work	D		
		Sorting.	E	Medium bench or machine work, ordinary automatic machines, rough grinding, medium buffing and polishing	E	Plating	D
		Cupola	C	Fine bench or machine work, fine automatic machines, medium grinding, fine buffing and polishing	G		
		Shakeout	D	Extra-fine bench or machine work, grinding, fine work . . .	H	Polishing and burnishing (see Machine shops)	
		Garages — service				Power plants (see Electric generating stations)	
		Repairs	E				
		Active traffic areas	C				
		Write-up	D				
		Glass works					
		Mix and furnace rooms, pressing and lehr, glass-blowing machines. . . .	C				
		Grinding, cutting, silvering	D				

Area/Activity	Illuminance Category	Area/Activity	Illuminance Category	Area/Activity	Illuminance Category	Area/Activity	Foot Lux Candles
Poultry industry (see also Farm — dairy)		Safety (see Fig. 44)		Active		IV. OUTDOOR FACILITIES	
Brooding, production, and laying houses		Sawmills		Rough, bulky itemsC		Building, (construction)	
Feeding, inspection, cleaningC		Secondary log deckB		Small itemsD		General	
Charts and recordsD		Head saw (cutting area viewed by sawyer)E		Storage yards (see Part IV, Outdoor Facilities)		construction100	10
Thermometers, thermostats, time clocksD		Head saw outfeedB		Structural steel fabricationE		Excavation work. . . .20	2
Hatcheries		Machine in-feeds (bull edger, resaws, edgers, trim, hula saws, planers)B		Sugar refining		Building exteriors	
General area and loading platformC		Main mill floor (base lighting)A		GradingE		Entrances	
Inside incubatorsD		Sorting tablesD		Color inspectionF		Active (pedestrian and/or conveyance) . . .50	5
Dubbing station.F		Rough lumber gradingD		Testing		Inactive (normally locked infrequently used)10	1
SexingH		Finished lumber gradingF		GeneralD		Vital locations or structures50	5
Egg handling, packing and shipping		Dry lumber warehouse (planer)C		Exacting tests, extra-fine instruments, scales, etc.F		Building surrounds . .10	1
General cleanlinessE		Dry kiln coiling shedB		Textile mills		Buildings and monuments, floodlighted	
Egg quality inspectionE		Chipper infeedB		Staple fiber preparation		Bright surroundings	
Loading platform, egg storage area, etc.C		Basement areas		Stock dyeing, tintingD		Light surfaces . . .150	15
Egg processing		ActiveA		Sorting and grading (wool and cotton)E ¹⁶		Medium light surfaces200	20
General lightingE		InactiveA		Yarn manufacturing		Medium dark surfaces300	30
Fowl processing plant		Filing room (work areas)E		Opening and picking (chute feed)D		Dark surfaces . . .500	50
General (excluding killing and unloading area)E		Service spaces (see also Storage rooms)		Carding (nonwoven web formation)D ²⁴		Dark surroundings	
Government inspection station and grading stationsE		Stairways, corridorsB		Drawing (gilling, pin drafting)D		Light surfaces . . .50	5
Unloading and killing areaC		Elevators, freight and passengerB		CombsingsD ²⁴		Medium light surfaces100	10
Feed storage		Toilets and wash roomsC		Roving (clubbing, fly frame)E		Medium dark surfaces150	15
Grain, feed rationsC		Sheet metal works		Spinning (cap spinning, twisting, texturing)E		Dark surfaces . . .200	20
ProcessingC		Miscellaneous machines		Yarn preparation		Bulletin and poster boards	
Charts and recordsD		ordinary bench workE		Winding, quilling, twisting .E		Bright surroundings	
Machine storage area (garage and machine shed)B		Presses, shears, stamps, spinning, medium bench workE		Warping (beaming, sizing)F ¹⁶		Light surfaces . . .500	50
Printing Industries		PunchesE		Warp tie-in or drawing-in (automatic)E		Dark surfaces . .1000	100
Type foundries		Tin plate inspection, galvanizedF		Fabric production		Dark surroundings	
Matrix making, dressing typeE		ScribingF		Weaving, knitting, tufting .F		Light surfaces . . .200	20
Font assembly—sorting . . .D		Shoe manufacturing — leather		InspectionG ¹⁶		Dark surfaces . . .500	50
CastingE		Cutting and stitching		Finishing		Central station (see Electric generating stations—exterior)	
Printing plants		Cutting tablesG		Fabric preparation (desizing, scouring, bleaching, singeing, and mercerization)D		Coal yards (protective)2	0.2
Color inspection and appraisalF		Marking, buttonholing skiving, sorting, vamping, countingG		Fabric dyeing (printing)D		Dredging20	2
