Lighting Design Technical Criteria and Summary Table
LIGHTING TECHNICAL CRITERIA

In section 5.10 of the Master Design Guidelines the general goals for the Marin County Civic Center campus lighting system were described. This appendix will discuss how those goals are quantified and achieved from a technical standpoint. Standard practice performance criteria (from The Illuminating Engineering Society (IES) Handbook, 9th Edition) will be defined for major areas and issues such as source color, light levels, and uniformity will be addressed. The major areas of the site can be broken down into the following categories for lighting: Parking Areas, Pathways, Recreation Areas, Roadways, Loading Docks, Building Entries, Signage, and Site Features.

Parking Areas

Lighting for parking areas should address issues of safety and security. Providing uniform light levels with contrast ratios within the noted guidelines assists in wayfinding and in facial recognition. The use of high color rendering light sources, such as ceramic metal halide, assists pedestrians in car identification as well as fellow pedestrian identification.

Pole mounted area light fixtures near historic structures should be provided to visually match the historic fixture scale, proportion and materiality. For improved photometric performance and glare control, ceramic metal halide lamps with electronic ballasts utilizing reflector optics and not prismatic refractors for improved visual comfort should be designed.

Pole mounted area light fixtures away from historic structures should be provided with full cut off optics, a simple profile structure and no visibly luminous elements. Fixture style should be somewhat non-descript and not visually compete with the historic styled light fixtures. Any fixture style at non-historic structures referencing the historic “hat” shape is not recommended.

In the parking areas at the Administration Building and Hall of Justice pass through, surface mounted luminous globes should be provided to visually match the historic fixture scale, proportion and materiality. An alternate method of deterring the birds from perching on the globes should be designed, perhaps with the use of a clear acrylic cylinder above the globe top.

Light Levels

Parking immediately adjacent to historic structures:

\[
E_{\text{MIN. HORIZ}} = 0.2 \text{ fc}; 
E_{\text{AVG HORIZ}} = 1.0 \text{ fc}; 
E_{\text{MIN VERT}} = 0.25 \text{ fc}
\]

Uniformity Ratios = Max:Min = 15:1 ; Avg:Min = 5:1

Parking not adjacent to historic structures:

\[
E_{\text{MIN. HORIZ}} = 0.2 \text{ fc}; 
E_{\text{AVG HORIZ}} = 1.0 \text{ fc}; 
E_{\text{MIN VERT}} = 0.25 \text{ fc}
\]

Uniformity Ratios = Max:Min = 15:1 ; Avg:Min = 5:1

Parking with Enhanced Security lighting:

\[
E_{\text{MIN. HORIZ}} = 0.5 \text{ fc}; 
E_{\text{AVG HORIZ}} = 2.5 \text{ fc}; 
E_{\text{MIN VERT}} = 0.5 \text{ fc}
\]

Uniformity Ratios = Max:Min = 15:1 ; Avg:Min = 5:1
Parking beneath the historic structure:
\[ E_{\text{MIN, HORIZ}} = 0.5 \text{ fc}; E_{\text{AVG \ HORIZ}} = 2.5 \text{ fc}; E_{\text{MIN \ VERT}} = 0.5 \text{ fc} \]
Uniformity Ratios = Max:Min = 15:1 ; Avg:Min = 5:1

Source Selection
Because good color rendition as well as efficiency and long lamp life is desired for these areas, ceramic metal halide is an appropriate source selection.

Connective Pathways
Connective Pathways provide alternative pedestrian paths and the lighting should be comfortable and should encourage movement between various campus areas. The lighting must also provide visual links between the Historic landmarks in the open areas at each terminus of the passageway and should clearly communicate the destination and length of the passageway. Sufficient vertical illumination should be provided to illuminate vertical landscape elements as well as the faces of other pedestrians. Vertical illumination at each terminus will aid in identification of passageways. While the use of pole mounted fixtures provides visual cohesiveness for the passageways, light levels along the passageways should be lower than at the ends. These areas of higher illumination create a visual terminus to each passageway, identify circulation intersections, and indicate the destination of each passageway.

Lighting for the Connective Pathways between and within new developments should facilitate wayfinding and create the sense of destinations at the gathering spaces. In addition, an important security consideration for walkways is to provide adequate vertical illuminance at approximately 6 feet above the walkway for pedestrian identification at a distance.

