

The March 2024 revision of this standard was a major rewrite. No highlights for changes were added to the body of the standard due to the breadth of the rewrite. All aspects of the standard should be reviewed by design professionals and contractors and assumed to be new.

Included in this Section:

- 1.0 General
- 2.0 Exterior Lighting
- 3.0 Interior Lighting
- 4.0 Lighting Controls
- 5.0 Light Revenue Metering

1.0 GENERAL

- A All fixtures shall be LED. Lamps/Bulbs with integral drivers such as screw in A19 and A21 base LED bulbs are not acceptable.
- B All fixtures shall be high quality, specification grade. Commodity grade fixtures are not allowed.
- C All fixtures shall be 4000 kelvin CCT.
- D All paint shall be polyester powder coated.
- E All fixtures shall have a minimum 5-year warranty. The warranty shall last from the date of substantial completion and cover the repair or replacement of defective electrical parts, including light source and driver.
- F Provide at least 3 approved manufacturers for each fixture specified.
- G Custom fixtures or fixtures available from only one manufacturer are not allowed.
- H For every fixture type installed on a project, provide spare fixtures/parts (light fixture only, does not include pole, arm/bracket, etc.)(The quantity of fixtures is covered in the Closeout Deliverables Matrix). Spare parts shall be neatly boxed and labeled to identify contents (project name, fixture type and tag, etc). Include the project's lighting plans and fixture schedule for reference. Spare parts shall be compliant with one or more of the following.
 - 1 For fixtures without field replaceable LED light engines/sources and LED drivers: Provide qty (1) complete spare fixture per 10 fixtures installed. Minimum of 1 of each type.
 - 2 For fixtures with field replaceable LED light engines/sources and LED drivers: Provide qty (2) each of field replaceable LED light engines/source and field replaceable LED drivers per 10 fixtures installed. Minimum of 2 each.

- 3 Fixtures that require removal of building finishes (sheetrock, etc) to replace the light fixture shall have field replaceable LED light engines/sources and LED drivers.

2.0 **EXTERIOR LIGHTING**

A GENERAL PROVISIONS

- 1 It is the responsibility of each project to provide temporary and permanent security, walkway, plaza, and parking lot lighting necessitated by that project. Such exterior lighting shall utilize down-lighting techniques and produce lighting power densities 20% below those defined in the current version of ASHRAE/IESNA Standard 90.1, Exterior Lighting Section.
- 2 New exterior lighting installations (fixtures and locations) shall follow the University Landscape Master plan.
 - a The make, model and manufacturer listed in the Landscape Master Plan for lighting fixtures are for reference. Substitutions with like fixtures will be considered.
- 3 For energy conservation and light pollution reduction, non-essential exterior lighting (landscape and architectural) shall be kept to a minimum and in no instance exceed 50% of the lighting power densities defined by the current version of AHRAE/IESNA 90.1, Exterior Lighting Section.
- 4 All conductors for exterior lighting shall be installed underground. For any installation other than underground, written permission from the Facilities Services Supervisor that oversees exterior lighting is required.
- 5 All exterior lighting shall be weatherproof. For example, if fixtures are provided with an individual photocell receptacle, and the lights are controlled by another device (other than a photocell), a "dummy" photocell or shorting cap shall be installed to weatherproof the fixture.
- 6 Exterior lighting (exceptions: Traditional Globes, see table below) including security lighting, shall be cut-off fixtures (BUG rating: B#U0G#, no upright) and shall document that no more than five percent of the total designed fixture lumens (sum total of all fixtures on site) are emitted at an angle of 90 degrees or higher from nadir (straight down). Luminaires shall be selected and designed to prevent visibility of the light source. Sag lenses, convex lenses and drop lenses are prohibited. Luminaires, including wall-mounted fixtures, shall not be tilted but shall be installed at 90 degrees horizontal.

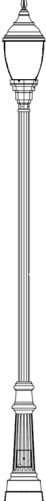
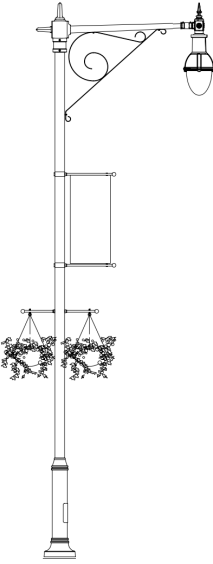

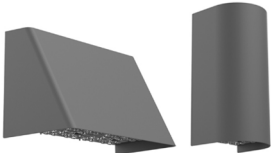
B FIXTURES:






- 1 Fixtures shall be aluminum or stainless steel.
- 2 Exposed hardware shall be stainless steel.
- 3 Concealed mounting hardware shall be galvanized or stainless steel.
- 4 All paint shall be fade and abrasion resistant, electrostatically applied, thermally cured, polyester powder coat finish with a minimum of 1000 hours for salt spray resistant finish in accordance with testing performed and per ASTM B117 standard.

