SECTION 26 51 00
LIGHTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Manufacturers – Lighting Fixtures
2. Lighting Fixtures and Components, General Requirements
3. Ballasts for Linear Fluorescent Lamps
4. Ballasts for Compact Fluorescent Lamps
5. Emergency Fluorescent Power Unit
6. Ballasts for HID Lamps
7. Exit Signs
8. Emergency Lighting Units
9. Incandescent Lamps
10. Fluorescent Lamps
11. HID Lamps
12. LED Lamps
13. Lighting Fixture Support Components

B. Meet the following performance requirements:

1. Seismic Performance: In accordance with Section 26 00 10.
2. Design and layout of lighting system in conformance with the energy code, IESNA recommended procedures and regulatory requirements.

1.2 RELATED WORK

A. Section 26 00 10 – Basic Electrical Requirements, is an integral part of this Section. Requirements and work indicated in 26 00 10 are not repeated in this Section.

B. Section 26 08 00 – Electrical General Commissioning Requirements. Provide Installer's and Manufacturer's support as required to coordinate with the Commissioning Agent and support all commissioning efforts and paperwork, Acceptance and Integrated Systems Testing.

1.3 COORDINATION

A. Coordinate work under provisions indicated in Section 26 00 10.

B. Coordinate fixture mountings with ceiling types and provide the required components for correct mounting of the fixture, including plaster frames, slope adjusters, etc. Review architectural reflected ceiling drawings and notify Architect of discrepancies prior to ordering fixtures or submitting shop drawings. No additional compensation will be allowed if wrong fixtures are ordered because coordination was not performed.

1.4 QUALIFICATIONS / QUALITY ASSURANCE

A. Conform to requirements indicated in Section 26 00 10.

B. Deliver to site, store, protect, and handle products under provisions of Section 26 00 10.

C. Accept products on site. Inspect for damage.

1.5 REGULATORY REQUIREMENTS AND STANDARDS

1. ANSI C78.379 - Electric Lamps - Incandescent and High- Intensity Discharge Reflector Lamps - Classification of Beam Patterns.
2. ANSI C82.1 - Ballasts for Fluorescent Lamps - Specifications.
3. UL 486 A and B.
4. Certified Ballast Manufactures Association (CBM).
5. Local Energy code, latest edition.
6. ASHRAE 90.1, latest edition.

1.6 SUBMITTALS

A. Submit as required here in and under Section 26 00 10.

B. Shop Drawings: Indicate dimensions and components for each luminaire.

C. Product Data: Provide dimensions, ratings, and performance data.

1.7 EXTRA MATERIALS

A. Furnish under provisions indicated in Section 26 00 10

B. Provide the following additional materials:

1. Provide two of each plastic lens.
2. Provide one case (minimum of 12) replacement lamps for each type of lamp and wattage installed. Provide five cases (60 lamps) of four-foot fluorescent lamps.
3. Provide two of each ballast type and rating.
4. Provide spare fuses for fused fixtures equal to 10% of total installed of each type.

1.8 PROJECT RECORD DOCUMENTS

A. Submit under provisions indicated in Section 26 00 10.

B. Accurately record locations of each luminaire.

1.9 OPERATION AND MAINTENANCE DATA

A. Submit under provisions indicated in Section 26 00 10.

B. Include instructions for maintaining luminaries, cleaning procedures and relamping schedule.

C. Include 8-1/2" x 11" typed copy of the fixture schedule indicating actual fixtures and lamps installed. Include manufacturer and catalog numbers of lamps.

1.10 WARRANTY

A. Provide under provisions indicated in Section 26 00 10.

1.11 LEED / SUSTAINABILITY

A. Conform to requirements indicated in Section 26 00 10.

PART 2 - PRODUCTS

2.1 MANUFACTURERS – LIGHTING FIXTURES

A. Basis-of-Design Product: Subject to compliance with requirements provide the product indicated on the Drawings or the first listed manufacturer or product below. Subject to

compliance with requirements a comparable product by one of the others listed may be acceptable:

a. As indicated on Drawing Fixture Schedule
b. Columbia Prescolite Moldcast.
c. Lithonia
d. Day Brite
e. Cooper lighting
f. Prescolite
g. Chloride
h. Dual light
i. Substitutions: Or equal, under provisions of Section 26 00 10.

