PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
1. Exit signs.
2. Luminaire supports.

1.3 DEFINITIONS

A. Fixture: See "Luminaire" Paragraph.

B. Luminaire: Complete lighting unit, including lamp, reflector, and housing.

1.4 ACTION SUBMITTALS

A. Shop drawings for all fixtures shall be submitted and reviewed prior to fabrication. Any material produced prior to the review of shop drawings or samples, and not in conformance with the Contract Documents, shall be rejected with the Contractor bearing full responsibility and cost. Submit shop drawings per Section 260500 for review, include the following:
1. Luminaires
2. Lamps
3. Batteries
4. Accessories

B. Submit shop drawings indexed, and in accordance with luminaire identification per drawings. Each item shall be tabbed, clearly identifying the catalog ordering numbers including all optional equipment specified.

C. Luminaire shop drawings shall include the following:
1. Manufacturer’s product information sheets. Photocopy of partial data sheet or drawings is not acceptable. Product information shall include the following:
a. Ballast type, manufacturer and performance characteristics
b. Lamp type, manufacturer and performance characteristics
c. Finish, frame, trim and housing type
d. Reflector system and characteristics
e. Diffuser type and characteristics
f. Weight and dimensions
g. Standard manufacturer options
h. Luminaire series and model number
i. Luminaire efficiency
j. Coefficient of utilization
k. Candlepower data table
l. Zonal lumens table

m. IES luminaire classification
n. Maintenance and operating instructions including tools required, types of cleaners to be used and suggested replacement parts list.
o. Average foot candle table.

2. Photometric data assembled in a standard IES photometric test report.

D. If requested by the Engineer, samples shall be submitted for final selection. Samples shall comply with the following:

1. Paint chips:
   a. Samples shall be provided and approved prior to any release to manufacture.
   b. Samples shall be a minimum of 3"x3" and be of exact finishes.
   c. Samples shall be exact representatives of the luminaires:
      1) Priming process
      2) Painting process
      3) Baking process
      4) Finish process
      5) Luminaire material (i.e. sheet metal, aluminum, wood, etc)
   d. Samples shall be labeled with manufacturers color call-out, as well as the paint manufacturer's call-out.
2. Fixtures:
   a. Submit for approval samples called for to the Engineer when and where directed, the components marked with the name of the project, and fixture type, and part number. Fixture shall be provided with a 6' cord and plug, and specified lamp. Allow two weeks from the date of receipt for thorough examination and review by the Engineer.
   b. Fixtures under the contract shall be identical with the approved sample fixture. No fixture used as a sample shall be allowed to be installed on the project.
   c. In the event the submissions are disapproved, the fixtures shall be returned to the contractor to immediately make a new submission of fixture or fixtures meeting the contract requirements.
   d. All charges for these shipments are to be prepaid by the Contractor.
   e. Samples shall be provided and approved prior to any release to manufacture.

1.5 INFORMATIONAL SUBMITTALS

A. Seismic Qualification Certificates: For luminaires, accessories, and components, from manufacturer.

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For luminaires and lighting systems to include in emergency, operation, and maintenance manuals.

1. Provide a list of all lamp types used on Project; use ANSI and manufacturers' codes.

1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Luminaire-mounted, emergency battery pack: One for every 50 emergency lighting units. Furnish at least one of each type.
   2. Diffusers and Lenses: One for every 100 of each type and rating installed. Furnish at least one of each type.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Protect finishes of exposed surfaces by applying a strippable, temporary protective covering before shipping.

1.9 WARRANTY

A. Contractor shall warranty equipment and installation free from defects in material and workmanship for a period of no less than (1) year from the date of project acceptance. This includes the fixture, its finishes and components.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Luminaires shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
   1. The term "withstand" means "the luminaire will remain in place without separation of any parts when subjected to the seismic forces specified."

2.2 GENERAL REQUIREMENTS FOR EMERGENCY LIGHTING

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in CEC, by a qualified testing agency, and marked for intended location and application.

B. NRTL Compliance: Fabricate and label emergency lighting units, exit signs, and batteries to comply with UL 924.

C. Comply with CEC and NFPA 101.

2.3 EXIT SIGNS

A. General Requirements for Exit Signs: Comply with UL 924; for sign colors, visibility, luminance, and lettering size, comply with authorities having jurisdiction.

