CITY OF Alameda

STREET, PARKING LOT, AND PATHWAY

LIGHTING DESIGN GUIDE

February 1, 2022

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1 PURPOSE

1.0 PURPOSE

The purpose of the Street, Parking Lot, and Pathway Lighting Design Guide is to present a standard to aid the public and private for designing future lighting installations. This guide provides recommended light levels and design practices for various roadway, public parking lot, and City park pathway situations. Values given here are for standard scenarios and need to be confirmed on a case by case basis.

For streets within City of Alameda that are classified as "Caltrans," Caltrans standards are to be used. Standards based on values and recommendations from the American National Standard Practice for Roadway Lighting, ANSI/IES RP-8-2014.

Street, Parking Lot, and Pathway Design Guide was originally prepared by Salas O'Brien for City of Alameda, August 2018.

2 GENERAL TECHNICAL INFORMATION AND DEFINITIONS

2.1 ADAPTIVE LIGHTING

Roadway lighting is designed to meet standard light levels for peak traffic conditions that may occur. These conditions include traffic volumes, presence of pedestrians, and ambient light levels. Adaptive lighting is a controls system that can be installed to automatically adjust lighting to meet changes in these conditions. This in turn may help to reduce energy consumption and minimize light pollution.

2.2 BIKEWAY

Any path of travel that is specifically designated for bike travel, regardless of if the path of travel is exclusive to bikes or shared with other modes of transportation.

2.3 CLASSIFICATION – PAVEMENT

Pavement classification is to be used in photometric modeling of illuminance. Below are the typical classes. Refer to Section 3.2. Class R3 is the typical pavement in the City of Alameda.

Class	Q0[1]	Description	Mode of Reflectance
R1	0.1	Portland cement concrete road surface. Minimum 12% of the aggregates composed of artificial brightener aggregates.	Mostly Diffuse
R2	0.07	Asphalt road surface with an aggregate composed of a minimum 60% gravel (size greater than 1cm.) Asphalt road surface with 10 to 15% artificial brightener in aggregate mix.	Mixed
R3	0.07	Asphalt road surface with dark aggregates; rough texture after some months of use (typical highways).	Slightly Specular
R4	0.08	Asphalt road surface with very smooth texture.	Mostly Specular

Table 1: Pavement Classifications

[1] Values from IES RP-8-14.

2 GENERAL TECHNICAL INFORMATION AND DEFINITIONS

2.4 CLASSIFICATION – PEDESTRIAN CONFLICT AREA

Pedestrian conflict areas are areas where pedestrian activity abutting a street occurs or can occur. These classifications, along with the area of conflict, are used to determine the illuminance values for such areas, including crosswalks and walkways.

Classification	Pedestrians per Hour	Examples
High	100 or more	Downtown retail areas, near theaters, concert halls, stadiums, transit terminals.
Medium	1 to 100	Downtown office areas, blocks with libraries, apartments, neighborhood shopping, industrial, parks, streets with transit lines.
Low	10 or fewer	Suburban streets with single family dwellings, low density residential developments, rural and semi-rural areas.

Table 2: Pedestrian Conflict Area Classifications

2.5 CLASSIFICATION – ROADWAY

Roadway classifications are to be used to determine which illuminance value to meet. See Appendix 4.1 for a map of existing City of Alameda roadway classifications.

Major	Principal network for through-traffic flow, typically known as arterials, thoroughfares, and preferentials. Primarily serve through traffic and secondarily provide access to abutting property.
Collector	Roadways servicing traffic between major and local streets. Mainly used for traffic movements within residential, commercial, and industrial areas; used for truck and bus movement, and give direct service to abutting properties.
Local	Primarily used for direct access to residential, commercial, industrial, or other abutting property.

Table 3: Roadway Classifications

2.6 COLOR TEMPERATURE

Color temperature is a value measured in degrees of Kelvin used to describe the appearance of light emitted from a lamp or light bulb.

