CHAPTER 4

MESA LIGHTING AND ELECTRICAL CODE

(1685,1736,3571,4637,4790)

4-4-1: LIGHTING CONTROL ORDINANCE: (4245,4637,4790)
4-4-2: NATIONAL ELECTRICAL CODE ADOPTED (4245,4637)
4-4-3: PENALTY CLAUSE (4245)

4-4-1: LIGHTING CONTROL ORDINANCE: (4245,4637)

(A) Purpose. This Section is intended to restrict the permitted use of outdoor artificial illuminating devices emitting undesirable rays into the night sky which have a detrimental effect on astronomical observations. (4245)

(B) Conformance with Applicable Regulations. All outdoor artificial illuminating devices shall be designed and installed in conformance with the provisions of this Section and all other Sections of Chapter 4-4. Where provisions of the Arizona State Statutes, or of the Federal laws, or other regulation of the City conflicts with the requirements of this Section, the most restrictive shall govern. (4245)

(C) Conformance with Applicable Standards. All outdoor artificial illuminating devices shall be installed in conformance with recognized standards as approved by the American National Standards Institute (ANSI) and the Illumination Engineering Society of North America (IES). Public street lighting shall be in conformance with the City of Mesa engineering and design standards. (4245,4637)

(D) Definitions. The following definitions shall apply to this chapter. (4245,4637)

OUTDOOR LIGHT FIXTURES: Outdoor artificial illuminating devices, outdoor fixtures, lamps, and other devices, permanent or portable, used for illumination or advertisement. Such devices shall include, but are not limited to, lighting for buildings and structures, recreational areas, parking lots, landscape areas, billboards and other signage, and street lighting. (4245)

FULLY SHIELDED: Those fixtures designed and erected in such a manner that light rays emitted by the fixture, either directly from the lamp or indirectly from the fixture, are only projected below a horizontal plane running through the lowest point on the fixture where light is emitted. (4245)

PARTIALLY SHIELDED: Those fixtures designed and erected in such a manner that the bottom edge of the shield is below the plane of the centerline of the light source (lamp), minimizing the light emitted above the horizontal. (4245)

FILTERED: Outdoor light fixtures whose transmission is less than five percent (5%) total emergent flux at wavelengths less than three thousand nine hundred (3,900) angstroms. Total emergent flux is defined as that between wavelengths of three thousand (3,000) and seven thousand (7,000)-angstrom units. (4245)

AMBIENT LIGHT LEVEL: The measured light level at night when all the lights associated with a facility are off. (4245)
INSTALLED: The initial installation of outdoor light fixtures defined herein, provided the date of such installation is on or after September 18, 2004. (4245)

(E) Where Required. All exterior walkways, parks, parking lots, sales areas, or similar facilities which are intended to be occupied by the public during hours of darkness shall be provided with illumination to the minimum level recommended by IES standards for the use intended, during hours of normal occupation. (4245)

(F) Shielding and Filtering. All exterior illuminating devices, except those exempt from this Section, shall be fully or partially shielded and filtered as required in the following table: (4245)

<table>
<thead>
<tr>
<th>FIXTURE LAMP TYPE</th>
<th>SHIELDED</th>
<th>FILTERED (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low-Pressure Sodium (1)</td>
<td>Partially</td>
<td>None</td>
</tr>
<tr>
<td>High-Pressure Sodium</td>
<td>Partially</td>
<td>None</td>
</tr>
<tr>
<td>Metal Halide</td>
<td>Fully</td>
<td>Yes</td>
</tr>
<tr>
<td>Fluorescent</td>
<td>Partially (3)</td>
<td>Yes (5)</td>
</tr>
<tr>
<td>Quartz (2)</td>
<td>Partially</td>
<td>None</td>
</tr>
<tr>
<td>Incandescent Greater than 150W</td>
<td>Partially</td>
<td>None</td>
</tr>
<tr>
<td>Incandescent 150W or Less</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Fossil Fuel</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Glass Tubes Filled with Neon, Argon, Krypton</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Other Lamp Types</td>
<td>AS APPROVED BY THE BUILDING SAFETY DIRECTOR</td>
<td></td>
</tr>
</tbody>
</table>

