SECTION 265000 - LIGHTING

PART 1 - GENERAL

1.1. RELATED SECTIONS:

1.2. SCOPE OF SECTION:

This section contains the requirements for equipment and installation related to exterior, interior, and special lighting applications.

1.3  GENERAL:

A. It is the responsibility of each project to provide all security and parking lot lighting necessitated by that project.

B. New exterior lighting installations should be in character with the architecture or its surroundings. Attention should be given to established historic districts or buildings. Exterior lighting in particular must utilize fixtures that provide superior glare control according to IES (full cutoff type optics).

C. Avoid specifying incandescent lighting, especially in hard-to-reach locations.

D. For energy conservation, extended architectural lighting should be avoided.

1.4  EXTERIOR LIGHTING:

A. LAMP TYPE: On the Main Campus, exterior lighting shall be metal halide. On the Health Sciences Campus, the exterior lighting shall be high pressure sodium.

B. FIXTURES: The following indicates the fixture type, by application:

1. Pole Mounted Fixtures, Close to Buildings:
   a. Fixture shall have square shape, sharp cutoff type, with flat, tempered glass lens in a hinged aluminum frame.

   b. Mounting height shall be 12' to 18' in the vicinity of trees; otherwise, mount at 27' to 31'.

   c. On Main Campus, fixtures shall have a dark bronze anodized finish. On Health Sciences Campus, fixtures shall have a natural anodized brushed finish.

   d. Housing material shall be .188" extruded aluminum with all welds and fasteners concealed. All exposed hardware shall be of stainless steel construction.
e. Optical system is to be 90 degrees field rotatable, of homogenous sheet aluminum, electrochemically brightened and sealed.

f. On Main Campus, round tapered pole shall be aluminum dark bronze anodized finish. On Health Sciences Campus, round tapered pole shall be aluminum natural anodized brushed finish. Consult project manager if more than 2 fixtures to be mounted on pole.

g. Acceptable Manufacturers: Gardco, Kim, or Sterner.

2. Wall Mounted Fixtures, Buildings and Walls:

a. Housing material shall be die cast or extruded aluminum with all welds and fasteners concealed. All exposed hardware shall be of stainless steel construction.

b. Acceptable Manufacturers for Health Sciences Campus: Lumark; Main Campus: McPhilben or Kim.

3. Pole Mounted Fixtures, Streets and Parking:

a. Fixture shall have square shape, sharp cutoff type, with flat, tempered glass lens in a hinged aluminum frame.

b. On Main Campus, fixtures shall have a dark bronze anodized finish. On Health Sciences Campus, fixtures shall have a natural anodized brushed finish.

c. Housing material shall be .188" extruded aluminum with all welds and fasteners concealed. All exposed hardware shall be of stainless steel construction.

d. Optical system is to be 90 degrees field rotatable, of homogenous sheet aluminum, electrochemically brightened and sealed.

e. On Main Campus, round tapered pole shall be aluminum dark bronze anodized finish, 40’ nominal length. On Health Sciences Campus, round tapered pole shall be aluminum natural anodized brushed finish, 40’ nominal length. Consult project manager if more than 2 fixtures to be mounted on pole. Poles shall be rated for 100 mph wind with 1.3 gust factor (minimum).

f. Acceptable Manufacturers: Gardco, Kim, or Sterner.

C. FIXTURE MOUNTING ON POLES:
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Fixtures shall be fastened with stainless steel hardware through factory drilled holes. Field cut holes are not allowed.

D. FIXTURE MOUNTING ON WALLS:

Fixtures shall be vandal resistant and securely mounted. Plastic anchors are not allowed.

E. LIGHT LEVEL:

Minimum maintained light level shall be 2.0 footcandles in parking lots and streets. High security areas may require as much as 5.0 footcandles minimum maintained light level.

F. GROUNDING:

Pole bases shall have reinforcing steel bonded together and connected to an equipment grounding conductor at the pole on a grounding lug inside the handhole. Bond ground to the branch circuit equipment grounding conductor and to a minimum of ¾” x 10’ copper plated, steel ground rod at the bottom of each pole.

G. CONTROL FOR MAIN CAMPUS:

1. Unless otherwise noted or specified by Project Manager, all exterior lighting shall be controlled by an Astronomic type time clock with battery back up. Time clock channel(s) shall provide the 120 volt control power to energize electrically held, multi-pole, lighting contactors of various voltages.

