

LIGHTING ZONE DESCRIPTION	ASPHRAE TABLE 9.4.3.A EXTERIOR LIGHTING ZONES
0 UNDEVELOPED AREAS WITHIN PARKS, FOREST LAND, RURAL AREAS AND UNDEVELOPED AREAS AS DEFINED BY THE AUTHORITY HAVING JURISDICTION.	
1 DEVELOPED AREAS OF NATIONAL PARKS, FOREST LAND, AND RURAL AREAS.	
2 AREA PREDOMINANTLY CONSISTING OF RESIDENTIAL ZONING, NEIGHBORHOOD BUSINESS DISTRICTS, LIGHT INDUSTRIAL WITH LIMITED NIGHTTIME AND RESIDENTIAL MIXED USE AREAS AND ALL OTHER AREAS	
3 ALL OTHER AREAS	
4 HIGH ACTIVITY COMMERCIAL DISTRICTS IN MAJOR METROPOLITAN AREAS AS DESIGNATED BY LOCAL JURISDICTIONS.	

ASPHRAE TABLE 9.4.3.B INDIVIDUAL LIGHTING POWER ALLOWANCES FOR BUILDING EXTERIORS	
BASE SITE ALLOWANCE	UNDEVELOPED PARKING AREA
ZONE 0	ZONE 1
500W	500W
600W	750W
1300W	
	ZONE 2
	0.04W/ft ²
	0.06W/ft ²
	0.10W/ft ²
	0.13W/ft ²
	ZONE 3
	0.8ft
	1.0ft
	1.1ft
	1.2ft
	1.3ft
	1.4ft
	1.5ft
	1.6ft
	1.7ft
	1.8ft
	1.9ft
	2.0ft
	2.1ft
	2.2ft
	2.3ft
	2.4ft
	2.5ft
	2.6ft
	2.7ft
	2.8ft
	2.9ft
	3.0ft
	3.1ft
	3.2ft
	3.3ft
	3.4ft
	3.5ft
	3.6ft
	3.7ft
	3.8ft
	3.9ft
	4.0ft
	4.1ft
	4.2ft
	4.3ft
	4.4ft
	4.5ft
	4.6ft
	4.7ft
	4.8ft
	4.9ft
	5.0ft
	5.1ft
	5.2ft
	5.3ft
	5.4ft
	5.5ft
	5.6ft
	5.7ft
	5.8ft
	5.9ft
	6.0ft
	6.1ft
	6.2ft
	6.3ft
	6.4ft
	6.5ft
	6.6ft
	6.7ft
	6.8ft
	6.9ft
	7.0ft
	7.1ft
	7.2ft
	7.3ft
	7.4ft
	7.5ft
	7.6ft
	7.7ft
	7.8ft
	7.9ft
	8.0ft
	8.1ft
	8.2ft
	8.3ft
	8.4ft
	8.5ft
	8.6ft
	8.7ft
	8.8ft
	8.9ft
	9.0ft
	9.1ft
	9.2ft
	9.3ft
	9.4ft
	9.5ft
	9.6ft
	9.7ft
	9.8ft
	9.9ft
	10.0ft

ASPHRAE 8.4.2 AUTOMATIC RECEPTACLE CONTROL. AT LEAST 50% OF ALL 125 VOLT 15- AND 20- AMP RECEPTACLES, INCLUDING THOSE INSTALLED IN MODULAR PARTITIONS, INSTALLED IN THE FOLLOWING SPACE TYPES:

- PRIVATE OFFICES
- OPEN OFFICES
- COMPUTER CLASSROOMS

SHALL BE CONTROLLED BY AN AUTOMATIC CONTROL DEVICE THAT SHALL FUNCTION ON:

- A SCHEDULED BASIS USING A TIME OF DAY OPERATED CONTROL DEVICE THAT TURNS RECEPTACLES OFF AT A SPECIFIC PROGRAMMED TIME-IN AN INDEPENDENT PROGRAM SCHEDULE SHALL BE PROVIDED FOR AREAS NO MORE THAN 25,000ft² BUT NOT MORE THAN ONE FLOOR, OR AN OCCUPANT SENSOR THAT SHALL TURN RECEPTACLES OFF WITHIN 30 MINUTES OF ALL OCCUPANTS LEAVING A SPACE, OR
- A SIGNAL FROM ANOTHER CONTROL OR ALARM SYSTEM THAT INDICATES THE AREA IS UNOCCUPIED.