Footnotes:
(1) This is the preferred lamp type to minimize undesirable light into the night sky, negatively affecting astronomical observations.
(2) For the purposes of this Section, quartz lamps shall not be considered as an incandescent light source.
(3) Outdoor advertising signs of the type constructed of translucent materials and wholly illuminated from within do not require shielding.
(4) Glass, acrylic, or translucent enclosures shall be deemed to satisfy filter requirements.
(5) Warm White and Natural Lamps are recommended to minimize detrimental effects.

(G) Visibility. No fixture, with a lamp size greater than 150W incandescent, shall be designed or erected where the lamp is directly visible to a person standing at the property line. (4245)

(H) Light Spillage. The light level at any property line, measured thirty-six inches (36") above ground level, shall be not more than 0.5 footcandles (5 Lux) above ambient light level, except for property lines adjacent to residential use property, the light level shall be not more than 0.3 footcandles (3 Lux) above ambient light level. Where the property is adjacent to a public street, the property line may be considered to be the centerline of the street. (4245)
(I) Prohibitions. The following fixture types shall not be used within the City of Mesa: (4245)

1. Searchlights. The operation of searchlights for advertising purposes is prohibited between the hours of eleven (11:00) P.M. and sunrise. (4245)

2. Mercury Vapor. The installation of mercury vapor fixtures is prohibited. (4245)

3. Maximum lamp wattage shall be limited in relation to mounting height as set forth in the following table, except for special use as approved. (4245)

<table>
<thead>
<tr>
<th>Wattage</th>
<th>Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,000</td>
<td>40 ft.</td>
</tr>
<tr>
<td>400</td>
<td>25 ft.</td>
</tr>
<tr>
<td>250</td>
<td>20 ft.</td>
</tr>
<tr>
<td>150</td>
<td>15 ft.</td>
</tr>
</tbody>
</table>

Fixtures with lamps less than 150 watts shall be permitted to be installed at any height, subject to conformance with other adopted codes.

Lamp wattages in this table are for HID arc lamps; other lamp types shall be limited to equivalent lumen output. (4245,4637)

(J) Nonconforming Fixtures. Outdoor light fixtures existing and fully installed prior to September 18, 2004 that complied with all applicable codes at installation may remain as "nonconforming;" provided, however, that no change in use, replacement, structural alteration, or restoration after abandonment of the outdoor light fixtures shall be made unless it thereafter conforms to the provisions of these regulations. (4245,4637)

EXCEPTION: No outdoor recreational facility, public or private, shall be illuminated by nonconforming means after eleven (11:00) P.M., except that a specific recreational or sporting event or other similar activity conducted at a ballpark, outdoor amphitheater, arena, or similar facility in progress prior to eleven (11:00) P.M. may continue until concluded. (4245)

(K) Fossil Fuel Lights (Gas). Lighting produced by the combustion of natural gas or other utility-type fossil fuels shall be exempt from the requirements of this Section, except lighting produced indirectly from combustion of natural gas or other utility-type fossil fuels, such as through the use of electricity to produce lighting shall not be exempted from compliance. (4245)
Federal and State Facilities. Facilities and lands owned, operated, or protected by the U.S. Federal Government or the State of Arizona are exempted by law from all requirements of this Section. Voluntary compliance with the intent of this Section at such facilities is encouraged. (4245)

Special Exemption. The Building Safety Director may grant a special exemption to the requirements of this Section only upon finding, in writing, that there are extreme geographic or geometric conditions warranting such exemption and that there are no conforming fixtures that can comply. (4245)

