

INTERIOR LIGHTING

1. General

- a. Design interior lighting to provide flexibility and ease of use. Designs shall provide adequate lighting for the intended space use/program while being energy efficient.
- b. Design lighting to meet Campus program needs and preferences. See *Directive 1C-10 - Coordination with Individual Campus Standards*.

2. Codes & Reference Standards

- a. New York State Uniform Code (current adopted version)
- b. New York State Energy Conservation Construction Code (NYSECCC), as adopted by the Fund. (current adopted version)
- c. ANSI/ASHRAE/IES Standard 90.1 Energy Standard for Buildings except Low-Rise Residential Buildings (referenced version from NYSECCC).
- d. Illuminating Engineering Society (IES): The Lighting Handbook – Tenth Edition.
- e. NFPA 70, “National Electrical Code” (referenced version from NYSECCC).

3. Light Fixtures (General)

- a. Fixtures shall be of a standard commercial design, without the use of custom fixtures.
- b. The number of lamp types used should be minimized to simplify maintenance.
- c. Fixtures shall be selected to minimize the need for multiple spare parts.
- d. Fixtures shall be easy to maintain, with optical systems that suit the lighting environment.
- e. All light sources shall be standard commercial LED type.

- f. Access of fixtures for maintenance and servicing shall be addressed and coordinated with the Campus during the design phase. Select and locate fixtures to provide proper Campus access by use of their preferred means and methods.
- g. Fixture color temperatures shall be specified and coordinated with existing Campus standards.

4. Emergency Lighting

- a. Emergency egress lighting shall be provided by powering select general lighting fixtures via emergency (life-safety) branch circuit, when available.
- b. Emergency egress lighting not powered by an emergency generator shall be provided by individual emergency lighting units (on-board battery), integral battery backup on select general lighting fixtures, or powering fixtures via central lighting inverter, selected in coordination with the Campus.
- c. Fixtures that function as both normal and emergency means of illumination shall be controlled by a combination of listed emergency relay (UL924) and occupancy sensor or building control signal to reduce lighting power by 50% when unoccupied longer than 15 minutes.
- d. Provide emergency lighting in mechanical and electrical rooms and in other spaces where required by the intended space/use program.

5. Lighting Controls

- a. Localized, room-level control system(s) are preferred for classrooms, multi-use rooms, private offices, etc.
- b. Network-based control systems shall be used for public areas, corridors, lobbies, atriums, etc.
- c. Coordinate with Campus during design to establish the type of lighting control (Localized vs. Networked) to be used for each space and to determine occupancy schedules. Select the level of complexity of operating controls, access levels and other user interfaces required by the intended space/use program.
- d. Where spaces have more than one access point, select and locate switches and controls to provide the level of control preferred by the Campus at each access point.

6. Lighting Level and Lighting Power Density

- a. Designs shall use target lighting levels as referenced in the IES Lighting Handbook, Tenth Edition.
- b. Illumination level for Emergency Egress Lighting
 1. Arranged to provide not less than an average of 1 footcandle, and a minimum at any point of 0.1 footcandles, along the path of egress at the floor level.
 2. Lighting Power Density (LPD) shall be in accordance with the compliance path used for the project, plus the NYStretch Energy Code 2020.
 3. Provide lighting levels that support the intended space use/program.

7. Submission Requirements

- a. Plan Drawings shall indicate fixture layout, switching arrangements, and branch circuiting. Primary and secondary daylight zones shall be shown on the documents.
- b. Fixture Schedule: Provide a complete fixture schedule for the project:
 1. Fixture Tag/Name, description, installation method (grid, suspended, etc.), lamp/LED data, input wattage, specific features or options, manufacturer and model number.
 2. Three (3) manufacturers must be specified for each fixture selection. See Directive 1C-2 Specification of Materials.
- c. Control System Details
 1. Provide wiring/interconnection diagrams for typical control solutions used throughout the project. Diagram shall highlight the wiring interconnections between controllers, occupant sensors, daylight sensors, power packs, and fixtures.
 2. Provide riser diagrams for network-based control systems.
 3. Sequence of operations for each control method used.
 4. Lighting plans shall indicate which fixtures are switched/dimmed with daylight responsive controls. Primary and secondary daylight zones shall be shown on the documents.

- d. Code Compliance Documentation
 - 1. Document the compliance path used for the lighting system, targeted LPD values, and resulting calculated LPD values.
 - 2. Photometric plans shall be provided to verify that targeted lighting levels have been reached.
- e. Specifications
 - 1. Specifications shall be tailored to suit the project and the chosen system methodology.
 - 2. Consider the need to require the services of the manufacturer's technical expert(s) and other quality assurance requirements in Directive 1C-2 Specification of Materials.
 - 3. Include requirements for functional testing and demonstration (prior to beneficial occupancy) of maintenance activities, potential lighting scenes, and other operating features that the Campus should be aware of.
 - 4. Coordinate with Campus staff during the design phase to outline training needs prior to beneficial occupancy, and the need for refresher training after beneficial occupancy.

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