2 GENERAL TECHNICAL INFORMATION AND DEFINITIONS

2.7 DARK SKY

Dark Sky refers to a lighting movement for reducing light pollution. International Dark Sky Association (IDA) is a non-profit organization that has been creating recommendations for outdoor lighting. Their requirements include:

- Always choose fully shielded fixtures that emit no light upward.
- Use "warm-white" or filtered LEDs (Color Temperature < 3000K; S/P ratio < 1.2) to minimize blue emission.
- Look for products with adaptive controls like dimmers, timers, and motion sensors.
- Consider dimming or turning off the lights during overnight hours.
- Avoid the temptation to over-light because of the higher luminous efficiency of LEDs.
- Only light the exact space and in the amount required for tasks.

2.8 GLARE

Glare, as it is commonly known, is divided into two types, disability glare and discomfort glare. Disability glare results in reduced visual performance and visibility while discomfort glare produces a sense of annoyance and/or pain. Veiling illuminance, a measure of disability glare, should be taken into consideration when developing and reviewing lighting designs. Refer to the values given in the Design Requirements.

2.9 HISTORIC STREET LIGHTS

1,297 street lights are deemed architecturally and historically significant by the Historical Advisory Board. The distinguished history of electric street lighting in Alameda is embodied in these post-top and pendant style street lights. The locations by type are included in Appendix 4.2. The complete Historic Monument Report is available upon request. Modification or movement of these lights requires Historical Advisory Board review. This designation of significance applies to the street lights, not the roadway or area.

2.10 LIGHT LOSS FACTORS

Light loss factors are a multitude of factors that reduce the light output of a fixture. Two factors to be considered are Lamp Lumen Depreciation and Luminaire Dirt Depreciation. Lamp Lumen Depreciation (LLD) is the reduction of light output due to the age of the lamp. This value is typically provided by the manufacturer and varies depending on both manufacturer and lamp type. Luminaire Dirt Depreciation (LDD) is the reduction of light output due to the accumulation of dirt and other particles on the luminaire. This value is based on the location of installation for the luminaire and can be reduced with proper luminaire maintenance and cleaning. Refer to the values given in the Design Requirements.

2.11 LIGHTING ZONES

A lighting zone is a term used to categorize an area based on the base or ambient light levels of that area. Part 6 of Title 24 (California Building Standards Code) characterizes each zone based on 2010 U.S. Census data. As the City of Alameda is considered urban by the U.S. Census data, Lighting Zone 3 (LZ3) shall be used during design unless otherwise specified.

2 GENERAL TECHNICAL INFORMATION AND DEFINITIONS

2.12 LUMINAIRE CLASSIFICATIONS SYSTEM (LCS)

The Luminaire Classification System described in IES TM-15-11, Luminaire Classification System for Outdoor Luminaires, defines the distribution of light from a luminaire within three primary solid angles, Back Light, Uplight, and Forward Light or Glare. This three-angle system is also known as the BUG (Backlight, Uplight, Glare) rating. These areas are further divided into a total of 10 secondary solid angles.

Bug ratings for luminaires shall meet Title 24 Part 6 and Part 11 standards.

Primary Angle	Secondary Angle	Abbreviation
Back Light	Very High	BVH
	High	BH
	Mid	BM
	Low	BL
Uplight	High	UH
	Low	UL
Glare (Forward Light)	Very High	FVH
	High	FH
	Mid	FM
	Low	FL

