ILLUMINANCE SELECTION

In 1979, the IESNA established an illuminance selection procedure, which was published in the 6th, 7th, and 8th editions of its *Lighting Handbook*. The philosophy of that procedure was to enable the lighting designer to select illuminances based on a knowledge of space and occupant characteristics as well as the task and worker characteristics.

The philosophy of that procedure has been embraced again in this edition, but the procedure has been modified and simplified to place visual performance and therefore illuminance selection more in balance with the other important lighting design criteria presented in this chapter and discussed throughout this edition of the *IESNA Lighting Handbook*. Specifically, the recommended illuminances provided in the Design Guide are based on the Society's judgment of best practice for "typical" applications. Every situation is unique so, naturally, typical conditions may not be appropriate for a specific application. As a professional, the lighting designer should have a better understanding of the particular space and the needs of the occupants and clients than what can be presented in a recommended illuminance value for a typical space.

Illuminance Recommendations

In 1979, the IESNA established nine illuminance categories, "A," the lowest set of recommended illuminances, through "I," the highest set. Each of the nine categories had general descriptions of the visual task, irrespective of the application. Generally, the same approach has been employed in this edition of the *IESNA Lighting Handbook* to help lighting designers establish the best task illuminance. However, four important modifications have been adopted.

- 1. The recommended illuminances are no longer provided without reference to a specific application. Every application in the Design Guide has a specific recommended illuminance (horizontal, vertical, or both) representing best practice for a typical application.
- 2. The nine illuminance selection categories established earlier by the IESNA have been reduced to seven categories and organized into three sets of visual tasks (orientation and simple, common, and special). These groupings provide additional clarity to the category descriptions (Figure 10-9).
- 3. Additional precision has been given to the task descriptions in each category. In the previous three editions it was impossible for the lighting designer to unambiguously ascertain what constituted, for example, "low contrast" or "small size." Specific ranges of contrast and size have been established for this edition (Figures 10-10 and 10-11).
- 4. Recommended illuminances increase roughly logarithmically with increasing task difficulty by combined changes in task contrast and task size, as defined in Figure 10-10. These recommendations are guided by both the scientific literature and practical experience.

Orientation and simple visual tasks. Visual performance is largely unimportant. These tasks are found in public spaces where reading and visual inspection are only occasionally performed. Higher levels are recommended for tasks where visual performance is occasionally important.

Α	Public spaces	30 lx (3 fc)
В	Simple orientation for short visits	50 lx (5 fc)
C	Working spaces where simple visual	
	tasks are performed	100 lx (10 fc)

Common visual tasks. Visual performance is important. These tasks are found in commercial, industrial and residential applications. Recommended illuminance levels differ because of the characteristics of the visual task being illuminated. Higher levels are recommended for visual tasks with critical elements of low contrast or small size.

D	Performance of visual tasks of high	300 lx (30 fc)
_	contrast and large size	
E	Performance of visual tasks of high	
	contrast and small size, or visual	
	tasks of low contrast and large	
	size	500 lx (50 fc)
F	Performance of visual tasks of low	
	contrast and small size	1000 lx (100 fc)

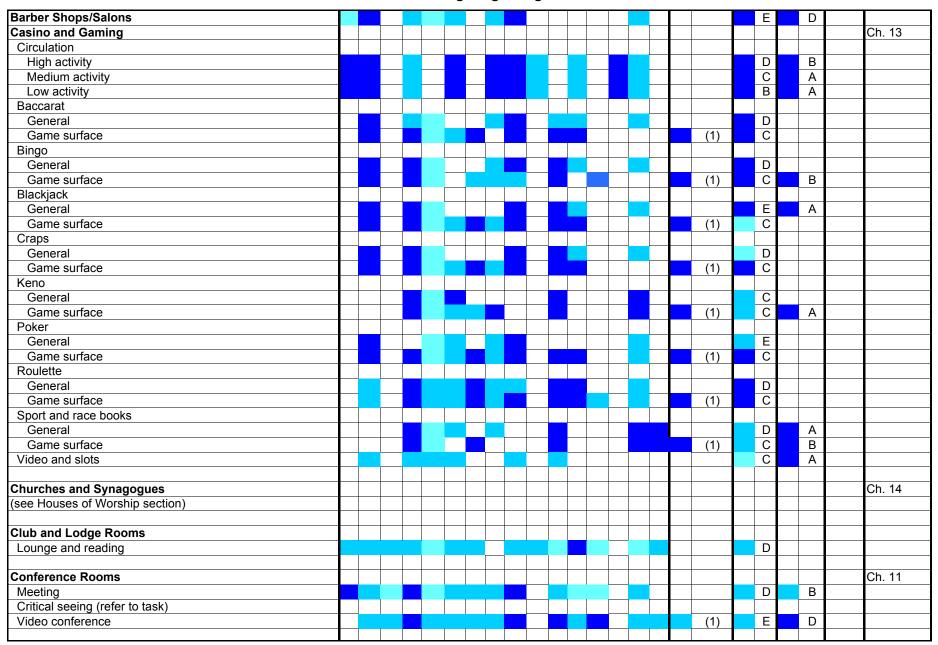
Special visual tasks. Visual performance is of critical importance. These tasks are very specialized, including those with very small or very low contrast critical elements. Recommended illuminance levels should be achieved with supplementary task lighting. Higher recommended levels are often achieved by moving the light source closer to the task.

G	Performance of visual tasks near	
	threshold	3000 to 10,000 lx
		(300 to 1000 fc)

^{*} Expected accuracy in illuminance calculations are given in Chapter 9, Lighting Calculations. To account for both uncertainty in photometric measurements and uncertainty in space reflections, measured illuminances should be with ± 10% of the recommended value. It should be noted, however, that the final illuminance may deviate from these recommended values due to other lighting design criteria.

Figure 10-9. Determination of Illuminance Categories*

I. INTERIOR LOCATIONS AND TASKS		Vei	y Im	porta	ant		lm	port	ant		So	me	what	imp	orta	ant		Blank :	= No	t im	porta	ant o	r not ap	plicable
	Appearance of Space and Luminaires	īg	Daylighting Integration and Control	Direct Glare	Flicker (and Strobe)	ight Distribution on Surfaces	ight Distribution on Task Plane (Uniformity)	uminances of Room Surfaces	Modeling of Faces or Objects	Point(s) of Interest	Reflected Glare	Shadows	Source/Task/Eye Geometry	Sparkle/Desirable Reflected Highlights	Surface Characteristics	System Control and Flexibility	Special Considerations	Notes on Special Considerations	Illuminance (Horizontal)	Category or Value (lux)	lluminance (Vertical)	Category or Value (lux)	Notes on Illuminance - see end of section	Reference Chapter(s)
Accounting (see Offices)	ίĕ	ŭ	۵	⊡	臣	Ľ	Ë		ž	Ā	ď	ঠ	S	ઝ	ડ	Ś	Š	ž	≝	ပိ	≝	ပိ	ž	<u>ഗ്</u> Ch. 11
- 1000aniani g (200 0 moss)																								J
Air Terminals																								Ch. 23
(see Transportation Terminals in Section V, Transportation)																								
Armories																				С		Α		
Amones																				0				
Art Galleries (see Museums)																								Ch. 14
,																								
Auditoriums																								
Assembly																				С				
Social activity					,															В		Α		
																								01 44
Banks (see Reading)	-																							Ch. 11
Lobby																		(4)						
General																		(1)		С		Α		
Writing area																		(1)		D E A		Α		
Tellers' stations					ı		1											(1)		F		Α		
ATM facilities — keypad																		(1)		Α		С		
ATM facilities — display screen																		(1)		Α		В	(2)	
ATM facilities — writing surface																				D		Α		
ATM facilities — surrounding area																				С		Α	(3)	



I. INTERIOR LOCATIONS AND TASKS		Ve	ry In	npoi	rtant		lm	port	ant		Sc	me	what	imp	orta	ant		Blank :	= No	t im	porta	ant o	r not a	plicable
	Appearance of Space and Luminaires	Color Appearance (and Color Contrast)	Daylighting Integration and Control	Direct Glare	Flicker (and Strobe)	Light Distribution on Surfaces	Light Distribution on Task Plane (Uniformity)	uminances of Room Surfaces	Modeling of Faces or Objects	Point(s) of Interest	Reflected Glare	Shadows	Source/Task/Eye Geometry	Sparkle/Desirable Reflected Highlights	Surface Characteristics	System Control and Flexibility	Special Considerations	Notes on Special Considerations	Illuminance (Horizontal)	Category or Value (lux)	Illuminance (Vertical)	Category or Value (lux)	Notes on Illuminance - see end of section	Reference Chapter(s)
Correctional Facilities Cells		U			<u> </u>				2	<u> </u>	Ш	0)	0)	0)	U)	0)	0)			D	_	В	(4)	Ch. 14
Day rooms																				D		В		
Corridors (see Service Spaces)	+																							
Court Rooms (see Reading)																								Ch. 14
Seating area (spectators)	4																	(4)		С		Α	(5)	
Judge and clerk	-										_						-	(1)	-	E E E		С	(5)	
Litigant's table Podium	-										-		-					(1) (1)				C	(6) (5)	
Witness chair																		(1)		D		В	(5)	
Dance Halls/Discotheques																								
Dance halls/discotheques																				Α		Α		
Ballrooms/social events																			ſ	В		Α		
Depots, Terminals, Stations	+																							Ch. 23
(see Transportation Terminals in Section V, Transportation)																								
Drafting/Graphic Arts	+															-								
CAD stations only																-				С		Α		
Mixed CAD and paper task	1																			D		A		