Light Levels
Pathways adjacent to Roadways:
\[ E_{\text{AVG}} = 0.5 \text{ fc}; E_{\text{AVG \ VERT}} = 1.0 \text{ fc} \]
Uniformity Ratio = Avg:Min = 4:1

Pathways distant from Roadways and adjacent to parking lots:
\[ E_{\text{AVG}} = 0.5 \text{ fc}; E_{\text{AVG \ VERT}} = 0.5 \text{ fc} \]
Uniformity Ratios = Avg:Min = 4:1

Historic Pathways:
\[ E_{\text{AVG}} = 0.5 \text{ fc}; E_{\text{AVG \ VERT}} = 0.5 \text{ fc} \]

Pathways under Historic Building at pass through:
\[ E_{\text{AVG}} = 10.0 \text{ fc day} \]
\[ E_{\text{AVG}} = 4.0 \text{ fc night} \]
\[ E_{\text{MIN \ VERT}} = 5 \text{ fc day} \]
\[ E_{\text{MIN \ VERT}} = 2 \text{ fc night} \]
Uniformity Ratio = Avg:Min = 3:1

Source Selection
Because good color rendition as well as efficiency and long lamp life is desired for these areas, ceramic metal halide is an appropriate source selection.
life is desired for these areas, ceramic metal halide is an appropriate source selection. Compact fluorescent sources with warm color temperature (3000K) is also appropriate for the decorative globes in the pass thru.

Recreation Areas
The following criteria are applicable to the variety of public gathering spaces in the Marin County Civic Center campus. As discussed in part three, the hierarchy of brightness composed of these elements should facilitate wayfinding and create the sense of active and well-illuminated open spaces. In addition, an important security consideration for walkways is to provide adequate vertical illuminance at approximately 6 feet above the walkway for pedestrian identification at a distance.

Light Levels
Parks:
\[ E_{\text{avg}} = 3.0 - 5.0 \text{ fc} \]

Sports Areas:
\[ E_{\text{avg}} = 5.0 \text{ fc}; \text{ Uniformity Ratio} = \text{Max:Min} = 3:1 \]

Gardens, Terraces, and Pools:
\[ E_{\text{avg}} = 5.0 \text{ fc} \]

Fountains and Large natural rock features:
\[ E_{\text{avg}} = 3.0 - 5.0 \text{ fc} \]

Source Selection
Because good color rendition as well as efficiency and long lamp life is desired for these areas, ceramic metal halide is an appropriate source selection. For areas of accent, compact fluorescent or halogen light sources are also appropriate.

Roadways
In determining the appropriate light level guidelines for roadways, the following classifications were used as described in the IES standard practice performance criteria publication (The Illumination Engineering Society of North America, Recommended Practice RP-8-00).

Light Levels
Collector Road with Medium Pedestrian Conflict classification:
\[ \text{Civic Center Drive} \quad E_{\text{avg}} = 0.6 - 0.9 \text{ fc} \]
\[ \text{Uniformity Avg:Min} = 4 \text{ to 1} \]
\[ \text{Memorial Drive} \quad E_{\text{avg}} = 0.5 - 0.7 \text{ fc} \]
\[ \text{Uniformity Avg:Min} = 6 \text{ to 1} \]

Local Road with Medium Pedestrian Conflict classification:
\[ \text{Avenue of the Flags} \quad E_{\text{avg}} = 0.5 - 0.7 \text{ fc} \]
\[ \text{Uniformity Avg:Min} = 6 \text{ to 1} \]

Intersections at Major/Collector Roads:
\[ E_{\text{avg}} = 2.2 \text{ fc} \quad \text{Uniformity Avg:Min} = 3 \text{ to 1} \]

Intersections at Collector/Local Roads:
\[ E_{\text{avg}} = 1.6 \text{ fc} \quad \text{Uniformity Avg:Min} = 4 \text{ to 1} \]
Intersections at Local/Local Roads
\[ E_{\text{AVG}} = 1.4 \text{ fc} \quad \text{Uniformity Avg:Min} = 6 \text{ to } 1 \]

**Source Selection**
Because good color rendition as well as efficiency and long lamp life is desired for these areas, ceramic metal halide is an appropriate source selection.

**Loading Docks**
Lighting at loading dock areas must provide adequate light levels and equally as important is providing light fixtures designed with good glare control. Shielded light fixtures assist drivers and workers at night in seeing obstructions or obstacles. Direct view of a bright light source can temporarily disable vision causing discomfort and a disability at performing tasks. At historic loading docks, light fixtures are recessed and concealed by the architecture, which is preferred for good glare control.

**Light Levels**
\[ E_{\text{AVG}} = 10 \text{ fc} \]
\[ E_{\text{AVG} \text{ VER}} = 3 \text{ fc} \]

**Source Selection**
Because good color rendition as well as efficiency and long lamp life is desired for these areas, ceramic metal halide or compact fluorescent is an appropriate source selection.