Machine composition.E		Stitching dark materials . . .G		Fabric finishing (calendering, sanforizing, sueding, chemical treatment)E ¹⁶		Electric generating stations — exterior	
Composing roomE		Making and finishing, nailers, sole layers, welt beaters and scarfers. trimmers, welters, lasters, edge setters sluggers, randers, wheelers, beers, cleaning, spraying, buffing, polishing, embossing . . .F		InspectionG ^{16,25}		Boiler areas	
PressesE		Shoe manufacturing—rubber		Tobacco products		Catwalks, general areas20	2
Imposing stonesF		Washing, coating, mill run compoundingD		Drying, strippingD		Stairs and platforms. . . .50	5
Proofreading.F		Varnishing, vulcanizing, calendering, upper and sole cuttingD		Grading and sortingF		Ground level areas including precipitators, FD and ID fans, bottom ash hoppers50	5
Electrotyping		Sole rolling, lining, making and finishing processes . . .E		Toilets and wash rooms (see Service spaces)		Cooling towers	
Molding, routing, finishing leveling molds, trimmingE		Soap manufacturing		UpholsteringF		Fan deck, platforms, stairs, valve areas50	5
Blocking, tinningD		Kettle houses. cutting, soap chip and powderD		Warehouse (see Storage rooms)		Pump areas20	2
Electroplating, washing, backingD		Stamping, wrapping and packing, filling and packing soap powderD		Welding		Fuel handling	
Photoengraving		Stairways (see Service spaces)		OrientationD		Barge unloading, car dumper, unloading, truck unloading, pumps, gas metering . . .50	5
Etching, staging, blockingD		Steel (see Iron and Steel)		Precision manual arc weldingH		Conveyors20	2
Routing, finishing, proofingE		Storage battery manufacturingD		Woodworking		Storage tanks10	1
Tint laying, maskingE		Storage rooms or warehouses		Rough sawing and bench workD		Coal storage piles, ash dumps2	0.2
Receiving and shipping (see Materials handling)		InactiveB		Sizing, planing, rough sanding, medium quality machine and bench work,D			
Railroad yards (see Part IV, Outdoor Facilities)				gluing, veneering, cooperageD			
Rubber goods — mechanical (see Fig. 50) ²¹				Fine bench and machine work, fine sanding and finishingE			
Rubber tire manufacturing (see Fig 50) ²¹				Central station (see Electric generating stations — exterior)			

Area/Activity Foot Lux Candles	Area/Activity Foot Lux Candles	Area/Activity Foot Lux Candles	Area/Activity Foot Lux Candles
Hydroelectric Powerhouse roof, stairs, platform and intake decks50 5 Inlet and discharge water area2 0.2 Intake structures Deck and laydown area50 5 Value pits20 2 Inlet water area . . .2 0.2 Parking areas Main plant parking20 2 Secondary parking10 1 Substation Horizontal general area . . .20 2 Vertical tasks . . .50 5 Transformer yards Horizontal general area . . .20 2 Vertical tasks . . .50 5 Turbine areas Building surrounds20 2 Turbine and heater decks, unloading bays50 5 Entrances, stairs and platforms50° 5°	Piers Freight200 20 Passenger200 20 Active shipping area surrounds. . .50 5 Prison yards50 5 Quarries50 5 Railroad yards Retarder classification yards Receiving yard Switch points . . .20 2 Body of yard . . .10 1 Hump area (vertical)200 20 Control tower and retarder area (vertical)100 10 Head end.50 5 Body10 1 Pull-out end20 2 Dispatch or forwarding yard10 1 Hump and car rider classification yard Receiving yard Switch points . . .20 2 Body of yard . . .10 1 Hump area50 5 Flat switching yards Side of cars (vertical).50 5 Switch points. . . .20 2 Trailer-on-flatcars Horizontal surface of flatcar50 5 Hold down points (vertical)50 5 Container-on flatcars30 3 Sawmills (see also Logging) Cut off saw100 10 Log haul20 2 Log hoist (side lift) . .20 2 Primary log deck. . .100 10 Barker in-feed . . .300 30 Green chain300 ²⁸ 30 ²⁸ Lumber strapping200 ²⁶ 20 ²⁶ Lumber handling areas20 2 Lumber loading areas50 5 Wood chip storage piles5 05 Service station (at grade) Dark surrounding Approach15 15 Driveway15 15 Pump island area200 20 Building faces (exclusive of glass)100 ¹⁴ 10 ¹⁴ Service areas . . .30 3 Landscape highlights.20 2 Light surrounding Approach30 3 Driveway50 5 Pump island area300 30 Building faces (exclusive of glass)300 ¹⁴ 30 ¹⁴ Service areas . . .70 7	Landscape highlights50 5 Ship yards General50 5 Ways100 10 Fabrication areas300 30 Smokestacks