Mylar		Ī											
High contrast media	-										Е	С	
Low contrast media	-										F	D	
	_										Г	U	
Vellum/mylar											_		
High contrast											E F	С	
Low contrast	_										F	D	
Overlays										(7)		_	
Light table											C E	Α	
Prints											Е	С	
Educational Facilities													Ch. 12
Corridors												С	
Classrooms													
General (see Reading)													
Art rooms											Е	D	
Drafting (see Drafting/Graphic Arts)													
Home economics (see Residences)													
Science laboratories						-					Е	D	
Lecture halls													
Audience (see Reading)													
Demonstration	-										F	Е	
Music rooms (see Reading)	_					1							
Shops (see Section II, Industrial)													
Sight saving rooms											F	Е	
Study halls (see Reading)	-					1					1		
Typing (see Reading)	_												
Gymnasiums	-												Ch. 20
Basketball	_										F	D	CH. 20
	_	ſ									F	ט	
Other sports (See Section IV, Sports)	_											_	
Social events		1									В	Α	01 00
Outdoor sports facilities (see Section IV, Sports)													Ch. 20
Cafeterias (see Food Service Facilities)													Ch. 13
Dormitories (see Residences)													Ch. 18
Elevators, Freight											В		
Elevators, Passenger											В	Α	
Emarganov Lighting	+												Ch. 29
Emergency Lighting	_				_								On. ∠9
(see Section VI, Emergency, Safety, and Security)													
- 1910 11 11													
Exhibition Halls											С	Α	

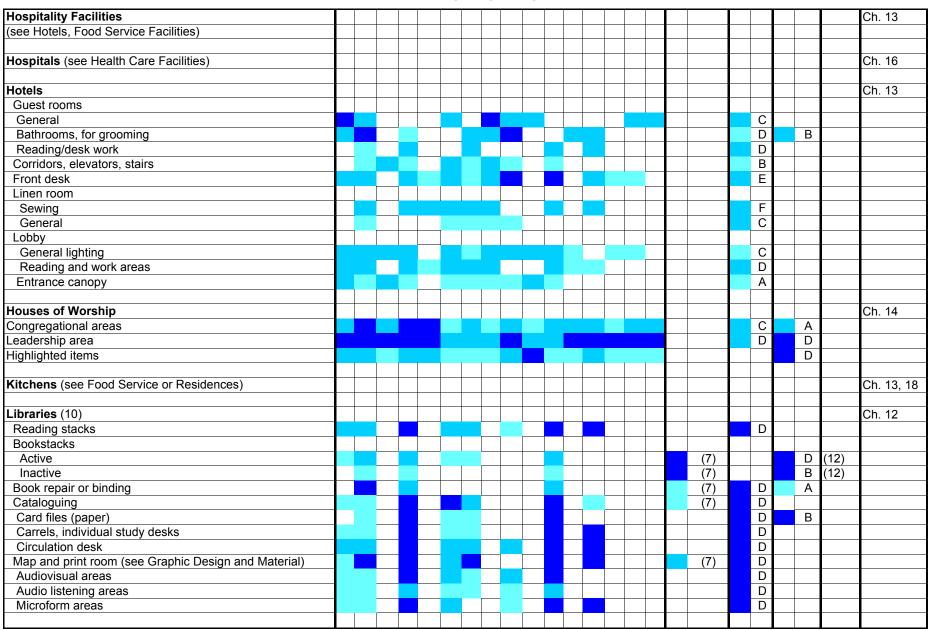
I. INTERIOR LOCATIONS AND TASKS		Ve	ry Im	por	tant		lm	port	ant		So	me	what	imp	orta	ant		Blank :	= No	t im	porta	ant o	r not ap	plicable
Design Issues	Appearance of Space and Luminaires	Color Appearance (and Color Contrast)	Daylighting Integration and Control	Direct Glare	Flicker (and Strobe)	ight Distribution on Surfaces	ight Distribution on Task Plane (Uniformity)	uminances of Room Surfaces	Modeling of Faces or Objects	Point(s) of Interest	Reflected Glare	Shadows	Source/Task/Eye Geometry	Sparkle/Desirable Reflected Highlights	Surface Characteristics	System Control and Flexibility	Special Considerations	Notes on Special Considerations	Iluminance (Horizontal)	Category or Value (lux)	Iluminance (Vertical)	Category or Value (lux)	Notes on Illuminance - see end of section	Reference Chapter(s)
Filing (see Offices and Reading)	₹	Ö	۵	՝	正	Li		ĭ	Σ	P	ď	S	Ŏ	Ś	ิ้ง	Ò,	Ś	Ž	=	Ö	≡	Ö	Ž	<u>~</u> Ch. 11
Financial Facilities (see Banks)																								Ch. 11
Fire Stations (see Municipal Buildings - Police and Fire)																								Ch. 11
Food Service Facilities (If equipment locations are known, see Residences-Kitchens) Butcher shop																				E		С		Ch. 13
Cashier Cleaning																				D		Α		
Dining Food displays														-						C E		Α	(8)	
Food storage Nonrefrigerated Refrigerated																				ВВ		A		
Galley Kitchen																				E E		C A		
Pantry Refuse area																				D		A		
Sculleries Thaw room																				E D		C A		

Food Courts							(9)	D	Α		Ch. 13
Garages — Parking (see Outdoor Facilities section)											Ch. 22
0	_										01 17
Gasoline Stations (see Retail Spaces - Outdoor:	_										Ch. 17
Service Station in Section III, Outdoor)											
Graphic Design and Material	 										
Color selection								F	D		
Charting and mapping								F	D		
Graphs	1							Е	C		
Keylining								F	D		
Layout and artwork								F	D		
Photographs, moderate detail								Е	С		
Health Care Facilities							// 6:				Ch. 16
Ambulance (local)	-				_		(10)	Е	С		
Anesthetizing							(10)	Е	С		
Autopsy and morgue							(10)				
Autopsy, general	-				_		(10)	Е	С		
Autopsy table	-				_		(10)	G	Е		
Morgue, general		_			_		(10)	D	В		
Cardiac function laboratory							(10)	Е	С		
Central sterile supply											
Inspection, general	-				_			Е	С		
Inspection	-							F	D		
Work areas, general	-				_			D	В		
Processed storage	_							D	В		
Corridors											
Nursing areas, day	.							С	A		
Nursing areas, night								В	А		
Operating areas, delivery, recovery,	 								•		
and laboratory suite and service		1						Е	Α		
Critical care areas							(40)		^		
General	-						(10)	B E	A C		
Examination	-						(10)	E	C	(4.4)	
Surgical task lighting							(10)	F		(11)	
Handwashing Cystoscopy room							(10)	E	С		
Dental suite							(10)	E	C		
							(10)		D		
General							(10)	D	В		
Instrument tray	1							E G	C E		
Oral cavity								G	E		

I. INTERIOR LOCATIONS AND TASKS		Ve	ry Im	port	tant		lm	port	tant		So	me	what	imp	orta	ant		Blank :	= No	t im	porta	ant o	r not ap	plicable
ECCATIONS AND TASKS	-						$\widehat{\mathbf{S}}$									1								Γ
	Appearance of Space and Luminaires	Color Appearance (and Color Contrast)	Daylighting Integration and Control	Direct Glare	Flicker (and Strobe)	ight Distribution on Surfaces	Light Distribution on Task Plane (Uniformity)	uminances of Room Surfaces	Modeling of Faces or Objects	Point(s) of Interest	Reflected Glare	Shadows	Source/Task/Eye Geometry	Sparkle/Desirable Reflected Highlights	Surface Characteristics	System Control and Flexibility	Special Considerations	Notes on Special Considerations	Illuminance (Horizontal)	Category or Value (lux)	Illuminance (Vertical)	Category or Value (lux)	Notes on Illuminance - see end of section	Reference Chapter(s)
Recovery room	4	0			ш	_	_	_	2	<u>п</u>	ľ	0)	0)	0)	(I)	(J)	(I)		=	0	=	0		<u>ir</u>
General																				С		Α		
Dialysis unit, medical																ı				C F		D		
Elevators																				В		Α		
EKG and specimen room																								
General																		(10)		Α		Α		
Emergency outpatient																								
General																		(10)		Ε		С		
Endoscopy rooms																								
General																		(10)		Ε		С		
Peritoneoscopy																		(10)		П		В		
Culdoscopy																		(10)		D		В		
Eye surgery																		(10)		G		Ε		
Fracture room																								
General																		(10)		Ε		С		
Local																		(10)		F		D		
Inhalation therapy													_					(10)		D		В		
Laboratories																								
Specimen collecting																		(10)		Ε		С		
Linens																								
Sorting soiled linen																				D		Α		
Central (clean) linen room																				D		Α		
Sewing room, general																		(10)		D		В		
Linen closet																				В		Α		
Lobby																		(10)		В		Α		
Locker rooms																				В		Α		
Medical illustration studio																		(10)		F		D		
Medical records																		(10)		Ε		С		
Nurseries																								
General																		(10)		В		Α		