**Building Entries**
Criteria for building entries are distinguished as active and inactive entries. Active entries are typically unlocked and open to the public while inactive entries are typically locked with only limited use. Building surrounds encompass areas adjacent to buildings that are typically not designated for any particular use but nonetheless require lighting for safety and security. This is generally accomplished by lighting systems for adjacent areas such as roadways, paths, landscaping, or the building itself and building surrounds typically do not require their own lighting. The performance criteria for these areas are:

**Light Levels**
- Active Entries \[ E_{\text{AVG}} = 5.0 \text{ fc} \]
- Inactive Entries \[ E_{\text{AVG}} = 3.0 \text{ fc} \]
- Prominent Structures \[ E_{\text{AVG}} = 3.0 \text{ fc} \]
- Building Surrounds \[ E_{\text{AVG}} = 0.6 \text{ fc} \]

**Source Selection**
Compact fluorescent lamps are recommended to allow for the selection of appropriate fixtures as well as color that is appropriate for a wide range of building materials, good color rendering, long lamp life, and consistency with the overall Center lighting.
**Signage**
Lighting for signage requires careful consideration of shadowing, veiling reflection, and glare issues that may affect legibility for pedestrians as well as motorists.

**Light Levels**
**Bulletin and Poster Boards (Dark Surroundings)**
Light Surfaces: \( E_{AVG \_VERT} = 10-20 \) fc
Dark Surfaces: \( E_{AVG \_VERT} = 20-30 \) fc

**Site Features**
Similar to lighting for planting, various site features such as artwork and sculpture do not have specific lighting performance criteria associated with them and the effective illumination of these objects is dependent on context - the relative brightness and color of the surrounding environment.

It is important to note that for the Administration Building and Hall of Justice, the “façade” lighting is achieved via downlights located within the arcades of the building perimeter and not by any traditional means of building floodlighting. This design concept and intent is what creates the silhouetted effect illustrated here.

While illumination of site features usually doesn’t contribute to the functional light levels of an area, it plays a key role in establishing a nighttime identity for the Marin County Civic Center campus and in reinforcing a perception of safety and security.

According to the IES (Illuminating Engineering Society) Handbook, the following general guidelines have been defined to assist in developing performance criteria:

**Light Levels**
Large Focal Points with graphics: \( E_{AVG} = 10-30 \) fc
Small Focal Points with graphics: \( E_{AVG} = 20-50 \) fc

**Floodlighting:**
Light Surfaces \( E_{AVG} = 5-10 \) fc
Med. Surfaces \( E_{AVG} = 10-15 \) fc
Dark Surfaces \( E_{AVG} = 15-20 \) fc
Large Focal Points \( E_{AVG} = 10 \) fc
Small Focal Points \( E_{AVG} = 20 \) fc

**Source Selection**
Sources for illuminating site features and signage will vary depending on the size and context of the element, but similar to landscape sources they should have good to excellent color rendition and long lamp life typical of ceramic metal halide or compact fluorescent lamps. Tungsten halogen lamps, used prudently, are also an appropriate source.
MARIN COUNTY CIVIC CENTER LIGHTING SUMMARY
The Marin County Civic Center campus is a complex development with a variety of functions, site features, vehicular routes, and pedestrian pathways. Accordingly, the lighting system for this entire development should appropriately address historic areas separate from new areas and act as a unifying element that is coordinated and integrated with signage, landscaping, and architectural elements. By utilizing lighting fixtures and effects to reinforce a sense of safety and security, establish a strong night-time identity, facilitate wayfinding, and simplify maintenance, the lighting design for the Marin County Civic Center campus will contribute to the safety and enjoyment of all night-time visitors.

The technical criteria and design approach details described in this section are summarized in the following table.
<table>
<thead>
<tr>
<th>Area Description</th>
<th>Example Location</th>
<th>Illuminance Criteria</th>
<th>Recommended Light Sources</th>
<th>Comments</th>
</tr>
</thead>
</table>
| Parking immediately adjacent to historic structures | Administration Building and Hall of Justice Parking | $E_{\text{MIN. HORIZ}} = 0.2 \text{ fc}$
$E_{\text{AVG HORIZ}} = 1.0 \text{ fc}$
$E_{\text{MIN VERT}} = 0.25 \text{ fc}$

Uniformity Ratios
Max:Min = 15:1
Avg:Min = 5:1 | Low wattage Ceramic Metal Halide with electronic ballasts
4100K color temperature 80+CRI | Pole mounted area light fixtures should be provided to visually match the historic fixture scale, proportion and materiality. For improved photometric performance and glare control, ceramic metal halide lamps with electronic ballasts with the use of reflector optics and not prismatic refractors should be designed. |
| Parking beneath the historic structure | Areas with Enhanced Security lighting | $E_{\text{MIN. HORIZ}} = 0.5 \text{ fc}$
$E_{\text{AVG HORIZ}} = 2.5 \text{ fc}$
$E_{\text{MIN VERT}} = 0.5 \text{ fc}$