- 5 Close to Observatory: UF is currently working on this section. For current information about exterior lighting around the area of the observatory please contact Facilities Services.
- 6 North of University Avenue and West of SW 13th Street: Projects that include public street lighting and are on university lands that lie north of University Avenue or west of SW 13 Street shall be lighted in consultation with the City of Gainesville (Public Works Department and Gainesville Regional Utilities). City of Gainesville standard fixtures shall be used for roadway and pedestrian lighting along public streets.

C FIXTURE TABLE

- 1 The following table represents commonly used and specified light fixtures. This does NOT mean these are the only manufacturers or fixture types allowed on a project. This is a guide to convey the typical types of fixtures, manufacturers, series and specifications.
- 2 Manufacturers and part numbers/series listed may have changed. Consult the manufacturers for updated information.
- 3 Pictures are for reference only and may not represent the exact manufacturer or model listed.

Fixture Type	Typical Locations	Acceptable Manufacturers	Notes, Specifications
<p>Traditional Globe Walkways</p> 	<p>Walkways Plazas</p>	<ul style="list-style-type: none"> • Hadco RL series • McGraw-Edison Generation series • Sternberg A850SRLED series 	<p>Prismatic globe (no cages or bands), solid decorative roof with finial, decorative fitter, 4" round fluted 12' pole, decorative fluted base, black. 7-pin receptacle inside housing.</p> <p>See Landscape Master Plan for installation locations.</p>
<p>Traditional Globe Roadways & Area</p> 	<p>Streets Parking Lots Plazas</p>	<ul style="list-style-type: none"> • Lumec Renaissance series • McGraw-Edison 1914LED series • Sternberg 1914LED series 	<p>Prismatic pendant globe (no cages or bands) teardrop lens, decorative straight 4'-6' arm/bracket, round smooth 20'-30' pole, decorative smooth base, black. 7-pin receptacle inside housing.</p> <p>Banner Arms & Planter Arms: Confirm layout with UF.</p> <p>See Landscape Master Plan for installation locations.</p>
<p>Cobra Head</p> 	<p>Streets Parking Lots</p>	<ul style="list-style-type: none"> • Lumec RoadFocus series • GE Evolve series • Acuity Autobahn series 	<p>No longer used on main campus, use only with FS approval. 7-pin receptacle, round smooth metal pole, 25-35' mounting height. BUG rating: B#U0G# (no uplight) No adjustable tilt fixtures.</p>
<p>Wall Mount</p> 	<p>Bldg Entries Bldg Perimeter</p>	<ul style="list-style-type: none"> • Gardco • McGraw Edison • Kim • Lumark • Acuity 	<p>These fixtures come in various shapes and sizes. BUG rating: B#U0G# (no uplight)</p>

Fixture Type	Typical Locations	Acceptable Manufacturers	Notes, Specifications
In-Ground Up-light 	Trees Flagpoles	<ul style="list-style-type: none"> • BK Lighting • Gardco • Erco • Kim • Lumiere 	Since this is an up-light fixture, use requires written approval from Facilities Services. Do not use this fixture type embedded in concrete.
Contemporary Area Light 	Streets Parking Lots Plazas	<ul style="list-style-type: none"> • Gardco Pureform • Lumark Prevail series • Acuity Legacy-D series 	20'-30' round smooth pole. BUG rating: B#U0G# (no uplight). See Landscape Master Plan for installation locations. No adjustable tilt fixtures.
Contemporary Walkways 	Walkways Plazas	<ul style="list-style-type: none"> • Gardco Pureform Post Top • Invue ABB Arbor series • Louis Poulsen Kipp series 	12' round straight smooth pole and matching bollard BUG rating: B#U0G# (no uplight) See Landscape Master Plan for installation locations. Bollards are not preferred. Confirm use with UF FS.
Floodlight 	Walls/Bldg Features Signs Trees	<ul style="list-style-type: none"> • BK Lighting • Gardco • Stonco • Kim • Lumark • Lumiere • Acuity • RAB 	Since this is an up-light fixture, use requires written approval from Facilities Services.
Downlight 	Bldg Entries Exterior Soffits	<ul style="list-style-type: none"> • HE Williams • Prescolite • Portfolio • Lightolier • Lithonia 	Minimum 6" aperture. If mounted in inaccessible ceiling, fixture shall be maintainable thru aperture.

