SECTION 265213 - EMERGENCY AND EXIT LIGHTING

Revise this Section by deleting and inserting text to meet Project-specific requirements.

This Section uses the term "Architect." Change this term to match that used to identify the design professional as defined in the General and Supplementary Conditions.

Verify that Section titles referenced in this Section are correct for this Project's Specifications; Section titles may have changed.

Luminaires are usually scheduled on Drawings. To coordinate this Section with a Drawing schedule, see the "Emergency Lighting Unit Schedule" Article in the Evaluations.

This Section may be used, in coordination with the proper interior or exterior lighting Specification Section, to specify only emergency power units and operation of emergency luminaires, with luminaires specified in the appropriate interior or exterior lighting Specification Section. The specifier should carefully review all choices to minimize conflicts between Sections.

See "Sustainable Design Considerations" Article in the Evaluations for a discussion of sustainable design requirements that may impact the editing of this Section.

1. GENERAL
   * + 1. RELATED DOCUMENTS

Retain or delete this article in all Sections of Project Manual.

* + - * 1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
      1. SUMMARY
         1. Section Includes:

Emergency lighting.

Exit signs.

Materials.

Luminaire support components.

* + - 1. DEFINITIONS

Retain terms that remain after this Section has been edited for a project.

Retain this article if definitions are needed to further clarify the Work in this Section or to define in one place the meaning of an important term or group of terms used throughout the Section Text. Standardized paragraphs are not appropriate here. Include only essential definitions not covered in the dictionary or not well understood by the affected industry or trade. Where possible, use an authoritative source and note that source in the editor's note above.

* + - * 1. CCT: Correlated color temperature.
        2. CRI: Color Rendering Index.
        3. Emergency Lighting Unit: A lighting unit with internal or external emergency battery powered supply and the means for controlling and charging the battery and unit operation.
        4. Fixture: See "Luminaire" Paragraph.
        5. Lumen: Measured output of lamp and luminaire, or both.
        6. Luminaire: Complete lighting unit, including lamp, reflector, and housing.
      1. SUBMITTALS
         1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
         2. Manufacturer’s installation instructions shall be provided along with product data.
         3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
         4. Product Data: For each type of emergency lighting unit, exit sign, and emergency lighting support.

Include data on features, accessories, and finishes.

Include physical description of the unit and dimensions.

Battery and charger for light units.

Include life, output of luminaire (lumens, CCT, and CRI), and energy-efficiency data.

Include photometric data and adjustment factors based on laboratory tests, complying with IES LM-45, for each luminaire type.

Retain one of two subparagraphs below. Retain "Testing Agency Certified Data" subparagraph below if photometric data for one or more luminaire(s) is based on independent laboratory tests; coordinate with the Interior Luminaire Schedule on Drawings to indicate which units meet this requirement. Retain "Manufacturers' Certified Data" subparagraph below if photometric data based on testing by accredited manufacturers' laboratories is considered adequate for luminaires for the Project. See the Evaluations.

Testing Agency Certified Data: For indicated [**luminaires**] [**and**] [**signs**], photometric data certified by a qualified independent testing agency. Photometric data for remaining [**luminaires**] [**and**] [**signs**] shall be certified by manufacturer.

Manufacturers' Certified Data: Photometric data certified by manufacturer's laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program for Energy Efficient Lighting Products.

* + - * 1. Shop Drawings: For nonstandard or custom luminaires.

Include plans, elevations, sections, and mounting and attachment details.

Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

Include diagrams for power, signal, and control wiring.

For custom luminaires, retain "Samples" paragraph below for single-stage Samples, with a subordinate list if applicable. Retain "Samples for Initial Selection" and "Samples for Verification" paragraphs for two-stage Samples.

* + - * 1. Samples: For each product and for each color and texture specified.
        2. Samples for Initial Selection: For each type of luminaire with factory-applied finishes.
        3. Samples for Verification: For each type of luminaire.

Include Samples of luminaires and accessories to verify finish selection.

* + - * 1. Product Schedule:

For emergency lighting units.[**Use same designations indicated on Drawings.**]

For exit signs.[**Use same designations indicated on Drawings**].

