PART 1   GENERAL

1.01  Campus-wide Exterior Lighting Master Plan: This plan should be referenced when designing any exterior lighting on campus. Where there may or will be an overlap/apparent conflict between the Master Plan and these standards, discuss with FS Engineers/Architects.

   A. Primary building entrances to use illumination as an identification of the entrance.

1.02  Minimize light pollution.

   A. Avoid Indirect-lighting.

   B. Avoid glare and light trespass by use of sharp cutoff luminaires. Special consideration should be given to luminaires located at the top of or on hillsides to prevent glare to passersby below the hillside.

   C. Avoid light trespass by use of sharp cutoff luminaires and shields.

1.03  Exterior lighting controls. Discuss options prior to design as UAF is moving to a centralized exterior lighting control system that may not be current building control system:

   A. Control outdoor lighting circuits from a lighting contactor supervised building DDC system.

   B. Luminaires to be compatible with future UAF campus-wide exterior lighting control system. For this purpose, installed fixtures should have standard NEMA twist-lock receptacle with weather cap installed and multi level, or dimmable drivers. Where exterior luminaires are mounted on buildings consult with FS/DDC for requirements.

   C. Consider multilevel or dimming lighting controlled with motion sensors as a means of energy conservation.

1.04  Provide lighting for covered walks, stairs, canopies and ramps.

1.05  Buried wiring:

   A. Discuss with FS Maintenance whether conductors are to be in a raceway, type of raceway, or direct buried.

   B. Install detectable warning tape above conduit or buried conductors.

   C. Under roadways and/or other traffic, including pedestrian, areas: corrosion protected rigid conduit with junction box at each end. Consult with FS/DDC whether conduit is to be metal or non-metallic type.
1.06 Provide an insulated ground conductor with all circuit wiring.

1.07 Mounting and poles:

A. Luminaires and freestanding light posts of a design per Exterior Lighting Master Plan and approved by campus architect.

B. Luminaire mounting height:
   1. On buildings: not higher than 25 feet.
   2. Poles: not higher than 30 feet.

C. Fixed base type poles with four anchor bolts per pole. All anchor bolts double-nutted to facilitate pole alignment and adjustment.

D. Concrete bases shall extend a minimum of 30 inches above finished grade. Bases shall be set back a minimum of 2 feet from the edge of sidewalks or roadways to the edge of the base. These standards are intended to reduce the likelihood of damage to the poles from snow removal and grounds keeping equipment.

E. Poles round tapered or round straight aluminum. Finishes of poles anodized light grey or dark bronze (West Ridge is Dark Bronze only). Other finishes may be allowed but must be approved through the Exterior Color Selection process.

F. Grounding and bonding:
   1. All poles shall have a grounding lug capable of accepting up to a #4 AWG.
   2. Raceways, pole, base, luminaire, and other non-current-carrying parts bonded together and grounded to lug.
   3. Install supplemental ground rods as needed.

G. Provide a base plate cover concealing anchor bolts and pole base plate.

H. Provide poles with suitable hand hole at base. Minimum size 6 inch x 6 inch. Variations to be approved by FS/DDC.

I. Provide 120 volt outlet on pole as needed.

PART 2 PRODUCTS

2.01 Reference Campus-wide Exterior Lighting Master Plan. Some areas of campus such as West Ridge have an established fixture style and pole color.
2.02 Fixture types:
   A. Sharp cut-off.
   B. Optically clear, tempered glass lens, heat and impact resistant lens: Horizontal with no vertical revealed component.
   C. Install fuse and fuse holders, sized as recommended by fixture manufacturer, at base hand hole location.

2.03 Controls: Identify all equipment, components, and wiring.
   A. Control exterior lighting by DDC signal.
   B. Provide a hand-off-auto switch in exterior lighting power circuit(s).
      1. The Hand position shall bypass the DDC/Campus-wide control signal and turn "on" the lighting normally controlled by DDC.
      2. The Off position shall bypass the DDC/Campus-wide control signal and turn "off" the lighting normally controlled by DDC.
      3. The Auto position shall cause the lighting to be turned "on" and "off" by the DDC.
      4. All contactors: Mechanically held, electrically operated.

2.04 Exterior luminaires:
   A. Light sources: Light Emitting Diodes (LED)
   B. Light to be not greater than 4100 Kelvin. Lower Kelvin may be used for architectural highlighting and/or wayfinding, in accordance with Campus Exterior Lighting Master Plan.
   C. LED Driver:
      1. Dimming to be standard on all luminaires not mounted on building:
         a. 0-10V control.
         b. If 0-10V signal not present: luminaire defaults to full brightness.
      2. Constant Light Output: Automatically compensates for changes in LED lumen output over time.
      3. Multi-volt input: 120V to 277V. Note that some circuits are 480V.
4. Power factor >0.9.
5. Efficiency >90% at full load.
6. Life to equal or exceed listed life of LED components.
7. Adjustable Output Current is preferred to allow replacement of existing drivers via external component change or programmable interface.
8. End of Life Notification is preferred to alert maintenance that predicted life of LED module has been reached.

D. Sharp cut-off to reduce:
   1. Night sky light pollution.
   2. Glare from fixtures on hillsides.
   3. Illumination into interior spaces of buildings.

E. Not acceptable:
   1. Indirect lighting as a primary source of illumination.
   2. Bollard type lighting.
   3. Underground luminaires or luminaires mounted in a road, sidewalk except as specifically directed by FS/DDC.

F. Maintenance features:
   1. Toolless entry.
   2. Captive screws and fasteners.
   3. Captive ballasts.
   5. Toolless electrical connections.

G. Power:
   1. 208V feeders to include neutral for future convenience outlets.
   2. TVSS protection on each circuit.
   3. Light poles near buildings to include convenience outlets.