4.1.10 STREETLIGHT REQUIREMENTS

A. General Requirements

1. Developers of residential, commercial, industrial or other types of properties are responsible for the design and installation of street lighting on all streets within and adjacent to their sites in accordance with these standards.

2. Streetlight plans and details shall be included with the improvement plans and shall be submitted for review by the City.

3. Streetlight design and construction plans shall be prepared and sealed by a licensed professional engineer registered in the State of Arizona.

4. Illumination design shall follow the Recommended Practice for Design and Maintenance of Roadway and Parking Facility Lighting, Illuminating Engineering Society, ANSI/IES RP-8.

B. Street Light Equipment

1. All new streetlights shall use Light Emitting Diode (LED) lighting fixtures with a correlated color temperature (CCT) of 3,000° K. LED luminaires shall be bronze except in areas where existing galvanized light poles are used. Gray luminaires shall be installed in those locations. All new LED luminaires shall be on the City's Approved Products List or an approved equal conforming to the City's specifications included in Section J. Luminaires not on the Approved Products List must be approved by the Streetlight Section of the Engineering Department.

2. All luminaires shall have a fail-off 7-pin photoelectric cell (PEC) rated for 20-year life.

3. All new streetlight poles and mast arms shall be square and bronze in color. Refer to City of Goodyear Standard Details G-3250-1 through G-3250-3 for square light pole and mast arm requirements. If new light poles are installed where existing round galvanized poles are in place, then round galvanized poles in accordance with City of Goodyear Standard Details G-3250-4 and G-3250-5 shall be installed at those locations.

4. All new streetlight poles installed on arterial and collector streets shall be on a concrete foundation. New streetlight poles on local streets shall be direct bury type.

5. Underground streetlight equipment shall conform to current Arizona Public Service (APS) standards.

C. Street Light Design Guidelines

1. Continuous lighting is required for all streets within the City except for areas designated as "Lighting Zone 1" pursuant to Article 10 of the Goodyear Zoning Ordinance. Refer to Section E for street lighting requirements in Dark Sky areas.

2. Illumination design for streets with continuous lighting shall follow the Recommended Practice for Design and Maintenance of Roadway and Parking Facility Lighting, Illuminating Engineering Society, ANSI/IES RP-8 for streets with a low pedestrian area classification. All photometric calculations shall be for maintained values using a light loss factor (LLF) of 0.85. At the City's discretion, higher lighting levels may be required on a case-by-case basis based on land use type, pedestrian activity, safety and/or security concerns.

3. Streets with medians shall have dual mast arm light poles installed within the median. If a street that will upon completion have a median, but the street is only partially constructed and the median is not completed, then the streetlights shall be designed as alternating along the outside. This situation occurs when a development constructs its half-street improvements, but the median cannot be completed until the development on the other side of the street completes its half-street improvements.

4. Streetlight layouts, lumen outputs, mounting heights and typical spacings are shown in Table 4.1.2 for each roadway classification. Note that these pole spacings are typical. Actual spacings shall be determined based on photometric calculations.

5. The public streetlight system shall be installed in the right-of-way unless right-of-way is not available. Where right-of-way is not available and where an easement allows for streetlight equipment, the engineer may design equipment within the easement with approval from the City Engineer.

6. Streetlights shall be located approximately 1-foot back of sidewalk where the sidewalk abuts the curb. Where the sidewalk is detached to create a landscaped area, streetlights shall be located approximately 4-feet back of the curb. The intent is to keep obstructions, including streetlights, out of the sidewalk.

7. In areas where standard vertical curb, roll curb or sidewalk do not exist, all poles shall be centered at least ten (10) feet from the edge of asphalt pavement.

8. There shall be a minimum seven (7) feet of clearance between streetlight poles, fire hydrants, and city water services facilities. Three (3) feet of

clearance is required for service taps (water/sewer) and two (2) feet of clearance is required from storm drains and city sewer facilities.