Table 4: BUG Rating Abbreviations

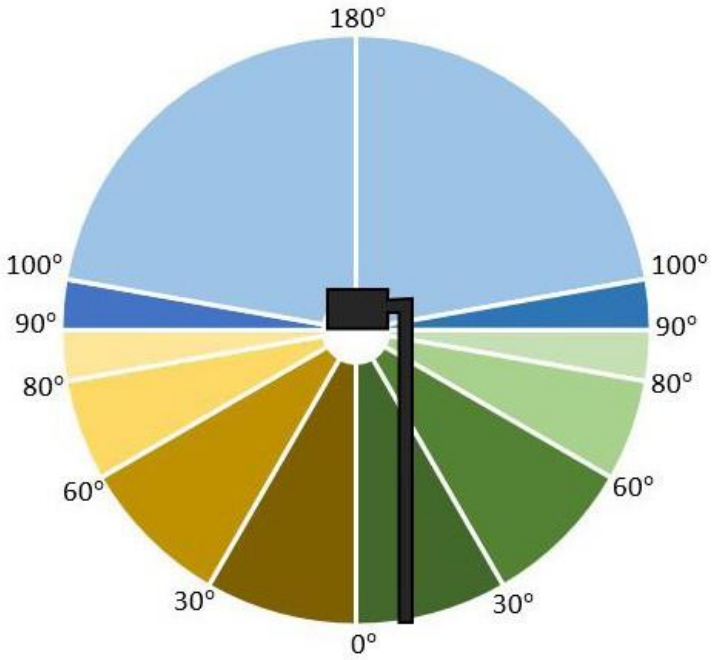

Figure 1: BUG Rating Angles

2 GENERAL TECHNICAL INFORMATION AND DEFINITIONS

2.13 MESOPIC LIGHT LEVELS

Mesopic light is a combination of light that falls between photopic (day vision) and scotopic (night vision) ranges. The rated lumens of luminaires are based on the photopic range of light. Luminance values from the mesopic range are required for streets that have a speed limit of 25 miles per hour or less. Per IES RP-8, a mesopic adjustment factor shall be used in conjunction with IES TM-12-12 to adjust the rated lumens of a luminaire from the photopic range to the mesopic range.

2.14 PEDESTRIAN WAY

A public way for pedestrian traffic not necessarily in vehicular traffic right-of-way. This includes sidewalks and walkways.

2.15 UNIFORMITY

Uniformity is a ratio between the maximum and minimum or average and minimum illuminance values that should be met. The closer the ratio gets to one (1), the more even the light distribution is in the measured area.

3 DESIGN REQUIREMENTS

3.0 DESIGN REQUIREMENTS

These design guides are to be followed for all modifications to roadway, parking lot, and pathway, lighting, including parks. Design guides are provided for replacement of existing lights and for new installation of lights. All new City roadways, parking lots, and pathways are to include lighting that meet these requirements unless specifically deemed unnecessary by the City of Alameda.

3.1 TARGET ILLUMINANCE VALUES

The following information is based on recommendations from the 2014 edition of ANSI/IES RP-8, Roadway Lighting. The values listed are for average maintained illuminance with the light loss factor included. Field measured values shall meet the average values within 10% of calculated values.

Designed values shall be within 5% of required values with no point below minimum values. In the tables below, illuminance values are recorded at pavement level unless specified and the following formulas are used for the ratios:

- Average Uniformity Ratio = Average Illuminance / Minimum Illuminance
- Max Uniformity Ratio = Maximum Illuminance / Minimum Illuminance
- Max Veiling Luminance Ratio = Maximum Veiling Illuminance / Average Illuminance
- Average Horizontal Uniformity Ratio = Average Horizontal Illuminance / Minimum Horizontal Illuminance

Values from IES RP-8 are in cd/m2 and have been converted to illuminance values for ease of verification. Pavement classification has been accounted for during conversion.

For streets within the City of Alameda that are classified as Caltrans, Caltrans standards are to be used.

A. Roadway Lighting

Roadway Classification	Pedestrian Conflict Area Classification	Average Illuminance Class R3 lux (fc)	Average Uniformity Ratio	Max Uniformity Ratio	Max Veiling Illuminance Ratio
Major	High	18 (1.8)	3.0	5.0	0.3
	Medium	13.5 (1.35)	3.0	5.0	0.3
	Low	9 (0.9)	3.5	6.0	0.3
Collector	High	12 (1.2)	3.0	5.0	0.4
	Medium	9 (0.9)	3.5	6.0	0.4
	Low	6 (0.6)	4.0	8.0	0.4
Local	High	9 (0.9)	6.0	10.0	0.4
	Medium	7.5 (0.75)	6.0	10.0	0.4
	Low	4.5 (0.45)	6.0	10.0	0.4

Table 5: Roadway Illuminance Values

3 DESIGN REQUIREMENTS

Intersecting Street Classifications	Average Maintained Illumination at Pavement by Pedestrian Conflict Area Classification lux (fc)			Max Uniformity Ratio
	High	Medium	Low	
Major/Major	34.0 (3.4)	26.0 (2.6)	18.0 (1.8)	3.0
Major/Collector	29.0 (2.9)	22.0 (2.2)	15.0 (1.5)	3.0
Major/Local	26.0 (2.6)	20.0 (2.0)	13.0 (1.3)	3.0
Collector/Collector	24.0 (2.4)	18.0 (1.8)	12.0 (1.2)	4.0
Collector/Local	21.0 (2.1)	16.0 (1.6)	10.0 (1.0)	4.0
Local/Local	18.0 (1.8)	14.0 (1.4)	8.0 (0.8)	6.0

