

ZONING

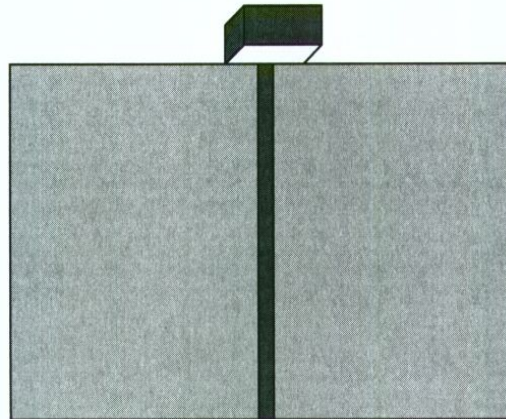
68 Attachment 2

Guidelines for Exterior Lighting [Added 10-13-2010]

Exterior Lighting Fixtures

Figure 1 Fully Shielded Fixtures

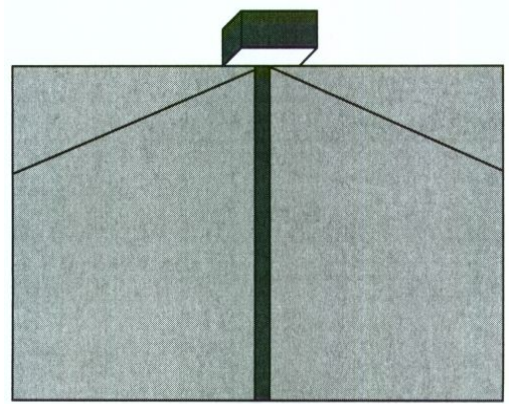
No light emitted below the lowest light-emitting part of the fixture and no restriction as to amount at various angles of the horizontal



Full Cutoff Fixture

Additionally restricts the amount of light emitted in the "glaze zone" (90° to 80° below horizontal) to 10% of the total light output

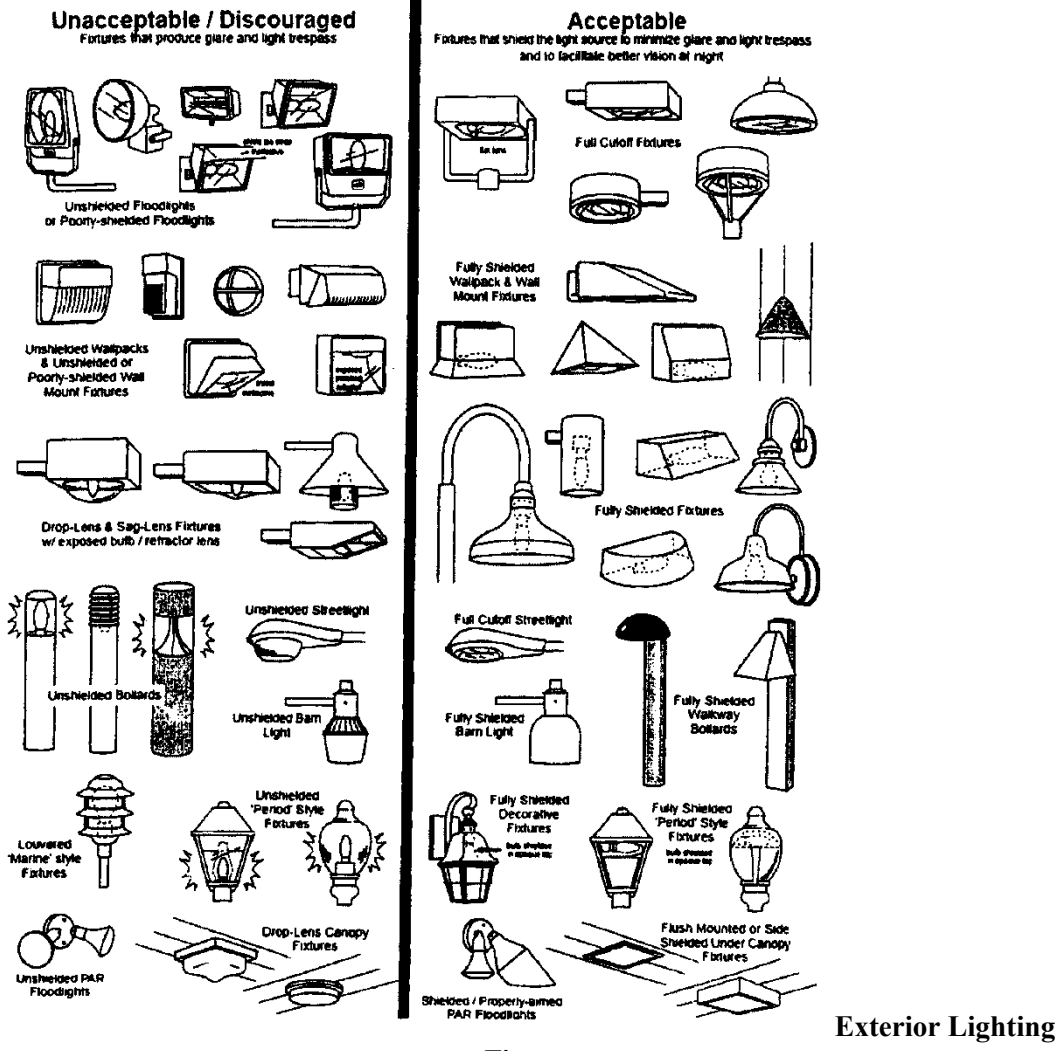
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Exterior Lighting Figures