9. Streetlight poles shall be located a minimum distance of six (6) feet from driveways. If the driveway has a wing, streetlight poles must be located a minimum distance of six (6) feet from the wing.

10. In cases where the required locations for streetlights conflict with underground or overhead utilities, streetlights may be set back a minimum of two (2) feet back of curb. However, any setback deviation must be approved by the Engineering Department, Streetlight Section.

11. Street lights shall not be installed within fifty (50) feet of a traffic signal pole that is illuminated.

12. When new traffic signal poles with luminaires are installed, existing streetlights within fifty (50) feet of the new traffic signal pole shall be removed.

13. Streetlight layout and design shall include existing and known future streetlight location information for all streets adjacent to and across from the proposed development.

14. New streetlight circuits shall be installed underground unless otherwise approved by the Engineer.

15. Once the right-of-way permit is issued, adherence to streetlight locations is expected. Exceptions may be granted for shifts up to five (5) feet parallel to the roadway when underground obstructions are encountered upon the written approval of Engineering Inspector. Shifts in streetlight placement shall not interfere with a driveway.

16. Street surfaces in cul-de-sacs shall be illuminated to the same standards as local streets.

17. Streetlight design at roundabout intersections shall follow the Illuminating Engineering Society (IES) Recommended Practice for Design and Maintenance of Roadway and Parking Facility Lighting (RP-8).

18. When proposed streetlights are near an airport runway, the Developer shall provide all necessary pole height clearance calculations to meet FAA criteria for review by COG Street Lighting staff.

TABLE 4.1.2 – Standard Street Light Design

STREET TYPE	MINIMUM LUMINAIRE LUMENS	ARM LENGTH (FT)	MOUNTING HEIGHT (FT)	SPACING[1] MAX (FT)	POLE LAYOUT
SQUARE BRONZE LIGHT POLES[2]					
PEDESTRIAN	3,900	2	15	75	SINGLE-SIDED
LOCAL STREET	4,900	2	25	200	SINGLE-SIDED
MINOR COLLECTOR	7,800	4	28	300	DOUBLE-SIDED STAGGERED
MAJOR COLLECTOR	7,800	8	36	250	MEDIAN
MAJOR COLLECTOR	7,800	8	36	250	DOUBLE-SIDED STAGGERED
MINOR ARTERIAL	11,000	8	40	225	MEDIAN
MINOR ARTERIAL	11,000	8	40	250	DOUBLE-SIDED STAGGERED
MAJOR/SCENIC ARTERIAL	11,000	8	40	200	MEDIAN
MAJOR/SCENIC ARTERIAL	11,000	8	40	200	DOUBLE-SIDED STAGGERED
ROUND GALVANIZED LIGHT POLES[3]					
LOCAL STREET	4,900	6	26	200	SINGLE-SIDED
MINOR COLLECTOR	7,800	6	33	300	DOUBLE-SIDED STAGGERED
MAJOR COLLECTOR	7,800	6	33	250	DOUBLE-SIDED STAGGERED
MINOR ARTERIAL	11,000	6	33	250	DOUBLE-SIDED STAGGERED
MAJOR/SCENIC ARTERIAL	11,000	6	33	200	DOUBLE-SIDED STAGGERED

1. Spacing is along one side of the road. The distance between alternating consecutive poles is half of this spacing.
2. All new streetlight installations shall use square bronze light poles.
3. Round galvanized poles shall only be installed where existing round galvanized poles are in place.

D. Intersection Lighting

1. Intersections of continuously illuminated streets shall be illuminated in accordance with the pavement illuminance criteria for full intersection lighting set forth in the Recommended Practice for Design and Maintenance of Roadway and Parking Facility Lighting, Illuminating Engineering Society, ANSI/IES RP-8 for streets with a low pedestrian area classification. At the City's discretion, higher lighting levels may be required on a case-by-case basis based on land use type, pedestrian activity, safety and/or security concerns.

