

SECTION 26 56 00 - EXTERIOR LIGHTING

PART I - GENERAL

1.1 RELATED DOCUMENTS

- A. *Drawing 26 56 00-1 – Street Light Installation*
- B. *Drawing 26 56 00-2 – Pedestrian Area Light Installation*
- C. *Drawing 26 56 00-3 – Parking Lot Light Installation*
- D. *Drawing 26 56 00-4 – Campus Lighting Control Schematic*

1.2 REFERENCE STANDARDS

- A. Illumination Engineering Society of North America (IESNA) – Lighting Handbook
- B. American Association of State Highway and Transportation Officials (AASHTO) – Roadway Lighting Design Guide
- C. International Dark-Sky Association (IDA)

1.3 SUMMARY [NOTE TO PSC:

- A. *Illumination Levels: New outdoor lighting shall be laid out and carefully coordinated with existing adjacent surroundings. Illumination levels, quality and uniformity shall be designed to IESNA and AASHTO guidelines, taking into consideration the traffic patterns and hours of use of the area. If in doubt, the higher level traffic category shall be the basis for design. All fixtures shall be approved by F&S prior to issuing bid documents. Consideration shall be given to bi-level LED lighting systems using occupancy sensors, if deemed acceptable for the location based on security concerns.*
- B. *Exterior Building Lighting: Shall be provided at entrances and courts to supplement campus lighting and to ensure illumination of steps and building entrances. Exterior lighting shall be installed for security and safety purposes only. Decorative façade lighting, and especially uplighting, are not permitted.*
- C. *Street Lighting: Consult with the F&S Architectural Review Committee and F&S Engineering at the beginning of design for direction on which light standard to use. i.e. whether to use decorative or non-decorative style fixtures in the project plus other pertinent information on manufacturers, models and finishes. Poles shall be placed approximately 75 feet apart, or as needed to achieve target illumination. Poles shall be carefully aligned with existing adjacent installations, and set to conform to new established grades. Street lighting shall be designed to also provide adequate illumination levels on adjacent sidewalks. Refer to Drawing 26 56 00-1.*
- D. *Pedestrian Area Lighting: Average illumination levels for sidewalks shall not less than 0.5 foot-candles (higher if warranted by usage according to the IES Handbook). Refer to Drawing 26 56 00-2. Bollard type lights are not permitted. Duplicate rows of street light and pedestrian poles along the same street are not permitted.*
- E. *Parking Lot Lighting: Average illumination levels shall be not less than 0.5 foot-candles. Refer to Drawing 26 56 00-3.*
- F. *Controls: Refer to Section 26 09 23 and Drawing 26 56 00-4.]*

1.4 SUBMITTALS

- A. *[Note to PSC: PSC shall submit point-by-point calculations for exterior lighting areas with drawing review submittals. Include average horizontal and vertical foot-candle levels, uniformity ratios and lighting power density.]*

PART 2 - PRODUCTS

2.1 GENERAL

- A. Efficient: *[Note to PSC: Per the Illinois Climate Action Plan (iCAP) goals, LED systems are the standard for all exterior lighting applications. Exterior illumination shall be provided by the most efficient light source compatible with the existing area lighting, on a total life cycle cost basis.]* Incandescent and linear fluorescent sources are not permitted for exterior illumination.
- B. Vandalism: Fixtures subject to vandalism by location or elevation shall have acrylic or UV-stabilized polycarbonate lens and tamper-resistant hardware. Fixtures protected from vandalism by elevation or location may have glass lens.
- C. Dark-Sky Friendly: Fixtures shall be full cutoff (except as below). Total up-lighting levels shall not exceed that allowed under LEED credit SS-8, "Light Pollution Reduction". *[Note to PSC: Priority shall be given to replacing or upgrading existing non-cutoff lighting during program development, especially in sensitive areas such as near the Observatory, campus residences and sensitive agricultural research.]*
- D. Voltage: Operating voltage of exterior lighting systems shall be limited to 480 volts or less.
- E. All Exterior lighting to be reviewed and approved by the F&S Architectural Review Committee.

2.2 EXTERIOR BUILDING LIGHTING

- A. Fixtures shall be full cutoff, wall pack or recessed canopy type. If used for egress lighting, locate any batteries remotely in a heated space.

2.3 STREET LIGHTS

- A. Decorative:
 - 1. Pole: Sternberg # 9234ARTF
 - 2. Luminaire: Sternberg # 1914 Libertyville
- B. Non-decorative
 - 1. Pole: Round black powder-coat steel with davit arm.
 - 2. Luminaire: Black powder-coat full cutoff LED cobra head, GE Evolve LED Scalable ERS3, Black, 4000k, or approved equal.
- C. *[Note to PSC: Contact F&S Engineering to establish further details such as banner arms, receptacles, etc. that may be needed on each project.]*
- D. Each pole shall be individually fused, with an in-line fuse located in the pole base.
- E. Provide a ground rod for all poles.

2.4 PEDESTRIAN AREAS – HISTORIC DISTRICT

- A. Pole shall be direct embed pre-stressed concrete, octagonal with black aggregate finish.
 - 1. StressCrete # KBC14-G-E11-DB -or-
 - 2. Ameron # VEK-04-SPL (6P3A).
 - 3. No other manufacturers will be accepted.
- B. Luminaire shall be octagonal lantern, with opaque polycarbonate lens with matching capital fitter and finial.
 - 1. Sternberg #MS805BLED, textured Black, 3500k -or- approved equal.
- C. Each pole shall be individually fused, with an in-line fuse located in the pole base.