Observation and treatment (10)	_		_						
General Gene	Observation and treatment					(10)	Е	С	
Desk C Corridors, day C B A A A A A A Medication station C C C C C C C C C									
Corridors, day						(10)			
Corridors, night						(10)			
Medication station (10) E C Obstetric delivery suite 1 <td>Corridors, day</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Α</td> <td></td>	Corridors, day							Α	
Observation Company							Α		
Labor rooms						(10)	Е	С	
General C	Obstetric delivery suite								
Local	Labor rooms								
Birthing room Delivery area Scrub, general Gener	General						С		
Delivery area Scrub, general G	Local						Е	С	
Scrub. general General	Birthing room						F	D	
General Gene									
Delivery table (10) G E						(10)		D	
Resuscitation	General						G		
Postdelivery recovery area	Delivery table					(10)	G		
Occupational therapy (10) D B Work areas, general (10) E C Patient rooms (10) E C General (10) B A Observation (10) A A Critical examination E C Reading (10) D B Toilets D D A Physical therapy departments (10) D B Gymnasiums (10) D B Tank rooms (10) D B Treatment cubicles (10) D B Postanesthetic recovery room E C C General E C C Local E C C Pulmonary function laboratories (10) E C Radiological suite (10) A A	Resuscitation					(10)	G	Е	
Work areas, general (10) D B Work tables or benches (10) E C Patient rooms (10) B A General (10) A A Observation (10) A A Critical examination E C B Reading (10) D B B Toilets D A A B A Physical therapy departments (10) D B	Postdelivery recovery area						Е	С	
Work areas, general (10) D B Work tables or benches (10) E C Patient rooms (10) B A General (10) A A Observation (10) A A Critical examination E C B Reading (10) D B B Toilets D A A B A Physical therapy departments (10) D B	Occupational therapy								
Work tables or benches (10) E C Patient rooms (10) B A General (10) B A Observation (10) A A Critical examination E C C Reading (10) D B Toilets D A A Physical therapy departments (10) D B Gymnasiums (10) D B Trank rooms (10) D B Treatment cubicles (10) D B Postanesthetic recovery room E C C General C C C Local C C C Pulmonary function laboratories C C C Radiological suite C C C	Work areas, general					(10)	D	В	
General		-				(10)	Е	С	
Observation (10) A A Critical examination E C Reading (10) D B Toilets D A Physical therapy departments (10) D B Gymnasiums (10) D B Tank rooms (10) D B Treatment cubicles (10) D B Postanesthetic recovery room C C C General C C C Local C C C Pulmonary function laboratories (10) E C Radiological suite (10) A A	Patient rooms								
Observation (10) A A Critical examination E C Reading (10) D B Toilets D A Physical therapy departments (10) D B Gymnasiums (10) D B Tank rooms (10) D B Treatment cubicles (10) D B Postanesthetic recovery room C C General C C Local C C Pulmonary function laboratories (10) E C Radiological suite (10) A A	General					(10)		Α	
Reading (10) D B Toilets D A Physical therapy departments D A Gymnasiums (10) D B Tank rooms (10) D B Treatment cubicles (10) D B Postanesthetic recovery room E C General E C Local G E Pulmonary function laboratories (10) E C Radiological suite (10) A A	Observation						Α	Α	
Toilets Physical therapy departments Gymnasiums Tank rooms Treatment cubicles Postanesthetic recovery room General Local Pulmonary function laboratories Radiological suite General (10)	Critical examination						Е	С	
Physical therapy departments Gymnasiums Tank rooms Treatment cubicles Postanesthetic recovery room General Local Pulmonary function laboratories Radiological suite General General (10) D B (10) D B C C C C C C C C C C C C C C C C C C	Reading					(10)	D	В	
Gymnasiums (10) D B Tank rooms (10) D B Treatment cubicles (10) D B Postanesthetic recovery room (10) D B General E C Local G E Pulmonary function laboratories (10) E C Radiological suite (10) A A	Toilets						D	Α	
Gymnasiums (10) D B Tank rooms (10) D B Treatment cubicles (10) D B Postanesthetic recovery room (10) D B General E C Local G E Pulmonary function laboratories (10) E C Radiological suite (10) A A	Physical therapy departments								
Treatment cubicles Postanesthetic recovery room General Local Pulmonary function laboratories Radiological suite General (10) D B C C C C C C C C C C C C C C C C C						(10)	D	В	
Treatment cubicles Postanesthetic recovery room General Local Pulmonary function laboratories Radiological suite General (10) D B C C E C C (10) E C (10) A A	Tank rooms					(10)	D	В	
General	Treatment cubicles						D	В	
General	Postanesthetic recovery room								
Local Pulmonary function laboratories Radiological suite General GE E C GE							Е	С	
Pulmonary function laboratories Radiological suite General (10) E C (10) A A	Local						G	Е	
Radiological suite General (10) A A	Pulmonary function laboratories					(10)	Е		
General (10) A A						` ′			
						(10)	Α	Α	
	Radiography/fluoroscopy room								

I. INTERIOR LOCATIONS AND TASKS			Ve	ry Imp	ortan	t	lm	port	ant		So	me	what	imp	orta	ant		Blank :	= No	t im	porta	ant o	r not ap	plicable
	Design Issues	Appearance of Space and Luminaires	Color Appearance (and Color Contrast)	Daylighting Integration and Control	Direct Grare Flicker (and Strobe)	Light Distribution on Surfaces	Light Distribution on Task Plane (Uniformity)	uminances of Room Surfaces	Modeling of Faces or Objects	Point(s) of Interest	Reflected Glare	Shadows	Source/Task/Eye Geometry	Sparkle/Desirable Reflected Highlights	Surface Characteristics	System Control and Flexibility	Special Considerations	Notes on Special Considerations	Illuminance (Horizontal)	Category or Value (lux)	Illuminance (Vertical)	Category or Value (lux)	Notes on Illuminance - see end of section	Reference Chapter(s)
Radiation therapy section		⋖	O) IT		-		2	<u> </u>	œ	S	S	S	ഗ	S	ഗ	Z	=	O	=	0	Z	<u> </u>
General																		(10)		В		Α		
Solarium																								
General																		(10)		С		Α		
Local for reading																		(10)		D		В		
Stairways																				С		Α		
Surgical suite																								
Operating room, general																		(10)		G		Ε		
Operating table																		(10)		G		Ε		
Scrub room																				F		D		
Instruments and sterile supply room																Ī				D E C		В		
Clean-up room, instruments																Ī				Ε		С		
Anesthesia storage																Ī				С		Α		
Substerilizing room																Ī				С		Α		
Surgical induction room																				E E		С		
Surgical holding area																Ī				Ε		С		
Toilets																				С		Α		
Utility room																j				D		Α		
Waiting areas																Ī								
General																		(10)		С		Α		
Local for reading																		(10)		D		В		
																Ī								
Homes (see Residences)																								Ch. 18
																								Ī



I. INTERIOR LOCATIONS AND TASKS			Ve	ry In	npoi	rtant		Impo	rtant		S	ome	what	imp	orta	ant		Blank :	= Nc	t im	port	ant o	r not a	oplicable
	Design Issues	Appearance of Space and Luminaires	Color Appearance (and Color Contrast)	Daylighting Integration and Control	Direct Glare	Flicker (and Strobe)	ight Distribution on Surfaces	Light Distribution on Task Plane (Uniformity)	Modeling of Faces or Objects	Point(s) of Interest	Reflected Glare	Shadows	Source/Task/Eye Geometry	Sparkle/Desirable Reflected Highlights	Surface Characteristics	System Control and Flexibility	Special Considerations	Notes on Special Considerations	Illuminance (Horizontal)	Category or Value (lux)	Illuminance (Vertical)	Category or Value (lux)	Notes on Illuminance - see end of section	Reference Chapter(s)
Locker Rooms		1		ш	_	ш.	_			<u> </u>		0)	0)	0)	0)	0)	0)		_	С		A		Ch. 12, 20
																				_				, , , ,
Merchandising Spaces																								Ch. 17
Retail store areas																								
Alteration room																				F		D		
Fitting room																								
Dressing areas						'						,								D		В		
Fitting areas																				F		D		
Locker rooms																				С		Α		
Stock rooms, wrapping																								
and packaging				_																D		В		
Sales transaction area																				D				
Circulation																				С				
General merchandise display																				Ε		С		
Feature display																				F		D		
Show windows																				G		Ε		

Shopping mall areas	$\overline{}$	\top							
Main concourse				1 1			D	В	
Food court (see Food Courts)	1	_							
Entertainment areas						(9)	Е	С	
Kiosks						(9)	F	D	
Directory/information desk						(0)	F	D	
Service corridors			_				D		
Restrooms							C	Α	
Child care							D	В	
Vertical transportation							D	Α	
Entry/vestibule							D		
Side arcade						(9)	D	В	
Landscape						()			
(see Retail Spaces — Outdoor in Section III, Outdoor)									Ch. 17, 21
Meeting rooms/offices							D	Α	ì
Supermarkets									
Meat — processed							Е	С	
Meat — fresh							Е	С	
Dairy cases							Е	С	
Produce							Е	С	
Floral displays							Е	С	
Gondolas							Е	С	
Shelving							Е	С	
Motels (see Hotels)									Ch. 13
Municipal Buildings - Police and Fire									Ch. 11
Police									
Identification records							F		
Jail cells and interrogation rooms							D	Α	
Fire Station							D	В	
Museums									Ch. 14
Flat displays on vertical surfaces						(7)		D	
Exhibit cases						(7)	D	В	
3-dimensional objects						(7)	D	В	
Realistic environments						(7)	D	В	
Lobbies, general gallery areas, corridors						(7)	С	Α	
Restoration or conservation shops and labs						(7)	Е	С	
		$\perp \perp \perp$							
Nursing Homes (see Health Care Facilities)		\perp							Ch. 16

I. INTERIOR			1/0	n, In	200	tont		Impor	tont		Som	owbo	at im	nort	ont		Dlank :	- Na	at im	nort	ont o	r not o	ppliochlo
LOCATIONS AND TASKS			ve	ry III	ipoi	tant		Impor	lant		Som	ewna	וווו	port	anı		Biank	= INC	וווו אכ	port	ant o	r not a	pplicable
LOCATIONS AND TASKS				l									1							r		1	1
	Design Issues	Appearance of Space and Luminaires	Color Appearance (and Color Contrast)	Daylighting Integration and Control	Direct Glare	Flicker (and Strobe)	Light Distribution on Surfaces	Light Distribution on Task Plane (Uniformity) Luminances of Room Surfaces	Modeling of Faces or Objects	Point(s) of Interest	Reflected Glare	Source/Task/Eve Geometry	Sparkle/Desirable Reflected Highlights	Surface Characteristics	System Control and Flexibility	Special Considerations	Notes on Special Considerations	Illuminance (Horizontal)	Category or Value (lux)	Illuminance (Vertical)	Category or Value (lux)	Notes on Illuminance - see end of section	Reference Chapter(s)
Offices (13)											- 0.	,	0,	U,	0,	0,					Ŭ		Ch. 11
Filing (see Reading)									1			-1							Е		С		
General and private offices (see Reading)																							
Open plan office																							
Intensive VDT use																	(14,15)		D		В		
Open plan office																	, ,						
Intermittent VDT use																	(14,15)		Ε		В		
Private office																	. , ,		Ε		В	1	
Libraries (see Libraries)																						1	
Lobbies, lounges, and reception areas																			С		Α		
Mail sorting																			Е		Α		
Copy rooms																			С		Α		
Parking Facilities (see Section III, Outdoor)																							Ch. 22
																						1	
Post Offices																							Ch. 11
Lobby								1	1			, , , , , , , , , , , , , , , , , , ,					(1)		С		Α		
Customer service counter																	(1)		Ē		Α		
Mail processing, general																	(1)		E				
r																	(- /						
												1	_						1				