* + - * 1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.

Retain "Coordination Drawings" paragraph below for situations where limited space necessitates maximum utilization for efficient installation of different components or if coordination is required for installation of products and materials by separate installers. Coordinate paragraph with other Sections specifying products listed below. Preparation of coordination drawings requires the participation of each trade involved in installations within the limited space.

* + - * 1. Coordination Drawings: Reflected ceiling plan(s) and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

Luminaires.

Suspended ceiling components.

Partitions and millwork that penetrate the ceiling or extend to within 12 inches of the plane of the luminaires.

Structural members to which equipment will be attached.

Size and location of initial access modules for acoustical tile.

Items penetrating finished ceiling including the following:

Other luminaires.

Air outlets and inlets.

Speakers.

Ceiling-mounted projectors.

Sprinklers.

Access panels.

<**Insert item**>.

Moldings.

<**Insert feature**>.

Coordinate "Qualification Data" paragraph below with qualification requirements in Section 014000 "Quality Requirements" and as may be supplemented in "Quality Assurance" Article.

* + - * 1. Qualification Data: For testing laboratory providing photometric data for luminaires.

Retain "Product Certificates" paragraph below to require submittal of product certificates from manufacturers.

* + - * 1. Product Certificates: For each type of luminaire.

Retain "Seismic Qualification Data" paragraph below if required by seismic criteria applicable to Project. Coordinate with Section 260548.16 "Seismic Controls for Electrical Systems." See ASCE/SEI 7 for certification requirements for equipment and components.

* + - * 1. Seismic Qualification Data: For luminaires, accessories, and components, from manufacturer.

Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.

Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.

Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

Provide seismic qualification certificate for each piece of equipment.

* + - * 1. Product Test Reports: For each luminaire for tests performed by [**manufacturer and witnessed by a qualified testing agency**] [**a qualified testing agency**].
        2. Sample Warranty: For manufacturer's[**special**] warranty.
      1. CLOSEOUT SUBMITTALS
         1. Operation and Maintenance Data: For luminaires and lighting systems to include in emergency, operation, and maintenance manuals.

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

* + - 1. MAINTENANCE MATERIAL SUBMITTALS
         1. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

Lamps: [**10 for every 100**] <**Insert quantity**> of each type and rating installed. Furnish at least one of each type.

Luminaire-mounted, emergency battery pack: One for every [**20**] [**50**] <**Insert quantity**> emergency lighting units. Furnish at least one of each type.

Diffusers and Lenses: [**One for every 100**] <**Insert quantity**> of each type and rating installed. Furnish at least one of each type.

Globes and Guards: [**One for every 20**] <**Insert quantity**> of each type and rating installed. Furnish at least one of each type.

* + - 1. QUALITY ASSURANCE
         1. Luminaire Photometric Data Testing Laboratory Qualifications: [**Luminaire manufacturer's laboratory**] [**Independent NRTL**] that is accredited under National Volunteer Laboratory Accreditation Program for Energy Efficient Lighting Products and complying with applicable IES testing standards.

Coordinate "FM Global Compliance" paragraph below with Drawings.

* + - * 1. FM Global Compliance: Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by FM Global.
        2. Mockups: For interior luminaires in room or module mockups, complete with power and control connections.

Obtain Architect's approval of luminaires and signs in mockups before starting installations.

Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.

Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

* + - * 1. List of Completed Installations: If brand names other than those specified are proposed for use, furnish the name, address, and telephone number of at least 5 comparable installations which can prove the proposed products have operated satisfactorily for 3 years.
        2. Service Availability: A fully equipped service organization shall be available to service the completed Work.
      1. MAINTENANCE
         1. Special Tools: Furnish 2 tools to remove and install fasteners on fixtures equipped with vandal resistant fasteners.
      2. DELIVERY, STORAGE, AND HANDLING
         1. Protect finishes of exposed surfaces by applying a strippable, temporary protective covering before shipping.
      3. WARRANTY

When warranties longer than one year are required and would exceed the "One-year Correction Period," verify with Director’s Representative that warranties stated in this article are not less than remedies available to Director’s Representative under prevailing local laws.