2.2 LIGHTING FIXTURES AND COMPONENTS, GENERAL REQUIREMENTS

A. Recessed Fixtures: Comply with NEMA LE 4 for ceiling compatibility for recessed fixtures.

B. Incandescent Fixtures: Comply with UL 1598. Where LER is specified, test according to NEMA LE 5A.

C. Fluorescent Fixtures: Comply with UL 1598. Where LER is specified, test according to NEMA LE 5 and NEMA LE 5A as applicable.

D. HID Fixtures: Comply with UL 1598. Where LER is specified, test according to NEMA LE 5B.

E. Metal Parts: Free of burrs and sharp corners and edges.

F. Sheet Metal Components: Steel, unless otherwise indicated. Form and support to prevent warping and sagging.

G. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position.

H. Reflecting surfaces shall have minimum reflectance as follows, unless otherwise indicated:

1. White Surfaces: 85 percent.
2. Specular Surfaces: 83 percent.
3. Diffusing Specular Surfaces: 75 percent.
4. Laminated Silver Metallized Film: 90 percent.

I. Plastic Diffusers, Covers, and Globes:

1. Acrylic Lighting Diffusers: 100 percent virgin acrylic plastic. High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
   a. Lens Thickness: At least 0.125 inch (3.175 mm) minimum unless different thickness is indicated.
   b. UV stabilized.
2. Glass: Annealed crystal glass, unless otherwise indicated.

2.3 BALLASTS FOR LINEAR FLUORESCENT LAMPS

A. Manufacturers: Subject to compliance with requirements, provide products by the manufacturer specified:

1. Valmont.
2. Advance Transformer Company
3. Electronic Ballast Technology (EBT)
4. Motorola
5. Universal Manufacturing Corp.

6. Lutron
7. Bodine
8. Substitutions: Or equal, under provisions of Section 26 00 10.

B. Electronic Ballasts: Comply with ANSI C82.11; instant programmed-start type, unless otherwise indicated, and designed for type and quantity of lamps served. Ballasts shall be designed for full light output unless dimmer or bi-level control is indicated.

1. Sound Rating: A.
2. Total Harmonic Distortion Rating: Less than 20 percent.
3. Transient Voltage Protection: IEEE C62.41, Category A or better.
4. Operating Frequency: 42 kHz or higher.
5. Lamp Current Crest Factor: 1.7 or less.
6. BF: 0.88 or higher.
7. Power Factor: 0.95 or higher.
8. Parallel Lamp Circuits: Multiple lamp ballasts shall comply with ANSI C 82.11 and shall be connected to maintain full light output on surviving lamps if one or more lamps fail.

C. Single Ballasts for Multiple Lighting Fixtures: Factory-wired with ballast arrangements and bundled extension wiring to suit final installation conditions without modification or rewiring in the field.

D. Ballasts for Low-Temperature Environments:

1. Temperatures 0 Deg F (Minus 17 Deg C) and Higher: [Electronic or electromagnetic] type rated for 0 deg F (minus 17 deg C) starting and operating temperature with indicated lamp types.

E. Provide Ballast Disconnect.

2.4 BALLASTS FOR COMPACT FLUORESCENT LAMPS

A. Description: Electronic programmed rapid-start type, complying with ANSI C 82.11, designed for type and quantity of lamps indicated. Ballast shall be designed for full light output unless dimmer or bi-level control is indicated:

1. Lamp end-of-life detection and shutdown circuit.
2. Automatic lamp starting after lamp replacement.
3. Sound Rating: A.
4. Total Harmonic Distortion Rating: Less than 20 percent.
5. Transient Voltage Protection: IEEE C62.41, Category A or better.
6. Operating Frequency: 20 kHz or higher.
7. Lamp Current Crest Factor: 1.7 or less.
8. BF: 0.95 or higher, unless otherwise indicated.
9. Power Factor: 0.95 or higher.
10. Interference: Comply with 47 CFR, Chapter 1, Part 18, Subpart C, for limitations on electromagnetic and radio-frequency interference for nonconsumer equipment.
11. Ballast Case Temperature: 75 deg C, maximum.
12. Thermally protected ballasts:

B. Ballasts for Dimmer-Controlled Lighting Fixtures: Electronic type.

1. Dimming Range: 100 to 5 percent of rated lamp lumens.
2. Ballast Input Watts: Can be reduced to 20 percent of normal.
3. Compatibility: Certified by manufacturer for use with specific dimming control system and lamp type indicated.