Uniformity Ratios
Max:Min = 15:1
Avg:Min = 5:1 | Low wattage Ceramic Metal Halide or compact fluorescent lamps with electronic ballasts
4100K color temperature 80+CRI | Surface mounted luminous globes should be provided to visually match the historic fixture scale, proportion and materiality. An alternate method of deterring the birds from perching on the globes should be designed, perhaps with the use of a clear acrylic cylinder above the globe top. |
| Parking not adjacent to historic structures | East Parking Lot | $E_{\text{MIN. HORIZ}} = 0.2 \text{ fc}$
$E_{\text{AVG HORIZ}} = 1.0 \text{ fc}$
$E_{\text{MIN VERT}} = 0.25 \text{ fc}$

Uniformity Ratios
Max:Min = 15:1
Avg:Min = 5:1 | Metal Halide with electronic ballasts
4100K-4000K color temperature 70+CRI | Pole mounted area light fixtures should be provided that utilize full cutoff optics and do not incorporate any visibly luminous fixture elements. The intent of these parking lot light |
### Area Description | Example Location | Illuminance Criteria | Recommended Light Sources | Comments |
|------------------|-----------------|---------------------|--------------------------|----------|
| Pathways adjacent to Roadways leading to historic structures | Pathways to Administration Building, Hall of Justice, Post Office | $E_{AVG} = 0.5 \text{ fc}$  
$E_{AVG~VERT} = 1.0 \text{ fc}$  
Uniformity Ratio  
Avg:Min = 4:1 | Low wattage Ceramic Metal Halide with electronic ballasts  
$4100K$ color temperature  
80+ CRI | Pole mounted area light fixtures should be provided to visually match the historic fixture scale, proportion and materiality. For improved photometric performance and glare control, ceramic metal halide lamps with electronic ballasts with the use of reflector optics and not prismatic refractors should be designed. |
| Pathways adjacent to Roadways leading to transitional structures | Pathways to Garage, Veterans Auditorium, Exhibition Buildings | $E_{AVG} = 0.5 \text{ fc}$  
$E_{AVG~VERT} = 1.0 \text{ fc}$  
Uniformity Ratio  
Avg:Min = 4:1 | Low wattage Ceramic Metal Halide with electronic ballasts  
$4100K$ color temperature  
80+ CRI |  |
| Pathways distant from Roadways and adjacent to Parking Lots |  | $E_{AVG} = 0.5 \text{ fc}$  
$E_{AVG~VERT} = 0.5 \text{ fc}$  
Uniformity Ratio  
Avg:Min = 4:1 | Low wattage Ceramic Metal Halide with electronic ballasts  
$4100K$ color temperature  
80+ CRI |  |
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</thead>
</table>
| Pathways under Historic Building | Administration Building and Hall of Justice | $E_{AVG} = 10$ fc day $E_{AVG} = 4$ fc night  
$E_{MINVERT} = 5$ fc day $E_{MINVERT} = 2$ fc night  
Uniformity Ratio Avg:Min = 3:1 | Compact fluorescent with electronic ballasts  
3000K color temperature 80+CRI |                           |
| Historic pathways     | Pathway to Overlook, Lagoon Pathway    | $E_{AVG} = 0.5$ fc $E_{AVG \_VERT} = 0.5$ fc | Low wattage Ceramic Metal Halide with electronic ballasts  
4100K color temperature 80+CRI |                           |
| RECREATION AREAS      |                                        |                                          |                           |                           |
| Parks                 | Temporary Dog Park, Children’s Playground | $E_{AVG} = 3.0-5.0$ fc                  | Low wattage Ceramic Metal Halide or Fluorescent with electronic ballasts  
4100K color temperature 80+CRI |                           |
| Sports Area           | Petanque Courts                        | $E_{AVG} = 5.0$ fc                      | Low wattage Ceramic Metal Halide or Fluorescent with electronic ballasts  
4100K color temperature 80+CRI |                           |
| Gardens               | Administration Building Garden Terrace | Softscape and Decorative Pools $E_{AVG} = 5.0$ fc  
Fountains and Large natural rock features $E_{AVG} = 3.0$ fc | Low wattage Ceramic Metal Halide or fluorescent with electronic ballasts. Low voltage halogen may be used in special |                           |
<table>
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</tr>
</thead>
<tbody>
<tr>
<td>Water and Rock Features</td>
<td>Lagoon water feature</td>
<td>Softscape and Decorative Pools $E_{\text{AVG}} = 5.0$ fc</td>
<td>Low wattage Ceramic Metal Halide or fluorescent with electronic ballasts Low voltage halogen may be used in special areas.</td>
<td>3000K to 4100K color temperature 80+ CRI</td>
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<td>Fountains and Large natural rock features $E_{\text{AVG}} = 3.0$ fc</td>
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<tr>
<td>ROADWAYS</td>
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<tr>
<td>Roadways leading to historic structures</td>
<td>Administration Building, Hall of Justice, Post Office</td>
<td>Collector-Intermediate Roads $E_{\text{AVG}} = 0.6 – 0.9$ fc Uniformity Avg:Min = 4 to 1</td>
<td>Metal Halide with electronic ballasts</td>
<td>4100K color temperature 70+ CRI</td>
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<td></td>
<td></td>
<td>Local-Intermediate Roads $E_{\text{AVG}} = 0.5 – 0.7$ fc Uniformity Avg:Min = 6 to 1</td>
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<td></td>
<td>Garage, Veterans Auditorium, Exhibition Buildings</td>
<td>Collector-Intermediate Roads $E_{\text{AVG}} = 0.6 – 0.9$ fc Uniformity Avg:Min = 4 to 1</td>
<td>Metal Halide with electronic ballasts</td>
<td>4100K color temperature 70+ CRI</td>
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<td>Local-Intermediate Roads $E_{\text{AVG}} = 0.5 – 0.7$ fc Uniformity Avg:Min = 6 to 1</td>
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<tr>
<td>Security access ramps</td>
<td>Ramp to rear of County Jail</td>
<td>Local Intermediate Roads E_{AVG} = 0.5 – 0.7 fc Uniformity Avg:Min = 6 to 1</td>
<td>Metal Halide or Fluorescent with electronic ballasts 4100K color temperature 70+ CRI</td>
<td></td>
</tr>
<tr>
<td>Existing Bikeways alongside roadways</td>
<td></td>
<td>E_{AVG} = 10 fc E_{AVG VERT} = 20 fc</td>
<td>Metal Halide with electronic ballasts 4100K color temperature 70+ CRI</td>
<td></td>
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<tr>
<td>Existing Bikeways distant from roadways</td>
<td></td>
<td>E_{AVG} = 5 fc E_{AVG VERT} = 5 fc</td>
<td>Metal Halide with electronic ballasts 4100K color temperature 70+ CRI</td>
<td></td>
</tr>
<tr>
<td>Intersections</td>
<td>Major/Collector E_{AVG} = 2.2 fc Avg:Min = 3 to 1</td>
<td>Collector/Local E_{AVG} = 1.6 fc Avg:Min = 4 to 1</td>
<td>Metal Halide with electronic ballasts 4100K color temperature 70+ CRI</td>
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<tr>
<td></td>
<td>Local/Local E_{AVG} = 1.4 fc Avg:Min = 6 to 1</td>
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**LOADING DOCKS**