* + - * 1. Warranty: Manufacturer and Installer agree to repair or replace components of luminaires that fail in materials or workmanship within specified warranty period.

Verify available warranties and warranty periods.

Warranty Period: [**Two**] <**Insert number**> year(s) from date of Substantial Completion.

Retain article for rechargeable batteries for emergency lighting equipment.

* + - * 1. Special Warranty for Emergency Lighting Batteries: Manufacturer's standard form in which manufacturer of battery-powered emergency lighting unit agrees to repair or replace components of rechargeable batteries that fail in materials or workmanship within specified warranty period.

Subparagraphs below are examples only. Verify available warranties and warranty periods for units and components and insert number below. Coordinate with "Emergency Luminaires" Article.

Warranty Period for Emergency Power Unit Batteries: [**Five**] <**Insert number**> years from date of Substantial Completion. Full warranty shall apply for [**first year and prorated warranty for the remaining four years**] [**the entire warranty period**].

Warranty Period for Self-Powered Exit Sign Batteries: [**Two**] [**Five**] <**Insert number**> years from date of Substantial Completion. Full warranty shall apply for [**first year and prorated warranty for the remaining six years**] [**the entire warranty period**].

1. PRODUCTS

Manufacturers and products listed in SpecAgent and MasterWorks Paragraph Builder are neither recommended nor endorsed by the AIA or Deltek. Before inserting names, verify that manufacturers and products listed there comply with requirements retained or revised in descriptions and are both available and suitable for the intended applications.

* + - 1. PERFORMANCE REQUIREMENTS

Retain "Seismic Performance" paragraph below for projects requiring seismic design. Delete paragraph if performance requirements are indicated on Drawings. Model building codes and ASCE/SEI 7 establish criteria for buildings subject to earthquake motions. Coordinate requirements with Structural Engineer.

* + - * 1. Seismic Performance: Luminaires shall withstand the effects of earthquake motions determined according to [**ASCE/SEI 7**] <**Insert requirement**>. [**Luminaires and lamps shall be labeled vibration and shock resistant.**]

Retain subparagraph below to define the term "withstand" if the term is used in the "Seismic Performance" paragraph. Option is used for essential facilities where equipment must operate during and immediately after an earthquake.

The term "withstand" means "the luminaire will remain in place without separation of any parts when subjected to the seismic forces specified[**and the luminaire will be fully operational during and after the seismic event**]."

* + - 1. GENERAL REQUIREMENTS FOR EMERGENCY LIGHTING
         1. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
         2. NRTL Compliance: Fabricate and label emergency lighting units, exit signs, and batteries to comply with UL 924.
         3. Comply with NFPA 70 and NFPA 101.
         4. Comply with NEMA LE 4 for recessed luminaires.
         5. Comply with UL 1598 for fluorescent luminaires.

Retain "Lamp Base" and "Bulb Shape" paragraphs below for luminaires with removable lamps.

* + - * 1. Lamp Base: Comply with [**ANSI C81.61**] [**or**] [**IEC 60061-1**].
        2. Bulb Shape: Complying with ANSI C79.1.

Retain one or both paragraphs in this article to specify emergency battery units for and operation of fluorescent, incandescent, and LED luminaires to provide code-required egress lighting. Indicate luminaire types to be equipped with these devices in the Interior Luminaire Schedule on Drawings, and indicate connections on lighting plans.

* + - * 1. Internal Type Emergency Power Unit: Self-contained, modular, battery-inverter unit, factory mounted within luminaire body[**and compatible with ballast**].

Emergency Connection: Operate [**one**] <**Insert number**> lamp(s) continuously at an output of [**1100**] <**Insert value**> lumens each upon loss of normal power. Connect unswitched circuit to battery-inverter unit and switched circuit to luminaire ballast.

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.

Revise "Environmental Limitations" subparagraph below to specify unusual environmental or service conditions. Coordinate with manufacturers' standard environmental ratings because unusual conditions may require considerable derating of equipment ratings and reduced life expectancy, especially for batteries.

Environmental Limitations: Rate equipment for continuous operation under the following conditions unless otherwise indicated:

Subparagraphs below should be revised to reflect Project conditions if special conditions exist.