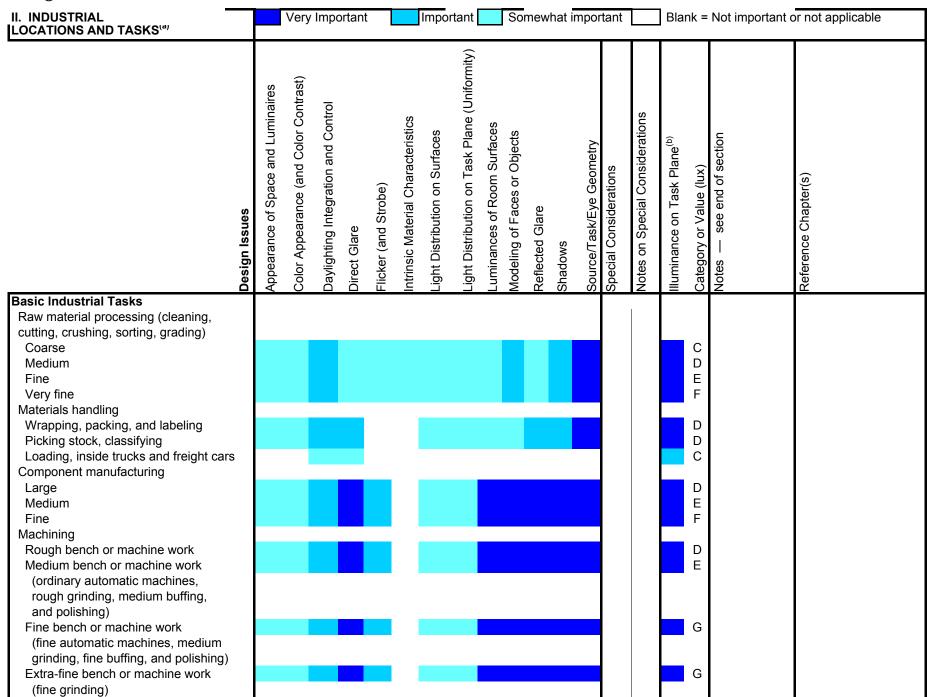
Reading (16)	$\overline{}$		1 1								I	Ch. 11, 12
rteading (10)												CII. 11, 12
Copied tasks												
Microfiche reader									Α	Α		
Photograph, moderate detail									E			
Thermal copy, poor						_			F			
Photocopies	1					-			D			
Photocopies, 3 rd generation	1					-			E			
Data processing tasks												
VDT screens									^	Δ.		
									A	Α		
Impact printer									_			
good ribbon									D			
2 nd carbon and greater									E			
ink jet/laser printer									D			
keyboard reading									D			
Machine rooms	\bot								_			
Active operations	\bot								D			
Tape storage									D	В		
Machine area					_				С			
Equipment service								_	Е	С		
Thermal print									Е			
Handwritten tasks												
#2 pencil and softer leads									D			
#3 pencil									Е			
#4 pencil and harder leads									F			
Ball-point pen									D			
Felt-tip pen									D			
Handwritten carbon copy									Е			
White boards										В		
Chalk boards										Е		
Printed tasks												
6-point type									Е			
8- and 10-point type									D			
Glossy magazines									D			
Maps									Е			
Newsprint									D			
Typed originals									D			
Telephone books		\perp							Е			
Residences												
General lighting					· .				В			
Conversation, relaxation, and entertainment									Α	Α		
Passage areas (circulation)									Α	Α		

I. INTERIOR		Ve	ry In	npor	tant		lm	porta	ant		So	mev	what im	porta	ant		Blank =	= No	t im	porta	ant o	r not a	plicable	e
LOCATIONS AND TASKS				ı	ı		1	1				1						1						
Design Issues	Appearance of Space and Luminaires	Color Appearance (and Color Contrast)	Daylighting Integration and Control	Direct Glare	Flicker (and Strobe)	Light Distribution on Surfaces	Light Distribution on Task Plane (Uniformity)	uminances of Room Surfaces	Modeling of Faces or Objects	Point(s) of Interest	Reflected Glare	Shadows	Source/Task/Eye Geometry Sparkle/Desirable Reflected Highlights	Surface Characteristics	System Control and Flexibility	Special Considerations	Notes on Special Considerations	Illuminance (Horizontal)	Category or Value (lux)	Illuminance (Vertical)	Category or Value (lux)	Notes on Illuminance - see end of section	Reference Chapter(s)	
Specific visual tasks		O					_		_			0)	0) 0)	0,	0)	0)				_	Ŭ		_	
Dining													'	' '					В					
Grooming																								
Makeup and shaving																			D		В			
Dressing evaluation (mirror)																			D		В			
Handcrafts and hobbies																								
Ordinary tasks (e.g,. crafts)																			D		В			
Difficult tasks (e.g., sewing)																			Е	-	С			
Critical tasks (e.g., workbench)																			F		D			
Easel hobbies																					D			
Ironing																			D					
Kitchen counter																								
Critical seeing (e.g., cutting)																			Ε		С			
General																			E D		В			
Kitchen range																								-
Difficult seeing (e.g., cooking)																			Е		С			-
Kitchen sink																								
Difficult seeing																			Е		С			-
Noncritical (clean up)																			D		В			-
Laundry																			D		Α			
Music study (piano, organ)																			D		В			
Reading																								
In a chair (casual)																			D		В			
In a chair (serious)																			Ε		С			
In bed (casual)																			D		В			

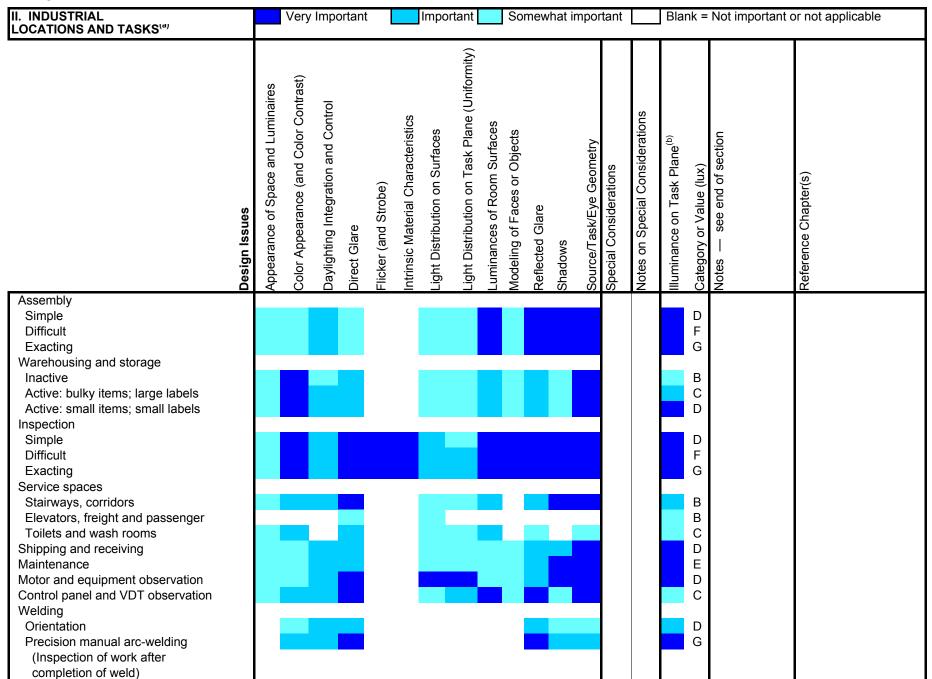
		1	 		 		,					
At desk												
Casual										D	Α	
Serious										Е	С	
Sewing (see Residences: Handcrafts and Hobbies)												
Table games										D	В	
Restaurants (see Food Service Facilities)												Ch. 13
Retail Spaces (see Merchandising Spaces)												Ch. 17
Safety (see Section VI, Emergency, Safety, and Security)												Ch. 29
Schools (see Educational Facilities)												Ch. 12
Service Spaces												Ch. 11, 19
(see Service Spaces in Section II, Industrial)												
Stairways and corridors										В		
Elevators (see Elevators)												
Toilets and washrooms						,	,			В	Α	
Service Stations												Ch. 17, 19
Service bays (see Section II, Industrial)												
Sales room (see Merchandise Spaces)												
Show Windows (see Merchandising Spaces)												Ch. 17
Stairways (see Service Spaces)												
Storage Rooms (see Section II, Industrial)												Ch. 19
,,												
Stores (see Merchandising Spaces)												Ch. 17
g spaces,												
Theatre and Motion Picture Houses												Ch. 15
												00
Toilets and Washrooms										В	Α	Ch. 11
											,,	J
Transportation Terminals												Ch. 23
(See Section V, Transportation)	1											J.1. 20
(COC COCION Y, Transportation)	1				+							
Winery (see Food Service Facilities)	-					-						Ch. 13, 17
Wine cellar					+				(7)	Α	Α	511. 15, 17
WILL COURT									(1)	^	$\overline{}$	