D. Provide a ground rod for all poles.

2.5 PEDESTRIAN AREAS – GENERAL LIGHTING

- A. Pole shall be 4" straight round aluminum, 14' height, powder coated smooth black, surface mounted to a concrete foundation raised 8" above finish grade, or approved equal.
- B. Luminaire shall be Eaton (Cooper) InVue Mesa, 4000k, MSA-LED-E1, black in color, or approved equal.

2.6 PEDESTRIAN AREAS – HOUSING STANDARD LIGHTING

- A. Pole shall be 4" straight round aluminum, 12' height, powder coated smooth grey, surface mounted to a concrete foundation raised 8" above finish grade, or approved equal.
- B. Luminaire shall be Eaton (Cooper) InVue Mesa, 4000k, MSA-LED-E1, grey in color, or approved equal.

2.7 PARKING LOTS

- A. Two sizes of standard poles and fixtures may be used. Consult with F&S prior to design. 39 ft. poles shall be round tapered steel, 10 in. to 3.8 in., black. 16 ft poles to be round straight aluminum, 5 in., anodized black. Manufacturer: Lithonia, Cree, Gardco or approved equal.. *[Note to PSC: Contact Owner in regard to the Capital Project Brand Name Policy.]*
- B. Luminaires for 39 ft poles to be architectural grade LED area light with acrylic lens, 4000k, black painted aluminum, full cutoff with either one or two fixtures per pole as necessary. Manufacturer to be one of the following, or approved equal:
 - 1. Lithonia, D-Series, Size 2
 - 2. Cree, ARE-EDG-4M-DA-12 Series
 - 3. Gardco, Ecoform with mast arm fitter
- C. Luminaires for 16 ft poles to be architectural grade LED area light with acrylic lens, 4000k, black painted aluminum, full cutoff with either one or two fixtures per pole as necessary. Manufacturer to be one of the following, or approved equal:
 - 1. Lithonia, D-Series, Size 0
 - 2. Cree, ARE-EDG-3M-DA-06-E Series
 - 3. Gardco, Ecoform
- D. Fixtures to include a pole mounted motion sensor that dims the fixture to 30% power when no movement is detected. Each fixture shall include a bi-level control that when activated, overrides the motion sensor to maintain full light output. Fixtures shall include transient voltage surge suppressor, one fuse, and a NEMA twist lock receptacle, (no control).
- E. Luminaires shall be arm or spider mounted round cylindrical cutoff fixture.
- F. Each pole shall be individually fused, with an in-line fuse located in the pole base.
- G. Provide a ground rod for all poles.

2.8 LAMPS

- A. Color temperature shall not exceed 4500K, and shall be coordinated with the existing adjacent area lighting.
- B. All fixtures shall use vertical mounted lamps wherever possible.
- C. Lamps shall be low mercury type and shall pass all federal TCLP (Toxicity Characteristic Leaching Procedure) test requirements at the time of manufacture.
- D. LED Lamps shall be field replaceable modules. Non-repairable fixtures shall not be used.

2.9 BALLASTS AND DRIVERS

- A. LED drivers shall be field replaceable and integrated with fixture housing for thermal management. Non-repairable fixtures shall not be used.
- B. Drivers shall include a five (5) year manufacturer's warranty.

2.10 RACEWAY AND CABLE

- A. Power Supply: Power for campus lighting shall be furnished from the nearest campus building with available and accessible power. Lighting control shall be located in the building transformer room. Refer to Section 26 09 23 – Lighting Controls and Drawing 26 56 00-4, Campus Lighting Control Schematic.
- B. Under Paved Areas or Plants: Where cable is routed under paved streets, paved driveways, sidewalks, or areas with planting, a 2-inch PVC conduit shall be provided. This conduit shall have a bushing on each end and extend a minimum of 1 foot beyond the pavement or planting. This conduit shall be located a minimum of 24 inches below the concrete. If not, it shall be encased in concrete.
- C. Conduit: Campus lighting conductors shall be routed in 1-inch PVC conduit.
 - 1. Poles with concrete bases shall have the PVC conduit routed through the pole's foundation to the base of the pole.
 - 2. Poles of the tamp-in type shall have the PVC conduit routed to a below grade junction box. Underground conductors shall be routed from the below grade junction box to the base of the pole.
 - 3. The underground junction boxes shall be precast polymer concrete, sized per the National Electrical Code, have covers flush with finished grade, and have covers engraved with the word "LIGHTING".
 - 4. For all exterior lighting projects, F&S Engineering shall be consulted as to the potential of the need for additional conduit raceway capacity for the installation or future installation of electric car charging stations.
- D. Wiring Connections: Wiring connections in light standards shall be made in accordance with high quality workmanship. They shall include a thorough overall coating of insulating paint. In lieu of coating with insulating paint, connections may be made with weatherproof wire nuts. Wire nuts shall incorporate a flame resistant shell rated for 105 degrees C (221 degrees F) as well as non-hardening sealant, to completely seal out moisture, which remains stable from 140 degrees C (-40 degrees F) to 105 degrees C (221 degrees F). Wire nuts shall be UL 486C listed.

END OF SECTION 26 56 00

This section of the *U of I Facilities Standards* establishes minimum requirements only.
It should not be used as a complete specification.