2. Isolated intersections on streets without continuous lighting shall be illuminated in accordance with the pavement illuminance criteria for partial (isolated) intersection lighting set forth in the Recommended Practice for Design and Maintenance of Roadway and Parking Facility Lighting, Illuminating Engineering Society, ANSI/IES RP-8. At the City's discretion, higher lighting levels may be required on a case-by-case basis based on land use type, pedestrian activity, safety and/or security concerns.

3. Luminaires at intersections shall be installed on traffic signal equipment when feasible. If no traffic signal exists, the street lights shall be placed in such a manner that the traffic signal can be installed at a later date with no interruption of street light service.

4. Streetlight equipment (poles and luminaire arms) at unsignalized intersections shall match the equipment on the intersecting streets.

5. Luminaires used for illuminating intersections shall be on the City's Approved Products List. Additional luminaires or higher/lower lumen output luminaires than the street classifications may be required to meet intersection light levels. For example, arterial street luminaires may be needed on intersecting collector streets to meet the recommended light level.

E. Dark Sky Streetlight Design

1. Dark Sky street lighting design may apply in areas designated as "Lighting Zone 1" pursuant to Article 10 of the Goodyear Zoning Ordinance.

2. In areas where Dark Sky street lighting design is applicable, continuous streetlighting is not required; only intersections are required to be illuminated.

3. Intersections in Dark Sky areas shall be illuminated in accordance with the pavement illuminance criteria for partial (isolated) intersection lighting set forth in the Recommended Practice for Design and Maintenance of Roadway and Parking Facility Lighting, Illuminating Engineering Society, ANSI/IES RP-8. At the City's discretion, higher lighting levels may be required on a

case-by-case basis based on land use type, pedestrian activity, safety and/or security concerns.

4. Street lighting design in Dark Sky areas shall follow all requirements within Section 4.1.10 of this Manual except for the requirements for continuous street lighting.

F. Bridge Specifications

1. This section applies to poles and luminaires installed on all bridge decks regardless of utility service area. Bridge mounted pole details and specifications are provided by APS.

2. The lighting designer shall coordinate with bridge structural engineer to design foundations for the light poles on the structure. See streetlight pole specifications for design criteria.

3. A cast in place junction box is required within three (3) feet of each pole mounted on a bridge.

4. Conduit between junction boxes on a bridge shall be a minimum of 2.5 inches in diameter.

5. Streetlight pole spacing on bridges shall be meet lighting criteria set forth in the Design Guidelines section.

6. The Engineer shall provide details showing the installation of expansion couplings in bridge abutments and expansion joints.

G. Developer Responsibility

1. Developers of residential subdivisions, apartments, condominiums, commercial, industrial projects, and all permitees are responsible for the design, materials, and installation costs of all street lighting on public streets within and adjacent to their project.

2. The Developer shall pay all City permit fees.

3. Design conflicts shall be resolved by the Developer to the satisfaction of the electrical utility company and City of Goodyear. It shall be Developer's responsibility to coordinate conflict resolution with electric utility company facilities, including vertical clearances without compromise to the uniformity in the lighting design.

4. APS Specific Requirements – All costs for streetlight installation including construction and energization are to be addressed in a streetlight construction contract between the Developer and APS.

5. The Developer shall be financially responsible for the installation and maintenance of the street lights for a two-year service term during the two-year warranty period.

H. Streetlight Plan Requirements

1. The streetlight design shall be submitted on E size sheets (24 inches by 36 inches). Plans shall be prepared so the north is to the top or right side of the sheet. The scale for the streetlight plan shall be 1-inch equals 20 feet or 1-inch equals 40 feet. See Plan Review requirement for electronic submittal.