Table 6: Roadway Intersection Illuminance Values

B. Pedestrian Way and Bikeway Lighting

Pedestrian Conflict Area Classification	Area of Conflict	Average Horizontal Illuminance lux (fc)	Minimum Vertical Illuminance at 1.5m/5ft lux (fc)	Average Horizontal Uniformity Ratio
High	Mixed Vehicle and Pedestrian	20.0 (2.0)	10.0 (1.0)	4.0
	Pedestrian Only	10.0 (1.0)	5.0 (0.5)	4.0
Medium	All Pedestrian Areas	5.0 (0.5)	2.0 (0.2)	4.0
Low	Low Density Residential (Less than 2 dwelling units per acre)	3.0 (0.3)	0.8 (0.08)	6.0
	Medium Density Residential (2-6 dwelling units per acre)	4.0 (0.4)	1.0 (0.1)	4.0

Table 7: Pedestrian Way and Bikeway Illuminance Values

C. Public Park Lot Lighting

	Minimum Horizontal Illuminance lux (fc)	Minimum Vertical Illuminance at 1.5m/5ft lux (fc)	Max Uniformity Ratio
Non-Residential	20 (2.0)	5 (0.5)	15.0
Residential	5 (0.5)	2.5 (0.25)	15.0

Table 8: Public Parking Lot Illuminance Values[2]

D. City Park Pathway Lighting

	Average Horizontal Illuminance lux (fc)
Pedestrian Way or Bikeway[3]	5 (0.5)

Table 9: City Park Pathway Illuminance Values

[2] Refer to Alameda Code of Ordinance 30-7.17 for additional requirements.

[3] When designing for such pathways, the following must be properly accounted for and may increase the illuminance value above those in the table: activity levels and tasks that will take place along the pathway, such as stairs, surface reflectance of pathway, accenting in place of or in addition to light fixtures.

3 DESIGN REQUIREMENTS

3.2 LIGHT LEVEL CALCULATION REQUIREMENTS

Light level calculations shall be done using a point by point calculation grid. The calculation grid requirements are as follows:

- Streets: Two (2) points per lane, 10' on center.
- Intersections: Points 10' on center, include all light fixtures contributing to the intersection.
- Sidewalks 10' Wide: Two (2) points, 5' on center, 2.5' from edges.
- Sidewalks 15' Wide: Three (3) points, 5' on center, 2.5' from edges.

A summary chart shall also be provided with the calculations showing all the required values have been met. The chart shall also include light fixture type and height. Calculation zones shall be provided for each area requiring different target illuminance values.

Design Parameters, Typical:

- Pavement Class: R3
- Luminaire Dirt Depreciation: 0.85

Acceptable software for use in calculating light levels includes, but is not limited to: AGI, Autolux, DIALux, LitePro, or Visual.