ASPHRAE TABLE 9.5.1 LIGHTING POWER DENSITIES USING THE BUILDING AREA METHOD			
BUILDING AREA TYPE	1*	LPD (W/FT ²)	2*
AUTOMOTIVE FACILITY	0.82	9	
CONVENTION CENTER	1.06	1.2	
COURTHOUSE	1.05	1.2	
DINING: BAR LOUNGE LEISURE	0.99	1.3	
DINING: CAFETERIA FAST FOOD	0.90	1.4	
DINING: FAMILY	0.89	1.6	
DORMITORY	0.61	1.0	
EXERCISE CENTER	0.88	1.0	
FIRE STATION	0.71	0.8	
GYMNASIUM	1.00	1.1	
HEALTH CARE CLINIC	0.87	1.0	
HOSPITAL	1.21	1.2	
HOTEL	1.00	1.0	
LIBRARY	1.18	1.3	
MANUFACTURING FACILITY	1.11	1.3	
MOUSEUM	0.88	1.0	
MOTION PICTURE THEATER	0.83	1.2	
MULTIFAMILY	0.60	0.7	
MUSEUM	1.06	1.1	
OFFICE	0.90	0.8	
PARKING GARAGE	0.25	0.3	
PENITENTIARY	0.97	1.0	
PERFORMING ARTS BUILDING	1.39	1.6	
POLICE STATION	0.96	1.0	
POST OFFICE	0.87	1.1	
RELIGIOUS BUILDING	1.05	1.3	
RETAIL	1.40	1.4	
SCHOOL/UNIVERSITY	0.99	1.2	
SPORTS ARENA	0.78	1.1	
TOWN HALL	0.92	1.1	
TRANSPORTATION	0.77	1.0	
WAREHOUSE	0.66	0.6	
WORKSHOP	1.20	1.4	

* - FROM ASPHRAE TABLE 9.5.1 & 2012 IECC TABLE C406.3 REDUCED INTERIOR LIGHTING POWER.
 2* - FROM 2012 IECC TABLE 405.5.2(1) INTERIOR LIGHTING, POWER ALLOWANCES: BUILDING AREA METHOD.

ASPHRAE LIGHTING DESIGN GUIDE (OUTDOOR)	
LOCATIONS AND TASKS	ILLUMINANCE* (LPD)** (W/FT ²)
BUILDING	GENERAL B/A
	INACTIVE ENTRANCES A/A
	GARDENS A-C/A
	B/A
HOSPITALITY	PLATFORM C/A
LOADING	B/A
PLAZAS	C/A
RETAIL SPACE	FAST FOOD C/A
	MALL A/A

REFER TO IECC TABLES FOR SPECIFIC SPACE REQUIREMENTS.
 * - HORIZONTAL/VERTICAL ILLUMINANCE (ILLUMINATING ENGINEERING SOCIETY OF NORTH AMERICA (IES) NINTH EDITION)
 ** - ASPHRAE 90.1 2010 LPD RECOMMENDATIONS

ACCESSIBILITY LIGHTING LEVELS	ILLUMINANCE (fc)
APPLICATION	ILLUX
AMBIENT LIGHTING	5 TO 30
TEXT PANELS	100 TO 300
CONTROLS	10 TO 30
DIRECTIONAL SIGNAGE	200 TO 300
RAMPS, STAIRS	100 TO 300
VISITOR PATHWAYS	100 TO 300

