

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 fixtures 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:

$$E_{\text{MIN, HORIZ}} = 0.2 \text{ fc}; E_{\text{AVG HORIZ}} = 1.0 \text{ fc}; E_{\text{MIN VERT}} = 0.25 \text{ fc}$$

$$\text{Uniformity Ratios} = \text{Max:Min} = 15:1 ; \text{Avg:Min} = 5:1$$

Parking not adjacent to historic structures:

$$E_{\text{MIN, HORIZ}} = 0.2 \text{ fc}; E_{\text{AVG HORIZ}} = 1.0 \text{ fc}; E_{\text{MIN VERT}} = 0.25 \text{ fc}$$

$$\text{Uniformity Ratios} = \text{Max:Min} = 15:1 ; \text{Avg:Min} = 5:1$$

Parking with Enhanced Security lighting:

$$E_{\text{MIN, HORIZ}} = 0.5 \text{ fc}; E_{\text{AVG HORIZ}} = 2.5 \text{ fc}; E_{\text{MIN VERT}} = 0.5 \text{ fc}$$

$$\text{Uniformity Ratios} = \text{Max:Min} = 15:1 ; \text{Avg:Min} = 5:1$$

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. 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:

$$E_{AVG} = 3.0-5.0 \text{ fc}$$

Sports Areas:

$$E_{AVG} = 5.0 \text{ fc}; \text{ Uniformity Ratio} = \text{Max:Min} = 3:1$$

Gardens, Terraces, and Pools:

$$E_{AVG} = 5.0 \text{ fc}$$

Fountains and Large natural rock features:

$$E_{AVG} = 3.0 - 5.0 \text{ fc}$$

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:

Civic Center Drive	$E_{AVG} = 0.6 - 0.9 \text{ fc}$
Memorial Drive	Uniformity Avg:Min = 4 to 1

Local Road with Medium Pedestrian Conflict classification:

Avenue of the Flags	$E_{AVG} = 0.5 - 0.7 \text{ fc}$
	Uniformity Avg:Min = 6 to 1

Intersections at Major/Collector Roads:

$E_{AVG} = 2.2 \text{ fc}$	Uniformity Avg:Min = 3 to 1
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Intersections at Collector/Local Roads

$E_{AVG} = 1.6 \text{ fc}$	Uniformity Avg:Min = 4 to 1
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Intersections at Local/Local Roads

$E_{AVG} = 1.4 \text{ fc}$ Uniformity Avg:Min = 6 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

$E_{AVG} = 10 \text{ fc}$
 $E_{AVG \text{ VERT}} = 3 \text{ fc}$

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 $E_{AVG} = 5.0 \text{ fc}$
 Inactive Entries $E_{AVG} = 3.0 \text{ fc}$

Prominent Structures $E_{AVG} = 3.0 \text{ fc}$

Building Surrounds $E_{AVG} = 0.6 \text{ fc}$

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.

Area Description	Example Location	Illuminance Criteria	Recommended Light Sources	Comments
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PARKING AREAS

Parking immediately adjacent to historic structures	Administration Building and Hall of Justice Parking	$E_{MIN. HORIZ} = 0.2 \text{ fc}$ $E_{AVG HORIZ} = 1.0 \text{ fc}$ $E_{MIN VERT} = 0.25 \text{ fc}$ 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.
	Areas with Enhanced Security lighting	$E_{MIN. HORIZ} = 0.5 \text{ fc}$ $E_{AVG HORIZ} = 2.5 \text{ fc}$ $E_{MIN VERT} = 0.5 \text{ fc}$ Uniformity Ratios Max:Min = 15:1 Avg:Min = 5:1		
Parking beneath the historic structure	Sheriff's department	$E_{MIN. HORIZ} = 0.5 \text{ fc}$ $E_{AVG HORIZ} = 2.5 \text{ fc}$ $E_{MIN VERT} = 0.5 \text{ fc}$ 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 fixtures 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.
	Areas with Enhanced Security lighting			
Parking not adjacent to historic structures	East Parking Lot	$E_{MIN. HORIZ} = 0.2 \text{ fc}$ $E_{AVG HORIZ} = 1.0 \text{ fc}$ $E_{MIN VERT} = 0.25 \text{ fc}$ 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
				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.