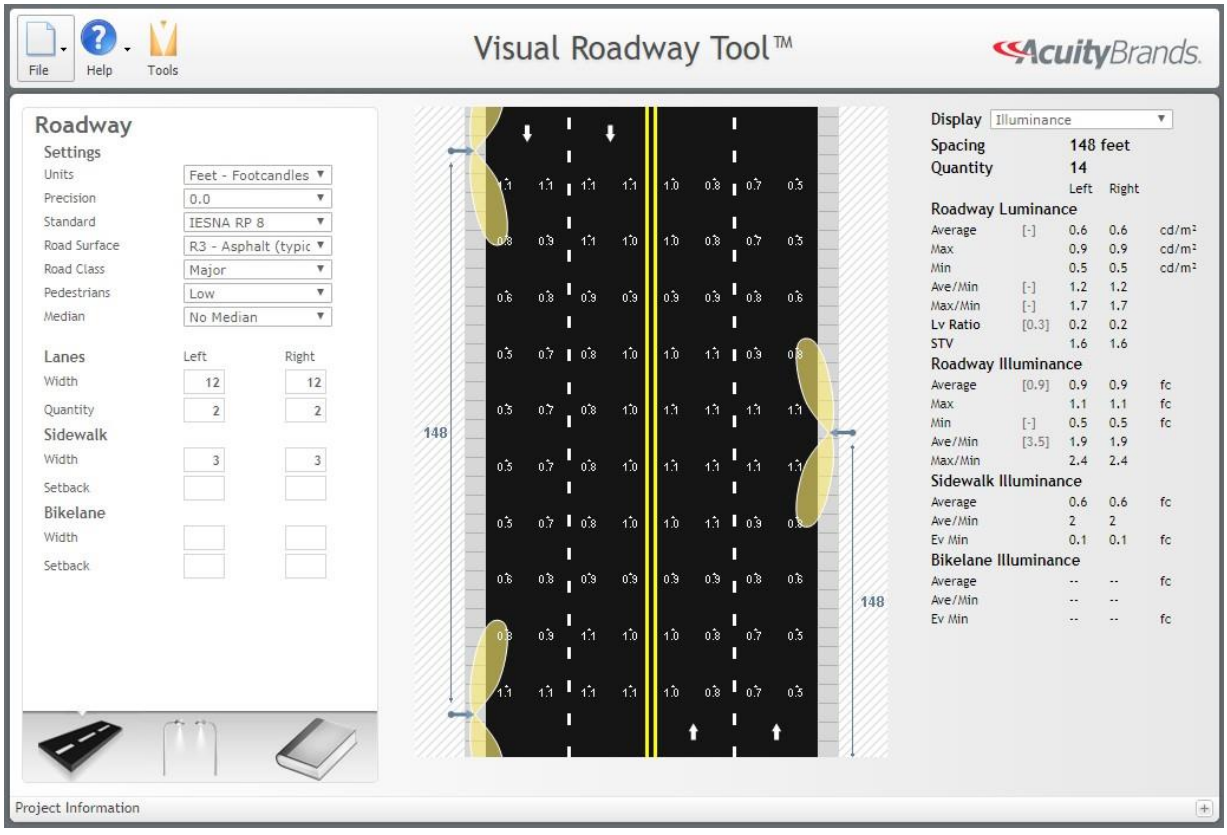

Figure 2: Example Usage of Visual Roadway Tool

3 DESIGN REQUIREMENTS

3.3 LIGHTING REPLACEMENT DESIGN GUIDE

Purpose

The purpose of this section is to present a guide for lighting design where there are existing installations, and where existing light levels will be maintained.

Design Plans

Design plans shall include the following:

1. Project title sheet indicating project location.
2. A list including quantity, wattage, and fixture type for all existing and proposed new lights within project area.
3. Include or reference all applicable City of Alameda standard detail drawings for light installation conforming to the most current standard details.
4. Lighting layout plans including:
    a. Existing/new utilities within the public right of way.
    b. Locations of points of electric service (AMP service).
    c. Locations of all lights within project limits.
    d. Locations of existing and proposed trees.
    e. Locations of centralized light service pedestals or enclosures.
    f. Routing of designated circuits to all light locations.
5. Single line diagram that identifies light service distribution from point of service to each light circuit and light controls.
6. Calculations showing voltage drop does not exceed 3% of nominal voltage from start of service to end of circuit.
7. Photometric calculation as described below.
8. Temporary lighting plan as described below, including photometric calculations, if planned disruption will last more than 14 days.

Lighting Layout and Photometric Calculation

1. Determine illuminance and uniformity of existing lighting installation. Value may be determined by photometric calculations or by measuring using an illuminance meter. Confirm lights are not located in designated historic areas. Refer to Section 2.9.
2. Develop a model for a general section of area to be lit, making sure to match existing fixture locations, a model for crosswalks with all applicable pedestrian conflict classifications, and a model of each type of applicable intersection.
3. Tailor the model to the specifics of the area, like driveways, existing or planned foliage/trees that may affect light levels, or any special areas that have differing illuminance requirements.
4. Using mesopic multipliers, adjust the lumens of the luminaires using IES TM-12 if the street has a speed limit of 25 miles per hour or less.
5. Ensure illuminance and uniformity requirements are met, including the light loss factor using the lamp lumen depreciation factor from the manufacturer and a luminaire dirt depreciation factor

3 DESIGN REQUIREMENTS

3.4 LIGHTING NEW INSTALLATION DESIGN GUIDE

Purpose

The purpose of this section is to present a guide for lighting installations for new developments, for new City park pathway lighting, or for where existing light levels will not be maintained.

