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 AE:]
   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 F&S Engineering at the beginning of design for direction on whether to use decorative or non-decorative style fixtures in the project, and whether fixtures/poles will be furnished by the U of I or by Contractor. 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 AE: AE 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 AE: LED systems are preferred 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 AE: 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.

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: The following decorative street lights will be University furnished, Contractor installed:
   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 cobra head.

C. [Note to AE: 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

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 22” round globe with clear pebbled polycarbonate lens, internal cutoff louver and roto-lock fittings.
   1. King Luminaire # KG22-LAW-K15 -or-
   2. Sternberg # G22WA-828T-7PT.
   3. No other manufacturers will be accepted.

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 PARKING LOTS

A. Poles shall be octagonal, direct embed concrete. Manufacturer: StressCrete. [Note to AE: Contact Owner in regard to the Capital Project Brand Name Policy.]

B. Luminaires shall be arm or spider mounted round cylindrical cutoff fixture.
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.

2.6 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.
E. High Intensity Discharge (HID) Lamps
   1. Diffuse Coated: All lamps shall be diffuse coated.
   2. Self-Extinguishing: All metal halide lamps shall have a self-extinguishing feature to disconnect the electrical supply to the arc tube if outer glass envelope is broken. If the fixture is of the totally enclosed type, the self-extinguishing feature is not required.
   3. Compatible: HID lamps shall be of the type that is compatible with existing area lighting.
   4. Metal halide HID lamps shall be clear, unless noted otherwise, with mogul or medium bases. Double-ended lamps are not acceptable. Any base type other than medium or mogul shall be submitted for review and approval in advance. Metal halide fixtures shall be lensed or utilize a lamp (PAR type) which does not require special arc tube protection. Mogul base pulse start lamps are not acceptable.

2.7 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. All HID ballasts shall be stabilized type for various types and sizes of lamps manufactured by General Electric, Osram-Sylvania or Philips.
C. HID ballasts shall be of the pulse-start electronic type for metal halide lamps. Ballast shall start and operate the lamp at ambient temperatures ranging from minus 20 degrees F to 105 degrees F. All ballasts shall have automatic thermal protection, and high power factor, minimum of 90 percent.
D. Ballasts and drivers shall include a five (5) year manufacturer’s warranty.

2.8 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”.

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.