Section 11 | Exterior Lighting
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Applicable Codes and Standards


- Refer to the pages that follow for Exterior Lighting Standards for the following types of spaces:
  - Campus Roads
  - Parking Lots
  - Sidewalks
  - Outdoor Stairs and Ramps
  - Plazas
  - Bus Stops
  - Blue Light Phones
  - Flagpoles
  - Public Art

- Design lighting layouts to meet standards for quantity, evenness and quality of light (as measured by average foot-candles and "max to min" ratios).

- Specify fixtures to produce light with a temperature of 4000 Kelvin and a Color Rendering Index (CRI) of 85 or better.

- Where the University's Exterior Lighting Standards do not cover a situation, use IESNA standards.
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Design Review Process

- Submit a photometric report that demonstrates compliance with the University's required light and evenness levels at the following stages of design:
  - 100% Design Development
  - 50% Construction Documents
  - 90% Construction Documents

- Include a plan view, photometric "design intent" sheet in the 100% Construction Documents submission. Show the intended lighting levels and requirements. Submit elevation views as needed if building facades will have special lighting.

- Analyze the relevant lighting typologies included in the project (e.g., roads, sidewalks, parking lots, etc.) Break down each typology into reasonably sized zones for analysis.

- Include a table that shows manufacturer, catalog number, lumens per fixture, light loss factor, wattage and mounting height for each fixture.

- Also include a table listing the University's FC standards for each spatial typology.
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Design Review Process: Photometric Criteria

Use the following criteria when preparing photometric analyses:

- Calculate all exterior photometrics at grade
- Assume the following:
  - 10% light loss for dirt and depreciation
  - 10% light loss for lumen depreciation for LED sources, 10% for fluorescent sources and 25% for HID sources (metal halide, high pressure sodium, low pressure sodium)
  - Sidewalk reflectance of 20%
  - Roadway reflectance of 10%

- Sample light levels on the following calculation grids:
  - Roadways and parking lots on 5 foot grid with no point more than 2 feet 6 inches from any edge
  - Parking garages on 3 foot grid with no point more than the 1 foot 6 inches from any edge
  - Sidewalks on 2 foot grid with no point more than 1 foot from any edge.
  - Public stairways, steps and ramps on 6 inch grid on both the horizontal and vertical planes. Stairs must be fully modeled in the photometric analysis with no point more than 6 inches from any edge.
  - Facades on 5 foot grid with no point more than 2 feet 6 inches from any edge.

- When lighting Public Art, request a design intent statement from the artist or architect addressing light, contrast and Dark Sky implications.

- Do not allow light above 75 degrees from nadir. Provide a beam of light that extends no more than 35 degrees from nadir. Exceptions include building lighting, flags, art and monuments.
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**Design Review Process: Photometric Report Example**

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### Statistics Table

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### Diagram

[Image of a detailed exterior lighting diagram with various symbols and measurements, including sidewalk reflectance, stairs, and parking lot areas.]
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Construction Administration Process

- During the submittal process, review a photometric report submitted by the Contractor along with light fixture information. A +/- 5% foot candle variance from the design intent plan is allowed. Compliance with maximum to minimum foot-candle levels is required.

- At Substantial Completion, evaluate exterior lighting both physically and photometrically. Take spot readings at 5% of the photometric points of each lighting zone to confirm light levels within 5% of the data points on the Contractor's submittal.

- Document light level readings per IESNA recommended practices at night.

- Document any deviations as either "acceptable" or corrected prior to certification of Substantial Completion.
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Space Typologies: Campus Roads

- Interior Campus Road
  - Maximum ......................... 3.0 FC
  - Minimum .......................... 0.3 FC
  - Extrapolated Average .......... 1.4 FC
  - Maximum to Minimum ........... 10 to 1

- Use medium height street lights spaced regularly to illuminate roads

- Locate poles in planting strips between the road and sidewalks

- Provide evenly-spaced pedestrian lights to illuminate the sidewalks

- Specify the Lithonia RSX2 LED fixture for a consistent campus image
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Space Typologies: Street Lights at Roads

- Provide Lithonia RSX2 LED light fixture at smaller parking lots and campus roads
- All fixtures to be black
- Provide fixture with cast aluminum body mounted to a round pole with the fixture face at 25' or 30' above finished grade depending on parking lot size
- Provide LED light producing between 12,000 and 22,000 lumens depending on height
- Specify 4000K color light with a CRI of 85 or better
- Specify lights to be Dark Sky compliant with no light above 75° from nadir and with a beam of light 35° from nadir
- Refer to pole base details on Page 10
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Space Typologies: Street Light Poles - Footing Details