D LIGHT LEVELS - ILLUMINANCE AND UNIFORMITY RATIO: Campus lighting shall provide security and comfort to nighttime campus users. Careful design is required to address the issues of glare, light trespass, and light pollution while providing adequate and efficient lighting. Lighting calculations shall be compliant with the latest edition of the appropriate IESNA Recommended Practice (such as RP-8 Recommended Practice: Lighting Roadway and Parking Facilities and RP-33 Lighting for Exterior Environments). If IESNA adopts revised standards for these applications, the latest version of the relevant IESNA standards shall apply. A photometric plan shall be provided that clearly demonstrates conformance with these standards. Deviations from these standards require approval of the University's

Lighting Committee. This approval may be obtained from the Lighting Standards Subcommittee (contact the Design and Construction Standards Subcommittee Chair).

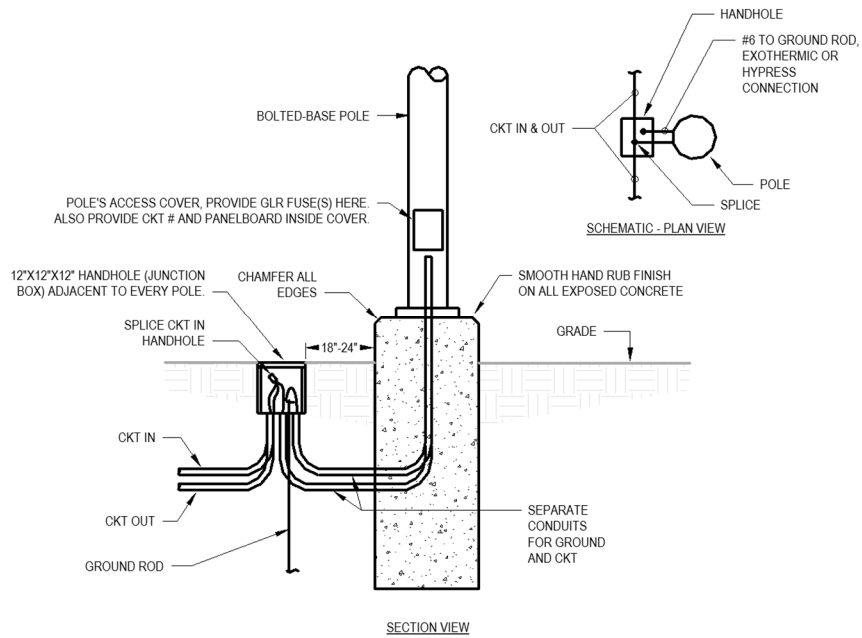
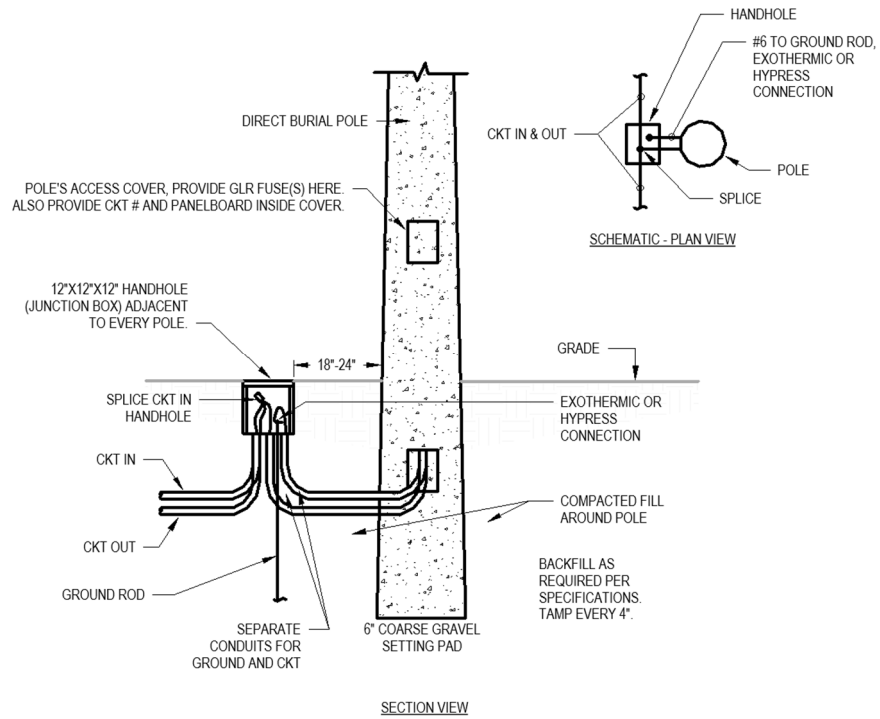
1 Design Areas and Spill Light