with advertising messages (see Bulletin and poster boards) Storage yards Active200 20 Inactive10 1 Water tanks with advertising messages (see Bulletin and poster boards) V. TRANSPORTATION VEHICLES Aircraft Passenger compartment General50 5 Reading (at seat). . .200 20 Airports Hangar apron10 1 Terminal building apron Parking area.5 0.5 Loading area . . .20 ¹⁴ 2 ¹⁴ Rail conveyances Boarding or exiting100 10 Fare box (rapid transit train) . . .150 15 Vestibule (commuter and intercity trains) . .100 10 Aisles100 10 Advertising cards (rapid transit and commuter trains)300 30 Back-lighted advertising cards (rapid transit and commuter trains)— 860 cd/m ² (250 fl.) average maximum300 ³ 30 ³ Reading300 ³ 30 ³ Rest room (inter- city train)200 20 Dining area (inter- city train)500 50 Food preparation (inter-city train). . .700 70 Lounger (inter-city train) General lighting200 20 Table games. . . .300 30 Sleeping car General lighting100 10 Normal reading. .300 ³ 30 ³ Prolonged seeing700 ³ 70 ³ Road Conveyances	Step well and adjacent ground area100 10 Fare box150 15 General lighting (for seat selection and movement) City and intercity buses at city stop . . .100 10 Inter-city bus at country stop. . .20 2 School bus while moving150 15 School bus at stops300 30 Advertising cards. .300 30 Back-lighted advertising cards (see Rail conveyances) Reading300 ³ 30 ³ Emergency exit (school bus)50 5 Ships Living Areas Staterooms and Cabins General lighting100 10 Reading and writing . . .300 ^{16,3} 30 ^{16,3} Prolonged seeing . . .700 ^{16,3} 70 ^{16,3} Baths (general lighting) . . .100 10 Mirrors (personal grooming . . .500 50 Barber shop and beauty parlor500 50 On Subject. .1000 100 Day rooms General lighting . . .200 ¹⁵ 20 ¹⁵ Desks500 ^{16,3} 50 ^{16,3} Dining rooms and messrooms. . .200 20 Enclosed promenades General lighting100 10 Entrances and passageways General100 10 Daytime embar- cation300 30 Gymnasiums General lighting300 30 Hospital Dispensary (general lighting). . .300 ¹⁶ 30 ¹⁶ Operating room General lighting . . .500 ¹⁶ 50 ¹⁶ Doctor's office.300 ¹⁶ 30 ¹⁶ Operating table . . .20000 2000 Wards General lighting100 10 Reading300 30 Toilets200 20 Libraries and lounges General lighting200 20
Flags, floodlighted (see Bulletin and poster boards)			
Gardens ¹⁹ General lighting5 0.5 Path, steps, away from house10 1 Backgrounds— fences, walls, trees, shrubbery . .20 2 Flower beds, rock gardens50 5 Trees, shrubbery, when emphasized50 5 Focal points, large100 10 Focal points, small200 20			
Gasoline station (see Service stations in Part II)			
Loading and unloading platforms200 20 Freight car interiors100 10			
Logging (see also Sawmills) Yarding30 3 Log loading and unloading50 5 Log stowing (water)5 0.5 Active log storage area (land)5 0.5 Log booming area (water) — foot traffic10 1 Active log handling area (water)20 2 Log grading — water or land50 5 Log bins (land)20 2 Lumber yards10 1			

Area/Activity	Foot Lux Candles	Area/Activity	Foot Lux Candles	
Prolonged seeing700 ^{16,3}	70 ^{16,3}	stores)50	5	¹ Include provisions for higher levels for exhibitions.
Purser's office . . .200 ¹⁶	20 ¹⁶	Laundries		² Specific limits are provided to minimize deterioration effects.
Shopping areas. . .200	20	General200 ¹⁶	20 ¹⁶	³ Task subject to veiling reflections. Illuminance listed is not an ESI value. Currently, insufficient experience in the use of ESI target values precludes the direct use of Equivalent Sphere Illumination in the present consensus approach to recommend illuminance values. Equivalent Sphere Illumination may be used as a tool in determining the effectiveness of controlling veiling reflections and as a part of the evaluation of lighting systems.
Smoking rooms . .150	.15	Machine and press finishing, sorting500	50	⁴ Illuminance values are listed based on experience and consensus. Values relate to needs during various religious ceremonies.
Stairs and foyers. .200	20	Lockers50	5	⁵ Degradation factors: Overlays — add 1 weighting factor for each overlay; Used material — estimate additional factors.
Recreation areas		Offices		⁶ Provide higher level over food service or selection areas.
Ball rooms150 ¹⁵	15 ¹⁵	General200	20	⁷ Supplying illumination as in delivery room must be available.
