

Element D Services

Lighting

D5020 Lighting and Branch Wiring

PART 1 - GENERAL

1.1 OVERVIEW

- A. This Section includes design standards and requirements for interior fixtures, lamps and accessories. This is a design standard and is not intended to be used as a Specification.

PART 2 - DESIGN CRITERIA

2.1 GENERAL

A. Interior Lighting

1. Perform all lighting calculations based on IES Lighting Handbook 9th Edition and the lighting power density criteria of the applicable edition of ANSI/ASHRAE/IESNA 90.1.
2. Refer to Project Facility Program document for lighting requirements.
3. Include the following information in all submitted calculations:
 - a. Room Name
 - b. Room Number
 - c. Fixture type chosen for the room
 - d. Number and type of lamps to be used in the room
 - e. Required illumination level (MD Anderson or IESNA)
 - f. Calculated illumination level

B. Details

1. Provide individual lighting fixture details or a lighting fixture schedule on the Drawings and not as part of the specifications. See Design Guideline Element D5022 Master Lighting Fixture Schedule for requirement.
2. Show switch and switch leg control for all fixtures.
3. Do not switch corridor fixtures on emergency power, stairwell, or exit fixtures.
4. All new lighting shall be LED.
5. Provide occupancy sensors to comply with ANSI/ASHRAE/IESNA 90.1 requirements.
6. Lighting fixtures in equipment rooms, telecommunication rooms, and utility rooms shall be mounted such that the fixture bottom is not less than 8 feet-6 inches above finished floor. Coordinate final location with equipment layout.

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7. Electrical and mechanical rooms shall have 50 percent of the lighting fixture on emergency power. When only (2) fixtures are in a room, both may be on one switch on emergency power. All lighting fixtures in telecommunications equipment rooms shall be on emergency power. Elevator machine room lighting shall be on a dedicated circuit. Do not use occupancy sensor for lighting control in elevator equipment room, provide single pole lighting switch.
8. Lensed fixtures shall have KSH20, 0.140 thickness acrylic lens material.
9. Under cabinet or 'task' lights shall be 120V, shall have solid fronts, shall have individual rocker type switches, and where two (2) or more are installed shall have individual switch mounted at area entry.
10. All linear fixtures shall be LED, of 2-, 3- or 4-foot sections only.
11. For animal facilities, all animal room lighting shall be on emergency power.
12. For animal facilities, cage washing room lighting shall be approximately 50 percent on emergency power. Lighting focal points shall be on washing, loading, and unloading areas.

C. Deviations

1. Whenever deviations from MD Anderson's Standards and/or Design Guidelines occur, the Engineer shall make recommendations applicable to that specific project.
2. Request approval from Owner for the implementation of any new or improved lighting products and/or systems that are energy efficient or result in cost savings.

D. Lighting Schemes

1. At least two (2) proposed lighting schemes for special areas (visitor lobbies, cafeterias, atriums, etc.) should be provided.
2. Each layout shall vary in concept and materials such as fixture layout, fixture type, louvers, reflectors, etc. This will enable MD Anderson to select the best scheme to suit goals and budget requirements.

E. Lighting Controls

1. All lighting for animal holding and procedure rooms shall be centrally controlled with programmable lighting cycles for each room as described in the Project Program Document. The central control shall be part of an environmental control computer located in the administrative office.
2. Provide housing and procedure rooms with a dimming system (Lutron or Edstrom compatible) with the use of automated features for ON/OFF control and scheduling.
3. Vivarium lighting shall be color-controlled LED fully integrated into the overall monitoring system by Avidity Science or approved equal.

F. Exit Fixtures

1. Provide exit light fixtures in accordance with NFPA 101, Life Safety Code.
2. Indicate double-faced fixtures and/or directional arrows on the Drawings, where required.

G. Closets or Lockers

1. Place fixtures appropriately to provide adequate lighting in closets and lockers.

H. Interstitial Spaces

1. Install lighting by strip lights equipped with industrial reflectors. Provide with wire guard where subject to physical damage.
2. Spaces with walkways or catwalks only:
 - a. Locate fixtures appropriately along catwalks and walkways.
 - b. Emergency circuits shall be switched at entry doors.
 - c. Switch all non-emergency powered fixtures from all access doors to the space. Long catwalk runs should be separately switched.

I. Exterior Lighting

1. All walkways, sidewalks, and parking lots shall be illuminated to levels recommended by the Illuminating Engineering Society (IES). Typical levels shall be according to the following:

LOCATION	ILLUMINATION AVERAGE (FC)
Sidewalks	0.5
Entryways	1
Heavily Traveled Areas	1
Parking Lots	0.5

2. Refer to ASHRAE 90.1 - 9.4.5 for exterior lighting limits.
3. Design and location of exterior lighting shall always consider tree and landscaping locations.

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- 4. Exterior building lighting shall be controlled with an astronomical time clock with manual bypass switch. Outside area and street lighting may be controlled with photoelectric cells or an astronomical time clock. Lighting contactors shall have provisions for connection to building automation system.
- 5. Refer to Design Guideline Element D5038 Security Systems for additional exterior lighting requirements.
- J. All engineering calculations of lighting analysis and light level study shall be made available to the Owner upon request.
- K. Lighting circuits with ceiling occupancy sensors shall also have wall mounted switches of the appropriate color.
- L. Locate stairwell and exit fixtures to be accessible from a 10-foot ladder placed on a flat surface.
- M. Consider lamp replacement at all fixture locations: high ceilings, above escalators, other floor openings, etc.
- N. Conference rooms shall have dimmable linear and/or compact downlights.
- O. All lighting control contactors shall be mechanically held. Contactors to be controlled locally. All contactors shall have a cover mounted H-O-A switch. All contactors shall have provisions for connection to building automation system.
- P. Lighting fixtures in bridges, window corridor areas, and other similar areas with high ambient outside lighting, shall have photocell area control.
- Q. Evaluate and make recommendations to the Owner if indirect lighting should be considered for any area in the Project.

PART 3 - SPECIAL CONTRACT DOCUMENT REQUIREMENTS

3.1 GENERAL

- A. A/E shall perform calculations of illumination levels for the spaces being designed.
- B. Building exterior and parking garages shall have point calculations provided.
- C. For exterior lighting, provide pole mounting height and pole base installation detail.

PART 4 - PRODUCTS

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4.1 GENERAL

- A. All standard fixtures shall be selected from the MD Anderson Master Lighting Fixture Schedule, referenced in Design Guideline Element D5022. Additional fixtures required for a specified project shall be selected by the engineer. Any deviations from above mentioned schedule require the Owner's written approval.
- B. Refer to Owner's Master Construction Specifications. These are available on the Owner's Design Guidelines website: <http://www2.mdanderson.org/depts/cpm/standards/specs.html>

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PART 5 - DOCUMENT REVISION HISTORY

Issue	Date	Revision Description	Reviser
	20190301	Original Issuance	
Rev. 1	20230622	Remove reference to fluorescent lighting and update to LED lighting and related controls.	G. Gabino

END OF ELEMENT D5020