Design Plans

Design plans shall include the following:

1. Project title sheet indicating project location.
2. A list including quantity, wattage, and fixture type for all existing and proposed new lights within project area.
3. Include or reference all applicable City of Alameda standard detail drawings for light installation conforming to the most current standard details.
4. Lighting layout plans including:
    a. Existing/new utilities within the public right of way.
    b. Locations of points of electric service (AMP service).
    c. Locations of all lights within project limits.
    d. Locations of existing and proposed trees.
    e. Locations of centralized light service pedestals or enclosures.
    f. Routing of designated circuits to all light locations.
5. Single line diagram that identifies light service distribution from point of service to each light circuit and light controls.
6. Calculations showing voltage drop does not exceed 3% of nominal voltage from start of service to end of circuit.
7. Photometric calculation as described below.
8. Temporary lighting plan as described below, including photometric calculations, if planned disruption will last more than 14 days.

Lighting Layout and Photometric Calculation

1. Determine classification and pedestrian activity and conflict areas using the map provided in Appendix 4.1. Confirm lights are not located in designated historic areas. Refer to Section 2.9.
2. Determine illuminance and uniformity requirements based on the tables in Section 3.1.
3. Develop a model for a general section of area to be lit, a model for crosswalks with all applicable pedestrian conflict classifications, and a model of each type of applicable intersection.
4. Tailor the model to the specifics of the area, like driveways, existing or planned foliage/trees that may affect light levels, or any special areas that have differing illuminance requirements.
5. Using mesopic multipliers, adjust the lumens of the luminaires using IES TM-12 if the street has a speed limit of 25 miles per hour or less.
6. Ensure illuminance and uniformity requirements are met, including the light loss factor using the lamp lumen depreciation factor from the manufacturer and the luminaire dirt depreciation factor.

3 DESIGN REQUIREMENTS

3.5 TEMPORARY LIGHTING REQUIREMENTS

All existing lights shall remain in operation at all times until final connections are made unless specifically instructed by City. For projects that require disconnection or removal of existing lights and will affect continuous operation of lights for one (1) or more days, temporary lighting will be required.

- If anticipated light disruption is 14 days or less, temporary light towers may be used. Project plans shall include construction note to provide light towers.
- If anticipated light disruption is more than 14 days, temporary lighting plan is required to provide uninterruptable light service.

3.6 DARK SKY CONSIDERATIONS

New installs and upgrades must consider Dark Sky recommendations and where feasible, comply. 3,000K or less will be specified for new fixtures and all remaining LED upgrades. Given the number of existing decorative and historic fixtures, fixtures with no up light will be difficult to comply with. The City will work to minimize up light to the extent feasible. The 4,000K LED fixtures installed by Alameda Municipal Power in 2015 will be replaced with 3,000K at the end of their useful life.

The City is actively pursuing funding for adaptive controls for public street and park pathway lighting, which will allow dimming during specified hours.

Alameda Point

Alameda Point is subject to strict lighting restrictions imposed by the United States Fish and Wildlife Service (FWS) for the protection of the endangered California Least Tern, which nests at Alameda Point each summer. FWS restrictions for portions of the Alameda Point site prohibit any up-light to be produced by luminaires to protect the adjacent Tern colony. To ensure that common luminaires can be used on the current and future phases for aesthetic continuity, it was decided to only use Dark Sky compliant luminaires across the entirety of Alameda Point.

On July 25, 2016, the Planning Board approved the street light designs for West Atlantic, which is a gateway into Alameda Point and Alameda Point side streets. The Schreder Hestia with Oleron Pole was approved for West Atlantic Avenue. The Luminis Eclipse Maxi was approved for second side streets.