I. INTERIOR		Ver	y Im	port	tant		mport	ant		Sor	mev	vhat	imp	orta	nt		Blank =	Not	imp	orta	nt or	not a	plicable	е
LOCATIONS AND TASKS							-																	
-	Appearance of Space and Luminaires	Color Appearance (and Color Contrast)	Daylighting Integration and Control	Direct Glare		Surfaces	Light Distribution on Task Plane (Uniformity) Luminances of Room Surfaces	Modeling of Faces or Objects		Reflected Glare	Shadows	Source/Task/Eye Geometry	Sparkle/Desirable Reflected Highlights	Surface Characteristics	System Control and Flexibility	Special Considerations	Notes on Special Considerations	lluminance (Horizontal)	Category or Value (lux)	Illuminance (Vertical)	Category or Value (lux)	Notes on Illuminance - see end of section	Reference Chapter(s)	
						_					0,	0,	0,	0,	0,	0,			Ŭ	_		_		
Notes:																								
(1) Consider lighting for video cameras.																								
(2) Maximum illuminance.																								
(3) At ground level.																								
(4) The minimum illuminance in a prison cell is 200 lx (20 fc); 300	lx (30 fc	c) sh	ould	be p	provide	ed fo	r rea	adin	g at	the	hea	d of	the	bed	l.							
(5) Adjustable task lighting recommended.																								
(6) Task lighting recommended, possibly located in ceiling.																								
(7) Degradation factors important to consider.																								
(8) In the display plane.																								
(9) Special lighting for signage or banners may be required.																								
(10) See Chapter for special considerations.																								
(11) Refer to Chapter 16, Health Care Facility Lighting, for s	pecifi	c re	com	men	ndatio	ns f	or sur	gical	task	k ligl	htin	g.												
(12) At 30" above floor.																								
(13) Design issues, including illuminances, can be listed for					Refer	to s	pecific	tasl	k un	der '	"Re	adin	ıg" o	r "G	rapl	nic D	esign a	and I	Mate	rials	", fo	r exam	ıple.	
(14) Lighting should be flexible to accommodate changes in		e fur	nitur	e.																				
(15) Accoustical aspects of luminaires need to be considered																								
(16) Design issues and illuminances listed for the task. See	"Offi	ces"	or "	Edu	ıcatior	nal I	Faciliti	es",	for e	exan	nple	e, for	r add	oitib	nal d	cons	ideratio	ns f	or th	e ro	om.			

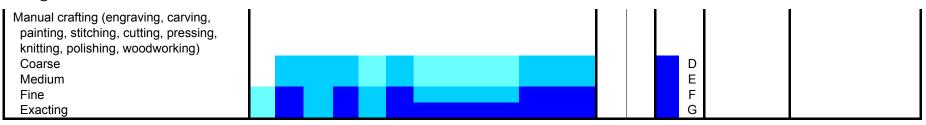








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Notes:

- (a) For details on specific tasks or spaces refer to Chapter 19, Industrial Lighting.
- (b) The task may be horizontal, inclined, or vertical.

Outdoor-1

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III. OUTDOOR		Ve	ry Ir	npor	tant		Imp	port	ant		Soi	mew	hat	impoi	rtant		Blan	K =	Not	ımpc	ortant or not applicable
LOCATIONS AND TASKS				ı										1						1	
Design Issues	Appearance of Space and Luminaires	Color Appearance (and Color Contrast)	Direct Glare	Light Distribution on Surfaces	Light Pollution/Trespass	Modeling of Faces or Objects	Peripheral Detection	Point(s) of Interest	Reflected Glare	Shadows	Source/Task/Eye Geometry	Sparkle/Desirable Reflected Highlights	Surface Characteristics	Special Considerations	Notes on Special Considerations	Illuminance (Horizontal)	Category or Value (lux) $^{(a,b)}$	Illuminance (Vertical)	Category or Value (lux) ^(a, b)	Notes on Illuminance — see end of section	Reference Chapter(s)
Advertising Signs and Poster Boards (see Bulletin and Poster Boards, or Signs)																					
(see Bulletin and Poster Boards, or Signs)																					
Rikowaya																					Ch. 21, 22, 29
Bikeways Alongside roadways — commercial areas																	10		20	(1)	Cn. 21, 22, 29
Distant from roadways																-	5		20 5	(1)	
Distant nom roadways																	0		0	(1)	
Building																					
General construction																	В		Α		
Excavation work																-	A		Α		
																					†
Building Exteriors																					Ch. 21, 29
Entrances																					
Active (pedestrian/conveyance)																	В		Α		
Inactive (normally locked, infrequent use)																	Α		Α		
Prominent structures																	В		Α		
Building and Crounda Security																					
Building and Grounds Security (see Section VI, Emergency, Safety, and Security)						\vdash															
(See Section VI, Emergency, Salety, and Security)																					
Buildings and Monuments, Floodlighted																					Ch. 21
Bright surrounding																					011. 21
Light surfaces															(2)				Α		†
Medium light surfaces															(2)				В		
Medium dark surfaces															(2)				В		
Dark surfaces															(2)				С		



\oplus			.0117	-igii	ung	DC31	9	Julia					
Dark surroundings													
Light surfaces						, , , , , , , , , , , , , , , , , , ,			(2)		Α	
Medium light surfaces									(2)		Α	
Medium light surfaces Medium dark surfaces									(2)		Α	
Dark surfaces									(2)		Α	
Bulletin and Poster Boards													Ch. 21
Bright surroundings													
Light surfaces									(2)	Α	D	
Dark surfaces									(2 (2	/	A	E	
Dark surroundings									_	_	- ' '		
Light surfaces									(2)	Α	С	
Dark surfaces									(2 (2	/	A	D	
Dark Surfaces									(2				
Coal Yards													
(see Section VI, Emergency, Safety, and Security)	+-										2		
(300 3000011 v1, Emergency, Salety, and Security)	\vdash												
Dredging	-										Α	Α	
Dreuging	 										^	^	
Flags, Floodlighted											С	Α	Ch. 21
riags, riodulighted											C	^	CII. 21
Gardens													Ch. 21
											E	2	CII. Z I
General lighting											5 10	2	
Paths, away from building				_	_				(2)	<u>, </u>		3	
Steps or ramps away from building					_				(3)	10	3	
Backgrounds — fences, walls, trees, and shrubbery						_					20	5	
Flower beds, rock gardens						_					A	Α	
Trees or shrubbery, emphasized							_				Α	Α	
Focal points, large							_				В	Α	
Focal points, small											С	Α	
Gazebos, trellises, decorative structures									(2	,	В	Α	
Terraces, patios, decks									(3)	В	Α	
Gasoline Station													
(see Retail Spaces, Outdoor: Service Station)													
Highways (see Roadways)													
Holiday and Entertainment													Ch. 13, 21
Holiday and festival lighting											С	Α	
Entertainment lighting											D	В	
Hospitality — Exterior													Ch. 13, 21
Restaurants and dining areas											В	Α	
Pool areas and terraces											В	Α	
Loading and Unloading													Ch. 19
Platforms											С	Α	
Freight car interiors											В	Α	

Outdoor-3

III. OUTDOOR		Vei	ry Ir	npor					ant			mew		impo	rtant		Blan	k =	Not	impo	ortant or not applicable
Design Issues	Appearance of Space and Luminaires	Color Appearance (and Color Contrast)	Direct Glare	Light Distribution on Surfaces	Light Pollution/Trespass	Modeling of Faces or Objects	Peripheral Detection	Point(s) of Interest	Reflected Glare	Shadows	Source/Task/Eye Geometry	Sparkle/Desirable Reflected Highlights	Surface Characteristics	Special Considerations	Notes on Special Considerations	Illuminance (Horizontal)	Category or Value (lux) ^(a, b)	Illuminance (Vertical)	Category or Value (lux) ^(a, b)	Notes on Illuminance — see end of section	Reference Chapter(s)
Yarding Log loading and unloading Log stowing (water) Active log storage area (land) Log booming area (water) — foot traffic Active log handling area — (water)	٩															=	A A 10 10 10		A		Ch. 19
Log grading — water or land Log bins (land) Lumber Yards Marinas																	B 20 10 B		3 A		Ch. 19 Ch. 21, 23
Parks, Plazas, and Pedestrian Malls Parking Areas Piers																	В		A	(4)	Ch. 21 Ch. 22, 29 Ch. 23
Freight Active shipping area Active shipping — surrounds Passenger Prison Yards															(3)	-	B A C				Ch. 14



Railroad Yards			Ch. 19, 23
Retarder classification yards			
Receiving yard			
Switch points	20	5	
Body of yard	10	3	
Hump area	A	C	
Control tower and retarder	7.		
area	Α	В	
Head end	A	A	
Body	10	3	
Pull-out end	20	5	
Dispatch or forwarding yard	10	3	
Hump and car rider classificaton yard	20	5	
Receiving yard	20	5	
	20	E	
Switch points Parky of yord	20	5	
Body of yard	10	3	
Hump area	Α	Α	
Flat switching yards			
Side of cars	Α	Α	
Switch points	20	5	
Trailer-on flatcars			
Horizontal surface of flatcar	А	Α	
Hold-down points	Α	Α	
Container-on flatcars	Α	Α	
Retail Spaces - Outdoor			Ch. 13, 17, 21, 29
Fast food restaurants	С	Α	
Car dealerships — business district			
Front row — adjacent to roadway	С	Α	
Car dealerships — small towns			
Front row — adjacent to roadway	В	Α	
Convenience stores	A	Α	
Pedestrian mall	A	Α	
Service station		/\	
Dark surrounding			
Approach	15	5	
Driveway	15	5	
Pump island area	A	A	
Building faces (exclusive of glass)	20	5	
Service areas	20	5	
Landscape highlights	10	3	
Light currounding	10	3	
Light surrounding Approach	20	E	
Äpproach Divorced	20	5	
Driveway Driveway island area	20	5	
Pump island area	В	Α	
Building faces (exclusive of glass)	Α	Α	
Service areas	Α	Α	
Service areas Landscape highlights		5 5	