Cocktail lounges150 ¹⁵	15 ¹⁵	Reading500 ^{16,3}	50 ^{16,3}	⁸ Illuminance values developed for various degrees of store area activity.
Swimming pools		Passenger counter50 ^{16,3}	50 ^{16,3}	⁹ Or not less than 1/3 the level in the adjacent areas.
General150 ¹⁵	15 ¹⁵	Storerooms50	5	¹⁰ Only when actual equipment service is in process. May be achieved by a general lighting system or portable equipment.
Underwater		Telephone exchange200	20	¹¹ For color matching, the spectral quality of the color of the light source is important.
Outdoors — 600 [60] lamp lumens/square meter [foot] of surface area		Operating Areas		¹² Veiling reflections may be produced on glass surfaces. It may be necessary to treat plus weighting factors as minus in order to obtain proper illuminance.
Indoors —1000 [100] lamp lumens/square meter [foot] of surface area		Access and casing100	10	¹³ Especially subject to veiling reflections. It may be necessary to shield the task or to re-orient it.
Theatre		Battery room100	10	¹⁴ Vertical.
Auditorium		Boiler rooms200 ¹⁶	200 ¹⁶	¹⁵ Illuminance values may vary widely, depending upon the effect desired, the decorative scheme, and the use made of the room.
General100 ¹⁵	10 ¹⁵	Cargo handling		¹⁶ Supplementary lighting should be provided in this space to produce the higher levels required for specific seeing tasks involved.
During picture .1	0.1	Control stations (except navigating areas)		¹⁷ Good to high color rendering capability should be considered in these areas. As lamps of higher luminous efficacy and higher color rendering capability become available and economically feasible they should be applied in all areas of health care facilities.
Navigating Areas		General Control consoles.200	20	¹⁸ Variable (dimming or switching).
Chart room		Gauge and control boards300	30	¹⁹ Values based on a 25 per cent reflectance which is average for vegetation and typical outdoor surfaces. These figures must be adjusted to specific reflectances of materials lighted for equivalent brightnesses. Levels give satisfactory brightness patterns when viewed from dimly lighted terraces or interiors. When viewed from dark areas they may be reduced by at least 1/2, or they may be doubled when a high key is desired.
General100	10	Switchboards . . .300	30	²⁰ General lighting should not be less than 1/3 of visual task illuminance nor less than 200 lux [20 footcandles].
On chart table500 ^{16,3}	50 ^{16,3}	Engine rooms200 ¹⁶	20 ¹⁶	²¹ Industry representatives have established a table of single illuminance values which in their opinion can be used in preference to employing reference 6. Illuminance values for specific operations can also be determined using illuminance categories of similar tasks and activities found in this table and the application of the appropriate weighting factors in Fig. 56.
Gyro room200	20	Generator and switchboard rooms200 ¹⁶	20 ¹⁶	²² Special lighting such that (1) the luminous area is large enough to cover the surface which is being inspected and (2) the luminance is within the limits necessary to obtain comfortable contrast conditions. This involves the use of sources of large area and relatively low luminance in which the source luminance is the principal factor rather than the illuminance produced at a given point.
Radar room200	20	Fan rooms (ventilation & air conditioning) . . .100	10	²³ Maximum levels — controlled system.
Radio room100 ¹⁶	10 ¹⁶	Motor rooms200	20	²⁴ Additional lighting needs to be provided for maintenance only.
Radio room, passenger foyer100	10	Motor generator rooms (cargo handling)100	10	²⁵ Color temperature of the light source is important for color matching.
Ship's offices		Pump room100	10	²⁶ Select upper level for high speed conveyor systems. For grading redwood lumber 3000 lux [300 footcandles] is required.
General200 ¹⁶	20 ¹⁶	Shaft alley100	10	
On desks and work tables500 ^{16,3}	50 ^{16,3}	Shaft alley escape30	3	
Wheelhouse . . .100	10	Steering gear room200	20	
Service Areas		Windlass rooms . .100	10	
Food preparation		Workshops		
General200 ¹⁶	20 ¹⁶	General300 ¹⁶	30 ¹⁶	
Butcher shop . .200 ¹⁶	20 ¹⁶	On top of work bench50 ¹⁶	50 ¹⁶	
Gallery300 ¹⁶	300 ¹⁶	Tailor shop500 ¹⁶	50 ¹⁶	
Pantry200 ¹⁶	20 ¹⁶	Cargo holds		
Thaw room. . . .200 ¹⁶	20 ¹⁶	Permanent luminaires . . .30 ¹⁶	3 ¹⁶	
Sculleries.200 ¹⁶	20 ¹⁶	Passageways and trunks . . .100	10	
Food storage (non- refrigerated) . .100	10			
Refrigerated spaces (ship's				