

INTERIOR LIGHTING

GENERAL INFORMATION

- 1.1 Designs for lighting should incorporate the most aggressive energy efficient technologies available in accordance with the University's requirement to save energy and reduce carbon footprint.
- 1.2 Comply with the New York City Energy Conservation Construction Code at an absolute minimum. It is expected that lighting designers will be as aggressive as possible to reduce electrical load from lighting – therefore innovative technologies will be considered, while simultaneously being cognizant of the long term maintenance cost.
- 1.3 Identify any and all rebate opportunities and work with the University to apply for them in a timely and thorough manner.

DESIGN REQUIREMENTS

2.1 Interior Lighting

- a. Each room/area shall have its light fixtures controlled from a local control device(s) for each circuit serving the room. Provide additional controls where required by energy code.
- b. CU works in conjunction with Signify to support a robust program of fixture types as well as Consultant Services such as photometric studies. See the Lighting LookBook for pre-approved fixtures. Alternate LED light sources shall be considered only if practical and must be submitted for review to Design and Compliance during the schematic design phase of the project. Lamps, boards, drivers and fixtures must be of a type that is commonly stocked in the maintenance department, easy to re-lamp and readily available from local suppliers.
- c. Incandescent lamps shall be avoided wherever possible.
- d. A Lamp List for proposed fixtures shall be submitted at the Design Development phase of the project for review by CPM and Operations.
- e. Specify appropriate dimming ballasts that coordinate with daylighting systems where daylighting concepts are used.

2.2 Emergency Lighting

- a. It is CUFO's goal to maximize safety and maintainability and minimize lifecycle cost. Power sources for emergency lighting should be determined as follows:

1. Emergency generator – utilize generator capacity whenever possible. Perform capacity analysis for any project requiring new or replacement emergency lighting.
 2. Inverter – provide logical grouping of emergency lighting on an inverter placed in a secured closet in an accessible location. For partial floor or partial building renovations, provide additional capacity as directed by CUFO.
 3. Fixture mounted battery ballasts – this option to be utilized when 1 and 2 are not feasible.
 4. Individual battery pack fixtures – this option is to be utilized only when options 1, 2 and 3 are not feasible. Exception: Battery packs shall be utilized in addition to the above methods in emergency generator and ATS rooms (3hr capacity).
- b. In the schematic phase of each project, provide a narrative report detailing the proposed concept for emergency lighting.
- c. Emergency lighting shall be provided as required by code, including:
1. Science Laboratories
 2. Toilet rooms to ensure safe egress.
 3. At the egress path in open office areas.
 4. in all generator rooms and enclosures
 5. electrical closets
 6. main electric service rooms
 7. UPS rooms
 8. Other rooms likely to require access by facility personnel during emergencies.
- d. Provide select egress and all security lighting on non-switched emergency circuits. The number of egress lights required to be unswitched shall be the minimum number of fixtures to maintain code required light levels. The remaining fixtures may be on occupancy control. The security and emergency egress lighting plan will be presented to the operations department prior to commencing construction drawings.

2.3 Exit Lights

- a. Provide self-contained, AC battery-illuminated exit light units with universal mounting and downlight component. New York City approved.
- b. Lamps: LED type rated for 25 years life.
- c. Graphics: The word “EXIT” shall be spelled in ¾ inch stroke red letters only.
- d. Directional Arrows: Chevron type design to indicate egress path.
- e. Battery: Sealed, maintenance-free, nickel-cadmium type, with 10-year nominal life.
- f. Charger: Integral, fully automatic, solid-state type, with sealed transfer relay.

- g. Finish: Matte black for exposed parts.
- h. Operation: Sign shall be illuminated by AC powered lamps under normal conditions. Relay shall turn emergency lamps on automatically when supply circuit voltage drops to 80 percent of nominal or below. Lamps shall operate for 90 minutes minimum. Lamps shall automatically disconnect from battery when voltage approaches deep-discharge value. When normal voltage is restored, AC powered lamps shall relight and DC lamps shall switch off. Battery shall automatically recharge within 16 hours and maintain on trickle charge.

2.4 Emergency Battery Packs

- a. Self-contained, surfaces wall mounted, with two lamp heads and provisions for a third lamp head on top of unit, and having the following features.
 - 1. Housing shall be 20-gage steel, minimum.
 - 2. LED indicator lights and push-to-test switch shall be on front panel, with concealed terminals for remote lamp heads.
 - 3. Integral lamp heads shall be mounted on top of housing with 180-deg, 2-way, and locking swivel joints for aiming. Lamp output shall be 18-watt minimum, bi-pin halogen type minimum.
 - 4. Battery: Sealed, maintenance-free, nickel-cadmium type, with 10-year normal life.
 - 5. Charger: Fully automatic, solid-state type, with sealed transfer relay and fused output circuits.
 - 6. Operation: Relay shall turn lamps on automatically when supply circuit voltage drops to 80 percent of nominal or below. Lamps shall operate for duration of 90 minutes minimum. Lamps shall automatically disconnect from battery when voltage approaches deep-discharge value. When normal voltage is restored battery shall automatically recharge within 16 hours and maintain on trickle charge.
- b. Integral emergency battery-inverter units shall be utilized where appropriate. Consideration of reduced light output during operation must be accounted for.

CONSTRUCTION REQUIREMENTS

3.1 Attic Stock

- a. Spare Lenses: 1 percent of spare glassware, lenses, or diffusers, but in no case less than one for each type classification of lighting fixture.
- b. Spare Lamps: 10 percent, but not less than 2 lamps in each case, of each type and size lamp used in each type fixture.

- c. Spare Battery Ballasts: One for each type unit installed.
 - d. Spare Batteries: One for each type battery installed.
- 3.2 Lighting control equipment shall be installed for easy access to maintenance and manipulation of the controls. Under no circumstances will this equipment be above ceiling or in any location requiring a ladder or lift to access.
- 3.3 The installing contractor shall provide appropriate training on the features of the lighting control system to the electric and controls department prior to acceptance.

END OF SECTION