C. Provide ballast disconnect.

2.5 EMERGENCY FLUORESCENT POWER UNIT

A. Basis-of-Design Product: Subject to compliance with requirements provide the product indicated on the Drawings or the first listed manufacturer or product below. Subject to compliance with requirements a comparable product by one of the others listed may be acceptable:

1. Bodine.
2. Sure-Lite.
3. Lithonia.
4. Chloride.
5. Dual-Lite Inc.
6. Substitutions: Or equal, under provisions of Section 26 00 10.

B. General: Provide self-contained battery powered inverter unit for direct mounting in designated fluorescent fixtures. Provide unit with fully automatic charger, nickel-cadmium battery, AC "ON" pilot light, and test switch. Design unit to automatically transfer to battery supply on loss of normal AC power and to operate fluorescent lamp with minimum lumen output as follows:

1. Three lamps on emergency operation – 3250-3400 lumen output. Bodine model B33.
2. Two Lamps on emergency operation - 1450-3500 lumen output. Bodine model B30.
3. Standard and high output single T5 lamp – 600-1325 lumen output. Bodine model LP600
4. Two 4 foot T12 lamps – 1100-1400 lumen output. Bodine model B50.
5. Two pin compact fluorescent lamps – 450-950 lumen output. Bodine model B426.

C. Four pin compact fluorescent lamps – 700-1250 lumen output. Bodine model B4CFG.

D. Internal Type: Self-contained, modular, battery-inverter unit, factory mounted within lighting fixture body and compatible with ballast. Comply with UL 924.

1. Emergency Connection: Connect unswitched circuit to battery-inverter unit and switched circuit to fixture ballast.
2. Night-Light Connection: Operate fluorescent lamp(s) on emergency ballst continuously.
3. Test Push Button and Indicator Light: Visible and accessible without opening fixture or entering ceiling space.
    a. Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.
    b. Indicator Light: LED indicates normal power on. Normal glow indicates trickle charge; bright glow indicates charging at end of discharge cycle.
4. Battery: Sealed, maintenance-free, nickel-cadmium type.
5. Charger: Fully automatic, solid-state, constant-current type with sealed power transfer relay.

E. External Type: Self-contained, modular, battery-inverter unit, suitable for powering one or more fluorescent lamps, remote mounted from lighting fixture. Comply with UL 924.

1. Emergency Connection: Connect unswitched circuit to battery-inverter unit and switched circuit to fixture ballast.
2. Night-Light Connection: Operate fluorescent(s) on emergency ballest lamp in a remote fixture continuously.
3. Battery: Sealed, maintenance-free, nickel-cadmium type.
4. Charger: Fully automatic, solid-state, constant-current type.
5. Housing: NEMA 250, Type 1 enclosure.
6. Test Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.
7. LED Indicator Light: Indicates normal power on. Normal glow indicates trickle charge; bright glow indicates charging at end of discharge cycle.

F. Provide ballast disconnect.

2.6 BALLASTS FOR HID LAMPS

A. Manufacturers: Subject to compliance with requirements, provide products by the manufacturer specified:

1. Venture
2. Universal
3. Valmont
4. Substitutions: Under provisions of Section 26 00 10.

B. Electromagnetic Ballast for Metal-Halide Lamps: Comply with ANSI C82.4 and UL 1029. Include the following features, unless otherwise indicated:

1. Ballast Circuit: Constant-wattage autotransformer or regulating high-power-factor type.
2. Minimum Starting Temperature: Minus 22 deg F (Minus 30 deg C) for single-lamp ballasts.
3. Normal Ambient Operating Temperature: 104 deg F (40 deg C).
4. Open-circuit operation that will not reduce average life.
5. Low-Noise Ballasts: Manufacturers' standard epoxy-encapsulated models designed to minimize audible fixture noise.