2. Computerized photometric lighting calculations are required with all plan submissions. Calculations shall be in accordance with the American National Standard Practice for Roadway Lighting, Illuminating Engineering Society of North America, IES RP-8, current edition. Submittals shall include the following information:

   a. Luminaire manufacturer and model number

   b. Luminaire mounting height

   c. Luminaire arm length

   d. Light pole station and offset

   e. Light loss factor

   f. Clear description of calculation zones

   g. Average maintained horizontal luminance for straight, flat roadways with no turn lanes

   h. Average maintained horizontal illuminance for curved roadways and roadway segments with turn lanes

   i. Average to minimum uniformity ratio

   j. Maximum to minimum uniformity ratio

   k. Maximum Veiling Luminance Ratio

   l. Calculation grid with iso-illuminance contour lines

3. Design line characteristics are as follows:

   a. Solid medium for proposed street improvements

b. Light and/or dashed for existing street improvements

c. Bold for streetlight system design

4. Label specific locations, sizes, and dimension from the center line and/or monument line along with the following:

   a. Existing and proposed underground utilities

   b. Existing and proposed overhead utilities

   c. Face of curb

   d. Width of sidewalk

   e. Width of any PUE

   f. Edge of right-of-way

   g. Edge of pavement

5. Public street lighting plans shall show luminaire and streetlight pole type including assigned street number.

6. Streetlights shall be shown on all roadway right-of-way adjacent to private developments.

7. Information needed on each set of plans:

   a. Vicinity Map

   b. Legend

   c. Construction Notes

   d. Streetlight Notes

   e. General Notes as Required

   f. Project Number/Kiva number, SDEV Number, CSPR Number, Project Title and Address, if applicable (36-point minimum font)

   g. Blue Stake Caution Label

   h. Quantities List

i. City Project Number, if applicable

j. Utility provider

8. On local, collector and arterial streets, all existing and/or proposed driveways and ADA ramps shall be shown on the streetlight plans

9. The Developer shall provide additional details of any items not covered by COG standard details requested by the City Engineer.

10. Private streetlights should be labeled in the streetlight plans per APS Standards.

11. Pole numbering is provided by APS.

12. All streetlight poles and equipment shall be shown on streetlight plans with station and offset dimension.

13. Streetlight general notes shall be included on the streetlight plans. See General Notes in Section H.

I. Streetlight Plan General Notes

The following information is provided to emphasize critical work and is intended to supplement the specifications. Should there be a conflict with the specifications, this document shall take precedence.

1. The Contractor shall comply with State and City statutes and ordinances and manufacturer's recommendations.

2. The Electrical Contractor shall comply with all licensing requirements set forth by the State Registrar of Contractor's office to perform work relating to streetlight installation in City of Goodyear right-of-way.

3. Prior to submitting a proposal, the bidder shall examine all general construction drawings and visit the construction site to become familiar with existing conditions under which they will operate and which will in any way affect the work under the contract. No subsequent allowance will be made in this connection in the behalf of the Contractor for any error or negligence on his part.

4. Prior to ordering any materials or doing any work, the Contractor should verify dimensions at the site, immediately report differences to the City Engineer or his/her designee and should not proceed with work until the City Engineer or his/her designee renders a decision.

5. The submittal package shall consist of three (3) copies of equipment/material to be installed and shall be bound/stapled in a folder and submitted at the time of permit application.

6. Alternate products shall be pre-approved by the City Engineer. Approval of alternate products shall be on an equal basis with the product specified and shall be submitted a minimum of ten (10) days prior to bid opening. Structural calculations shall be furnished for alternate products and certified by a structural engineer, registered in the State of Arizona. Luminaires shall meet or exceed the photometric, electrical, and mechanical requirements for the specified products.

7. The Contractor shall contact the APS inspector identified on the APS construction drawing for a pre-construction meeting prior to any excavation.

8. Light poles shall be installed plumb in two (2) directions, ninety (90) degrees apart, be adjusted to provide proper alignment to the roadway being lighted and be properly grounded when the installation is completed. Damaged paint or coatings shall be repaired to the City Engineer or his/her designee's satisfaction.