Ambient Temperature: Less than 0 deg F or exceeding 104 deg F, with an average value exceeding 95 deg F over a 24-hour period.

Ambient Storage Temperature: Not less than minus 4 deg F and not exceeding 140 deg F.

Humidity: More than 95 percent (condensing).

Altitude: Exceeding 3300 feet.

<**Insert unusual service condition**>.

Retain "Nightlight Connection" subparagraph below to require nightlight connections. If used, differentiate two connection modes on Drawings or in the Interior Luminaire Schedule on Drawings.

Nightlight Connection: Operate lamp continuously at [**40**] <**Insert value**> percent of rated light output.

Test Push-Button and Indicator Light: Visible and accessible without opening luminaire or entering ceiling space.

Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.

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

Revise "Battery" subparagraph below to specify battery type. See the Evaluations for discussion on battery types. Verify that battery selection is available as UL-listed unit and coordinate with "Warranty" Article.

Battery: Sealed, maintenance-free, [**nickel-cadmium**] [**lead-acid**] type.

Charger: Fully automatic, solid-state, constant-current type with sealed power transfer relay.

Retain "Remote Test" subparagraph below to allow periodic test, as required by codes for emergency equipment, to be performed using a handheld remote device to trigger simulation of loss of normal power in the tested unit.

Remote Test: Switch in handheld remote device aimed in direction of tested unit initiates coded infrared signal. Signal reception by factory-installed infrared receiver in tested unit triggers simulation of loss of its normal power supply, providing visual confirmation of either proper or failed emergency response.

Retain "Integral Self-Test" subparagraph below to eliminate necessity to manually perform periodic test required by codes for emergency equipment. Verify requirements of authorities having jurisdiction.

Integral Self-Test: Factory-installed electronic device automatically initiates code-required test of unit emergency operation at required intervals. Test failure is annunciated by an integral audible alarm and a flashing red LED.

* + - * 1. External Type: Self-contained, modular, battery-inverter unit, suitable for powering one or more lamps, remote mounted from luminaire.

Emergency Connection: Operate [**one**] <**Insert number**> [**fluorescent**] [**incandescent**] [**LED**] lamp continuously. Connect unswitched circuit to battery-inverter unit and switched circuit to luminaire[**ballast**].

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.

Retain "Nightlight Connection" subparagraph below if nightlight connections are used. If used, differentiate two connection modes on Drawings or in the Interior Luminaire Schedule on Drawings.

Nightlight Connection: Operate lamp in a remote luminaire continuously.

Battery: Sealed, maintenance-free, [**nickel-cadmium**] [**lead-acid**] type.

Charger: Fully automatic, solid-state, constant-current type.

Housing: NEMA 250, Type 1 enclosure listed for installation inside, on top of, or remote from luminaire. Remote assembly shall be located no less than half the distance recommended by the [**ballast**] [**emergency power unit**] manufacturer, whichever is less.

Test Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.

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

Retain "Remote Test" subparagraph below to allow periodic test, as required by codes for emergency equipment, to be performed using a handheld remote device to trigger simulation of loss of normal power in the tested unit.

Remote Test: Switch in handheld remote device aimed in direction of tested unit initiates coded infrared signal. Signal reception by factory-installed infrared receiver in tested unit triggers simulation of loss of its normal power supply, providing visual confirmation of either proper or failed emergency response.

Retain "Integral Self-Test" subparagraph below to eliminate necessity to manually perform periodic test required by codes for emergency equipment. Verify requirements of authorities having jurisdiction.

Integral Self-Test: Factory-installed electronic device automatically initiates code-required test of unit emergency operation at required intervals. Test failure is annunciated by an integral audible alarm and a flashing red LED.

* + - 1. EMERGENCY LIGHTING

Supplement paragraphs below with information in the Interior Luminaire Schedule or with details on Drawings.

* + - * 1. General Requirements for Emergency Lighting Units: Self-contained units.

Retain "Emergency Luminaires" paragraph below for luminaires used for general or task lighting that are connected to normal and emergency power or are connected to normal power with a single battery backup. Coordinate luminaire type or description with the appropriate Interior Lighting Specification Section.