RECOMMENDED MAINTAINED ILLUMINANCE VALUES FOR:
 THEATRE, FIGURE 15-2
 PHOTOGRAPHY, FIGURE 15-7
 CAR DEALERSHIP, FIGURE 17-18
 SERVICE STATION, FIGURE 17-20
 MALLS, FIGURE 17-21
 RESIDENTIAL, FIGURE 18-2
 SPORTS LIGHTING, FIGURE 18-2
 FLOODLIGHTING & MONUMENTS, FIGURE 21-12

ASPHRAE LIGHTING DESIGN GUIDE	
LOCATIONS AND TASKS	ILLUMINANCE* (W/FT ²)
AUDITORIUMS	ASSSEMBLY C/-
BANK	SOBRIETY C/A
COURT ROOM	SEATING C/A
JUDGE/CLERK	E/C
PODIUM	E/C
EDUCATIONAL	BASKETBALL F/D
	CORRIDOR -/C
	GENERAL CLASS (OFF) E/-
	SCIENCE LAB E/D
EXHIBITION HALL	C/A
FOOD SERVICE	DINING C/A
GRAPHIC DESIGN	KITCHEN E/A
HEALTH CARE	COLOR F/D
NURSING	EXAM F/D
OPERATING	E/A
CRITICAL CARE GENERAL	B/A
CRITICAL CARE EXAM	E/C
RECOVERY	C/A
PATIENT ROOM	B/A
WAITING ROOM	C/A
INDUSTRIAL	COURSE C**
	MEDIUM F**
	FINE F**
	VERY FINE F**
LIBRARY	STACKS D/-
MERCHANDISING	RETAIL F/D
OFFICE	PRIVATE D-E/B
OPEN	E/B
READING DATA PROCESSING	A/A
HANDWRITTEN	D-F/
SERVICE SPACE	PRINTED D-E/
TOILET	ALL E/C
SUPERMARKET	ALL B/A

REFER TO IECC TABLES FOR SPECIFIC SPACE REQUIREMENTS.
 * - HORIZONTAL/VERTICAL ILLUMINANCE (ILLUMINATING ENGINEERING SOCIETY OF NORTH AMERICA (IES) NINTH EDITION)
 ** - ASPHRAE 90.1 2010 LPD RECOMMENDATIONS, TABLE 9.6.1.
 # - NUMEROUS SPECIFIC CATEGORIES, SEE IES BOOK.

INDEX OF 9TH EDITION IESNA
 13 - Hospitality Facilities and Entertainment Lighting
 14 - Lighting for Public Places and Institutions
 01 - Light and Optics
 02 - Measurement of Light and Other Radiant Energy
 03 - Vision and Perception
 04 - Color
 05 - Nonvisual Effects of Optical Radiation
 PART 2 LIGHTING ENGINEERING
 01 - Light Sources
 02 - Daylighting
 08 - Lighting Calculations
 09 - Lighting Calculations

RECOMMENDED MAINTAINED ILLUMINANCE FOR PARKING LOTS & GARAGES	SECURITY (fc)
LOT	SECURITY (fc)
	ENHANCED 0.5
	UNIFORMITY, MAX TO MIN 20:1
	MINIMUM VERTICAL 0.1
	MIN HORIZONTAL (fc) MIN VERTICAL
	BASIC 1.0
	RAMPS DAY 2.0
	NIGHT 1.0
	ENTRANCE AREAS DAY 50
	NIGHT 1.0
	STAIRWAYS 2.0

FIGURE 10-9
 IES NINTH EDITION, ILLUMINANCE RECOMMENDATIONS
 CATEGORY ACTIVITY
 A PUBLIC SPACES 3fc
 B SIMPLE ORIENTATION FOR SHORT VISITS 5fc
 C WORKING SPACES WHERE SIMPLE VISUAL TASKS ARE PERFORMED 10fc
 COMMON VISUAL TASKS
 D PERFORMANCE OF VISUAL TASKS OF HIGH CONTRAST AND LARGE SIZE 30fc
 E PERFORMANCE OF VISUAL TASKS OF HIGH CONTRAST AND SMALL SIZE OR VISUAL TASKS OF LOW CONTRAST AND LARGE SIZE 50fc
 F PERFORMANCE OF VISUAL TASKS OF LOW CONTRAST AND SMALL SIZE 100fc
 SPECIAL VISUAL TASKS
 G PERFORMANCE OF VISUAL TASKS NEAR THRESHOLD 300 TO 1000fc