9. Light poles shall be installed per APS Standard Details and the City of Goodyear Engineering and Design Standards Policy Manual.

10. Direct buried poles shall be set in a twelve (12) inch augured hole, depth per plans, in undisturbed earth. Pole shall be set plumb in two directions 90 degrees apart. Hand tamping of ABC backfill with pneumatic or vibrating equipment is the acceptable method of compaction. Backfill shall be compacted to 90% of maximum density as defined by ASTM D-2922 and D-3017.

11. The direct buried portion of pole shall be coated with Valspar VM 355 coal tar epoxy 28 mils of thick wet, 20 mils of thick dry. After epoxy has dried conformally half lap pole with corrosion resistant 10 mil rubber tape. This tape shall be uniform and without folds, wrinkles or gaps.

12. Foundations for base mounted light poles shall be in conformance with City of Goodyear Standard Detail G-3250-7.

13. Streetlights are inspected by the utility company and by City of Goodyear. When accepted and energized, the utility company will install a streetlight number on each pole.

14. A minimum clearance of seven (7) feet must be provided to fire hydrants.

15. Luminaires shall be installed level and include a photocell. The luminaires shall be free of dust, dirt or anything that would impair the output of the light. Adjust photocell to face north.

16. Surplus excavation shall be disposed of by the Contractor.

17. Conduit shall be UL rated, suitable for underground use and shall be installed per APS requirements. Coordinate with APS for conduit size, type and routing.

18. Install #14/2 Cu with 14 Cu ground Type UF-B, 90°C, 600V cable in 1" Car Flex conduit from the pole to the junction box.

19. Install #14/2 Cu with 14 Cu ground Type UF-B, 90°C, 600V cable in pole from handhole to luminaire. Provide 12-inches of slack for termination.

20. Install Buchanan 65U breakaway in-line fused streetlight kit; 12-6 AWG, 600 Volt in pole handhole for each underground conductor. Leave minimum of 12-inches of slack in conductors for servicing the fuses and fuse holders outside the pole.

21. Install laminated plastic nameplate on pole to read "SERVICE DISCONNECT LOCATED INSIDE HANDHOLE". Fasten nameplate with self-tapping stainless-steel screws.

22. Install bare #6 solid Cu grounding electrode conductor from pole ground lug to ground rod and attach. Make sure the connection to the ground lug and to the ground rod is tight and solid.

23. Install underground junction box and ground rod provided by APS, per APS Detail 8655-8657. APS will install fusing in j-box. APS requires city inspection and clearance prior to service connection.

24. Before digging or driving ground rod, be sure to call Blue Stake to get underground facilities located. See Section 100, paragraph 100.12 of the APS service requirements manual. If ground rod cannot be driven, an alternate grounding method shall be used. See APS Details 2449 thru 2460 for alternative grounding methods.

25. Excavation for pull boxes and material specifications shall be per the electric utility company standards.

26. Trenches shall be installed per serving utility company standards. See Section 600 in the APS Service Manual for trenching requirements. The use of a common electric utility company trench is permitted.

27. An APS construction print must be used as a trenching reference. Trenching variations must have written APS CSR approval. Follow details for construction. Variations in trench route may result in a redesign fee payable by the Contractor.

28. It is the Contractor's responsibility to contact the utility company for coordination of the trenching and the installation of conduit. All trenching and conduit shall be inspected by APS. Do not backfill until inspected.

29. The Contractor is responsible for the integrity of all conduits until APS has installed conductors.

30. It is the Contractor's responsibility to restore all property, landscaping, paving and driveways that are disturbed during streetlight construction to their original condition in conformance with MAG Specification Section 107.9.

31. The Contractor will coordinate with APS and City of Goodyear for de-energizing of streetlight conductor.

32. The Contractor is responsible for verifying vertical and horizontal clearances to existing overhead lines and poles when placing new streetlights.