<table>
<thead>
<tr>
<th>Area Description</th>
<th>Location</th>
<th>Illuminance Criteria</th>
<th>Recommended Light Sources</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>At Historic Structures</td>
<td>Administration Building, Hall of Justice, Post Office</td>
<td>E_{AVG} = 10 fc E_{AVG VERT} = 3 fc</td>
<td>Low wattage Ceramic Metal Halide or Fluorescent with electronic ballasts 3000K color temperature 80+ CRI</td>
<td></td>
</tr>
<tr>
<td>At Transitional Structures</td>
<td>Garage, Veterans Auditorium, Exhibition</td>
<td>E_{AVG} = 10 fc E_{AVG VERT} = 3 fc</td>
<td>Low wattage Ceramic Metal Halide or Fluorescent with</td>
<td></td>
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<tr>
<td>Area Description</td>
<td>Example Location</td>
<td>Illuminance Criteria</td>
<td>Recommended Light Sources</td>
<td>Comments</td>
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<tr>
<td>Buildings</td>
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</tr>
</tbody>
</table>
| Historic Building Entries | Administration Building, Hall of Justice, Post Office | Active Entries \(E_{AVG} = 5\) fc  
Inactive Entries \(E_{AVG} = 3\) fc  
Prominent Structures \(E_{AVG} = 3.0\) fc  
Building Surrounds \(E_{AVG} = 0.6\) fc | Low wattage Ceramic Metal Halide or Fluorescent with electronic ballasts | 3000K color temperature 80+CRI |
| Transitional Building Entries | Garage, Veterans Auditorium, Exhibition Buildings | Active Entries \(E_{AVG} = 5\) fc  
Inactive Entries \(E_{AVG} = 3\) fc  
Prominent Structures \(E_{AVG} = 3.0\) fc  
Building Surrounds \(E_{AVG} = 0.6\) fc | Low wattage Ceramic Metal Halide or Fluorescent with electronic ballasts | 3000K color temperature 80+CRI |
| Signage          |                                                                                  |                     |                          |          |
| Existing Wayfinding Historic Signage |                                                                 | Large Focal Points  
Large Focal Points w/graphics \(E_{AVG} = 10-30\) fc  
Small Focal Points w/graphics \(E_{AVG} = 20-50\) fc | Low wattage Ceramic Metal Halide or Fluorescent with electronic ballasts | 3000K color temperature 80+CRI |
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<tr>
<th>Area Description</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Historic Site Features</td>
<td>Spire Building Façade</td>
<td>Façade Floodlighting: Light Surfaces $E_{AVG} = 5-10$ fc Med. Surfaces $E_{AVG} = 10-15$ fc Dark Surfaces $E_{AVG} = 15-20$ fc</td>
<td>Ceramic Metal Halide or Fluorescent with electronic ballasts 3000K color temperature 80+ CRI</td>
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<td></td>
<td></td>
<td>Large Focal Points $E_{AVG} = 10$ fc Small Focal Points $E_{AVG} = 20$ fc</td>
<td>Ceramic Metal Halide with electronic ballasts 3000K color temperature 80+ CRI</td>
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</tbody>
</table>
### NEW PARKING AREAS