III. OUTDOOR		\/0	ny In	npor			_		ant				hat	imno	rtant		Blan	k –	Not	imno	ortant or not applic	able
LOCATIONS AND TASKS		vei	yıl	npor	ıan	·	1 1111	μοιι	anı		30	iiiew	ııal	шро	ııanı		וואום	IK -	NUL	шрс	лтангог погаррис	abie
Ser	of Space and Luminaires	Color Appearance (and Color Contrast)		ution on Surfaces	Light Pollution/Trespass	Modeling of Faces or Objects	Detection	nterest	Glare		√Eye Geometry	Sparkle/Desirable Reflected Highlights	Characteristics	siderations	Notes on Special Considerations	(Horizontal)	Category or Value (lux) ^(a, b)	(Vertical)	or Value (lux) $^{(a,b)}$	uminance — see end of section	Chapter(s)	
Design Issues	Appearance of	Color Appea	Direct Glare	Light Distribution on	Light Polluti	Modeling of	Peripheral Detection	Point(s) of Interest	Reflected G	Shadows	Source/Task/Eye	Sparkle/Des	Surface Cha	Special Considerations	Notes on Sp	Illuminance (Horizontal)	Category or	Illuminance (Vertical)	Category or	Notes on	Ch. 22	
Roadways																				(5)	Ch. 22	
Roadway Rest Areas																				(6)	Ch. 22	
Sculptures																	Α		В		Ch. 21	
Ship Yards General Ways Fabrication areas																	A B D		A A B		Ch. 19, 23	
Shopping Centers (see Parking and Building Exterior, Entrances)																						
Signs Advertising Externally lighted roadway															(2)		A A		C C		Ch. 21, 22	
Smokestacks with Advertising Messages (see Bulletin and Poster Boards)																						
Storage Yards Active Inactive																	C 10		A 3		Ch. 19	
Streets (See Roadways)																					Ch. 22	
Tunnels																				(7)	Ch. 22	

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$lackbox{}$						3-		- J		9									
<i>N</i> alkways													(3)					(8)	Ch. 21, 22, 29
Water Tanks with Advertising Messages																			Ch. 22
(see Bulletin and Poster Boards)																			
Water and Rock Features																			Ch. 21
Softscape (natural water bodies)															В		Α		
Fountains, waterfalls															Α		В		
Decorative pools													(3)		В		Α		
Large natural rock features													. ,		Α		В		
Notes:																			
(a) Low illuminances (less than 30 lux) are given	in lux;	valu	es g	reate	r than	30 lux	x ar	e giv	en i	n lett	er ca	tegor	ies.						
(b) When security is a concern, consult Chapter 2	29, Em	erge	ncy,	Safe	ety, and	d Sec	urity	/ Lig	hting	g, for	addi	itional	illum	inan	ce re	comi	men	datio	ons.
(1) Intersections and conflict zones may require I	higher	illum	inan	ces.															
(2) Lighting must not interfere with visibility for personal content of the personal content of the content of	edestri	ans,	mot	orists	, or bo	aters													
(3) Hazards such as stairs or areas adjacent to b	odies	of wa	ater s	shoul	d be c	learly	ide	ntifie	d ar	nd lig	hted	for sa	fety.						
(4) Illuminances for parking areas listed in Chapt	er 22,	Roa	dwa	y Ligl	nting.														
(5) Illuminances for Roadway listed in Chapter 22	2, Road	dway	Ligl	hting.															
(6) Illuminances for Rest Areas listed in Chapter																			
(7) Illuminances for Tunnels listed in Chapter 22,																			
(8) Illuminances for Walkways listed in Chapter 2					J .														
			Ī																

IV. SPORTS AND RECREATION		Ve	ery I	mp	orta	nt		Imp	orta	ant		Son	newha	t impo	rtant		Blank = Not i	mportant or not applicable
LOCATIONS AND TASKS ^(a)										_								
Design Issues	Color Appearance (and Color Contrast)	Daylighting Integration and Control	Direct Glare	Flicker (and Strobe)	-ight Distribution on Task Plane (Uniformity)	ight Pollution/Trespass	Luminaire Noise	Modeling of Faces or Objects	Reflected Glare	Shadows	Special Considerations	Notes on Special Considerations	Illuminance (Horizontal)	Category or Value (lux) ^(b)	Illuminance (Vertical)	Category or Value (lux) ^(b)	Notes on Illuminance — see end of section	Reference Chapter(s)
Archery (Indoor)	ပ	Ω	Ω	正	Ξ	二	ユ	Σ	<u>~</u>	S	S	Z	=	S	=	O	Z	α
Target at 18.3m																	(1)	
Shooting line																	(' /	
Archery (Outdoor)																		
Target at 30.4m																	(1)	
Shooting line	-																(1)	
Chooling line																		
Badminton (Indoor)																		
Baseball	-																	
Professional (Outdoor)																	(2)	
Recreational						-											(2)	
Recreational	-																(2)	
	+																	
Basketball	+																	
Indoor																		
Outdoor																		
Outdoor	₽																	
Billianda																		
Billiards																		



			 	 	_	 	g •		 	
Bowling (Indoor)										
Approach										
Lane										
Target										
Bowling, Lawn										
-										
Boxing and Wrestling										
Croquet (or Roque)										
Curling (Hack to Hog)									(3)	
Fencing										
 Football										
Professional (indoor)										
Professional (outdoor)										
Recreational (outdoor)										
Golf										
Driving range tee boxes									(3)	
Course tee boxes									(3)	
Fairways									(3)	
Greens									(3)	
Driving range at 183 m										
Miniature golf										
Gymnasiums (refer to individual sports listed)										
 Handball				+	+					
Outdoor										
Hockey, Field										
inorey, i idiu										
Hockey, Ice and Figure Skating										
(indoor)										
Hockey, Ice (Outdoor) and										
Roller Skating										
Horse Shoes (see Quoits)					-					
Horse Offices (See Quotes)	1			+						
							<u> </u>			

IV. SPORTS AND RECREATION		Me	ery Im	nort				orta			Som		t impor	tant		Blank - Not in	mportant or not applicable
LOCATIONS AND TASKS ^(a)		Ve	y III	port	anı		шр	orta			3011	lewiiai	ı iiripoi	lanı		DIATIK - NOUT	ilportant or not applicable
LOCATIONO AND TAONO	╁										<u> </u>					<u> </u>	
Design Issues	Color Appearance (and Color Contrast)	and Cc	Direct Glare	Light Distribution on Task Plane (Uniformity)	ass	Luminaire Noise	Modeling of Faces or Objects	Reflected Glare	Shadows	Special Considerations	Notes on Special Considerations	Illuminance (Horizontal)	Category or Value (lux) ^(b)	Illuminance (Vertical)	Category or Value (lux) ^(b)	Notes on Illuminance — see end of section	Reference Chapter(s)
Horse Shows	S	Ω					≥	<u>~</u>	S	S	Z		Ö		S	Z	<u>~</u>
Lacrosse														ſ			
Playgrounds																	
Quoits																	
Racing (Outdoor)	1																
Motor — Track																	
Bicycle — Track	1	_												-		(3)	
Dog	1					\vdash										(3)	
Dragstrip		_				\vdash										(3)	
Drugotip																(0)	
Racquetball	1																
Indoor																	
Rodeo and Animal Shows														[
Roque (see Croquet)																	
Shooting Indoor	\vdash																
Shooting, Indoor																	
Target																	
Shooting line																	
Shooting line																	



Shooting, Outdoor at 45 m							
Target							
Shooting line							
Shuffleboard							
Indoor							
Outdoor							
Skating, Speed							
Indoor						(3)	
Outdoor						(3)	
						,	
Skeet and Trap Targets at 18.3 m Shooting line							
Targets at 18.3 m							
Shooting line							
Skiing							
Soccer (see Football)							
Softball							
Squash							
Swimming (Water Sports)							
Indoor — on pool deck							
Outdoor — on pool deck					_		
Tennis							
Indoor							
Outdoor							
Trap (see Skeet and Trap)							
			1				
Volleyball							
Indoor							
Outdoor							
04.400.							

