SECTION 26 55 71
MEDICAL AND SURGICAL LIGHTING FIXTURES

PART 1 - GENERAL

1.1 DESCRIPTION

This section specifies the furnishing, installation, and connection of the surgical lighting fixtures.

1.2 RELATED WORK

A. Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS: General electrical requirements and items that are common to more than one section of Division 26.

B. Section 26 05 26, GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS: Requirements for personnel safety and to provide a low impedance path for possible ground fault currents.

1.3 QUALITY ASSURANCE

Refer to Paragraph, QUALIFICATIONS, in Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS.

1.4 SUBMITTALS

A. Submit in accordance with Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS.

B. Shop Drawings:

1. Clearly present sufficient information to determine compliance with drawings and specifications.
2. Include electrical ratings, dimensions, mounting details, materials required clearances, terminations, wiring and connection diagrams, lubrication, ballasts, lenses, louvers, lamps, and controls.
3. Include photometric data for surgical lighting fixture Type T from an independent testing laboratory. The photometric report shall include data to show that the surgical light fixtures are in full compliance with requirements for illumination level, shadow reduction, beam heat, and color temperature. Where testing procedures or parameters are specified, the report shall indicate the surgical light fixtures were tested to those criteria.

C. Manuals:

1. When submitting the shop drawings, submit companion copies of complete maintenance and operating manuals, including technical data sheets, wiring diagrams, and information for ordering replacement parts.

a. Wiring diagrams shall have their terminals identified to facilitate installation, operation, and maintenance.
b. Wiring diagrams shall indicate internal wiring for each item of equipment and the interconnections between the items of equipment.
c. Provide a clear and concise description of operation including all details required to properly operate the equipment and system.
d. Approvals will be based on complete submissions of manuals together with shop drawings.

2. Two weeks prior to final inspection, submit four copies of a final updated maintenance and operating manual to the COTR.
   a. The manual shall be updated to include any information necessitated by shop drawing approval.
   b. Complete "As Installed" wiring and schematic diagrams shall be included, showing all pieces of equipment and their interconnecting wiring.
   c. Show all terminal identification.
   d. Include information for testing, repair, troubleshooting, lubrication, assembly, disassembly, and recommended maintenance procedures and intervals.
   e. Provide a replacement parts list with current prices. Include a list of recommended spare parts, lamps, tools, and instruments for testing and maintenance.

D. Certifications: Two weeks prior to final inspection, submit four copies of the following to the COTR:
   1. Certification by the manufacturer that the materials are in accordance with the drawings and specifications.
   2. Certification by the contractor that the equipment has been properly adjusted, installed, and tested.

1.5 APPLICABLE PUBLICATIONS

A. Publications listed below (including amendments, addenda, revisions, supplements, and errata) form a part of this specification to the extent referenced. Publications are referenced in the text by designation only.

B. National Fire Protection Association (NFPA):
70-08.....National Electrical Code (NEC)

99-05.....Health Care Facilities

C. Underwriters Laboratories, Inc. (UL):

60601-1.....Medical Electrical Equipment, Part 1: General Requirements for Safety

PART 2 - PRODUCTS

2.1 SURGICAL LIGHTING FIXTURES, GENERAL

A. Fixtures shall be in accordance with UL 60601-1, NEC, and NFPA 99, as shown on the drawings and as specified.

B. Fixtures shall be complete, grounded, fungi-proof, adequately enclosed for asepsis, and designed for use in human operating rooms by a manufacturer that regularly produces such fixtures.

C. Fixtures shall be supplied complete with suspension systems, lightheads, transformers, and controls. Components shall be products of a single manufacturer.

D. Suspension components shall not flex during normal use. Articulation of the suspension to any position in its range shall maintain the lighthead at that point without drift.

E. All exposed surfaces shall be free of burrs and sharp edges. Finishes on all exposed surfaces shall be specifically designed to resist scuffing and deleterious effects of the use of hospital cleaning materials.

F. Except for finished aluminum, stainless steel, chrome, nickel and brass surfaces, all metal surfaces shall be thoroughly cleaned and painted at the factory with a corrosion-resistant primer and not fewer than two coats of lacquer or baked enamel finish.

G. Maximum leakage current of each lighthead and its respective control shall not exceed 100 microamperes as measured in accordance with UL 60601-1.

2.2 SURGICAL LIGHTING FIXTURE TYPES

A. A. Dual Lighthead Minor Procedure(Type T): Refer to lighting fixture schedule on Drawings.

2.3 LIGHTHEAD

A. Lighthead Housing: The lighthead housing shall be not greater than 30 in [760 mm] in diameter.

B. Light Source:

1. Light source shall be light-emitting diode (LED). Light-emitting diodes consist of multiple LEDs within a single head.

2. Light source shall have the following characteristics:
   a. Corrected color temperature as noted on fixture schedule.
   b. Radiant heat energy in the light beam 42 in [1070 mm] below the lighthead shall not exceed 25,000 microwatts per square cm at maximum intensity in the light pattern.
   c. Color Rendering Index (CRI) shall be a minimum of 92, as measured on the ASTM E 308 chromaticity diagram.
   e. Light-emitting diode life shall be an average of 25,000 hours.

C. Beam intensity and position shall be adjustable through operation of control panel.

2.4 CONTROLS

A. Provide a wall-mounted intensity and light beam positioning control unit for each pair of lightheads and the required backbox for the intensity control unit as required by the manufacturer.

B. The control unit shall be adjustable with a minimum of five discrete steps. LED dimming range shall be 100% to 30%.

C. The minimum wall control box functions shall include an on-off switch, intensity adjustment, and endoscopic light actuation located outside the sterile field. Controls shall move in a free, smooth, and silent manner without drifting, regardless of position.

D. The controls shall have adequate radio frequency suppression appropriate for applications where sensitive electronic medical equipment is used.

E. Each unit shall be readily removable from its wall box for servicing or replacement, utilizing electrical plug connections.

F. In the event of a control unit fault, the unit shall default to maximum intensity of illumination.

G.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Installation shall be in accordance with NEC and in accordance with the manufacturer's recommendations.

B. Coordinate the components electrically and mechanically with the ceiling heights and with other equipment, such as radiology equipment, ductwork, service drops, and like items, in the room where each fixture will be installed.

C. Mount the controls with the bottom of the control 59 in [1500 mm] above the finished floor.

D. For remote transformer installation, ensure that the wiring distance is not more than that allowed by the manufacturer.

E. Upon completion of the installation, conduct an operating test to demonstrate that each surgical lighting fixture meets the requirements of this specification. Perform all manufacturer's recommended visual and physical performance checks.

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