B. All exit signs and emergency egress lighting shall be powered via a central battery inverter or generator.

C. Internally Lighted Signs:
   1. Lamps for AC Operation: LEDs; 50,000 hours minimum rated lamp life.

2. Self-Powered Exit Signs (Battery Type): Internal emergency power unit.

D. Self-Luminous Signs:
1. Powered by tritium gas, with universal bracket for flush-ceiling, wall, or end mounting. Signs shall be guaranteed by manufacturer to maintain the minimum brightness requirements in UL 924 for 20 years.

2.4 MATERIALS

A. Metal Parts:
1. Free of burrs and sharp corners and edges.
2. Sheet metal components shall be steel unless otherwise indicated.
3. Form and support to prevent warping and sagging.

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

C. Housings:
1. Extruded aluminum housing.
2. Clear powder coat finish.

2.5 METAL FINISHES

A. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.6 LUMINAIRE SUPPORT COMPONENTS

A. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for channel and angle iron supports and nonmetallic channel and angle supports.

B. Support Wires: ASTM A 641/A 641M, Class 3, soft temper, zinc-coated steel, 10 gauge.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for conditions affecting performance of luminaires.

B. Examine roughing-in for luminaire to verify actual locations of luminaire and electrical connections before luminaire installation.

C. Examine walls, floors, roofs, and ceilings for suitable conditions where emergency lighting luminaires will be installed.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Comply with NECA 1.

B. Install luminaires level, plumb, and square with ceilings and walls unless otherwise indicated.

C. Luminaires shall be installed complete with all accessories, glassware, canopies, sockets, reflectors, optics, wiring devices and supplied with new lamps of the type and wattage indicated on plans or in this specification unless specifically noted otherwise

D. All luminaires shall be supported in accordance with ASTM E-580 recommended guidelines for seismic restraint, as well as the latest version of the International Building Code related to lateral and vertical bracing, including but not limited to:
1. Recessed luminaires shall have a minimum of four (4) #10 gauge wires attached to structure above; (1) wire at each corner of the luminaire. The wires shall be independent of ceiling support system.
2. All lighting fixtures shall be positively attached to the suspended ceiling system. The attachment device shall have a capacity of 100 percent of the lighting fixture weight acting in any direction.
3. Pendant-hung lighting fixtures shall be supported directly from the structure above with #9 gauge wire or approved alternate support without using the ceiling suspension system for direct support.

E. Mount luminaries in mechanical yards, areas and rooms to clear any mechanical equipment, conduit and clearances. Coordinate mounting with mechanical plans.

F. Junction box and ballast compartment shall be accessible from below when housing is installed in final position. Wiring shall be secured from damage when accessed for relamping.

G. All surface mounted luminaires installed on a suspended ceiling grid shall have four (4) supporting clips positively attaching corners of housing to the ceiling. Installation shall include 1/8" spacers between the housing and ceiling tile where applicable.

H. Wall mounted luminaries and junction boxes shall be rigidly supported to structure to provide adequate support during normal operation.

I. All wall mounted fixtures shall be mounted to a supporting wall bracing material in addition to the junction box. The bracing material is secured to structural elements in the wall. The bracing shall be capable of supporting the weight of the fixture and comply with the manufacturer’s requirements and recommendations.

J. Actual locations of luminaires and dimensions shall be referenced to architectural drawings. Electrical plans shall not be used to scale for construction purposes. Any discrepancies shall be brought to the engineer's attention prior to installation.

K. Where luminaires are served from two sources, a barrier shall be provided to separate emergency source from normal source with notation indicating separate sources.

3.3 IDENTIFICATION

A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

3.4 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:
   1. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery power and retransfer to normal.

B. Exit signs shall be individually reviewed after installation completion to ensure directional arrows are properly provided and positioned.

C. Luminaire will be considered defective if it does not pass operation tests and inspections.

D. Prepare test and inspection reports.

3.5 STARTUP SERVICE

A. Perform startup service:
   1. Charge batteries minimum of 24 hours and conduct one-hour discharge test.

END OF SECTION