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IV. SPORTS AND RECREATION		Ve	ery Ir	npo	ortar	nt		Imp	ort	ant		Son	newha	t impo	rtant		Blank = No	t important or not applicable
LOCATIONS AND TASKS ^(a)																		
Design Issues	Color Appearance (and Color Contrast)	Daylighting Integration and Control	Direct Glare	(ac	Light Distribution on Task Plane (Uniformity)	Light Pollution/Trespass	e Noise	Modeling of Faces or Objects	Reflected Glare	Shadows	Special Considerations	Notes on Special Considerations	Illuminance (Horizontal)	Category or Value (lux) ^(b)		Category or Value (lux) ^(b)		Reference Chapter(s)
	+		\rightarrow	-														
Notes:	+		\dashv				1											
(a) Criteria are for recreational or lowest classes o	of pla	av u	nles	ss of	ther	wis	e st	tate	ed.	For	othe	er cla	sses o	of play	and	for I	ighting	
for television cameras for professional or higher cla																		
(b) All illuminace values for sporting events/activiti																		
(1) Vertical illuminance should increase with shooti	ing (dista	ınce) .														
(2) Infield values																		
(3) Readings taken at grade. All other readings taken	ken :	at 1	mef	ter ((36") at	ove	e gr	rad	e.								
-																		

T										,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			٠.5												
V. TRANSPORTATION ^(a)			Ve	ry li	mpo	rtar	nt		lm	port	ant			Sc	me	wha	t im	port	ant		Bla	ank =	= Nc	t important or	not applicable
LOCATIONS AND TASKS			1	ı			ı		1		1			1	1	ı		1		1			ı	1	
	Design Issues	Appearance of Space and Luminaires	Color Appearance (and Color Contrast)	Daylighting Integration and Control	Direct Glare	Flicker (and Strobe)	ight Distribution on Surfaces	Light Distribution on Task Plane (Uniformity)	uminances of Room Surfaces	Modeling of Faces or Objects	Point(s) of Interest	Reflected Glare	Shadows	Source/Task/Eye Geometry	Sparkle/Desirable Reflected Highlights	Surface Characteristics	System Control and Flexibility	Special Considerations	Notes on Special Considerations	Illuminance (Horizontal)	Category or Value (lux) ^(b)	lluminance (Vertical)	Category or Value (lux) ^(b)	Notes on Illuminance — see end of section	Reference Chapter(s)
Aircraft		⋖	0		Ц	ш		_	_	2	ш	Щ	0)	()	()	()	()	()	_	=	0	=	0		Ch. 23
Passenger compartment																									211. 20
General																					Α		Α		
Reading (at seat)																					D				
Airports																									Ch. 23
Hangar apron																					10		3		
Terminal building apron																									
Parking area																					5		2		
Loading area																					20		5		
Buses (See Road Conveyances)																									Ch. 23
Rail Conveyances																									Ch. 23
Boarding or exiting			1																		Α		Α		
Fare box (rapid transit train)																					A B		Α		
Vestibule (commuter and																					Α		Α		
intercity trains)																									
Aisles																					Α		Α		
Advertising cards (rapid transit																									
and commuter trains)																							D		
Back-lighted advertising cards																									
(rapid transit and commuter trains)																									
860 cd/m2 (80 cd/ft2)																									
average maximum.																								Ì	

V. TRANSPORTATION ^(a)			Ve	ry II	nam	rtar	nt		lm	port	ant			So	mev	wha [·]	t imi	porta	ant		Bla	ank =	= No	t important or	not applicable
LOCATIONS AND TASKS			, , ,	۱۱ ر			••			, , , , , , , , , , , , , , , , , , ,	IL	l						, J. W			J.0	~	. 10	portant of	st applicable
	Design Issues	Appearance of Space and Luminaires	Color Appearance (and Color Contrast)	Daylighting Integration and Control	Direct Glare	Flicker (and Strobe)	ight Distribution on Surfaces	Light Distribution on Task Plane (Uniformity)	_uminances of Room Surfaces	Modeling of Faces or Objects	Point(s) of Interest	Reflected Glare	Shadows	Source/Task/Eye Geometry	Sparkle/Desirable Reflected Highlights	Surface Characteristics	System Control and Flexibility	Special Considerations	Notes on Special Considerations	lluminance (Horizontal)	Category or Value (lux) ^(b)	lluminance (Vertical)	Category or Value (lux) ^(b)	Notes on Illuminance — see end of section	Reference Chapter(s)
Reading (at seat)	De	Αp	ပိ	Ds	ä	Ë	ij	ij	<u> </u>	ĭ	Po	Re	S	So	Sp	S	Sy	Sp	N	۱II	D	ווור	Čs	Ž	& S
Rest rooms (intercity train)																					В				
Dining area (intercity train)							ì				ı				r						D		Α		
Food preparation (intercity train)																					Ε		Α	(1)	
Lounge (intercity train)																									
General lighting																					В		Α		
Table games																					D				
Sleeping car																									
General lighting																					Α		Α		
Normal reading																					D				
Prolonged reading													1								Е				
 																									01.00
Road Conveyances																					^		_		Ch. 23
Step well and adjacent ground area																					Α		Α		
Fare box																					В		A		
General lighting																					A A A B		Α		
City/intercity buses at city stop																					Α		A		
Intercity bus at country stop School bus while moving																					A		A		
School bus while moving School bus at stops																					D		A		+
Advertising cards																					ט		D		1
Back-lighted advertising cards																							ט		1
(see Rail Conveyances)																									
Reading (at seat)																					D				1
Emergency exit (school bus)																					A				1
Linergency exit (scribbi bus)																					$\overline{}$				



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Olein a														Oh 00
Ships										-				Ch. 23
Living areas										-				
Staterooms and cabins											_			
General lighting											В	Α		
Reading and writing														
(see Reading in Section I, Interior)														
Prolonged seeing														
(see Reading in Section I, Interior)														
Baths (general lighting)											В			
Mirrors (personal grooming)											D	В		
Barber shop/salon														
General											D	В		
On subject											Е	С		
Day rooms														
General lighting											В	Α		
At desks (see Reading in Section I, Interior)														
Dining rooms and messrooms														
Fine dining									(1)		В	Α		
Coffee shop, cafeteria									(1) (1) (1)		D	С		
Snack, fast food									(1)		Ε	С		
Enclosed promenades														
Night			,								Α	Α		
Day											В	Α		
Entrances/passageways														
Night							,				Α	Α		
Day											В	Α		
Daytime embarkation											D	В		
Gymnasiums														
Exercise, recreation											D	В		
Hospitals														Ch. 16
see Health Care Facilities in Section I, Interior)														
Dispensary (general lighting)											D	В		
Doctor's office								-			D	В		
Operating room														
General lighting											F	D		
Operating table											G	F	(2, 3)	
Wards											J	_	\ <u>-</u> , \(\sigma\)	
General lighting							\vdash				В	Α		
Critical examination											E	C		
Reading areas	1							-			D	Α		
Toilets	1										В	Α		

												- 9												
V. TRANSPORTATION ^(a)		Ve	ery Ir	mpor	tan	t		Imp	oorta	ınt			So	mev	wha	t im	oorta	ant		Bla	ınk =	No	t important or	not applicable
LOCATIONS AND TASKS		,	,																					
Design Issues		nce (an	Daylighting Integration and Control	Direct Glare	Flicker (and Strobe)	ight Distribution on Surfaces	ight Distribution on Task Plane (Uniformity)	uminances of Room Surfaces	Modeling of Faces or Objects	Point(s) of Interest	Reflected Glare	Shadows	Source/Task/Eye Geometry	Sparkle/Desirable Reflected Highlights	Surface Characteristics	System Control and Flexibility	Special Considerations	Notes on Special Considerations	lluminance (Horizontal)	Category or Value (lux) ^(b)	Illuminance (Vertical)	Category or Value (lux) ^(b)	Notes on Illuminance — see end of section	Reference Chapter(s)
Recreation areas			_		_	_	_	_	_		_	0)	0)	0)	0)	0)	0)	_		$\overline{}$	_		_	ш.
Ballrooms																				В		Α		
Cocktail lounges																				В	-	Α		
Swimming pools																						-		Ch. 20
General																				В		Α		011. 20
Underwater	1								_												-	- 1	(4)	
Theatre or Auditorium																							(- /	Ch. 15
(see Theater and Motion Picture House,																								011. 10
in Section I, Interior)																								
Navigating areas										-														
Chart room										-														
General	1																			В		Α		
On chart table										1										D		В		
Gyro room	1																			В		_		
Radar room	1																			В				
Radio room	1																							
Operating areas	1																			Ε		С		
Passenger foyer																				D				
Ship's offices																								
General lighting/lobby areas		1																		В				
Clerical tasks									_											Е		Α		
Wheelhouse, pilothouse, bridge																								
Day, in-port during maintenance	1																			В		Α		
Night when underway	1																						(5)	