2. Exterior lighting circuits shall be segregated and fed by different lighting contactors so as to zone the lighting to prevent complete blackout in the event of coil failure or contactor failure.

3. Time clock shall be two (2) channel type for controlling up to two different lighting circuits that operate at different hours.

4. Power to time clock shall originate from a dedicated 120 volt source.

5. Time clocks that control emergency lighting circuits shall also be powered from an emergency power source.

6. Approved Time Clock: Tork DZS-200A or equal by Paragon.

7. Building and parking lot lights should be separately controlled.
H. CONTROL FOR HEALTH SCIENCES CAMPUS:

1. Security lighting which will stay on all night should have photo-cell control; parking lot, architectural, and other lighting, which may not need to be on all night should have combination photo-cell and timer control. Time control shall be provided by the building EMCS if present. **Photo cell control should operate section of lighting from one photo cell.**

2. Exterior lighting circuits shall be segregated and fed by different lighting contactors so as to zone the lighting to prevent complete blackout in the event of coil failure or contactor failure.

3. Building and parking lot lights should be separately controlled.

1.4 INTERIOR LIGHTING:

A. FIXTURES:

1. Fixtures shall be identical to fixtures currently in use when practical. Consult with Project Manager when making selection.

2. Each fluorescent fixture shall be equipped with one or two ballast. Fixtures may not be tandem wired.

B. LAMPS:

1. Fluorescent lamps shall be Low Mercury “Green Tip” T8 fluorescent lamps with 4100 K color temperature, minimum Color Rendering Index (CRI) of 85.

2. Fluorescent lamps shall have rated life of 20,000 hours with rapid start ballast and 15,000 hours with instant start ballast. Instant start ballast shall be used only where lighting remains on continuously such as egress lighting.

3. Acceptable Manufacturers: Lamps shall be equal to Phillips TL80.

C. BALLASTS:

1. Ballasts shall be electronic, high frequency (at least 20 khz), designed specifically for use with T8 lamps.

2. Ballasts shall be third party listed (Class P) with a Class A sound rating.

3. Ballasts shall produce less than 10 percent Total Harmonic Distortion (THD) in the input current waveform and shall operate at a power factor of at least 90 percent.
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4. ONLY one or two lamp ballasts are acceptable.

5. Qualifying manufacturers shall have been manufacturing electronic fluorescent ballasts for a minimum of five years with a satisfactory performance record. Ballasts shall be warranted by the manufacturer for a minimum of five years.

6. Acceptable Manufacturers: Advance, MagneTek, Osram, Motorola, or approved equal.

7. PCB Ballast Disposal: Unless existing ballasts are labeled to indicate no PCB's, it shall be assumed they contain PCB's; and they shall be legally disposed of at the contractor's expense.

8. Dimming Ballasts shall be architectural grade, equal or better than the Lutron FDB series.

D. CONTROLS:

1. Consideration should be given to the full range of lighting control options including occupancy sensors, dual level control, separate switching of daylight zones, dimming controls, and EMCS control.

2. Occupancy sensors, such as dual technology, are required on all classrooms, computer labs, teaching labs, and auditoriums.

3. Consider low voltage lighting controls. Low voltage controls may provide reduced installation costs and improved flexibility for future changes in switching configurations and control methods.

E. EMERGENCY EGRESS LIGHTING:

1. EGRESS LIGHTING shall be provided as required by code for a minimum of ninety minutes after a power failure. The following methods may be used, with preference in the order listed.
   a. Connection of selected fixtures to emergency generator circuits (if available).
   b. Wall or ceiling mounted battery back-up fixtures with low voltage incandescent spot or flood lights.

2. EXIT SIGNS:
   a. GENERAL: In buildings without emergency generators, provide exit signs with battery back-up and charger.
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b. TYPE: Exit signs shall be completely solid state with Light Emitting Diodes (LEDs) as light source and minimum 5-year warranty on fixture, batteries, and lights. Sign facing shall provide full uniform illumination. Main Campus exit signs shall be all white die-cast aluminum housing with white face, red letters. Health Sciences Campus exit signs shall be black aluminum housing with brushed aluminum face with green letters.

c. ACCEPTABLE MANUFACTURERS: Lithonia, Emergilite, or Exide or equal.

END OF SECTION