RECOMMENDED AVERAGE ILLUMINANCES FOR SECURITY LIGHTING APPLICATION	ILLUMINANCE (fc) NOTES
LARGE OPEN AREA	0.5 TO 2.0 THE GREATER THE BRIGHTNESS OF THE SURROUNDING AREA, THE HIGHER THE ILLUMINANCE REQUIRED TO BALANCE THE BRIGHTNESSES IN THE SPACES.
BUILDINGS	0.5 TO 2.0 THE GREATER THE BRIGHTNESS OF THE BUILDING FACADE, THE HIGHER THE ILLUMINANCE REQUIRED TO BALANCE THE BRIGHTNESSES IN THE SPACE.
PERIMETER FENCE	0.5 ILLUMINANCE ON THE GROUND ON EITHER SIDE OF THE FENCE.
ENTRANCE GATEHOUSES	10 ILLUMINANCE ON THE WORKPLANE IN THE GATEHOUSE. THIS LIGHTING MUST BE DIMMABLE TO LOW LEVELS AT NIGHT SO THE GUARD CAN SEE OUTSIDE THE GATEHOUSE.

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 DEVELOPED AREAS OF NATIONAL PARKS, FOREST LAND, AND RURAL AREAS.
 AREA PREDOMINANTLY CONSISTING OF RESIDENTIAL ZONING, NEIGHBORHOOD BUSINESS DISTRICTS, LIGHT INDUSTRIAL WITH LIMITED NIGHTTIME AND RESIDENTIAL MIXED USE AREAS AND ALL OTHER AREAS
 4 HIGH ACTIVITY COMMERCIAL DISTRICTS IN MAJOR METROPOLITAN AREAS AS DESIGNATED BY LOCAL JURISDICTIONS.

ASPHRAE TABLE 9.4.3.B INDIVIDUAL LIGHTING POWER ALLOWANCES FOR BUILDING EXTERIORS
 BASE SITE ALLOWANCE
 UNDEVELOPED PARKING AREA
 PARKING AREA & DRIVES
 BUILDING GROUNDS
 WALKWAYS > THAN 10'
 WALKWAYS > THAN 10'
 PLAZA AREAS
 SPECIAL FEATURE
 STAIRWAYS
 PEDESTRIAN TUNNELS
 LANDSCAPING
 BUILDING ENTRANCES AND EXITS
 MAIN ENTRIES
 OTHER DOORS
 ENTRY CANOPIES
 SALES CANOPIES
 FREE STANDING
 NON TRADEABLE SURFACES
 BUILDING FACADES
 ENTRANCES & INSPECTION
 LOADING AREAS
 PARKING NEAR 24 HOUR RETAIL

DESIGNERS GUIDE
 TRADABLE = IF THERE ARE WATS LEFT OVER FROM CALCULATIONS, THEY MAY BE USED SOMEWHERE ELSE.
 NONTRADABLE = IF THERE ARE WATS LEFT OVER FROM CALCULATIONS, THEY MAY NOT BE USED ANYWHERE ELSE.
 - = NO ALLOWANCE.
 W/ft² = WATS/ft²