When Set in Planting Strip or other Landscaping

When Set in Plaza or other Pedestrian Paving
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Space Typologies: Sidewalks

- Sidewalks along Cullen, Wheeler, Elgin, Calhoun, Scott, MLK, Old Spanish Trail (City Streets)
  - Maximum .................................. 7.0 FC
  - Minimum .................................. 1.0 FC
  - Extrapolated Average .................. 4.0 FC
  - Maximum to Minimum ................. 7 to 1

- Sidewalks along Interior Campus Roads
  - Maximum ............................... 5.0 FC
  - Minimum ............................... 0.75 FC
  - Extrapolated Average ............... 2.5 FC
  - Maximum to Minimum ............... 7 to 1

- Provide evenly-spaced pedestrian lights at 40' min. to 60' max. on center, typical, to illuminate the sidewalks

- Locate pedestrian poles in planting strips between the roads and sidewalks

- Coordinate light pole and street trees to create a consistent even spacing along the road

- Locate poles a consistent 2 foot from the edge of the sidewalk
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Space Typologies: Sidewalks on Campus

- Maximum .......................... 5.0 FC
- Minimum .......................... 0.75 FC
- Extrapolated Average ............... 2.5 FC
- Maximum to Minimum ............... 7 to 1

- Space pedestrian light poles at 40' min. to 60' max. feet on center, typical
- Maintain consistent spacing along the length of the sidewalk
- Locate light poles a consistent 2 feet from the edge of the sidewalk
- See the accompanying diagrams for typical tree and pedestrian light layouts

Note: Pedestrian lights located at 40' min. to 60' max. feet on center along a small sidewalk with informal tree planting.
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Space Typologies: Sidewalks on Campus

Note: Trees spaced regularly at 20 to 30 feet on center, with pedestrian lights interspersed at 40 to 60 feet on center. R2 optics typical.

Note: Trees spaced regularly at 20 to 30 feet on center, with pedestrian lights located on alternating sides at 20 to 30 feet on center.
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Pedestrian Light Fixture and Pole

- Provide LED luminaire, model: Saturn 2 color: black as made by Selux Lighting
- Provide consistent quality lighting by specifying 4000 K temperature and 85 or better CRI
- Use tapered round black poles that are 13 feet tall, hinged for ease of maintenance. Mount the luminaire so that the center of light to grade is approximately 14’-0” feet above grade
- Slope the top of concrete foundation base for adequate drainage
- Do not provide tenons
- Refer to UH Design Guidelines, section 11.0 for current standard fixture

Selux Saturn Cutoff 2 LED pedestrian Light Fixture Head, black

Standard round base cover (BC)

Selux Saturn Cutoff LED pedestrian light pole - black, 13’-0” height
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Pedestrian Light Pole - Footing Details

Pedestrian Pole located in Paving (Sidewalks or Plazas)

Pedestrian Pole located in Landscaping (Lawn or Planting Beds)
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Space Typologies: Plazas, Stairs and Ramps

- Maximum .................................... 5 FC
- Minimum .................................... 0.65 FC
- Extrapolated Average ................. 2.5 FC
- Maximum to Minimum ............... 8 to 1

- Use pedestrian lights, lighted handrails or other special lighting to achieve illumination requirements.

- Avoid the use of wall-packs or other wall-mounted fixtures that create glare.
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Preferred Plaza Light Pole

- Provide Selux Modular Column light fixture. All fixtures to be black. Specify 4000 K color light with a CRI of 85 or better

- Configure lights per photometric requirements on a case-by-case basis
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Space Typologies: Plazas, Stairs and Ramps

- Outdoor Stairs and Ramps
  - Maximum .................................. 10 FC
  - Minimum ................................. 2.5 FC
  - Extrapolated Average ................. 5 FC
  - Maximum to Minimum .............. 4 to 1

- Ensure that stairs and ramps in public spaces, and particularly those that form part of the egress path from a building, are well illuminated.

- Use pedestrian lights, lighted handrails or other special lighting to achieve illumination requirements.