33. Prior to acceptance, the Developer shall energize and operate the entire roadway lighting system, from sunset to sunrise for three (3) consecutive days without interruption or failure. If a luminaire should fail, it shall be immediately replaced. The Developer shall be responsible for furnishing all personnel and equipment to successfully perform this test.

34. Acceptance of the completed improvements will not be given until 4 mil photo mylar reproducible "as built" plans have been submitted to and approved by the City Engineer or his/her designee. All pole numbers shall be recorded on the as-builts.

35. The Contractor shall guarantee all work for a period of two (2) years from the date of final acceptance by the City Engineer or his/her designee against imperfect workmanship, failure, malfunction of materials and/or equipment due to faulty or imperfect workmanship. This guarantee is to be in writing to the City at the time of issuing final acceptance. Materials and workmanship found to be defective within the warranty period shall be replaced without cost to the City.

36. The Developer shall be financially responsible for the cost of operation and maintenance of the street lights through the completion of the two (2) year warranty period. Fees for the operational costs of the lights will be collected during the permitting process.

37. The Contractor shall provide to the City a ten-year manufacturer's warranty for the LED luminaires (fixtures only).

J. LED Luminaire Requirements

1. General Requirements - The luminaire shall be a fully integrated assembly and shall comply with the measurement, performance and safety standards listed below.

a. The entire fixture including internal components and as a whole unit shall be either Underwriters Laboratories (UL) certified, Canadian Standards Association (CSA) international certified or equivalent.

b. The luminaire shall be listed and labeled by a Nationally Recognized Testing Laboratory (NRTL) as being in compliance with UL 1598 and suitable for use in wet locations.

c. The luminaire shall be in compliance with the following UL standards (latest approved):

1. 8750 Light Emitting Diode (LED) Light Sources for Use in Lighting Products

2. 1012 Power Units other than Class 2

3. 2108 Low Voltage Lighting Systems

d. The luminaire shall start and operate in an ambient temperature range of -40°C to 50°C. The In-SITU Temperature Measurement Test (ISTMT) laboratory must be approved by OSHA as a NRTL, must be qualified, verified and recognized through the U.S. Department of Energy (DOE) CALiPER program, or must be recognized through UL's Data Acceptance Program.

e. The light sources and drivers shall be Restriction of Hazardous Substances (RoHS) compliant.

f. The luminaire shall have an International Electrotechnical Commission (IEC) 529 Ingress Protection (IP) rating of IP 66 or greater for the optical assemblies of the luminaire.

g. The power supply shall meet or exceed Federal Communications Commission (FCC) 47 Part 15/18 to achieve consumer interference emission limits.

h. The power supply shall have a minimum Class A sound rating per ANSI Standard C63.4.

i. The luminaire shall follow American National Standards Institute (ANSI) C78.377.2011 – Specifications for the Chromaticity of Solid-State Lighting Products.

j. The luminaire shall be tested according to Illuminating Engineering Society of North America (IESNA) LM-79-08 - IESNA Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products.

k. The luminaire shall have lumen maintenance measured in accordance with IESNA LM-80-08 – IESNA Approved Method: Measuring Lumen Maintenance of LED Lighting Sources.

l. The luminaire shall have long term lumen maintenance documented according to IESNA TM-21-11 – Projecting Long Term Lumen Maintenance (LM) of LED Light Sources.

m. The luminaire shall have LM-79 testing conducted by a National Voluntary Laboratory Accreditation Program (NVLAP) accredited lab or a lab that is qualified, verified and recognized through DOE's CALiPER program.

n. The luminaire shall be classified in accordance with IESNA TM-15-07 Luminaire Classification System for Outdoor Luminaires, Addendum A: Backlight, Uplight and Glare (BUG) ratings.