<table>
<thead>
<tr>
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<th>Recommended Light Sources</th>
<th>Comments</th>
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</thead>
</table>
| Parking immediately adjacent to historic structures |  | $E_{\text{MIN, HORIZ}} = 0.2 \text{ fc}$  
$E_{\text{AVG, HORIZ}} = 1.0 \text{ fc}$  
$E_{\text{MIN, VERT}} = 0.25 \text{ fc}$  
Uniformity Ratios  
Max:Min = 15:1  
Avg:Min = 5:1 | Low wattage Ceramic Metal Halide with electronic ballasts  
4100K color temperature  
80+ CRI | Pole mounted area light fixtures should be provided to visually match the historic fixture scale, proportion and materiality. For improved photometric performance and glare control, ceramic metal halide lamps with electronic ballasts with the use of reflector optics and not prismatic refractors should be designed. |
| Parking not adjacent to historic structures |  | $E_{\text{MIN, HORIZ}} = 0.2 \text{ fc}$  
$E_{\text{AVG, HORIZ}} = 1.0 \text{ fc}$  
$E_{\text{MIN, VERT}} = 0.25 \text{ fc}$  
Uniformity Ratios  
Max:Min = 15:1  
Avg:Min = 5:1 | Metal Halide with electronic ballasts  
4100K color temperature  
70+ CRI | Pole mounted area light fixtures should be provided that utilize full cutoff optics and do not incorporate any visibly luminous fixture elements. The intent of these parking lot light fixtures is to visually disappear during the night and be visually non-descript during the daytime. Any fixture style referencing the historic “hat” shape is not recommended. |
| Parking Garages | Basic Areas  
$E_{\text{MIN, HORIZ}} = 1.0 \text{ fc}$  
$E_{\text{AVG, HORIZ}} = 5.0 \text{ fc}$  
Max:Min = 10:1  
$E_{\text{MIN, VERT}} = 0.5 \text{ fc}$ | Low wattage Ceramic Metal Halide or Linear Fluorescent with electronic ballasts | Fixture with low glare characteristics such that direct view of light source is avoided. |
<table>
<thead>
<tr>
<th>Area Description</th>
<th>Example Location</th>
<th>Illuminance Criteria</th>
<th>Recommended Light Sources</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ramps - Daytime</td>
<td></td>
<td>$\text{E}<em>{\text{MIN, HORIZ}} = 2.0 \text{ fc}$ $\text{E}</em>{\text{MIN, VERT}} = 1.0 \text{ fc}$</td>
<td>4100K color temperature 80+ CRI</td>
<td></td>
</tr>
<tr>
<td>Ramps - Nighttime</td>
<td></td>
<td>$\text{E}<em>{\text{MIN, HORIZ}} = 1.0 \text{ fc}$ $\text{E}</em>{\text{MIN, VERT}} = 0.5 \text{ fc}$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Entrance Areas - Day</td>
<td></td>
<td>$\text{E}<em>{\text{MIN, HORIZ}} = 50.0 \text{ fc}$ $\text{E}</em>{\text{MIN, VERT}} = 25.0 \text{ fc}$ (includes daylight)</td>
<td></td>
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<tr>
<td>Entrance Areas - Night</td>
<td></td>
<td>$\text{E}<em>{\text{MIN, HORIZ}} = 1.0 \text{ fc}$ $\text{E}</em>{\text{MIN, VERT}} = 0.5 \text{ fc}$</td>
<td></td>
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<tr>
<td>Stairways</td>
<td></td>
<td>$\text{E}<em>{\text{MIN, HORIZ}} = 2.0 \text{ fc}$ $\text{E}</em>{\text{MIN, VERT}} = 1.0 \text{ fc}$</td>
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</tbody>
</table>