Figure 2
Examples of Acceptable/Unacceptable Lighting Fixtures

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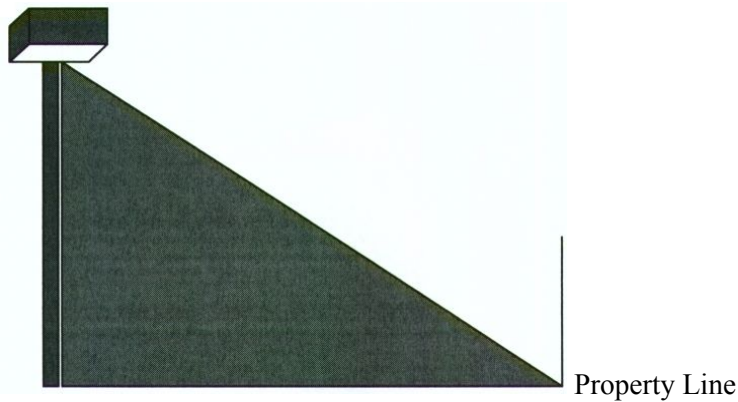
Figures

Figure 3
Calculating Fixture Height In Relation To Distance To Property Line

Without available photometric data to execute a lighting plan, fixture placement setbacks can help to reduce incidence of light trespass and glare across property lines.

Fixture*

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Mounting Height = 1/3 distance to property line plus three feet

A fully shielded or full cutoff fixture will generally contain light to a site to reduce light trespass if this formula is followed:

Divide the distance (D) to the property line by three and add three feet to equal the maximum Mounting Height (MH).

Formula: MH no greater than 1/3 distance to property line plus three feet (the Kennebunkport Formula)

For example:

Maximum Mounting Height	Distance to Property Line
15	36
12	27
9	18
6	9

NOTES:

* Assumes common full cutoff fixture. Asymmetrical “sharp cutoff” full cutoff fixtures that have steeper cutoff angles or shielding at the “house side” may be placed closer to property boundaries, provided their cutoff angles do not result in light trespass and footcandle measurements can be provided on a lighting plan.

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Tables of Limits of Illumination Levels

Table 1
Limits of Light Illumination Target Areas for Parking Lots

Light levels indicated are for active use of the facility during open business hours:

IESNA Document	Illuminance Levels						Uniformity		
	EMIN	EMAX	EAVE	EV-MIN	EV-AVE	ESC-MIN	MAX/MIN	AVE/MIN	MAX/AVE
Lighting for Parking Facilities RP-20-98									
Medium	0.6		2.4				20:1	4:1	
Low	0.2		0.8				20:1	4:1	
High	0.9		3.6				20:1	4:1	

NOTES:

High: large shopping centers over 300,000 square feet of retail space.

Medium: community shopping centers between 5,000 square feet and 299,000 square feet of retail space.

Low: neighborhood shopping retail of less than 5,000 square feet.

After hours, light levels may be cut by 50% or more.

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Tables of Limits of Illumination Levels

Table 2
Limits of Illumination for Target Areas:
Car Dealerships, Sidewalks, Walkways and Gas Stations

	Illuminance Levels						Uniformity		
IESNA Document	EMIN	EMAX	EAVE	EV-MIN	EV-AVE	ESC-MIN	MAX/MIN	AVE/MIN	MAX/AVE
Lighting for Parking Facilities RP-20-98									
Medium	0.6		2.4				20:1	4:1	
Low	0.2		0.8				20:1	4:1	
High	0.9		3.6				20:1	4:1	

	Illuminance Levels						Uniformity		
IESNA Document	EMIN	EMAX	EAVE	EV-MIN	EV-AVE	ESC-MIN	MAX/MIN	AVE/MIN	MAX/AVE
Lighting for Exterior Environments RP-33-99									
Sidewalks (Roadside) and Type A Bikeways	0.6		2.4				20:1	4:1	
Commercial areas			1		2		10:1		
Intermediate areas			0.5		1		10:1		
Residential areas			0.2		0.5		10:1		

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IESNA Document	Illuminance Levels						Uniformity		
	EMIN	EMAX	EAVE	EV-MIN	EV-AVE	ESC-MIN	MAX/MIN	AVE/MIN	MAX/AVE
Walkways Distant from Roadways and Type B Bikeways									
Commercial areas			0.5		0.5		10:1		
Intermediate areas			0.5		1		10:1		
Residential areas			2		0.5		10:1		
Car Dealerships									
Secondary Business Districts									
Adjacent to roadway		5-10					5:1		
Other rows		2.5-5					10:1		

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Tables of Limits of Illumination Levels

Table 3
Limits of Illumination for Roadways

IESNA Document	Illuminance Levels						Uniformity		
	EMIN	EMAX	EAVE	EV-MIN	EV-AVE	ESC-MIN	MAX/MIN	AVE/MIN	MAX/AVE
Roadway Lighting ANSIRP-8-00									
Walkways/Bikeways; Mixed use	High Pedestrian Conflict			2	1.0			4.0	
Walkways/Bikeways; Pedestrian use only	High Pedestrian Conflict			1	0.5			4.0	
Walkways/Bikeways; Pedestrian use only	Medium Pedestrian Conflict			0.5	0.2			4.0	
Collector (R2 & R3)	High-Medium-Low Pedestrian Conflict			1.2-0.9-0.6				4.0	
Local	High-Medium-Low Pedestrian Conflict			0.9-0.7-0.4				4.0	