2. LED Luminaire Housing Requirements:

a. The luminaire housing shall be constructed of cast aluminum housing with a corrosive resistant powder coat finish in gray or dark bronze. No parts shall be polycarbonate. The surface treatment shall withstand a minimum of 3,000 hours for salt and fog condition in accordance with testing performed per ASTM Standard B117.

b. All hardware on the exterior of the housing including cover and latch shall be stainless steel, zinc, or steel with zinc alloy electroplate and chromate top coat.

c. A die-cast trigger latch or stainless-steel tool-less screw on the door frame shall allow for tool-less entry and enable easy and secure opening with one hand.

d. The door assembly shall have a safety latch to prevent the door from falling when opening.

e. The luminaire shall have readily accessible internal parts.

f. The driver must be internally mounted, easily accessible, replaceable and thermally separated from the optical compartment.

g. The luminaire shall mount on nominal 2 inch (2 3/8 OD) horizontal tenon.

h. Two and four bolt mounting must provide 3G vibration rating per American Standards Institute and Institute of Electrical and Electronics Engineers (IEEE) C136.31.

i. The mounting assembly shall permit ±5 degrees adjustment for leveling in a minimum of 5 steps.

j. The luminaire shall have an integrated bubble level.

k. The luminaire housing shall have passive cooling fins integrated as part of the housing for heat dissipation (no vents, internal fans or moving parts) and be designed for water shedding and to be self-cleaning.

l. The luminaire shall have field installable and manufacture installed options for house side light shields.

m. The luminaire shall not weigh more than 35 pounds when fully assembled and installed.

n. The luminaire shall have an effective projected area of no more than 1.2 square feet (when viewed from either side or either end).

o. The luminaire shall have a 7-prong twist-lock photo-electric control receptacle (PECR) in accordance with ANSI C136.41-2013. The driver dimming leads shall be wired to prongs four and five. The PECR shall be rotatable up to 359 degrees. Housing shall provide 360 degree stop to prevent the internal twisting of PECR wire assemblies resulting in potential electrical short. The PECR shall be connected to the same voltage as the luminaire.

p. The luminaire shall be labeled internally and externally in accordance with ANSI C136.15.

3. LED Luminaire Electrical Requirements:

a. The power supply shall fully operate in a temperature range no less than -20º C to 50° C.

b. The electronic driver shall have the following:

1. Rated life of 100,000 hours based on thermal data for the driver case temperature in the luminaire at a 25°C ambient temperature.

2. Input voltage of 120 to 277 volt at 60 Hz.

3. Output frequency >120 to avoid visible flicker.

4. A power factor of 0.90 or greater at full load.

5. A total harmonic distortion of 20% or less at full load.

6. Thermal overload protection.

7. Self-limited short circuit protected and over load protected.

8. Electrical components that are protected per ANSI/IEEE Standard C62.41, for Category C (10kv/5ka) applications. The transient suppressor is not required to be RoHS compliant.

9. Driver case shall meet Ingress Protection (IP) 66 standards.

10. Capable of 0-10V dimming.

11. Terminated with quick disconnect wire harnesses for easy maintenance. Wire nut termination is not acceptable.

12. A terminal block for terminating pole wiring to the luminaire that will accommodate #6 thru #18 American Wire Gauge (AWG) pole wire.

4. LED Performance Requirements:

a. The luminaire shall meet the chromaticity requirements as follows:

1. The standard color for the LED luminaire shall be white. The colors shall conform to the color regions based on the 1931 International Commission on Illumination (CIE) chromaticity diagram.

2. Nominal Correlated Color Temperature of 3,000K ± 300K

b. The luminaire shall have a minimum luminaire efficacy of 85 lumens/watt.

c. The luminaire shall have a minimum Color Rendering Index (CRI) of 70.

d. The Lumen Maintenance Life (L70) from the TM-21 Report must not be below 82% or L82 at 70,000 hours at 25°C ambient for the 3,000K and 4,000K luminaires.

e. The luminaire shall have an IESNA Backlight, Uplight and Glare (BUG) rating as follows:

    1. Backlight rating shall not exceed 3.

    2. Uplight rating shall not exceed 0.

    3. Glare rating shall not exceed 3.