* + - * 1. Emergency Luminaires:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=11571) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Dual-Lite](http://www.specagent.com/Lookup?uid=123457166361).

Emergi-Lite.

Exide Electronics.

Or equal.

Retain "Emergency Luminaires" subparagraph below and edit for each luminaire type required.

Emergency Luminaires: <**Insert Drawing designation**> as indicated on [**Interior Luminaire Schedule**] [**and**] [**Drawings**], with the following additional features:

Operating at nominal voltage of [**120 V ac**] [**277 V ac**] [**6 V dc**] [**9.6 V dc**] [**12 V dc**] [**24 V dc**].

Coordinate requirements below with "Emergency Power Units" Article.

[**Internal**] [**External**] emergency power unit.

Rated for installation in damp locations, and for sealed and gasketed luminaires in wet locations.

UL 94 [**5VA**] [**5VB**] [**V-0**] [**V-1**] [**V-2**] [**HB**] flame rating.

Retain "Emergency Lighting Unit" paragraph below for dedicated emergency light lighting units with emergency power unit. Examples of this type of lighting unit would be wallpacks and similar types of standalone lighting units.

* + - * 1. Emergency Lighting Unit:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=11572) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Dual-Lite](http://www.specagent.com/Lookup?uid=123457166371).

Emergi-Lite.

Exide Electronics.

Or equal.

Emergency Lighting Unit: <**Insert Drawing designation**> as indicated on [**Interior Luminaire Schedule**] [**Drawings}.**

Retain "Emergency Lighting Unit" subparagraph below and edit for each luminaire type required.

Operating at nominal voltage of [**120 V ac**] [**277 V ac**] [**6 V dc**] [**9.6 V dc**] [**12 V dc**] [**24 V dc**].

[**Wall**] <**Insert mount type**> with universal junction box adaptor.

UV stable thermoplastic housing[**, rated for damp locations**].

Two [**Halogen**] [**Krypton**] [**LED**] lamp heads.

Coordinate requirements below with "Emergency Power Units" Article.

[**Internal**] [**External**] emergency power unit.

Retain "Remote Emergency Lighting Units" paragraph below for emergency luminaires connected to an external emergency power unit.

* + - * 1. Remote Emergency Lighting Units:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=11573) Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:

Dual-Lite.

Emergi-Lite.

Exide Electronics.

Or equal.

Copy "Emergency Lighting Unit" subparagraph below and edit for each luminaire type required.

Emergency Lighting Unit: <**Insert Drawing designation**> as indicated on [**Interior Luminaire Schedule**] [**Drawings**].

Operating at nominal voltage of [**120 V ac**] [**277 V ac**] [**6 V dc**] [**9.6 V dc**] [**12 V dc**] [**24 V dc**].

[**Wall**] <**Insert mount type**> with universal junction box adaptor.

UV stable thermoplastic housing[**, rated for damp locations**].

[**One**] [**Two**] [**Halogen**] [**Krypton**] [**LED**] lamp heads.

External emergency power unit.

* + - 1. EXIT SIGNS
         1. General Requirements for Exit Signs: Comply with UL 924; for sign colors, visibility, luminance, and lettering size, comply with authorities having jurisdiction.
         2. Internally Lighted Signs:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=11575) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Cooper Lighting Solutions; Signify North America Corp](http://www.specagent.com/Lookup?uid=123457166385).

Exitronix.

Siltron Illumination Inc.

Or equal.

Operating at nominal voltage of [**120 V ac**] [**277 V ac**] [**6 V dc**] [**9.6 V dc**] [**12 V dc**] [**24 V dc**].

Lamps for AC Operation:

Retain one of first two subparagraphs below.

LEED v4 for Healthcare MR Prerequisite"PBT Source Reduction - Mercury" does not allow use of fluorescent lamps.

Fluorescent, two for each luminaire; 20,000 hours of rated lamp life.

LEDs; 50,000 hours minimum rated lamp life.