PATHWAYS

Pathways adjacent to Roadways leading to historic structures	Pathways to Administration Building, Hall of Justice, Post Office	$E_{AVG} = 0.5 \text{ fc}$ $E_{AVG \text{ VERT}} = 1.0 \text{ fc}$ 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	$E_{AVG} = 0.5 \text{ fc}$ $E_{AVG \text{ VERT}} = 1.0 \text{ fc}$ 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		$E_{AVG} = 0.5 \text{ fc}$ $E_{AVG \text{ VERT}} = 0.5 \text{ fc}$ Uniformity Ratio Avg:Min = 4:1	Low wattage Ceramic Metal Halide with electronic ballasts 4100K color temperature 80+ CRI	

Area Description	Example Location	Illuminance Criteria	Recommended Light Sources	Comments
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 Uniformity Ratio Max:Min = 3:1	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	

Area Description	Example Location	Illuminance Criteria	Recommended Light Sources	Comments
Water and Rock Features	Lagoon water feature	<p>Softscape and Decorative Pools E_{AVG} = 5.0 fc</p> <p>Fountains and Large natural rock features E_{AVG} = 3.0 fc</p>	<p>areas.</p> <p>3000K to 4100K color temperature 80+ CRI</p> <p>Low wattage Ceramic Metal Halide or fluorescent with electronic ballasts. Low voltage halogen may be used in special areas.</p> <p>3000K to 4100K color temperature 80+ CRI</p>	

ROADWAYS

Roadways leading to historic structures	Administration Building, Hall of Justice, Post Office	<p>Collector-Intermediate Roads E_{AVG} = 0.6 – 0.9 fc Uniformity Avg:Min = 4 to 1</p> <p>Local-Intermediate Roads E_{AVG} = 0.5 – 0.7 fc Uniformity Avg:Min = 6 to 1</p>	<p>Metal Halide with electronic ballasts</p> <p>4100K color temperature 70+ CRI</p>	
Roadways leading to transitional structures	Garage, Veterans Auditorium, Exhibition Buildings	<p>Collector-Intermediate Roads E_{AVG} = 0.6 – 0.9 fc Uniformity Avg:Min = 4 to 1</p> <p>Local-Intermediate Roads E_{AVG} = 0.5 – 0.7 fc Uniformity Avg:Min = 6 to 1</p>	<p>Metal Halide with electronic ballasts</p> <p>4100K color temperature 70+ CRI</p>	

Area Description	Example Location	Illuminance Criteria	Recommended Light Sources	Comments
Security access ramps	Ramp to rear of County Jail	Local Intermediate Roads $E_{AVG} = 0.5 - 0.7 \text{ fc}$ Uniformity Avg:Min = 6 to 1	Metal Halide or Fluorescent with electronic ballasts 4100K color temperature 70+ CRI	
Existing Bikeways alongside roadways		$E_{AVG} = 10 \text{ fc}$ $E_{AVG \text{ VERT}} = 20 \text{ fc}$	Metal Halide with electronic ballasts 4100K color temperature 70+ CRI	
Existing Bikeways distant from roadways		$E_{AVG} = 5 \text{ fc}$ $E_{AVG \text{ VERT}} = 5 \text{ fc}$	Metal Halide with electronic ballasts 4100K color temperature 70+ CRI	
Intersections		Major/Collector $E_{AVG} = 2.2 \text{ fc}$ Avg:Min = 3 to 1 Collector/Local $E_{AVG} = 1.6 \text{ fc}$ Avg:Min = 4 to 1 Local/Local $E_{AVG} = 1.4 \text{ fc}$ Avg:Min = 6 to 1	Metal Halide with electronic ballasts 4100K color temperature 70+ CRI	

LOADING DOCKS

At Historic Structures	Administration Building, Hall of Justice, Post Office	$E_{AVG} = 10 \text{ fc}$ $E_{AVG \text{ VERT}} = 3 \text{ fc}$	Low wattage Ceramic Metal Halide or Fluorescent with electronic ballasts 3000K color temperature 80+ CRI	
At Transitional Structures	Garage, Veterans Auditorium, Exhibition	$E_{AVG} = 10 \text{ fc}$ $E_{AVG \text{ VERT}} = 3 \text{ fc}$	Low wattage Ceramic Metal Halide or Fluorescent with	

Area Description	Example Location	Illuminance Criteria	Recommended Light Sources	Comments
	Buildings		electronic ballasts 3000K to 4100K color temperature 80+ CRI	

