

**Light Readings**  
**September 20, 2010**

<b>Location</b>	<b>Footcandles (max reading)</b>	<b>Type of light</b>
Courthouse parking lot	2	Old fashioned, single light
Walmart	4.8 9.2 16	Double cutoff light
Kmart	2	Triple non-cutoff light
N. 7 <sup>th</sup> Ave Street Light x from IGA	4.7	Single, cutoff light
Hastings	1.4	Single, cutoff lights, height approx. 20 ft tall (turning into the parking lot, it was so dark I thought the lights were off at first)
Main St. street light just east of 19 <sup>th</sup>	5	Single, non-cutoff
Mall	3 12.6 0.5	Double cutoff light fixture by movie theatre Triple cutoff light fixture by Penny's Big blocky light near main entrance
Taco Bell	20.5	Cutoff, single
Ressler	37.2 21	Double cutoff light fixture Single cutoff light fixture
Honda	7 9	Double cutoff light fixture Quad cutoff light fixture
Conoco Station, Four Corners	43	Recesses lights in ceiling above gas pumps



# Bozeman Lighting

the manufacturer's recommendations. Mounting heights shall be measured from grade and shall comply with the requirements of Table 42-3.

Table 42-3

Maintained Lumens (Minimum Maintained Average Values)	Mounting Height
9500-8000	25 feet
22500-9500	35 feet
33000-22500	38 feet

6. Pathway Intersection Lighting. Pathway lights shall be installed at all intersections of pathways and streets, located within the proposed development or along existing streets or roads abutting the development, if said intersection is located in areas other than lighted intersections. All pathway lights shall comply with City of Bozeman specifications.

Table 42-4

	Average Horizontal Illuminance at Pathway in Maintained Footcandles
Mixed vehicle and pedestrian	2.0
Pedestrian only	1.0

Source: *Roadway Lighting (RP-8-00)*, Illuminating Engineering Society of North American, 2000.

## D. Site Lighting.

1. Parking Lot Lighting.

Table 42-5

	Basic <sup>1</sup>	Security <sup>2</sup>
Minimum Horizontal Illuminance in Maintained Footcandles	0.2	0.5
Minimum Vertical Illuminance in Maintained Footcandles	0.1	0.25
Uniformity Ratio, Maximum : Minimum	20:01	15:00

Source: *Parking Lot Lighting*, Illuminating Engineering Society of North American, 1998.

<sup>1</sup>Basic lighting provides for the safety of customers and employees during business hours, and for the security of on-site, outside storage of goods and/or materials.

<sup>2</sup>Security lighting provides for the safety of employees during nonbusiness hours, and for the security of on-site, outside storage of goods and/or materials.

2. Building Entrances. Illuminance for building entrances (including commercial, industrial, institutional and municipal) shall average 5.0 maintained footcandles.
3. Car Dealership Lighting.

Table 42-6

Area	Maximum Illuminance on Pavement (in Maintained Footcandles)	Uniformity Ratio
<b>Maximum : Minimum</b>		
<b>Main Business Districts</b>		
Adjacent to roadway	10 - 20	5:01
Other rows	5 - 10	10:01
Entrances	5 - 10	5:01
Driveways	2 - 3	10:01
<b>Secondary Business Districts</b>		
Adjacent to roadway	5 - 10	5:01

Other Rows	2.5 - 5	10:01
Entrances	2.5 - 5	5:01
Driveways	1 - 2	10:00

Source: *Lighting for Exterior Environments, Illuminating Engineering Society of North American, 1998.*

4. Service Station or Gas Pump Area Lighting.

Table 42-7

Area Description	Average Illuminance on Described Area (in Maintained Footcandles)
Approach with dark surroundings	1.5
Driveway with dark surroundings	1.5
Pump island area with dark surroundings	5
Building facades with dark surroundings	2
Service areas with dark surroundings	2
Landscape highlights with dark surroundings	1
Approach with light surroundings	2
Driveway with light surroundings	2
Pump island area with light surroundings	10
Building facades with light surroundings	3
Service areas with light surroundings	3
Landscape highlights with light surroundings	2

Source: *Lighting for Exterior Environments, Illuminating Engineering Society of North American, 1998.*

5. Site Lighting Support Structures. The ballasts; pole type, strength and anchor bolts; and pole foundation shall be appropriate for the proposed lighting and shall be installed per the manufacturer's recommendations. Height shall be measured from grade. Except as allowed in Sections E and G, light poles for parking lot lighting shall not exceed 25 feet.
6. Site Lighting Installation and Maintenance.
- a. For new installations, electrical feeds for fixtures mounted on poles shall be run underground, not overhead.
  - b. Poles supporting lighting fixtures for the illumination of parking areas and located directly behind parking spaces, shall be placed a minimum of 5 feet outside the paved area, or on concrete pedestals at least 30 inches high above the pavement, or suitably protected by other approved means.
  - c. Lighting fixtures and ancillary equipment shall be maintained so as always to meet the requirements of this ordinance.
7. Miscellaneous Site Lighting Specifications. Except as otherwise allowed in Sections E and G, all lighting shall comply with the following requirements:
- a. All outdoor lighting, whether or not required by this ordinance, shall be aimed, located, designed, fitted and maintained so as not to present a hazard to drivers or pedestrians by impairing their ability to safely traverse and so as not to create a nuisance by projecting or reflecting objectionable light onto a neighboring use or property.
  - b. All outdoor lighting fixtures shall be shielded in such a manner that no light is emitted above a horizontal plane passing through the lowest point of the light emitting element, so that direct light emitted above the horizontal plane is eliminated.

## **Water Conveyance Facility Standards from Rural section of code**

### 5.1.1 Water Conveyance Facilities.

- A. Identification of Water Conveyance Facilities.** Any proposed Development requiring a LUP shall identify all Water Conveyance Facilities located on the property or, if off-site, those Water Conveyance Facilities located within 100 feet of the Development requiring and LUP. The applicant shall acknowledge the user of the Water Conveyance Facility's right to access and maintain any the Water Conveyance Facility on the "Agricultural Acknowledgement Form" detailed in Section 5.1.3.
- B. Setback from Water Conveyance Facility.** All new Development requiring a LUP shall be set back 50 feet from the centerline of any Water Conveyance Facility unless such setback is waived or reduced by the water user or Water Conveyance Facility's authorized representatives during the comment period described in Section 5.1.1.B. This setback may be superceded if specifically delineated through the subdivision process and shown on the final plat.
- C. Stormwater or snowmelt runoff.** Unless there is written consent from the appropriate water users and/or water conveyance facility's authorized representatives, no proposed Development requiring a LUP shall direct stormwater, snowmelt runoff, water from dewatering practices, or other water originating from within the boundaries of the Development to any irrigation ditch, canal, pipeline, or other water conveyance facility.