- a At the initial design phase, the light fixture category and design area shall be identified. The lighting design area shall be confirmed with the project manager to be used for illumination standards.
- b The lighting design area shall consider adjacent areas and their relation to illumination within the project site. Spill light (e.g. light that falls outside the project site where the luminaire is installed) shall be evaluated in the context of adjacent areas. Project sites adjacent to built areas must ensure that illumination on the project periphery provides an acceptable transition or uniformity to illumination levels in adjacent areas. Project sites adjacent to undeveloped natural areas shall ensure that a gradual transition exists between the project site edge and the darker undeveloped site. Care should be taken to ensure that light trespass does not interfere with natural habits or attract pedestrians into areas where their presence is discouraged. Project sites adjacent to public roads and non-university property should consult the appropriate local government codes regarding light spillage.
- c Lighting applications in "green areas" (i.e. lawns, softscapes) should assume that the design area includes only the walkways and plazas within the "green area" unless otherwise directed by the project manager.
- d Illuminating footpaths through natural areas is generally discouraged. However, when a formal walkway exists through the natural area for use during nighttime hours, it shall be illuminated.
- e Isolated Sites and Locations Away from Main Campus: Exterior luminaries, including all site and wall-mounted fixtures, shall produce no more than 0.20 horizontal and vertical footcandles at the site perimeter and 0.01 horizontal footcandles 15 feet outside of the site. Design.)

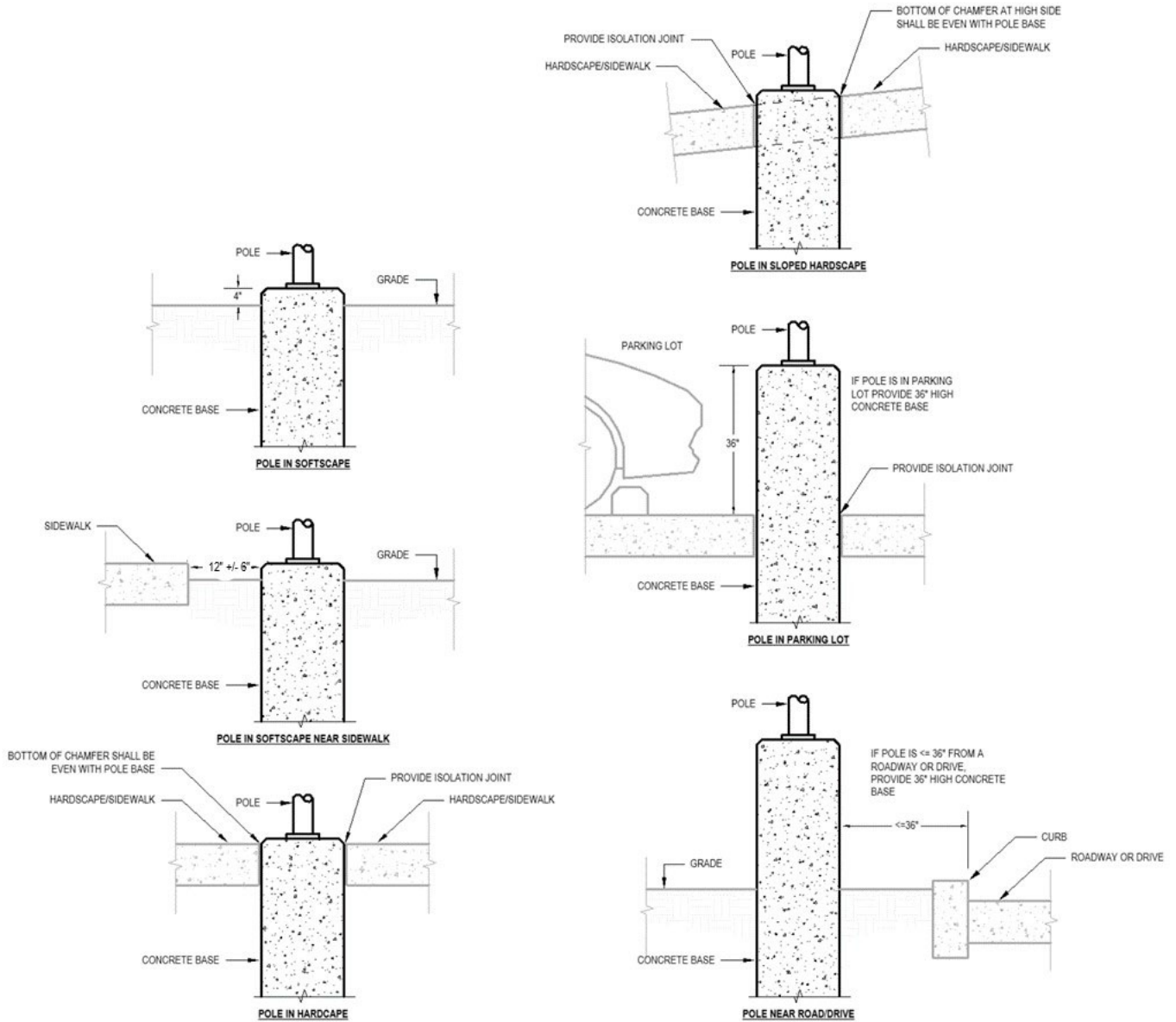
2 Other Applications:

- a Lighting intensities for projects or locations not specifically identified in this section (for example athletic fields and courts, bikeways, and parking garages) shall be designed as recommended by the Illuminating Engineering Society of North America (IESNA).
- b Lighting at Automated Teller Machines is governed by the Florida Building Code and IESNA.
- c Special attention should be given to illumination levels at bicycle parking facilities, crosswalks and bus stops on night routes to ensure visibility, security, and uniformity. Illuminance at these locations should be consistent with that achieved in the surrounding area, whether it be a parking lot, building entry, sidewalk or road edge.
- d Bus shelters are required to be internally lighted. Consult the Transportation and Parking Services Director for information on bus shelter lighting.

- 3 Uniformity: All exterior lighting applications shall provide a maximum 4:1 average-to-minimum uniformity ratio unless IESNA standards require a different uniformity ratio specific to a certain application. When a uniformity ratio is specified by IESNA, that ratio shall prevail.
- E FIXTURE MOUNTING: Fixtures shall be fastened with galvanized hardware through cast holes. Field cut holes are not acceptable. All hardware shall be made of non-rusting, non-corroding material.
- F GROUNDING:
- 1 The circuit ground shall terminate at the fixture only.
 - 2 All poles (Steel, aluminum, concrete, etc) shall have all conductive metal parts bonded together, connected to the fixture at the top and connected to an independent pole grounding conductor and the 5/8" x 10' ground rod located in the in-ground junction box.
- G POLES:
- 1 Aluminum poles are preferred. Provide with steel reinforcement as needed to comply with applicable wind loads, etc.
 - 2 Concrete and stainless-steel poles shall only be used within less public areas of campus defined as IFAS, Veterinary Medicine research fields, barns and greenhouses, Facilities Services warehouses, the Surge Area, and certain remote properties. Follow the landscape master plan for all other poles.
 - 3 Concrete poles shall be pre-stressed and shall have a 4" X 6" access cover located 18" above finished grade. Cover shall be stainless steel, fastened with stainless steel tamper resistant screws, and bonded to ground with flexible braid copper of the same size as the equipment-grounding conductor.
 - 4 Pole Details



5 Pole Concrete Base Details



H EXECUTION:

- 1 All Circuit Continuation splices / joints shall be made in an inground handhole located in the ground within 2' of the pole.
 - a Circuit Continuation splices shall not be made in pole. Splices for fuses shall be in the pole.
- 2 Locations of inground handholes shall be marked on as-built prints.
- 3 The ground rod for the light poles shall be located inside the inground handhole.
 - a An individual bare conductor (#6 gauge) shall be run for bonding light pole to the ground rod. Mechanical type ground clamps are not allowed.
- 4 All exterior light poles shall have 5 amp GLR type fuses located inside the access cover of all light poles.

- 5 Acceptable manufacturers of inground handholes are: Quazite, NewBasis. Load Designation - AASHTO - H15 minimum or higher as required by location.
- 6 Provide a marked up as-built site plan (PDF) to FS. As-built shall contain actual conduit routings, handhole locations, fixture locations & fixture catalog #s. UF FS will use this information to enter into their GIS system

3.0 **INTERIOR LIGHTING**

A **MAINTENANCE ACCESSIBILITY:** All interior lighting fixtures shall be installed so that they are serviceable from standard ladders or lifts used in a prescribed and safe manner.

- 1 If a lift is used, it must be able to enter and move throughout the building to the location of the light fixture without structural modifications and be able to set up under the fixture with all riggers installed and operator not leaning.
- 2 Do not install lights above obstructions such as hanging artwork.
- 3 Stairs: It is preferred to mount lights above landings, not directly above the steps. Above stairs or on stair landings, fixtures should be wall mounted between 7'-8" and 8'-0" high to allow use of 6' step ladders or they shall be ceiling mounted so long as a 6'-8' step ladder can reach them.
- 4 The installation of any fixtures that require scaffolding or use of extension ladders for access is not allowed.

