

ILLUMINATION RECOMMENDATIONS—OUTDOOR

These recommendations for outdoor lighting are for average maintained (mean) illuminance at grade except in the case of roadways where they are average for the end of the lamp life. Except where specifically indicated, the layout and coverage arrangements and footcandle/uniformity graphs on subsequent pages are configured so that reasonable uniformity is obtained with commonly available wide distribution lighting equipment such as a NEMA 5X5 (or wider) floodlight and ANSI Type II, III, IV, and V roadway distributions. The illuminance recommendations herein are extractions from *IESNA LIGHTING HANDBOOK*.

GENERAL APPLICATION	AVERAGE MAINTAINED FOOTCANDLES	
AIRPORTS		
Hanger aprons to approximately 50 feet (15M) out	1.0	
Service aprons to approximately 200 feet (61M)	2.0	
Center of aircraft service (vertical)	5.0	
BUILDING EXTERIOR-SITE AREAS ADJACENT TO		
Active entrances-pedestrian or vehicle	5.0	
Inactive entrances-normally locked	1.0	
Vital locations or structures (security)	5.0	
Building surroundings	1.0	
BUILDING FLOODLIGHTING	BRIGHT	DARK
Light Surrounding Surface	5	2
Medium Gray Surrounding Surface	7	3
Medium Dark Surrounding Surface	7	4
Dark Surrounding Surface	10	5
CENTRAL STATIONS-ELECTRIC UTILITY		
Barge unloading, car dumping	5.0	
Conveyors	2.0	
Storage tanks	1.0	
Storage piles-coal, ash	0.2	
Substation general lighting	2.0	
FLOODLIGHTED SIGNS		
Bright surroundings, light surfaces	50	
Bright surroundings, dark surfaces	100	
Dark surroundings, light surfaces	20	
Dark surroundings, dark surfaces	50	
PARKING AREAS		
High activity	5.0	
Medium activity	3.0	
Low activity	1.0	
QUARRIES AND OPEN MINES		
Men and machines	5.0	
ROADWAYS-NON-DEDICATED AND PRIVATE		
High activity	2.0	
Medium activity	1.0	
Low activity	0.5	
SHIPPING-PIERS		
Freight	20.0	
Passengers	20.0	
Surrounding active areas	5.0	
YARDS		
General	5.0	
Prison-general lighting	5.0	
Railroad-general lighting bare yard	1.0	
Storage-inactive	1.0	
Storage-active	20.0	

GENERAL APPLICATION			
ROADWAYS—MINIMUM AVERAGE HORIZONTAL FOOTCANDLES			
	Commercial	Intermediate	Residential
Freeway—Major Urban	0.84 (3:1)	0.84 (3:1)	0.84 (3:1)
Freeway—All Other	0.56 (3:1)	0.56 (3:1)	0.56 (3:1)
Divided Highway	1.30 (3:1)	1.12 (3:1)	0.84 (3:1)
Major	1.58 (3:1)	1.21 (3:1)	0.84 (3:1)
Collector	1.12 (4:1)	0.84 (4:1)	0.56 (3:1)
Local	0.84 (6:1)	0.65 (6:1)	0.37 (6:1)

NOTE: Minimum Average FCS refers to average footcandles at end-of-life lamp or group relamping.

ILLUMINANCE METHOD-RECOMMENDED VALUES						
Road and Pedestrian Conflict Area		Pavement Classification (Minimum Maintained Average Values)			Uniformity Ratio E_{min}/E_{max}	Veiling Luminance Ratio L_{max}/L_{min}
Road	Pedestrian Conflict Area	R1 lux/fc	R2 & R3 lux/fc	R4 lux/fc		
Freeway Class A		6.0/0.6	6.0/0.6	8.0/0.8	3.0	0.3
Freeway Class B		4.0/0.4	6.0/0.6	5.0/0.5	3.0	0.3
Expressway	High	10.0/1.0	14.0/1.4	13.0/1.3	3.0	0.3
	Medium	8.0/0.8	12.0/1.2	10.0/1.0	3.0	0.3
	Low	6.0/0.6	9.0/0.9	8.0/0.8	3.0	0.3
Major	High	12.0/1.2	17.0/1.7	15.0/1.5	3.0	0.3
	Medium	9.0/0.9	13.0/1.3	11.0/1.1	3.0	0.3
	Low	6.0/0.6	9.0/0.9	8.0/0.8	3.0	0.3
Collector	High	8.0/0.8	12.0/1.2	10.0/1.0	4.0	0.4
	Medium	6.0/0.6	9.0/0.9	8.0/0.8	4.0	0.4
	Low	4.0/0.4	6.0/0.6	5.0/0.5	4.0	0.4
Local	High	6.0/0.6	9.0/0.9	8.0/0.8	6.0	0.4
	Medium	5.0/0.5	7.0/0.7	6.0/0.6	6.0	0.4
	Low	3.0/0.3	4.0/0.4	4.0/0.4	6.0	0.4

LUMINANCE METHOD-RECOMMENDED VALUES					
Road and Pedestrian Conflict Area		Average Luminance	Uniformity Ratio	Uniformity Ratio	Veiling Luminance Ratio
Road	Pedestrian Conflict Area	L_{avg} (fc)	L_{min}/L_{max} (Minimum 40:1)	L_{min}/L_{max} (Minimum 40:1)	L_{max}/L_{min} (Minimum 40:1)
Freeway Class A		0.6	3.5	6.0	0.3
Freeway Class B		0.4	3.5	6.0	0.3
Expressway	High	1.0	3.0	5.0	0.3
	Medium	0.8	3.0	5.0	0.3
	Low	0.6	3.5	6.0	0.3
Major	High	1.2	3.0	5.0	0.3
	Medium	0.9	3.0	5.0	0.3
	Low	0.6	3.5	6.0	0.3
Collector	High	0.8	3.0	5.0	0.4
	Medium	0.6	3.5	6.0	0.4
	Low	0.4	4.0	8.0	0.4
Local	High	0.6	6.0	10.0	0.4
	Medium	0.5	6.0	10.0	0.4
	Low	0.3	6.0	10.0	0.4