BUILDING ENTRIES

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 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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Area Description	Example Location	Illuminance Criteria	Recommended Light Sources	Comments
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SITE FEATURES

Historic Site Features	Spire Building Façade	Façade 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	Ceramic Metal Halide or Fluorescent with electronic ballasts 3000K color temperature 80+ CRI Ceramic Metal Halide with electronic ballasts 3000K color temperature 80+ CRI	
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NEW AREAS

Area Description	Example Location	Illuminance Criteria	Recommended Light Sources	Comments
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NEW PARKING AREAS

Parking immediately adjacent to historic structures		<p>$E_{MIN. HORIZ} = 0.2 \text{ fc}$ $E_{AVG HORIZ} = 1.0 \text{ fc}$ $E_{MIN VERT} = 0.25 \text{ fc}$</p> <p>Uniformity Ratios Max:Min = 15:1 Avg:Min = 5:1</p>	<p>Low wattage Ceramic Metal Halide with electronic ballasts</p> <p>4100K color temperature 80+ CRI</p>	<p>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>
Parking not adjacent to historic structures		<p>$E_{MIN. HORIZ} = 0.2 \text{ fc}$ $E_{AVG HORIZ} = 1.0 \text{ fc}$ $E_{MIN VERT} = 0.25 \text{ fc}$</p> <p>Uniformity Ratios Max:Min = 15:1 Avg:Min = 5:1</p>	<p>Metal Halide with electronic ballasts</p> <p>4100K color temperature 70+ CRI</p>	<p>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.</p>
Parking Garages		<p>Basic Areas $E_{MIN. HORIZ} = 1.0 \text{ fc}$ $E_{AVG HORIZ} = 5.0 \text{ fc}$ Max:Min = 10:1 $E_{MIN VERT} = 0.5 \text{ fc}$</p>	<p>Low wattage Ceramic Metal Halide or Linear Fluorescent with electronic ballasts</p>	<p>Fixture with low glare characteristics such that direct view of light source is avoided.</p>

Area Description	Example Location	Illuminance Criteria	Recommended Light Sources	Comments
		Ramps - Daytime E _{MIN. HORIZ} = 2.0 fc E _{MIN VERT} = 1.0 fc	4100K color temperature 80+ CRI	
		Ramps - Nighttime E _{MIN. HORIZ} = 1.0 fc E _{MIN VERT} = 0.5 fc		
		Entrance Areas - Day E _{MIN. HORIZ} = 50.0 fc E _{MIN VERT} = 25.0 fc (includes daylight)		
		Entrance Areas - Night E _{MIN. HORIZ} = 1.0 fc E _{MIN VERT} = 0.5 fc		
		Stairways E _{MIN. HORIZ} = 2.0 fc E _{MIN VERT} = 1.0 fc		

NEW PATHWAYS

Pathways adjacent to Roadways leading to historic structures		E _{AVG} = 0.5 fc E _{AVG VERT} = 1.0 fc	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		E _{AVG} = 0.5 fc E _{AVG VERT} = 1.0 fc	Low wattage Ceramic Metal Halide with electronic ballasts	

Area Description	Example Location	Illuminance Criteria	Recommended Light Sources	Comments
<p>structures</p> <p>Pathways adjacent to Roadways leading to new structures</p> <p>Pathways distant from Roadways and adjacent to Parking Lots</p> <p>New Feature Pathways</p>		<p>$E_{AVG} = 0.5 \text{ fc}$ $E_{AVG \text{ VERT}} = 1.0 \text{ fc}$</p> <p>$E_{AVG} = 0.5 \text{ fc}$ $E_{AVG \text{ VERT}} = 0.5 \text{ fc}$</p> <p>$E_{AVG} = 1.0 \text{ fc}$ $E_{AVG \text{ VERT}} = 1.0 \text{ fc}$</p>	<p>4100K color temperature 80+ CRI</p> <p>Low wattage Ceramic Metal Halide with electronic ballasts</p> <p>4100K color temperature 80+ CRI</p> <p>Low wattage Ceramic Metal Halide with electronic ballasts</p> <p>4100K color temperature 80+ CRI</p> <p>Low wattage Ceramic Metal Halide or Fluorescent with electronic ballasts</p> <p>4100K color temperature 80+ CRI</p>	<p>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.</p>

Area Description	Example Location	Illuminance Criteria	Recommended Light Sources	Comments
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NEW RECREATION AREAS