**NEW PATHWAYS**

| Pathways adjacent to Roadways leading to historic structures | $\text{E}_{\text{AVG}} = 0.5 \text{ fc}$ $\text{E}_{\text{AVG VERT}} = 1.0 \text{ fc}$ | Low wattage Ceramic Metal Halide with electronic ballasts | Pole mounted area light fixtures should be provided to visually match the historic fixture scale, proportion and materiality. For improved photometric performance and glare control, ceramic metal halide lamps with electronic ballasts with the use of reflector optics and not prismatic refractors should be designed. |

<p>| Pathways adjacent to Roadways leading to transitional       | $\text{E}<em>{\text{AVG}} = 0.5 \text{ fc}$ $\text{E}</em>{\text{AVG VERT}} = 1.0 \text{ fc}$ | Low wattage Ceramic Metal Halide with electronic ballasts |          |</p>
<table>
<thead>
<tr>
<th>Area Description</th>
<th>Example Location</th>
<th>Illuminance Criteria</th>
<th>Recommended Light Sources</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>structures</td>
<td></td>
<td></td>
<td>4100K color temperature 80+CRI</td>
<td>Pole mounted area light fixtures should be provided that utilize full cutoff optics and do not incorporate any visibly luminous fixture elements. The intent of these parking lot light fixtures is to visually disappear during the night and be visually non-descript during the daytime. Any fixture style referencing the historic “hat” shape is not recommended.</td>
</tr>
<tr>
<td>Pathways adjacent to Roadways</td>
<td></td>
<td>$E_{AVG} = 0.5 \text{ fc}$ $E_{AVG \text{ VERT}} = 1.0 \text{ fc}$</td>
<td>Low wattage Ceramic Metal Halide with electronic ballasts 4100K color temperature 80+CRI</td>
<td></td>
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<tr>
<td>leading to new structures</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Pathways distant from Roadways</td>
<td></td>
<td>$E_{AVG} = 0.5 \text{ fc}$ $E_{AVG \text{ VERT}} = 0.5 \text{ fc}$</td>
<td>Low wattage Ceramic Metal Halide with electronic ballasts 4100K color temperature 80+CRI</td>
<td></td>
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<tr>
<td>and adjacent to Parking Lots</td>
<td></td>
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<tr>
<td>New Feature Pathways</td>
<td></td>
<td>$E_{AVG} = 1.0 \text{ fc}$ $E_{AVG \text{ VERT}} = 1.0 \text{ fc}$</td>
<td>Low wattage Ceramic Metal Halide or Fluorescent with electronic ballasts 4100K color temperature 80+CRI</td>
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<tr>
<td><strong>NEW RECREATION AREAS</strong></td>
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<tr>
<td>Parks or Playground</td>
<td></td>
<td>$I_{AVG} = 3.0-5.0$ fc</td>
<td>Low wattage Ceramic Metal Halide or Fluorescent with electronic ballasts</td>
<td>3000K color temperature 80+CRI</td>
</tr>
<tr>
<td>Gardens</td>
<td>Softscape and Decorative Pools $I_{AVG} = 5.0$ fc</td>
<td>Low wattage Ceramic Metal Halide or fluorescent with electronic ballasts. Low voltage halogen may be used in special areas.</td>
<td>3000K color temperature 80+CRI</td>
<td></td>
</tr>
<tr>
<td>Water and Rock Features</td>
<td>Softscape and Decorative Pools $I_{AVG} = 5.0$ fc</td>
<td>Low wattage Ceramic Metal Halide or fluorescent with electronic ballasts. Low voltage halogen may be used in special areas.</td>
<td>3000K color temperature 80+CRI</td>
<td></td>
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<tr>
<td><strong>NEW ROADWAYS</strong></td>
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<tr>
<td>Roadways leading to historic structures</td>
<td>Administration Building, Hall of Justice, U.S. Post Office</td>
<td>$I_{AVG} = 0.6 - 0.8$ fc Uniformity</td>
<td>Metal Halide with electronic ballasts</td>
<td></td>
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<td>Area Description</td>
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<td>Avg:Min = 4 to 1</td>
<td>4100K color temperature 70+CRI</td>
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<tr>
<td></td>
<td></td>
<td>Local Intermediate Roads E\text{AVG} = 0.5 - 0.7 fc Uniformity Avg:Min = 6 to 1</td>
<td>Metal Halide with electronic ballasts</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Collector Intermediate Roads E\text{AVG} = 0.6 - 0.8 fc Uniformity Avg:Min = 4 to 1</td>
<td>4100K color temperature 70+CRI</td>
<td></td>
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<td></td>
<td>Garage, Veterans' Memorial Auditorium,</td>
<td>Local Intermediate Roads E\text{AVG} = 0.5 - 0.7 fc Uniformity Avg:Min = 6 to 1</td>
<td>Metal Halide with electronic ballasts</td>
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<td></td>
<td>Exhibit Hall</td>
<td>Collector Intermediate Roads E\text{AVG} = 0.6 - 0.8 fc Uniformity Avg:Min = 4 to 1</td>