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

Retain "Master/Remote Sign Configurations" subparagraph below if master/remote sign configurations are required to suit code locations both above and at floor adjacent to exit door. Coordinate with Drawings.

Master/Remote Sign Configurations:

Master Unit: Comply with requirements above for self-powered exit signs, and provide additional capacity in [**LED power supply**] [**ballast**] [**battery**] for power connection to remote unit.

Remote Unit: Comply with requirements above for self-powered exit signs, except omit power supply, battery, and test features. Arrange to receive full power requirements from master unit. Connect for testing concurrently with master unit as a unified system.

* + - * 1. Internally Lighted Vandal Resistant Signs:

Manufacturers:

Kennall

Doan

Operating at nominal voltage of [**120 V ac**] [**277 V ac**] [**6 V dc**] [**9.6 V dc**] [**12 V dc**] [**24 V dc**].

Lamps for AC Operation:

Retain one of first two subparagraphs below.

LEED v4 for Healthcare MR Prerequisite"PBT Source Reduction - Mercury" does not allow use of fluorescent lamps.

Fluorescent, two for each luminaire; 20,000 hours of rated lamp life.

LEDs; 50,000 hours minimum rated lamp life.

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

Master/Remote Sign Configurations:

Master Unit: Comply with requirements above for self-powered exit signs, and provide additional capacity in [**LED power supply**] [**ballast**] [**battery**] for power connection to remote unit.

Remote Unit: Comply with requirements above for self-powered exit signs, except omit power supply, battery, and test features. Arrange to receive full power requirements from master unit. Connect for testing concurrently with master unit as a unified system.

Vandal Resistant Fasteners

* + - * 1. Self-Luminous Signs:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=11576) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Cooper Lighting Solutions; Signify North America Corp](http://www.specagent.com/Lookup?uid=123457166394).

[Dual-Lite](http://www.specagent.com/Lookup?uid=123457166393).

[Lithonia Lighting; Acuity Brands Lighting, Inc](http://www.specagent.com/Lookup?uid=123457166396).

Or equal.

Retain one of two subparagraphs below. See the Evaluations for guidance on specifying tritium gas and photoluminescent (strontium oxide) self-luminous exit signs.

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 [**10**] [**15**] [**20**] years.

Use strontium oxide aluminate compound to store ambient light and release the stored energy when the light is removed. Include universal bracket for flush-ceiling, wall, or end mounting.

* + - 1. MATERIALS
         1. Metal Parts:

Free of burrs and sharp corners and edges.

Sheet metal components shall be steel unless otherwise indicated.

Form and support to prevent warping and sagging.

* + - * 1. Doors, Frames, and Other Internal Access:

Smooth operating, free of light leakage under operating conditions.

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.

* + - * 1. Diffusers and Globes:

[**Tempered Fresnel glass**] [**Prismatic glass**] [**Diffuse glass**] [**Clear glass**] [**Prismatic acrylic**] [**Clear, UV-stabilized acrylic**].

Retain "Glass" subparagraph below if glass option is chosen in "Diffusers and Globes" paragraph.

Glass: Annealed crystal glass unless otherwise indicated.

Retain "Acrylic" subparagraph below if acrylic option is chosen in "Diffusers and Globes" paragraph.

Acrylic: 100 percent virgin acrylic plastic, with high resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.

Retain "Lens Thickness" subparagraph below for all diffuser and globe types.

Lens Thickness: At least 0.125 inch minimum unless otherwise indicated.

* + - * 1. Housings:

[**Extruded aluminum**] <**Insert type**> housing[**and heat sink**].

[**Clear**] <**Insert color**> [**anodized**] [**powder coat**] [**painted**] finish.

* + - * 1. Conduit: [**Rigid galvanized steel**] [**Electrical metallic tubing**] [**Flexible metallic conduit**], minimum 3/4 inch in diameter.
      1. METAL FINISHES
         1. 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. LUMINAIRE SUPPORT COMPONENTS
         1. Support Wires: ASTM A641/A641M, Class 3, soft temper, zinc-coated steel, [**12 gage**] <**Insert size**>.
      3. VANDAL RESISTANT
         1. Cabinet door having vandal resistant fasteners or lockable device and continuous piano hinge.