Parks or Playground		$E_{AVG} = 3.0-5.0$ fc	Low wattage Ceramic Metal Halide or Fluorescent with electronic ballasts 3000K color temperature 80+ CRI	
Gardens		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 areas. 3000K color temperature 80+ CRI	
Water and Rock Features		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 areas. 3000K color temperature 80+ CRI	

NEW ROADWAYS

Roadways leading to historic structures	Administration Building, Hall of Justice, U.S. Post Office	Collector-Intermediate Roads $E_{AVG} = 0.6 - 0.8$ fc Uniformity	Metal Halide with electronic ballasts	
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Area Description	Example Location	Illuminance Criteria	Recommended Light Sources	Comments
Roadways leading to transitional structures	Garage, Veterans' Memorial Auditorium, Exhibit Hall	Avg:Min = 4 to 1 Local Intermediate Roads $E_{AVG} = 0.5 - 0.7$ fc Uniformity Avg:Min = 6 to 1 Collector-Intermediate Roads $E_{AVG} = 0.6 - 0.8$ fc Uniformity Avg:Min = 4 to 1 Local Intermediate Roads $E_{AVG} = 0.5 - 0.7$ fc Uniformity Avg:Min = 6 to 1	4100K color temperature 70+ CRI Metal Halide with electronic ballasts 4100K color temperature 70+ CRI	
Roadways leading to new structures		Collector-Intermediate Roads $E_{AVG} = 0.6 - 0.8$ fc Uniformity Avg:Min = 4 to 1 Local Intermediate Roads $E_{AVG} = 0.5 - 0.7$ fc Uniformity Avg:Min = 6 to 1	Metal Halide with electronic ballasts 4100K color temperature 70+ CRI	
Security access ramps		Local Intermediate Roads $E_{AVG} = 0.5 - 0.7$ fc Uniformity Avg:Min = 6 to 1	Metal Halide or Fluorescent with electronic ballasts 4100K color temperature 70+ CRI	
New Bikeways alongside roadways		$E_{AVG} = 10$ fc $E_{AVG VERT} = 20$ fc	Metal Halide with electronic ballasts 4100K color temperature	

Area Description	Example Location	Illuminance Criteria	Recommended Light Sources	Comments
New Bikeways distant from roadways		$E_{AVG} = 5 \text{ fc}$ $E_{AVG \text{ VERT}} = 5 \text{ fc}$	70+ CRI Metal Halide with electronic ballasts 4100K color temperature 70+ CRI	

NEW LOADING DOCKS

At New Structures		$E_{AVG} = 10 \text{ fc}$ $E_{AVG \text{ VERT}} = 3 \text{ fc}$	Low wattage Ceramic Metal Halide or Fluorescent with electronic ballasts 4100K color temperature 80+ CRI	Provide shielded light fixtures.
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NEW BUILDING ENTRIES

Building Entries		Active Entries $E_{AVG} = 5 \text{ fc}$ Inactive Entries $E_{AVG} = 3 \text{ fc}$ Prominent Structures $E_{AVG} = 3.0 \text{ fc}$ Building Surrounds $E_{AVG} = 0.6 \text{ fc}$	Low wattage Ceramic Metal Halide or Fluorescent with electronic ballasts 3000K color temperature 80+ CRI	
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NEW SIGNAGE

New wayfinding signage		Large Focal Points w/graphics $E_{AVG} = 10\text{-}30 \text{ fc}$ Small Focal Points w/graphics $E_{AVG} = 20\text{-}50 \text{ fc}$	Low wattage Ceramic Metal Halide or Fluorescent with electronic ballasts 3000K color temperature 80+ CRI	
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Area Description	Example Location	Illuminance Criteria	Recommended Light Sources	Comments
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NEW SITE FEATURES

Site Features		<p>Façade Floodlighting: Light Surfaces $E_{AVG} = 5-10$ fc</p> <p>Med. Surfaces $E_{AVG} = 10-15$ fc</p> <p>Dark Surfaces $E_{AVG} = 15-20$ fc</p> <p>Large Focal Points $E_{AVG} = 10$ fc</p> <p>Small Focal Points $E_{AVG} = 20$ fc</p>	<p>Ceramic Metal Halide or Fluorescent with electronic ballasts</p> <p>3000K color temperature 80+ CRI</p> <p>Ceramic Metal Halide with electronic ballasts</p> <p>3000K color temperature 80+ CRI</p>	
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