Outdoor Advertising Lighting. Upward-emitting lighting located upon existing outdoor advertising shall be exempt from compliance with this Section, provided that such lighting is equipped with a permanent automatic shutoff device and will not be operated between the hours of eleven (11:00) P.M. and six (6:00) A.M. (4245)

Automated Shutoff Device. In addition to the specific exemptions provided in this Section, outdoor light fixtures not meeting the provisions of this Section shall be allowed to remain, provided such fixtures are extinguished between the hours of eleven (11:00) P.M. and sunrise by an automatic shutoff device. (4245)

Temporary Exemptions. The Building Safety Director may grant a temporary exemption to the requirements of this Section, for a period of up to thirty (30) days, renewable at the discretion of the Building Safety Director. (4245)

The request for temporary exemption shall be submitted by the property owner and shall contain the following information, at a minimum: (4245)

1. Specific exemptions requested. (4245)
2. Type and use of exterior lighting involved. (4245)
3. Type of shielding and filtering of fixtures, if any. (4245)
4. Duration of time for the requested exemption. (4245)
5. Type of lamp and calculated lumens for all fixtures involved. (4245)
6. Total wattage of lamps for all fixtures involved. (4245)
7. Proposed location of exterior lighting. (4245)
8. Previous temporary exemptions, if any. (4245)
9. Other data and information as required by the Building Safety Director. (4245)

Within five (5) working days from the receipt of a properly completed request for temporary exemption, the Building Safety Director shall approve or reject the request. Such action shall be in writing. If rejected, the applicant shall have the right of appeal to the Building Board of Appeals, pursuant to Title 2 Chapter 11 of the Mesa City Code. (4245, 4637)
(Q) Flagpole Lighting. Upward emitting lighting whose purpose is to illuminate a flag on a flagpole at night shall be exempt from compliance with this section provided all of the following provisions are met:

1. The flag flown on the flagpole shall be permitted under Title 11, Mesa Zoning Ordinance. (4790)

2. The fixtures used to illuminate the flag shall be of a light source permitted by this chapter with lamps rated at not more than 75 watts. (4790)

3. The fixture used to illuminate the flag shall be limited to not more than three fixtures, ground or building mounted, aimed upwards, with no fixture exceeding the light level or lamp visibility requirements shown in Subparagraphs (G) or (H) above. (4790)

4-4-2: NATIONAL ELECTRICAL CODE ADOPTED: (4245,4637)
That certain document known as the National Electrical Code, published as a Code in book form by the National Fire Protection Association and entitled, National Electrical Code, 2005 Edition, is hereby referred to, adopted, and made a part hereof as if fully set forth in this Section, with the following changes in and amendments to said Code: (4245,4637)

(A) Article 80 Title and Administration is added to read as follows: (4245,4637)

Article 80 Title and Administration. (4245,4637)

80.1 Title. These regulations shall be known as the "Mesa Electrical Code," may be cited as such, and will be referred to herein as "this Code." For administration of this Code, refer to Title 4, Chapter 1, Mesa Administrative Code. (4245)

(B) Article 100 Definitions is amended by amending the definition of "Authority Having Jurisdiction (AHJ)" to read as follows:

Authority Having Jurisdiction (AHJ). The Authority Having Jurisdiction shall be construed to be the Building Safety Director or designee who is responsible for administering and enforcing the Mesa Electrical Code. (4637)

(C) Article 230.70(B) Marking is amended to read as follows: (4245,4637)

230.70(B) Marking. Each service disconnect shall be permanently marked to identify it as a service disconnect. Markings shall be of sufficient durability to withstand the environment involved. Identifying labels required for disconnecting means shall have engraved or raised letters and be secured by screws or rivets (plastic tape shall not be considered durable material). (4245)

(D) Article 250.118 Types of Equipment Grounding Conductors is amended to read as follows: (4245,4637)