<td>4100K color temperature 70+CRI</td>
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<td></td>
<td></td>
<td>Local Intermediate Roads E\text{AVG} = 0.5 - 0.7 fc Uniformity Avg:Min = 6 to 1</td>
<td>Metal Halide with electronic ballasts</td>
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<td></td>
<td></td>
<td>Collector Intermediate Roads E\text{AVG} = 0.6 - 0.8 fc Uniformity Avg:Min = 4 to 1</td>
<td>4100K color temperature 70+CRI</td>
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<td></td>
<td></td>
<td>Local Intermediate Roads E\text{AVG} = 0.5 - 0.7 fc Uniformity Avg:Min = 6 to 1</td>
<td>Metal Halide or Fluorescent with electronic ballasts</td>
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<td></td>
<td>Security access ramps</td>
<td>Local Intermediate Roads E\text{AVG} = 0.5 - 0.7 fc Uniformity Avg:Min = 6 to 1</td>
<td>4100K color temperature 70+CRI</td>
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<td></td>
<td>New Bikeways alongside roadways</td>
<td>E\text{AVG} = 10 fc E\text{AVG VERT} = 20 fc</td>
<td>Metal Halide with electronic ballasts</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>4100K color temperature</td>
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</tbody>
</table>
| New Bikeways distant from roadways|                  | $E_{\text{AVG}} = 5 \text{ fc}$  
                           |                  | $E_{\text{AVG \, VERT}} = 5 \text{ fc}$  | 70+CRI  
                           |                  | Metal Halide with electronic ballasts  
                           |                  | 4100K color temperature 70+CRI  |            |
| NEW LOADING DOCKS                |                  |                      |                           |                               |
| At New Structures                |                  | $E_{\text{AVG}} = 10 \text{ fc}$  
                           |                  | $E_{\text{AVG \, VERT}} = 3 \text{ fc}$  | Low wattage Ceramic Metal Halide or Fluorescent with electronic ballasts  
                           |                  |                                      | 4100K color temperature 80+CRI  
                           |                  | Provide shielded light fixtures.  |            |
| NEW BUILDING ENTRIES             |                  |                      |                           |                               |
| Building Entries                 |                  | $E_{\text{AVG}} = 5 \text{ fc}$  
                           |                  | $E_{\text{AVG}} = 3 \text{ fc}$  
                           |                      |                     | Low wattage Ceramic Metal Halide or Fluorescent with electronic ballasts  
                           |                  | Prominent Structures $E_{\text{AVG}} = 3.0 \text{ fc}$  
                           |                  | Building Surrounds $E_{\text{AVG}} = 0.6 \text{ fc}$  | 3000K color temperature 80+CRI  
                           |                  |                                      |            |
| NEW SIGNAGE                      |                  |                      |                           |                               |
| New wayfinding signage           |                  | $E_{\text{AVG}} = 10-30 \text{ fc}$  
                           |                  | $E_{\text{AVG}} = 20-50 \text{ fc}$  | Low wattage Ceramic Metal Halide or Fluorescent with electronic ballasts  
                           |                  | Large Focal Points w/graphics  
                           |                  | Small Focal Points w/graphics  
                           |                                      | 3000K color temperature 80+CRI  
<p>| | | |
|                  |                                      |            |</p>
<table>
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<tbody>
<tr>
<td><strong>NEW SITE FEATURES</strong></td>
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<tr>
<td>Site Features</td>
<td>Façade Floodlighting: Light Surfaces $E_{AVG} = 5-10$ fc</td>
<td>Ceramic Metal Halide or Fluorescent with electronic ballasts</td>
<td>3000K color temperature 80+ CRI</td>
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<tr>
<td></td>
<td>Med. Surfaces $E_{AVG} = 10-15$ fc</td>
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<td></td>
<td>Dark Surfaces $E_{AVG} = 15-20$ fc</td>
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<tr>
<td></td>
<td>Large Focal Points $E_{AVG} = 10$ fc</td>
<td>Ceramic Metal Halide with electronic ballasts</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Small Focal Points $E_{AVG} = 20$ fc</td>
<td>3000K color temperature 80+ CRI</td>
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