B **DISCONNECTS:** All interior lighting shall be wired with quick-disconnect type connectors to easily disconnect the light fixture. These quick-disconnects do not require the circuit to be de-energized to disconnect a fixture. Install the quick-disconnect inside the termination compartment of the luminaire. Do not use quick-disconnects for the ground wire. Quick disconnect shall be similar to Wago luminaire disconnect rated for 600V and #16-12AWG. Typical quick-disconnect image is below:



C **FIXTURES:** The project lighting designer/electrical engineer shall select the appropriate fixtures for the project. Selections shall be presented to the UF Project Manager early in the design phase for review. It is the University's goal to reduce electrical energy consumption while providing safe, easily maintainable, pleasing, sufficiently lit spaces. For example, consider reducing the average maintained footcandle (fc) level in offices and provide task lighting. This reduces building energy consumption while providing individual occupants with lighting control. Consider the use of occupancy sensors and daylight harvesting (see control section).

- 1 LED lights are to be used on Campus.
 - a LED lights shall be rated at a minimum of 80% light output at 10 years.

- b LED lights other than standard in ceiling grid lights (2x2, 2x4, 1x4) shall have field replaceable LED modules and drivers.
- c All fixtures shall be labelled as to when they were installed by the contractor. sharpie OK
- d Submit documentation that indicates specified products have been tested, or will be tested, for compatibility with the lighting controls being procured and will perform as specified. Control devices or systems shall be able to control luminaires with flicker free, continuous dimming, in range specified.
- e The CRI (color rendering index) of all lights shall be a minimum of 80.




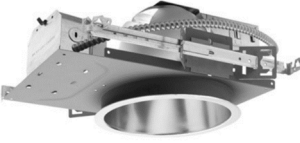

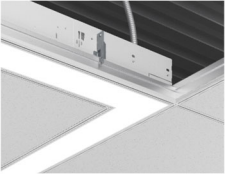


D EMERGENCY LIGHTING:


- 1 Provide emergency power per one (or more) of the following methods, in descending order of preference:
 - a Emergency generator & ATS: In a building with a standby emergency generator, connect all emergency and EXIT lights to the emergency branch ATS. Do not use unit equipment / battery packs (unless required by code for specific spaces).
 - b Unit equipment / battery packs: In a building without a standby emergency generator, use unit equipment / battery packs for all emergency and EXIT lights.
 - c Central UPS/battery system: In a building without a standby emergency generator, use a central UPS/battery system for all emergency and EXIT lights
- 2 Push test buttons: For maintenance purposes, when push test buttons are installed and they cannot be reached by a standard 8 foot step ladder, the push to test switches shall be located at typical wall switch height.

E TEACHING AUDITORIUMS: Refer to UF Academic Technology department Section 115200 for special lighting requirements for teaching auditoriums relating to the installation and operation of audio-visual equipment. A catwalk system is an option for access teaching auditorium lighting fixtures.