COMMON SPACE TYPE	LPD	RCR	THRESHOLD	BUILDING SPECIFIC SPACE TYPES	LPD	RCR	THRESHOLD
ATRIUM	FIRST 40' IN HEIGHT 0.03*	NA	WIDTH<3'	HOSPITAL	0.89	4	WIDTH<3'
AUDIENCE/SEATING AREA	HEIGHT ABOVE 40' 0.02*	NA	6	CORRIDOR/TRANSITION	2.26	6	6
AUDITORIUM	0.79	6	8	EMERGENCY	1.66	4	8
FOR PERFORMING ARTS THEATER	1.14	4	6	EXAM/TREATMENT	0.60	4	6
FOR MOTION PICTURE THEATER	1.24	4	6	LAUNDRY/WASHING	1.07	6	6
CLASSROOM/LECTURE/MULTIPURPOSE	1.23	6	6	LOUNGE/RECREATION	1.27	6	6
CONFERENCE/MEETING/MULTIPURPOSE	0.65	4	4	MEDICAL SUPPLY	0.88	6	6
CORRIDOR/TRANSITION	0.65	4	4	NURSERY	0.87	6	6
DINING AREA	1.31	4	4	NURSE STATION	0.89	6	6
BAR/LOUNGE/LEISURE	0.89	4	4	OPERATING ROOM	0.82	6	6
FOR FAMILY DINING	0.40	6	6	PATIENT ROOM	0.82	6	6
(PERFORMING ARTS)	0.95	6	6	PHARMACY	0.91	6	6
DRESSING/FITTING (PERFORMING ARTS)	0.95	6	6	PHYSICAL THERAPY	1.15	6	6
ELECTRICAL/MECHANICAL	1.28	6	6	RADIOLOGY/IMAGING	0.82	6	6
FOOD PREPARATION	1.81	6	6	RECOVERY	1.11	6	6
LABORATORY	0.90	4	4	DINING AREA	1.06	4	4
MEDICAL/INDUSTRIAL/RESEARCH	2.00	6	6	GUEST ROOM	0.88	4	4
LOBBY	0.52	4	4	LOBBY	0.72	4	4
ELEVATOR	0.75	4	4	HIGHWAY LODGING DINING	0.75	4	4
PERFORMING ARTS THEATER	0.52	4	4	HIGHWAY LODGING GUEST ROOM	0.72	4	4
MOTION PICTURE THEATER	0.75	4	4	CARD FILE & CATALOGING	0.72	4	4
LOCKER ROOM	0.73	4	4	READING AREA	0.93	4	4
LOUNGE RECREATION	1.11	4	4	STACKS	1.71	4	4
OFFICE	0.98	4	4	CORRIDOR/TRANSITION	1.29	4	4
ENCLOSED	1.68	6	6	DETAILED MANUFACTURING	0.95	6	6
OPEN PLAN	0.69	10	10	EQUIPMENT ROOM	1.05	4	4
(FOR ACCENT LIGHTING SEE 9.6.2(b))	0.63	6	6	EXTRA HIGH BAY (>50')*	1.05	4	4
RESTROOMS	1.59	6	6	HIGH BAY (25'-50')**	1.23	4	4
SALES AREA	0.63	6	6	LOW BAY (<25')**	1.19	4	4
STAIRWAY	0.63	6	6	GENERAL EXHIBITION	1.05	6	6
STORAGE	0.63	6	6	MUSEUM	1.05	6	6
WORKSHOP	0.63	6	6	MUSEUM	1.05	6	6

ASPHRAE TABLE 9.6.1 LIGHTING POWER DENSITIES USING THE SPACE BY SPACE METHOD
 BUILDING SPECIFIC SPACE TYPES
 SERVICE/REPAIR 0.67
 BANKING ACTIVITY AREA 0.82
 AUDIENCE SEATING 0.82
 EXHIBIT SPACE 1.45
 CONFINEMENT CELLS 1.72
 JUDGES CHAMBERS 1.10
 AUDIENCE SEATING 0.43
 PENITENTIARY CLASSROOM 1.34
 PENITENTIARY DINING 1.07
 LIVING QUARTERS 0.38
 ENGINE ROOM 0.56
 SLEEPING QUARTERS 0.25
 FITNESS AREA 0.72
 AUDIENCE SEATING AREA 0.43
 PLAYING AREA 1.20