C. Electronic Ballast for Metal-Halide Lamps: Include the following features unless otherwise indicated:

1. Lamp end-of-life detection and shutdown circuit.
2. Sound Rating: A.
3. Total Harmonic Distortion Rating: Less than 15 percent.
4. Transient Voltage Protection: IEEE C62.41, Category A or better.
5. Lamp Current Crest Factor: 1.5 or less.
6. Power Factor: .90 or higher.
7. Interference: Comply with 47 CFR, Chapter 1, Part 18, Subpart C, for limitations on electromagnetic and radio-frequency interference for nonconsumer equipment.
8. Protection: Class P thermal cutout.
9. Retain subparagraph and associated subparagraphs below for bi-level ballasts.

D. Auxiliary Instant-On Quartz System: Factory-installed feature automatically switches quartz lamp on when fixture is initially energized and when power outages occur. System automatically turns quartz lamp off when HID lamp reaches approximately 60 percent light output.

E. Provide ballast disconnect.

2.7 EXIT SIGNS

A. Description: Comply with UL 924; for sign colors, visibility, luminance, and lettering size, comply with NFPA 101 and authorities having jurisdiction.

B. Internally Lighted Signs:

1. Lamps for AC Operation: LEDs, 70,000 hours minimum rated lamp life. At end of lamp life sign illumination shall comply with code requirements.
2. Self-Powered Exit Signs (Battery Type): Integral automatic charger in a self-contained power pack.
   a. Battery: Sealed, maintenance-free, nickel-cadmium type.
   b. Charger: Fully automatic, solid-state type with sealed transfer relay.
   c. Operation: Relay automatically energizes lamp from battery when circuit voltage drops to 80 percent of nominal voltage or below. When normal voltage is restored, relay disconnects lamps from battery, and battery is automatically recharged and floated on charger.
   d. Test Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.

e. LED Indicator Light: Indicates normal power on. Normal glow indicates trickle charge; bright glow indicates charging at end of discharge cycle.

2.8 EMERGENCY LIGHTING UNITS

A. Description: Self-contained units complying with UL 924.

1. Battery: Sealed, maintenance-free, lead-acid type.
2. Charger: Fully automatic, solid-state type with sealed transfer relay.
3. Operation: Relay automatically turns lamp on when power supply circuit voltage drops to 80 percent of nominal voltage or below. Lamp automatically disconnects from battery when voltage approaches deep-discharge level. When normal voltage is restored, relay disconnects lamps from battery, and battery is automatically recharged and floated on charger.
4. Test Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.
5. LED Indicator Light: Indicates normal power on. Normal glow indicates trickle charge; bright glow indicates charging at end of discharge cycle.
6. Integral Time-Delay Relay: Holds unit on for fixed interval of 15 minutes when power is restored after an outage.

2.9 INCANDESCENT LAMPS

A. Manufacturers: Subject to compliance with requirements, provide products by the manufacturer specified:

1. Manufacturers:
   a. General Electric Company.
   b. Osram-Sylvania.
   c. North American Phillips Ltg. Corp.
   d. Lite Tronics (for long life lamps).
   e. Substitutions: Under provisions of Section 26 00 10.
2. Incandescent lamps shall be inside frosted, extended service unless otherwise indicated.
3. Provide 130 volt lamps.

2.10 FLUORESCENT LAMPS

A. Manufacturers: Subject to compliance with requirements, provide products by the manufacturer specified:

1. Manufacturers:
   a. General Electric Company.
   b. North American Phillips Ltg. Corp.
   c. Osram-Sylvania
2. Substitutions: Under provisions of Section 26 00 10.

B. All lamps of a particular type shall be furnished by one manufacturer.

C. Low-Mercury Lamps: Comply with EPA's toxicity characteristic leaching procedure test; shall yield less than 0.2 mg of mercury per liter when tested according to NEMA LL 1.

D. T8 rapid-start low-mercury lamps, rated 32 W maximum, nominal length of 48 inches (1220 mm), 2800 initial lumens (minimum), CRI 75 (minimum), color temperature 3500 K, and average rated life 20,000 hours, unless otherwise indicated.

T8 rapid-start low-mercury lamps, rated 17 W maximum, nominal length of 24 inches (610 mm), 1300 initial lumens (minimum), CRI 75 (minimum), color temperature 3500 K, and average rated life of 20,000 hours, unless otherwise indicated.