250.118 Types Of Equipment Grounding Conductors. The equipment grounding conductor run with or enclosing the circuit conductors shall be one (1) or more of a combination of the following: (4245)
1. A copper, aluminum, or copper-clad aluminum, or copper-clad aluminum conductor. This conductor shall be solid or stranded; insulated, covered, or bare; and in the form of a wire or a busbar of any shape. (4245)

2. Armor of Type AC cable as provided in 320.108. (4245)

3. The copper sheath of mineral-insulated, metal-sheathed cable. (4245)

4. Type MC cable where listed and identified for grounding in accordance with the following: (4245)
   (a) The combined metallic sheath and grounding conductor of interlocked metal-type Type MC cable. (4245)
   (b) The metallic sheath or the combined metallic sheath and grounding conductors of the smooth or corrugated tube-type MC cable. (4245)

5. Cable trays as permitted in 392.3(C) and 392.7. (4245)

6. Cablebus framework as permitted in 370.3. (4245)

7. Other electrically continuous metal raceways and auxiliary gutters listed for grounding. (4245)

(E) Article 310.5 Minimum Size of Conductors is amended by adding a note at the bottom of Table 310.5 to read as follows: (4245,4637)

   Note: Aluminum conductors smaller than #8 AWG shall not be used for lighting or power circuits indoors. (4245)

(F) Article 310.15 Ampacities for Conductors Rated 0-2000 Volts is amended by replacing Table 310-15(B)(6) with the following table: (4245,4637)

(G) Article 334.10 Uses Permitted is amended by replacing paragraph (3) to read as follows: (4245,4637)

   (3) Other residential ancillary structures permitted to be of Types III, IV, and V construction except as prohibited in 334.12. Cables shall be concealed within walls, floors, or ceilings that provide a thermal barrier of material that has at least a fifteen- (15-) minute finish rating as identified in listings of fire-rated assemblies. (4245)

(H) Article 334.12 Uses Not Permitted is amended by revising Item A(3) to read as follows: (4245,4637)

   (3) As service-entrance or feeder cable. (4245,4637)
(I) Section 501.30 Grounding, Class I, Divisions 1 and 2 shall be amended by deleting the Exception to paragraph (B). (4245,4637)

(J) Section 502.30 Grounding, Class II, Divisions 1 and 2 shall be amended by deleting the Exception to paragraph (B). (4245,4637)

Table 310-15(B)(6)

<table>
<thead>
<tr>
<th>Conductor (AWG or kcmil)</th>
<th>Copper</th>
<th>Aluminum or Copper-Clad Aluminum</th>
<th>Service or Feeder Rating (Amperes)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>&lt; 30°C (86° F)</td>
<td>&gt; 30°C (86° F)</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>100</td>
<td>----</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>110</td>
<td>----</td>
</tr>
<tr>
<td>2</td>
<td>1/0</td>
<td>125</td>
<td>100</td>
</tr>
<tr>
<td>1</td>
<td>2/0</td>
<td>150</td>
<td>125</td>
</tr>
<tr>
<td>1/0</td>
<td>3/0</td>
<td>175</td>
<td>150</td>
</tr>
<tr>
<td>2/0</td>
<td>4/0</td>
<td>200</td>
<td>175</td>
</tr>
<tr>
<td>3/0</td>
<td>250</td>
<td>225</td>
<td>200</td>
</tr>
<tr>
<td>4/0</td>
<td>300</td>
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<td>300</td>
</tr>
<tr>
<td>400</td>
<td>600</td>
<td>400</td>
<td>350</td>
</tr>
<tr>
<td>500</td>
<td>750</td>
<td>----</td>
<td>400</td>
</tr>
</tbody>
</table>

(K) Section 503.30 Grounding, Class III, Divisions 1 and 2 shall be amended by deleting the Exception to paragraph (B). (4245,4637)

4-4-3: PENALTY CLAUSE: (4245,4637)
Any person, firm, or corporation who shall violate any of the provisions of this Chapter of the Mesa City Code as amended shall be subject to all penalties and provisions of Section 4-1-9. (4245,4637)