Issee Food Service Facilities in Section I, Interior)	Φ		0.	4/~	9	g D	coigii	Care				
See Food Service Facilities in Section I, Interior) Ch. 1	Service areas											
Ch. 1 Ch.	Food preparation											Ch. 13
(see Food Service Facilities in Section I, Interior)	(see Food Service Facilities in Section I, Interior)											
Food Service Facilities in Section I, Interior) Laundries D A A	Sculleries											Ch. 13
(see Food Service Facilities in Section I, Interior)	(see Food Service Facilities in Section I, Interior)											
Laundries	Food storage											Ch. 13
General	(see Food Service Facilities in Section I, Interior)											
Machine and press finish, sorting	Laundries											
Lockers B A Offices D A General D A Reading (see Reading in Section I, Interior) D B Passenger/service counter D B Storerooms A A Telephone exchange E C Operating areas B A Access and casing B A Battery room B B A Boiler rooms B A B Cargo handling (weather deck) B A B Control stations (except B A A navigating areas) B A B General D B B Control stations (except D B B navigating areas) D B C General D B C Control consoles D B C Gauge and control boards D B B </td <td>General</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Α</td> <td></td>	General										Α	
Lockers B A Offices D A General D A Reading (see Reading in Section I, Interior) D B Passenger/service counter D B Storerooms A A Telephone exchange E C Operating areas B A Access and casing B A Battery room B B A Boiler rooms B A B Cargo handling (weather deck) B A B Control stations (except B A A navigating areas) B A B General D B B Control stations (except D B B navigating areas) D B C General D B C Control consoles D B C Gauge and control boards D B B </td <td>Machine and press finish, sorting</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Ε</td> <td>С</td> <td></td>	Machine and press finish, sorting									Ε	С	
Offices DAA General DAA Reading (see Reading in Section I, Interior) DBB Passenger/service counter DBB Storerooms AAAA Telephone exchange ECC Operating areas AAAA Access and casing BAAA Battery room BAAA Boiler rooms BAAA Cargo handling (weather deck) BAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA												
General D	Lockers									В	Α	
Reading (see Reading in Section I, Interior) D B Passenger/service counter D B Storerooms A A Telephone exchange E C Operating areas B A Access and casing B A Battery room B B A Boiler rooms B A B A Cargo handling (weather deck) B A A A Control stations (except B A A A A A A A A A A A A B A B A A A B A A A B A A B A B A B A B A B B </td <td>Offices</td> <td></td>	Offices											
Passenger/service counter							· ·			D	Α	
Passenger/service counter	Reading (see Reading in Section I, Interior)											
Telephone exchange	Passenger/service counter			·						D	В	
Telephone exchange Operating areas Operating a	Storerooms									Α	Α	
Access and casing Battery room Boiler rooms Cargo handling (weather deck) Control stations (except navigating areas) General Control consoles Gauge and control boards Switchboards Engine rooms Generator/switchboard rooms Fan rooms (ventilation and air conditioning) Motor generator rooms (cargo handling) Pump room Shaft alley Shaft alley Shaft alley Steering gear room B A A B A A B B A A B B A A B B A A B B A A B B A A B B A A B B A A B B A A B B A A B B A A B B B A B B B B	Telephone exchange									Ε	С	
Battery room Boiler rooms Boil	Operating areas											
Boiler rooms	Access and casing										Α	
Cargo handling (weather deck) B A Control stations (except D B navigating areas) D B General D B Control consoles E C Gauge and control boards D B Switchboards D B Engine rooms D B Generator/switchboard rooms D B Fan rooms D B (ventilation and air conditioning) B A Motor generator rooms D B (cargo handling) B A Pump room D B Shaft alley B A Shaft alley escape A A Steering gear room D B	Battery room										Α	
Control stations (except	Boiler rooms									В	Α	
navigating areas) General Control consoles Gauge and control boards Switchboards Engine rooms Generator/switchboard rooms Fan rooms (ventilation and air conditioning) Motor generator rooms (cargo handling) Pump room Shaft alley Shaft alley escape Steering gear room D B B C C C C B B C C B B C C B B C C B B C C B B C C B B C C B B C C B B C C B B C C B B C C B B C C B B C C B B C C B B C C D B B A C C D B B A A A A A Steering gear room	Cargo handling (weather deck)									В	Α	
Control consoles	Control stations (except											
Control consoles Gauge and control boards Switchboards Engine rooms Engine rooms Generator/switchboard rooms Fan rooms (ventilation and air conditioning) Motor rooms Motor generator rooms (cargo handling) Pump room Shaft alley Shaft alley escape Steering gear room E C C B B C C B C C B B C C	navigating areas)											
Gauge and control boards Switchboards Engine rooms Generator/switchboard rooms Fan rooms (ventilation and air conditioning) Motor rooms Gauge and control boards D B B Control boards D Control boards	General										В	
Switchboards Engine rooms Generator/switchboard rooms Fan rooms (ventilation and air conditioning) Motor rooms Cargo handling) Pump room Shaft alley Shaft alley escape Steering gear room D B D B D B A A Steering gear room	Control consoles										С	
Engine rooms Generator/switchboard rooms Fan rooms (ventilation and air conditioning) Motor rooms D B A B A Cargo handling) Pump room Shaft alley Shaft alley escape Steering gear room D B Cargo handling D B A Cargo handling D B Cargo handling D												
Generator/switchboard rooms Fan rooms (ventilation and air conditioning) Motor rooms Motor generator rooms (cargo handling) Pump room Shaft alley Shaft alley escape Steering gear room D B A D B A A A Steering gear room	Switchboards											
Fan rooms (ventilation and air conditioning) Motor rooms D B Motor generator rooms (cargo handling) Pump room Shaft alley Shaft alley escape Steering gear room D B A A Steering gear room												
(ventilation and air conditioning) Motor rooms Motor generator rooms (cargo handling) Pump room Shaft alley Steering gear room B A A A B A A B B A B B A B B B B B B A B	Generator/switchboard rooms									D	В	
Motor rooms D B Motor generator rooms D B (cargo handling) D B A Pump room D B A Shaft alley B A A Shaft alley escape A A A Steering gear room D B B	Fan rooms											
Motor generator rooms	(ventilation and air conditioning)										Α	
(cargo handling) B A B A B B A B B B B B B B B A B A A B A A A A A A A B B A A A A A B B A A A A A B B A A A A B B A A A A A B A A A A A A A B A A A A A A B A A A A A A B A A A B A A A B A A A B A A B A A A B A A B A A A B A A												
(cargo handling) B A B A B A B B A B B B A B B A B A A A A A A A A A B B A A A A A B B A A A A A B B A A A A B B A A A A A B B A A A A A A A B A A A A B A A A A B A A A B A A A B A A B A A A B A A B A A B A A B A A B A A B A A	Motor generator rooms											
Pump room Shaft alley Shaft alley escape Steering gear room D B A A A D B B A D B B A D B B A D B B B A D B B B A D B B B B											Α	
Shaft alley Shaft alley escape Steering gear room B A A B B A A B B B A B B B B B B B B B										D	В	
Shaft alley escape Steering gear room A A A D B										В	Α	
Steering gear room D B										Α		
										D	В	
windiass rooms	Windlass rooms									В	Α	

V. TRANSPORTATION ^(a)		Ve	ery li	mpo	rtar	nt		lm	porta	ant			So	me	wha	t im	oort	ant		Bla	ınk =	No	t important or	not applicable
Design Issues	Appearance of Space and Luminaires	Color Appearance (and Color Contrast)	Daylighting Integration and Control	Direct Glare	Flicker (and Strobe)	ight Distribution on Surfaces	Light Distribution on Task Plane (Uniformity)	uminances of Room Surfaces	Modeling of Faces or Objects	Point(s) of Interest	Reflected Glare	Shadows	Source/Task/Eye Geometry	Sparkle/Desirable Reflected Highlights	Surface Characteristics	System Control and Flexibility	Special Considerations	Notes on Special Considerations	Illuminance (Horizontal)	Category or Value (lux) ^(b)	Illuminance (Vertical)	Category or Value (lux) ^(b)	Notes on Illuminance — see end of section	Reference Chapter(s)
	Ap	ပိ	Da	۵	Ë	Lig	Lig	Lur	Š	Po	Re	Sh	So	Sp	Sul	Sys	Sp	O N	III	Са	≘	Ca	Ö Z	Re
Workshops																								
(see Machining in Section II, Industrial)																				_		_		
General																		(0)		D	_	В		
On bench top																		(6)		Ε		С		
Machine shop																		(6)		G		Ε		
Cargo holds																								
Safety									_											Α		Α		
During cargo handling									_											D		В		
Passageways and trunks																				Α		Α		
Transportation Terminals																								Ch. 23
Waiting room and lounge												_								В		Α		
Ticket counters																				Е		D		
Baggage checking																				D		В		
Rest rooms																				В		D		
Concourse																				Α		Α		
Boarding area																				В		В		
Notes:																								
(a) Danism in our and list of the					- 1						.	L.	_			1 8 4	4	-1-						
(a) Design issues are listed for room or space. Re			ecfi	c ta	SK L	ınde	er R	ead	ıng c	or G	rap	nıc	Des	sign	and	ı Ma	teria	als,						
for example, for task design issues and illumina								٠.																
(b) Low illuminances (less than 30 lux) are given in	ı lux	; va	iues	gre	ate	tha	an 3	u lu	x are	e gi	ven	ın l	ette	r ca	teg	ories	5 .							

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(1) Consider use of heat lamps to keep foods hot.	
(2) Higher levels of surgical task lighting may be required for special procedures	
(3) Potential for heat build-up due to high illuminance levels; consider special opt	tics for heat mitigation.
(4) Outdoor pools: 600 lamp lm/m ² (60 lamp lm/ft ²); indoor pools: 1000 lamp lm/m ²	² (100 lamp lm/ft ²)
(5) At night the wheelhouse must be kept as dark as possible to permit visibility	
of objects on the water, hazards to navigation, and navigational lights.	
(6) Potential for degradation with selected materials (plastics or adhesives).	



W SUSPENDING CASETY AND OSCUPITY	1		.,						-		_						, 1	- 1	Б.		N	
VI. EMERGENCY, SAFETY, AND SECURITY			Very Important Important Somewhat important Blar											ank = Not important or not applicable								
						\sim										ī		1			ı	1
	Design Issues	Appearance of Space and Luminaires	Color Appearance (and Color Contrast) Direct Glare	Flicker	Light Distribution on Surfaces	Light Distribution on Task Plane (Uniformity	Light Pollution/Trespass	Luminances of Room Surfaces	Modeling of Faces or Objects	Peripheral Detection	Reflected Glare	Shadows	Source/Task/Eye Geometry	Surface Characteristics	Special Considerations	Notes on Special Considerations	Illuminance (Horizontal)	Category or Value (lux) ^(a)	Illuminance (Vertical)	Category or Value (lux) ^(a)	Notes on Illuminance	Reference chapter(s)
Emergency Lighting													,	-				Ť	_			 Ch. 29
Egress path																		10			(1, 2)	
Areas adj. to egress path																		0.5			(2)	
Stairwells																					(2)	
Exterior path of egress																		10			(1, 2)	
Safety																					(2)	Ch. 29
Security, Buildings and Grounds																						Ch. 29
CCTV Surveillance																					(3)	
Perimeter Fences for Correctional Facilities																				10	(3, 4)	
Protection of People																					(3)	
Residential security																					(3)	
Security of property																					(3)	
Notes:																						
(a) Low illuminances (less than 30 lux) are given i	n lux;	valu	es gre	eate	tha	n 30) lu	x are	e giv	en i	n le	tter	cate	gori	es.							
(1) 10 lx along center of egress path, 1 lx along 1-	m har	nd ce	entere	d or	ear	229	nat	th														
(2) Minimum illuminance for safety are listed in Ch									Seci	ıritv												
(3) Illuminances for security are listed in Chapter 2										-,												
(4) Two levels of vertical illuminance are required.										ne f	or f	ull-a	lert	ope	ratio	n (5	50 lx)				
				ľ			`									,						