3 DESIGN REQUIREMENTS

3.7 MATERIAL REQUIREMENTS

Conduit

1. Street lighting conduits to be Schedule 40 PVC.
2. Pathway lighting conduits to be Schedule 40 PVC.

Controls

1. Streetlights to have a 7-pin photocell.

Fuse

1. For street lighting, install a 30A, in-line, water tight, fuseholder with a per manufacturer recommended fuse for each streetlight in the adjacent pullbox.

Light Poles

1. Aluminum.
2. Where coloring is required, pole to be powder coated.

Luminaire

Luminaires to conform to the following:

1. Lamp Type: LED.
2. Color Temperature: 3,000K.
3. Minimum Color Rendering Index: 70.
4. Lumen Maintenance Life per TM-21, L_{70} : > 60,000 hours reported.
5. BUG Rating: Minimum per California Green Building Code Table 5.106.8. All roadway and parking fixtures to have uplight values of U0. Only areas with pre-existing decorative luminaires may have uplight values greater than U0[4].
6. IP Rating: 66.
7. Driver Lifetime: 100,000 hours.
8. Dimming: 0-10V Driver to be provided with all fixtures.

Pullboxes

1. Minimum size of 10” wide x 17” long x 18” deep.
2. Pullbox lid to be bolt-down, all grip with penta head bolts.
2. Pullbox to be H20 traffic rated concrete with metal lid in all drive areas and concrete with concrete lid in all other areas.
    a. Drive areas: Christy B1017, Jensen HT1017, or approved equal.
    b. Other areas: Christy N09, Jensen HN1017, or approved equal.

[4] Refer to Section 3.6.

Receptacles (Pole Mounted)

Receptacles to conform to the following:

1. 20A, NEMA 5-20R.
2. GFCI with diagnostic indicator for mis-wiring.
3. Weather resistant.
4. NEMA 3R, while-in-use, metallic cover with a maximum 3-1/4 inch internal depth. Red Dot CKMUV or approved equal.
5. For receptacles on light poles, install a 30A, in-line, water tight, fuseholder with a 15A fuse for each streetlight in pole.

Wiring

1. Wire to be THWN.
2. Wires to be sized for a maximum voltage drop of 3%.

Service Pedestal

1. Streetlight circuits to be controlled by a service pedestal. Seek City guidance on whether the metered or unmetered.

APPENDICES

4.1 STREET CLASSIFICATIONS MAP

Legend

Street Lighting Classification, as defined in IES RP-8-14

- CALTRANS
- MAJOR
- COLLECTOR
- LOCAL

MAIN ST
W RED LINE AV
MOSLEY AV
WEBSTER TUBE
POSEY TUBE
MONARCH
W MIDWAY AV
SINGLETON AV
WILLIE STARGELL
W TOWER AV
MAIN ST
ORION
WEBSTER
CONSTITUTION
ATLANTIC AV
PACIFIC AV
LINCOLN AV
WEBSTER
W HORNET AV
CENTRAL AV
GRAND
LINCOLN AV
PARK ST
TILDEN WY
GRAND
ENCINAL AV
OTIS DR
BROADWAY
HIGH ST
OTIS DR
PARK ST
OTIS DR
HIGH ST
ISLAND DR
HARBOR BAY PKWY
MECARTNEY
HARBOR BAY PKWY

Bay Farm Island

4.2 EXCERPT FROM HISTORIC MONUMENT NOMINATION REPORT SHOWING LOCATIONS

VI. LOCATIONS OF SIGNIFICANT STREETLIGHTS IN ALAMEDA, CALIFORNIA

Post-top globe lights (Total: 103)

Quantity	Date	Location
17	ca. 1912	Bay (San Antonio to sea wall)
8	ca. 1912	Caroline (San Antonio to sea wall)
5	ca. 1912	Dayton Avenue (Grand to Palmera)
3	ca. 1922	Doris Court
2	ca. 1925	Grace Court
9	ca. 1912	Hawthorne
2	ca. 1924	Lewelling Court
2	ca. 1920	Marion Court
1	ca. 1912	Morton (South of San Jose)
8	ca. 1913	Palmera Court
11	ca. 1912	St. Charles (San Antonio to sea wall)
15	ca. 1916	Sterling
7	ca. 1912	Weber (San Antonio to Sea Wall)
3	?	McKinley Park
10	?	Washington Park

Post Top Trident (Total: 1)

