

PART 1: GENERAL

1.01 LUMINAIRES

- A. This stand justified through life cycle cost (LCC) analysis and submitted to the University for approval.
- B. Lighting design shall meet the requirements of the ASHRAE 90.1 as currently adopted by the State of Texas Energy Code and meet the recommended illumination levels of the current edition of the Illuminating Engineering Society of North America (IESNA) Lighting Handbook.
- C. In addition the lighting fixtures.
- E. Do not use low pressure sodium, mercury vapor or standard incandescent lamps.
- F. Utilize LED fixtures for all specialty lighting, under counter and exterior lighting.
- G. LED Approved Manufacturers
 - a. CREE or approved equal
- H. 2'x2' fixtures are not accepted by SHSU
- I. Prior to selection of any luminary fixtures the A/E will consult through PM with SHSU Energy Manager.

HID Lighting

- A. Mercury vapor and high & low pressure sodium lamps/luminaires are not allowed, only metal halide.
- B. "Open type" fixtures should not be used indoors due to safety concerns.

C. PULSE Start Lamps

- 1. Minimum rated lamp life shall be 20,000 hours for lamps >150 watt and 15,000 hours for lamps 150 watt
- 2. CCT of 4000K and CRI 80

D. PULSE Start Ballasts -. t(i)-3.a(r)-p (g)10.e(r)-4caea d po(ht)-3.te t(i)-3.he(r)-rmaihtehteile Iee4(t(i)-3.or3()

7. Shall be tested in accordance with LM-80 lumen depreciation test. Provide to the University, test results of each unique lamp. The L70 rated life result shall be a minimum of 25,000 hours for MR11, 16 and candelabra lamps; 40,000 hours for PAR 20, 30, 38 and BR30 lamps.
8. Shall carry a 5 year minimum product warranty covering failure of ALL electrical components.

B. Luminaires

1. The luminaire manufacturer shall be registered as a DOE Quality Advocate.
2. Shall meet DOE's Energy Star or Design Light Consortium performance criteria
3. The luminaire manufacturer shall provide the manufacturer's name of the LED being used in the luminaire.
4. Shall be UL, or ETL, listed and be furnished complete with LEDs and power supplies.
5. LED light source packages, arrays or modules used in the luminaire shall be tested in accordance with LM-80 lumen depreciation test. Provide to the University, test results of each unique package, array or module. The L70 rated life result shall be a minimum of 50,000 hours.
6. Shall be tested in accordance with LM-79-08 electrical and photometric measurements. Provide to the University, test results of each unique luminaire.
7. The CCT shall be 5000K unless otherwise approved by the University. The CRI shall be 80.
8. Each luminaire shall have a power factor 90%.
9. In instances where the LED sources are to be mounted directly into the architecture, such as installing a strip LED by using an adhesive tape, the LED manufacturer shall provide a recommended heat sink volume adequate to achieve rated life at L70.
10. Each luminaire shall carry a 5 year minimum product warranty covering failure of ALL electrical components.

C. Power Supplies

1. LED power supplies shall operate LEDs within the current limit specification of the manufacturer
2. Shall operate from 60Hz input source and have input power factor >90% and a minimum efficiency of 70% at full rated load of the driver.
3. Shall have short circuit and overload protection.

CREE - BETA LED Area Lighting Fixture: LED Area Lighting “The Edge” Type V-short

Model #: Beta LED# ARE-EDG-5S-R3-24-E-UL-BZ-350

Spec: LED minimum Type V short 6000k 263ci Lumens voltage 120-270 wet listed

Color: Dark Bronze

Parking Lot Pole:

United Lighting Standards 30’

Model # SSHP-30-6-7-T2-TMB

Specs: 6” Square hinged steel pole, height 30’

2. Pedestrian Walk, Plaza Light Standard (NO EXCEPTIONS without prior approval)

CREE - BETA LED Fixture: The edge Round Luminaire

Model# BLD-EDR-5M-R5-06-E-UL-BZ-350

Spec: LED, minimum 5,250 lumens voltage 120-270, wet listed

Color: Dark Bronze

Walkway Pole:

United Lighting Standards 12’ Aluminum Pole

Model # RSHA-1521-T2-DB

Specs: Round hinged Aluminum pole, height 12’, shaft OD 5”

Color: Dark Bronze

3. Wall Packs:

CREE – BETA LED Fixture: The Edge LED Wall Pack

Model # SEC-EDG-3M-WM-04-D-UL-BZ-350-40K

Spec: LED, minimum 3,343 lumens, voltage 120-277, wet listed

Color: Dark Bronze

4. Parking Garage:

COOPER LIGHTING – LUMARK

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ENERGY TECH - LED Low Profile Canopy Light

Model # CP-VE-15/30W-45/60K- Mit-

PART 3: EXECUTION

3.01 INTERIOR LIGHTING

A. Professional Service Provider (PSP) shall provide a room by room, computer generated photometric lighting design for approval. All calculations and data shall be presented in the design development and construction documents. Also provide tabulated results of lighting power density calculations in W/sf showing the actual, the ASHRAE 90.1 allowable, and the 25% savings target per 1.01, C. Increased energy consumption of 10% or more must be reported in accordance with State Energy Code reporting procedures.

REFER: <http://www.seco.cpa.state.tx.us/tbec/statefunded.php>.

B. Applications other than standard general purpose lighting (T8 lamps), require presentation to the University. Use of specialty lamps requires prior University approval. Minimize the number of different lamp types used.

C. Emergency light fixtures shall have the LED emergency light indicator mounted such that it is visible from the ground.

D. Lay-in type fluorescent fixtures must have supports to structure at two opposing corners minimum. These supports are to be attached to the fixture housing. Ceiling supports are in addition to these supports.

E. Outlet boxes for lighting shall be 4" square or 4" octagon boxes mounted to the structure. These boxes may feed up to 4 light fixtures individually so that each fixture can be taken out of service without affecting the remainder of a circuit. Do not daisy chain light fixtures.

F. Stairwell light fixtures shall be located such that they may be reached safely with no more than an 8-foot ladder.

G. Lighting Designer shall verify installation meets design intent and operates properly unless a commissioning agent assumes this responsibility.

3.02 EXTERIOR LIGHTING

A. All walkways, sidewalks, and parking lots shall be illuminated to levels recommended by the IESNA or as required to meet the University's security needs, whichever is higher.

B. Upon request from Utilities & Energy Management Electrical Distribution Division, all engineering calculations of illumination levels and lighting power density shall be presented in construction documents.

C. Exterior lighting should be accomplished using lighting standards and wall packs. Lighting bollards, step and handrail lighting, tree lighting, and in-grade fixtures are not allowed.

- D. Exterior and site lighting shall be shown on site plan. List distances between poles, fixtures and other site lighting devices.
- E. Provide pole mounting height and pole base installation detail.
- F. Lighting Designer shall verify installation meets design intent and operates properly unless a commissioning agent assumes this responsibility.