T5 rapid-start low-mercury lamps, rated 28 W maximum, nominal length of 45.2 inches (1150 mm), 2900 initial lumens (minimum), CRI 85 (minimum), color temperature 3500 K, and average rated life of 20,000 hours, unless otherwise indicated.

T5HO rapid-start, high-output low-mercury lamps, rated 54 W maximum, nominal length of 45.2 inches (1150 mm), 5000 initial lumens (minimum), CRI 85 (minimum), color temperature 3500 K, and average rated life of 20,000 hours, unless otherwise indicated.

Compact Fluorescent Lamps: 4-Pin, low mercury, CRI 80 (minimum), color temperature 3500 K, average rated life of 10,000 hours at 3 hours operation per start, and suitable for use with dimming ballasts, unless otherwise indicated.

1. 13 W: T4, double or triple tube, rated 900 initial lumens (minimum).
2. 18 W: T4, double or triple tube, rated 1200 initial lumens (minimum).
3. 26 W: T4, double or triple tube, rated 1800 initial lumens (minimum).
4. 32 W: T4, triple tube, rated 2400 initial lumens (minimum).
5. 42 W: T4, triple tube, rated 3200 initial lumens (minimum).
6. 55 W: T4, triple tube, rated 4300 initial lumens (minimum).

2.11 HID LAMPS

A. Manufacturers: Subject to compliance with requirements, provide products by the manufacturer specified:

1. Venture
2. OSRAM Sylvania
3. North American Phillips Ltg Corp
4. Substitutions: Under provisions of Section 26 00 10

B. Pulse-Start, Metal-Halide Lamps: Minimum CRI 65, and color temperature 4000 K.

C. Ceramic, Pulse-Start, Metal-Halide Lamps: Minimum CRI 80, and color temperature 4000 K.

2.12 LIGHTING FIXTURE SUPPORT COMPONENTS

A. Comply with Division 26 Section "Hangers and Supports for Electrical Systems" for channel- and angle-iron supports and nonmetallic channel and angle supports.

B. Single-Stem Hangers: 1/2-inch (13-mm) steel tubing with swivel ball fittings and ceiling canopy. Finish same as fixture.

C. Twin-Stem Hangers: Two, 1/2-inch (13-mm) steel tubes with single canopy designed to mount a single fixture. Finish same as fixture.

D. Wires: ASTM A 641/A 641M, Class 3, soft temper, zinc-coated steel, 12 gage (2.68 mm).

E. Wires for Humid Spaces: ASTM A 580/A 580M, Composition 302 or 304, annealed stainless steel, 12 gage (2.68 mm).

F. Rod Hangers: 3/16-inch (5-mm) minimum diameter, cadmium-plated, threaded steel rod.

G. Hook Hangers: Integrated assembly matched to fixture and line voltage and equipped with threaded attachment, cord, and locking-type plug.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrate and supporting grids for luminaires.

B. Examine each luminaire to determine suitability for lamps specified.

C. Verify ceiling types prior to ordering luminaires. Advise Architect of any discrepancies and proceed as directed by the Architect.

D. Investigate lighting fixture locations and supports to ensure that no interference exists between lighting fixture, supports and other equipment. Correct interferences as directed by Architect.

3.2 INSTALLATION

A. Lighting fixtures: Set level, plumb, and square with ceilings and walls. Install lamps in each fixture.

B. Support for Lighting Fixtures in or on Grid-Type Suspended Ceilings: Use grid as a support element.

1. Support luminaires independent of suspended ceiling framing, directly to building structure at 4 points with a minimum of 2 diagonal points up to structure with chain wire or threaded rod. Locate supports not more than 6 inches (150 mm) from lighting fixture corners. Meet codes or regulations for support requirements. Provide channel supports below ducts or other obstructions (piping, cable tray, etc.) to support fixtures when fixture locations coincide with duct installation. Support channel from building structure with threaded rod. Rigidly support from structure, with boxes supporting fixtures. Install support tautly.
2. Support Clips: Fasten to lighting fixtures and to ceiling grid members at or near each fixture corner with clips that are UL listed for the application.
3. Fixtures of Sizes Less Than Ceiling Grid: Install as indicated on reflected ceiling plans or center in acoustical panel, and support fixtures independently with at least two 3/4-inch (20-mm) metal channels spanning and secured to ceiling tees.