- Do not use step lights in stair risers or walls.
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Space Typologies: Preferred Lighted Handrail

- Preferred fixture is by Efficient-Tec International, style: illuminated stainless steel handrail, 4000k illumination color with clear prismatic diffuser. Similar products by other manufacturers will be considered.

- Basis of Design: Efficient-Tec, stainless steel with high output led option
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Space Typologies: Small and Medium Parking Lots

- Maximum ..................... 15.0 FC
- Minimum ...................... 1.5 FC
- Extrapolated Average .......... 4.0 FC
- Maximum to Minimum ........ 10 to 1

- Refer to the following diagrams for examples of proper light pole spacing and height. Pole heights and spacing will vary depending on the parking lot configuration.

- Use 22'-6" or 27'-6" poles mounted to 2'-6" concrete bases.

- Where appropriate, use 10 foot long davit arms to improve the distribution and evenness of light.

- Coordinate light pole spacing with tree spacing
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Space Typologies: Medium and Large Parking Lots

Medium Parking Lot With Offset Grid
Diagram shows a large parking lot with an offset grid of light poles with 10’ davit arms.

Large Parking Lot With Regular Grid
Diagram shows a large parking lot with a regular grid of light poles with 10’ davit arms.
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Street Lights at Small to Medium-sized Parking Lots

- Provide Lithonia RSX2 LED light fixture at smaller parking lots
- Provide Lens that is flat and flush with bottom of fixture
- All fixtures to be black
- Provide fixture with cast aluminum body mounted to a round pole with the fixture face at 25' or 30' above finished grade depending on parking lot size
- Provide LED light producing between 12,000 and 22,000 lumens depending on height
- Specify 4000K color light with a CRI of 85 or better
- Specify lights to be Dark Sky compliant with no light above 75° from nadir and with a beam of light 35° from nadir
- Refer to pole base details on Page 24
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Large Parking Lots

- Provide high-mast parking lot pole with light fixture mounted 32'-6" above finished grade. Specify light fixture by Lithonia Lighting. All fixtures to be black. Provide lens that is flat and flush with bottom of fixture.

- Mount fixture to 10'-0" strut arm extending from the pole with a supporting 45 degree diagonal from the bottom. All poles and arms to be black.

- At large parking lots, provide LED light producing between 21,000 and 40,000 lumens depending on height. Specify 4000K color light with a CRI of 85 or better.

- Refer to light pole base detail on Page 24.
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Parking Lot Light Poles - Footing Details

When Set in Parking Lot

- STANDARD LIGHT POLE
- GASKETED HOLE W/COVER
- LEVELING NUT (TYP)
- 2" NON-SHRINK GROUT (ROUND EDGES)
- 2'-6" ABOVE GRADE
- TOP OF EXISTING GRADE
- CONDUIT
- 24" DIA

*REINFORCING AND DEPTH PER STRUCTURAL ENGINEERING & GEOTECHNICAL REPORT
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Space Typologies: Specialty Lighting

- Bus Shelter
  - Average .......................... 10 FC
  - Minimum .......................... 1.5 FC

- Extend light distribution 20 feet from ends of bus stop parallel to street and 10 feet behind the structure.

- If no shelter exists, provide a 10 FC pool of light 20 feet in diameter.
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Space Typologies: Specialty Lighting

- Blue light emergency call station
  - Minimum ....................................... 5.0 FC
  - Maximum to minimum .................... 4 to 1

- Extend pool of lighting 25 feet in all visible directions.

- Provide 4000K and 85 CRI or better

- Mount blue marker light at approximately 12 feet above finished grade.

- If blue marker light cannot provide necessary light levels, provide supplemental pedestrian light poles.
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Space Typologies: Specialty Lighting

- Flag Pole Lighting
- Comply with required lighting of U.S. Flag Code
- Section 6a of the U.S. Flag Code indicates that it is a "universal custom to display the flag only from sunrise to sunset on buildings and on stationary flagstaffs in the open - however, when a patriotic effect is desired, the flag may be displayed twenty-four hours a day if properly illuminated during the hours of darkness."
- Design lighting of flags, U.S. or other, in accordance with the adjacent diagram
- Avoid use of in-ground light fixtures
The campus art collection is an important portion of the campus identity and as such needs a uniform approach to illumination.

Highlight important campus monuments using lighting. The entry obelisks on Cullen Blvd. are an example.

Lighting levels for public art are determined on a case-by-case basis working closely with the artist.

Avoid in-grade lighting if possible.