F FIXTURE TABLE

- 1 The following table represents commonly used and specified light fixtures. This does NOT mean these are the only manufacturers or fixture types allowed on a project. This is a guide to convey the typical types of fixtures, manufacturers, series and specifications.
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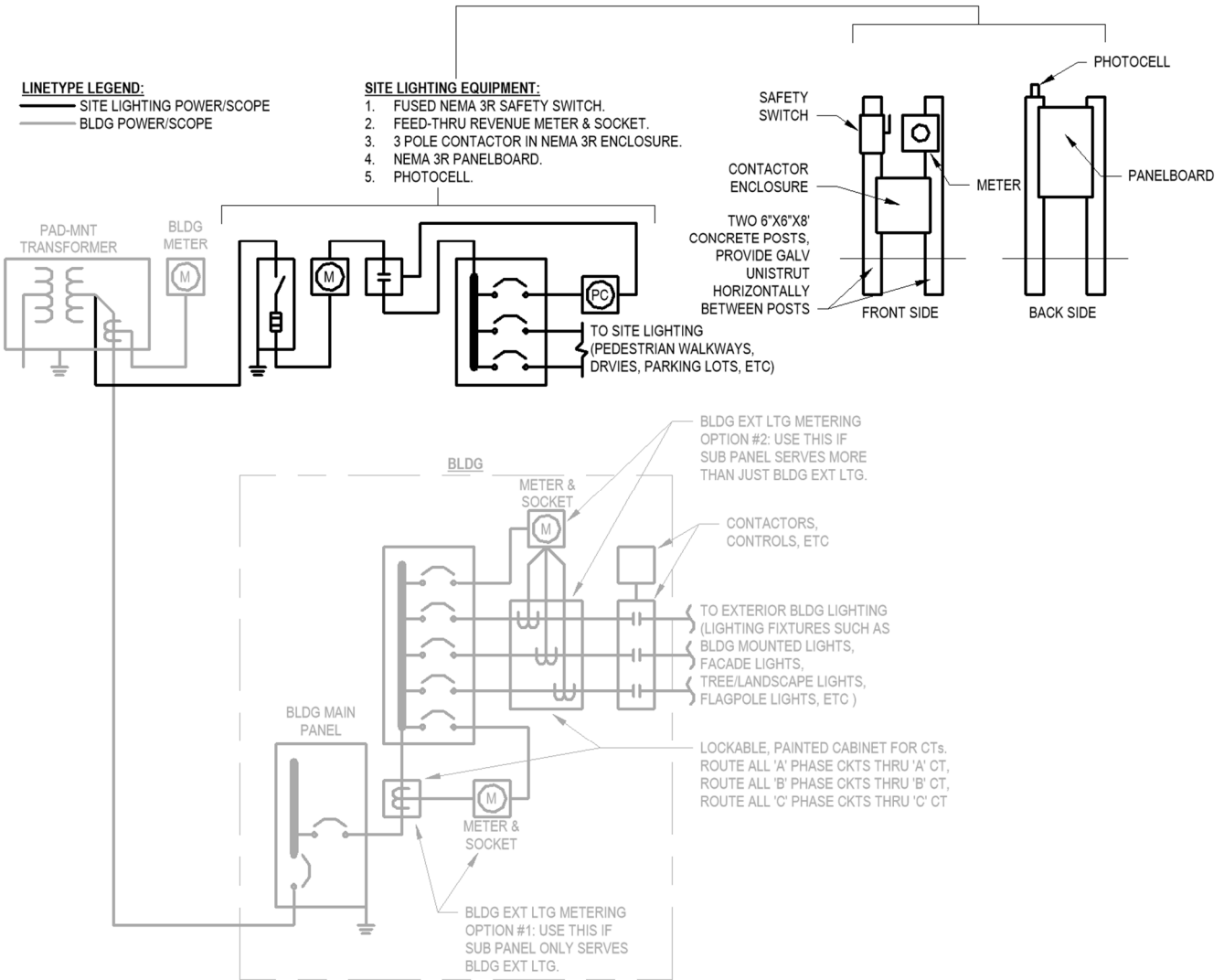
Fixture Type	Typical Locations	Acceptable Manufacturers	Notes, Specifications
Flat Panel 1x4,2x2,2x4 	Hallways Offices Classrooms Storerooms	<ul style="list-style-type: none"> • Day-Brite Flux Panel • Metalux CGTX • Lithonia EPANL • HE Williams BP 	
Flat Panel Downlights 		<ul style="list-style-type: none"> • Signify • Metalux • Lithonia • HE Williams 	
Troffer 1x4,2x2,2x4 	Hallways Offices Classrooms	<ul style="list-style-type: none"> • Day-Brite • Metalux • HE Williams • Lithonia • Columbia 	
Downlight 	Hallways Offices Conference Classrooms	<ul style="list-style-type: none"> • HE Williams • Prescolite • Portfolio • Lightolier • Lithonia • Elite 	If mounted in inaccessible ceiling, fixture shall be maintainable thru aperture which shall be 4" minimum.
Pendant Linear 	Hallways Offices	<ul style="list-style-type: none"> • Finelite • Corelite • Ledalite • Mark Architectural • Litecontrol 	
Recessed Linear 	Hallways Offices Conference Classrooms	<ul style="list-style-type: none"> • Finelite • Corelite • Ledalite • Mark Architectural • Litecontrol 	
Industrial Pendant 	Mech/Elec Rooms	<ul style="list-style-type: none"> • Day-Brite FluxStream • Metalux • HE Williams • Lithonia 	Up & Down light. Lens.
EXIT Edge-Lit 	Interior	<ul style="list-style-type: none"> • Beghelli • Sure-Lites • Dual-Lite • Lithonia • Compass 	Photoluminescent) non-electric) signs are not allowed.

Fixture Type	Typical Locations	Acceptable Manufacturers	Notes, Specifications
EXIT 	Interior	<ul style="list-style-type: none"> • Beghelli • Sure-Lites • Dual-Lite • Lithonia 	Aluminum housing. Steel or plastic housings not allowed. Red or green lettering. All exit signs shall remain on continuously and shall not be switched.

4.0 LIGHTING CONTROLS

A EXTERIOR

- 1 Roadways, parking lots, drives, and pedestrian pathways shall be circuited and powered from stand-alone metered and controlled electrical equipment fed directly from pad-mount transformers.