C. Suspended Lighting Fixture Support:

1. Pendants and Rods: Where longer than 48 inches (1200 mm), brace to limit swinging.
2. Stem-Mounted, Single-Unit Fixtures: Suspend with twin-stem hangers.
3. Continuous Rows: Use tubing or stem for wiring at one point and tubing or rod for suspension for each unit length of fixture chassis, including one at each end.

D. Air-Handling Lighting Fixtures: Install with dampers closed and ready for adjustment.

E. Adjust aimable lighting fixtures to provide required light intensities.

F. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

G. Install in accordance with manufacturer's instructions.

H. Install suspended luminaires and exit signs using pendants supported from earthquake-type swivel hangers. Provide pendant length required to suspend luminaire at indicated height.

I. Locate recessed ceiling luminaires as indicated on reflected ceiling plan. Install luminaires and exit signs symmetrically and centered or at quarter points of ceiling tiles, unless otherwise specifically indicated.

J. Install surface mounted luminaires and exit signs plumb and adjust to align with building lines and with each other. Secure to prohibit movement.

K. Exposed Grid Ceilings: Support surface mounted luminaires on grid ceiling directly from building structure. Fasten surface mounted luminaires to ceiling T using bolts, screws, rivets, or suitable clips.

L. Install recessed luminaires to permit removal from below.

M. Install recessed luminaires using accessories and firestopping materials to meet regulatory requirements for fire rating.

N. Install luminaires, emergency lighting units and exit signs at height as indicated on Drawings, as scheduled and as directed by Architect. Provide approved aligner canopies, hangers, plaster rings, trim rings and other appurtenances as required.

O. Install accessories furnished with each luminaire.

P. Connect luminaires, emergency lighting units and exit signs to branch circuit outlets as indicated.

Q. Make wiring connections to branch circuit using building wire with insulation suitable for temperature conditions within luminaire.

R. Bond products and metal accessories to branch circuit equipment grounding conductor.

S. Install specified lamps in each luminaire and emergency lighting units.

T. Bond luminaires, metal accessories and metal poles to branch circuit equipment grounding conductor.

U. Minimum wire size for emergency battery remote heads shall be #10 AWG minimum.

V. Connect emergency lighting fixtures to the unswitched side of circuit serving lighting in area.

W. Install remote ballasts on vibration isolation as indicated in Section 260548. Install between ballast and fixture to meet recommendations of the manufacturer for proper operation of the fixture. Provide No. 8 AWG minimum between ballast and fixture.

3.3 INTERFACE WITH OTHER PRODUCTS

A. Interface with air handling accessories furnished and installed under Division 23.

3.4 FIELD QUALITY CONTROL

A. Operate each luminaire after installation and connection. Inspect for proper connection and operation. Inspect for proper connection and operation.

B. Furnish parabolic louvers enclosed in plastic. Leave plastic in place until directed by construction superintendent to remove at completion of project.Use cotton gloves to handle parabolic louvers and reflectors to prevent finger prints.

D. Replace all lamps prior to turning over to Owner if lamps were used for temporary lighting beyond requirement for testing (for over ten percent of rated lamp life).

3.5 ADJUSTING

A. Adjust Work under provisions of Section 26 00 10.

B. Aim and adjust luminaires as required for proper coverage and illumination levels as indicated on Drawings or as directed.

C. Adjust exit sign directional chevrons as indicated.

D. Relamp luminaires which have failed lamps at date of Substantial Completion.

3.6 CLEANING

A. Clean Work under provisions of Section 26 00 10.

B. Clean electrical parts to remove conductive and deleterious materials.

C. Remove dirt and debris from enclosure.

D. Clean photometric control surfaces as recommended by manufacturer.

E. Clean to remove finger prints and dust, dirt or debris from all fixture visible surfaces, reflectors, etc.

F. Clean finishes and touch up damage.

3.7 DEMONSTRATION

A. Provide systems demonstration under provisions of Section 26 00 10.

B. Provide minimum of two hours demonstration of luminaire operation.

3.8 FIELD QUALITY CONTROL

A. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery and retransfer to normal.

B. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.

END OF SECTION