1	ca. 1917	St. Margaret Court

16-Fluted Post Top (Total: 76)

Quantity	Date	Location
1	1939	Fernside Marina (Cornell)
2	1939	" " (Harvard)
3	1939	" " (Cambridge)
2	1939	" " (Versailles)
17	1939	" " (Marina)
16	1939	" " (Windsor)
7	1941	Woodstock (Cypress)
3	1941	" (Main)
8	1941	" (Second)
10	1941	" (Footpaths)
4	?	Central Substation (Eagle)
1	?	" " (Minturn)
2	?	" " (Grand)

Concrete Post Top (Total: 1)

1	?	Hoover Court

16-Fluted Pendant (Total: 675)*

36	1939	Broadway (Otis to Santa Clara)
122	1948	Buena Vista (Webster to Park)
75*	1941	Central (Webster to Chestnut)
80	1947	Central (Chestnut to High)
108*	1947	Encinal (Sherman to Fernside)
3	1939	Gibbons (Central to Santa Clara)
33	1949	High (Encinal to Fernside)
15	1948	Lincoln (Fifth to Webster)
12	1949	Lincoln (Webster to Eighth)
7*	1949	Marshall Way
2	1947	Morton (Encinal to Central)
16	1948	Pacific (Central to Fourth)
6	?	Park Street (Clement to Blanding)
160	1939	Santa Clara (Webster to High)

*Including DOUBLE PENDANTS

1	1941	Central and Encinal
11	1947	Encinal Esplanade
2	1949	Marshall and Pacific

Octo-Fluted Pendant (Total: 236)

Quantity	Date	Location
13	1954	Buena Vista (Tilden to Versailles)
1	ca.1953	Calhoun (High to Post)
2	ca.1953	Court (Calhoun to Fillmore)
16	1953	Eastshore (Central to Fernside)
1	ca.1953	Fillmore (Court to High)
2	ca.1953	Central (Fernside to Eastshore)
3	ca.1953	Constance Circle
19	1952	High (Otis to Encinal)
3	ca.1953	Liberty (Fernside to Eastshore)
7	1954	Morton (San Jose to Encinal)
14	1954	Ninth (San Antonio to Santa Clara)
5	ca.1953	Oak (Santa Clara to Lincoln)
6	ca.1953	Post (Otis to Washington)
27	1954	San Antonio (Ninth to Morton)
91	1954	San Jose (Morton to High)
1	ca.1953	Toyon Terrace
25	1954	Versailles (Central to Fernside)

Smooth-Pole Pendants (Total: 205)

Quantity	Date	Location
2	1955	Fifth (Lincoln to Pacific)
14	1956	Sixth (Central to Pacific)
4	ca.1956	Alameda (Oak to Park)
9	1957	Broadway (Santa Clara to Buena Vista)
4	1955	Central (Lincoln to Third)
23	1957	Central (Fourth to Webster)
7	1956/58	Eastshore (Encinal to Meyers)
4	1958	Encinal (Fernside to Eastshore)
8	1956/57	Everett (Central to Lincoln)
9	ca.1956	Hansen
1	ca.1956	Janis Circle
21	1957	Lincoln (Park to Versailles)
1	ca.1956	Meyers
10	ca.1956	Oak (Santa Clara to Encinal)
21	ca.1956	Pacific (Fourth to Webster)
11	1957	Pearl (Central to Buena Vista)
31	1956	Santa Clara (Third to Webster)
20	ca.1956	Tilden Way
5	ca.1956	Webb (Park to Everett)

4.3 REVISION LOG

4 APPENDICES

Revision Log

Description	Date
Initial Release	09/07/2018
Remove certain details and update others. Updated minimum 5 A fuse in box to per manufacturer recommended fuse size. Update material requirement from Sched 80 to Sched 40. Removed minimum wire size requirements. Removed requirements for pathway lights to have a programmable time clock in a service enclosure. Update wire to THWN. Add requirement for service pedestal.	03/06/2020
Update detail SL11 to include new custom base	12/01/20
Removed Standard Details in Appendix. These are now published on City website and should not be in two locations. Current standards can be found here: https://www.alamedaca.gov/files/content/public/departments/public-works-department/coa_standardplans_dec2021.pdf	2/11/22