- 2 Building mounted perimeter security and entry/exit lights: Shall be on photocell control only and shall remain on when it is dark. This provides continuous lighting at night for security reasons.
- 3 CONTROL: See Specification Section 260900.
 - a All security lighting shall have photo-cell and timer control; parking lot, architectural, and other lighting, which may not need to be on all night shall have combination photo-cell and timer control. Time control shall be provided by the Building Automation / Control System, if present.
 - b Building and parking lot lights shall be separately controlled.
 - c Lighting in the perimeter zones of multi-level parking garages shall be wired and controlled separately, to stay off when there is sufficient daylight.
- 4 TIME CLOCKS:
 - a All time clocks shall have a snap-out timing mechanism, such as with a Tork 1103.
 - b For the Health Science Center, a digital clock with battery or capacitor back-up may be acceptable.

B INTERIOR

- 1 The preferred method of controlling interior lighting and complying with code required automatic lighting controls is installing low voltage digital occupancy/vacancy sensor systems that use RF wireless communications or CAT6 cabling between devices. These systems can also provide the HVAC/BAS system with space occupancy status as needed as well as interface with the building fire alarm system for turning egress lights ON during alarm conditions where required by code.
 - a Acceptable manufacturers are:
 - i WattStopper DLM
 - ii Hubbell NX
 - iii Acuity nLight
 - iv Lutron Vive
 - v Crestron
 - b Controller shall be located above main entry door above accessible ceiling.
 - c Wireless battery powered devices shall be lithium-ion and last 7+ years.
 - d Color of CAT6 cabling shall be yellow.
 - e For every device type installed on a project, provide spare devices per the following.
 - i Spare parts shall be neatly boxed and labeled to identify contents (project name, device, etc). Include the project's lighting plans for reference.

- ii Provide qty (1) complete spare device per 20 devices installed. Minimum of 1 of each type.
 - f Room controllers can be stand alone or networked together with other rooms.
 - g Room controllers shall operate as stand-alone mode if network fails.
- 2 PoE LIGHTING: This section is under review by Facilities Services. Power over Ethernet lighting is currently not allowed, but is being studied by the University. If the project would like to use PoE lighting please ask for direction before design begins. .
- 3 SAFETY
 - a Per code, automatic lighting control should not be installed where it poses a hazard to occupants. The following space types are typically included in this category:
 - i Rooms where patient care is rendered.
 - ii Mechanical rooms with pumps, air handlers and other equipment with moving or rotating parts.
 - iii Elevator equipment rooms.
 - iv Shops and other “industrial” use spaces with drill presses, saws, lathes, etc.
 - v Laboratory spaces that use chemicals or other materials that if dropped or spilled could cause harm.
 - vi Electrical rooms with panelboards, switchboards, transformers, etc.
- 4 0-10V WIRING:
 - a 0-10V is the preferred type of dimming for most applications.
 - b Class 1 wiring of the 0-10V system is preferred because it keeps the wiring inside the conduit system with the line voltage conductors.
 - c Wire color shall be pink (not grey) and violet.
- 5 CLASSROOMS & LECTURE HALLS: In the absence of special user needs such as lighting control systems for performing arts spaces, lighting for auditoriums and classrooms larger than 75 seats shall be directly controllable by A/V control system interfaces and be BACnet compatible. In the event the system chosen integrates the A/V and lighting control functions in one unit, maintenance of the lighting component shall become the responsibility of the same resources that maintain the A/V system. Permanently labeled zone and scene push-button lighting controls will be provided at appropriate locations, including the instructor location, with the capability of adding additional button or touch-screen control interfaces as needed by the end-user. In auditoriums, some room lighting shall be controllable from manual controls strategically located at means of egress.

5.0 LIGHT REVENUE METERING

A EXTERIOR

- 1 The following is the Facilities Services policy for metering on exterior lighting projects:
 - a Lighting installations do not need a meter if the connected load is less than one KVA.
 - b New lights should preferably be connected to existing, metered, lighting circuits. If the existing lighting circuit is un-metered, and the subsequent connected load is greater than one KVA, then the lighting project must include installation of a meter for the entire lighting circuit.
- 2 Alternatively, new lights in areas of general use may be connected to a building funded by the University's E & G (Education & General) budget, and new lights in non-E & G areas may be connected to a building funded by the benefiting non-E & G entity. If the new lighting load is less than 0.5 KVA, then it may be connected to an E & G or non-E & G circuit, regardless of who is the beneficiary.

B INTERIOR

- 1 There is no requirement to separately meter interior lighting. However, projects may choose to meter interior lighting for various reasons such as LEED points, energy monitoring, etc.

END OF SECTION