1. EXECUTION
   * + 1. EXAMINATION
          1. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for conditions affecting performance of luminaires.
          2. Examine roughing-in for luminaire to verify actual locations of luminaire and electrical connections before luminaire installation.
          3. Examine walls, floors, roofs, and ceilings for suitable conditions where emergency lighting luminaires will be installed.
          4. Proceed with installation only after unsatisfactory conditions have been corrected.
       2. INSTALLATION
          1. Comply with NECA 1.
          2. Install luminaires level, plumb, and square with ceilings and walls unless otherwise indicated.

Retain paragraph below for emergency lighting luminaires that require Contractor installed lamps. Delete for emergency lighting units with preinstalled lamps.

* + - * 1. Install lamps in each luminaire.

If this Specification is used to specify emergency power units and emergency luminaire operation, and luminaires are specified in another interior lighting Specification Section, delete "Supports," "Wall-Mounted Luminaire Support," "Suspended Luminaire Support," and "Ceiling Grid Mounted Luminaires" paragraphs below.

* + - * 1. Supports:

Sized and rated for luminaire[**and emergency power unit**] weight.

Able to maintain luminaire position when testing emergency power unit.

Provide support for luminaire and emergency power unit without causing deflection of ceiling or wall.

Luminaire-mounting devices shall be capable of supporting a horizontal force of 100 percent of luminaire and emergency power unit weight and vertical force of 400 percent of luminaire weight.

* + - * 1. Wall-Mounted Luminaire Support:

[**Attached to structural members in walls**] [**Attached to a minimum 20-gage backing plate attached to wall structural members**] [**Attached using through bolts and backing plates on either side of wall**] <**Insert means of attachment**>.

Do not attach luminaires directly to gypsum board.

* + - * 1. Suspended Luminaire Support:

Pendants and Rods: Where longer than 48 inches, brace to limit swinging.

Stem-Mounted, Single-Unit Luminaires: Suspend with twin-stem hangers. Support with approved outlet box and accessories that hold stem and provide damping of luminaire oscillations. Support outlet box vertically to building structure using approved devices.

Continuous Rows of Luminaires: Use tubing or stem for wiring at one point and [**tubing or rod**] [**wire support**] for suspension for each unit length of luminaire chassis, including one at each end.

Do not use ceiling grid as support for pendant luminaires. Connect support wires or rods to building structure.

* + - * 1. Ceiling Grid Mounted Luminaires:

Secure to any required outlet box.

Secure emergency power unit using approved fasteners in a minimum of four locations, spaced near corners of emergency power unit.

Retain subparagraph below if ceiling grid is not connected to building structure at all four corners of the luminaire opening.

Use approved devices and support components to connect luminaire to ceiling grid and building structure in a minimum of four locations, spaced near corners of luminaire.

* + - 1. IDENTIFICATION
         1. Identify system components, wiring, cabling, and terminals.
      2. FIELD QUALITY CONTROL

Retain "Perform the following tests and inspections" paragraph below to require Contractor to perform tests and inspections.

* + - * 1. Perform the following tests and inspections:

Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation for 90 minutes. Verify transfer from normal power to battery power and retransfer to normal.

* + - * 1. Luminaire will be considered defective if it does not pass operation tests and inspections.
        2. Prepare test and inspection reports.
      1. STARTUP SERVICE
         1. Perform startup service:

Charge [**emergency power units**] [**and**] [**batteries**] minimum of one hour and depress switch to conduct short-duration test.

Charge [**emergency power units**] [**and**] [**batteries**] minimum of 24 hours and conduct one-hour discharge test.

* + - 1. ADJUSTING

Verify with Director’s Representative that adjusting service is required for Project.

* + - * 1. Adjustments: Within [**12**] <**Insert number**> months of date of Substantial Completion, provide on-site visit to do the following:

Inspect all luminaires. Replace lamps, [**emergency power units**] [**, batteries,**] [**signs,**] or luminaires that are defective.

Parts and supplies shall be manufacturer's authorized replacement parts and supplies.

Conduct short-duration tests on all emergency lighting.

END OF SECTION 265213