Preparing Activity: NASA Superseding
UFGS-26 52 00.00 40 (November 2017)

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated July 2023
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SECTION 26 52 00.00 40

EMERGENCY LIGHTING
08/23

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NOTE: This guide specification covers the requirements for battery-operated incandescent and emergency lighting units and lamps. Special systems requirements such as lamp-in fluorescent fixtures, battery or central systems are also covered in this section.

Design the number and location of units to provide a minimum of 10 lux 1 foot-candle in compliance with OSHA; otherwise modify mounting and field-testing requirements.

Show on the drawings a three-dimensional detail of each fixture with letter designation keyed to the drawings and electrical symbols describing the type, style, class, kind, and size of fixture.

Adhere to UFC 1-300-02 Unified Facilities Guide Specifications (UFGS) Format Standard when editing this guide specification or preparing new project specification sections. Edit this guide specification for project specific requirements by adding, deleting, or revising text. For bracketed items, choose applicable item(s) or insert appropriate information.

Remove information and requirements not required in respective project, whether or not brackets are present.

Comments, suggestions and recommended changes for this guide specification are welcome and should be submitted as a Criteria Change Request (CCR).

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PART 1 GENERAL

1.1 REFERENCES

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NOTE: This paragraph is used to list the publications cited in the text of the guide specification. The publications are referred to in the text by basic designation only and listed in this paragraph by organization, designation, date, and title.

Use the Reference Wizard's Check Reference feature when you add a Reference Identifier (RID) outside of the Section's Reference Article to automatically place the reference in the Reference Article. Also use the Reference Wizard's Check Reference feature to update the issue dates.

References not used in the text will automatically be deleted from this section of the project specification when you choose to reconcile references in the publish print process.

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The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

INTERNATIONAL ELECTROTECHNICAL COMMISSION (IEC)

IEC 62133-1	(2017) Secondary cells and batteries containing alkaline or other non-acid electrolytes
IEC 62133-2	(2017) Standard Certification for Lithium Polymer Battery

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(2023) National Electrical Code
NFPA 101	(2021; TIA 21-1) Life Safety Code

UNDERWRITERS LABORATORIES (UL)

UL 924	(2016; Reprint Dec 2022) UL Standard for Safety Emergency Lighting and Power Equipment

1.2 ADMINISTRATIVE REQUIREMENTS

1.2.1 Preinstallation Meetings

No later than [30] [_____] days after contract award, submit installation drawings for the Central Emergency Lighting Systems, indicating the location of installed fixtures.

Submit material, equipment, and fixture lists showing the manufacturer's

style or catalog numbers, specification and drawing reference numbers, and a sample warranty. Also submit the manufacturer's catalog data and certificates of conformance for the following items:

a. Emergency Lighting Egress Units

b. Emergency Fluorescent Lighting

c. Central Emergency Lighting Systems

d. Accessories

1.3 SUBMITTALS

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NOTE: Review Submittal Description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list, and corresponding submittal items in the text, to reflect only the submittals required for the project. The Guide Specification technical editors have classified those items that require Government approval, due to their complexity or criticality, with a "G." Generally, other submittal items can be reviewed by the Contractor's Quality Control System. Only add a “G” to an item, if the submittal is sufficiently important or complex in context of the project.

For Army projects, fill in the empty brackets following the "G" classification, with a code of up to three characters to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for Architect-Engineer; "DO" for District Office (Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes following the "G" typically are not used for Navy, Air Force, and NASA projects.

The "S" classification indicates submittals required as proof of compliance for sustainability Guiding Principles Validation or Third Party Certification and as described in Section 01 33 00 SUBMITTAL PROCEDURES.

Choose the first bracketed item for Navy, Air Force and NASA projects, or choose the second bracketed item for Army projects.

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Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are [for Contractor Quality Control approval.][for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government.] Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Central Emergency Lighting Systems; G[, [____]]

SD-03 Product Data

Material, Equipment, and Fixture Lists; G[, [____]]

Sample Warranty; G[, [____]]

Emergency Lighting Egress Units; G[, [____]]

Emergency Fluorescent Lighting; G[, [____]]

Central Emergency Lighting Systems; G[, [____]]

Accessories; G[, [____]]

Troffer Mounted Led Emergency Lighting; G[, [____]]

Self-Testing Module

SD-06 Test Reports

System Operational Tests; G[, [____]]

SD-07 Certificates

Certificates of Conformance

SD-11 Closeout Submittals

Warranty

System Operational Test Report

PART 2 PRODUCTS

2.1 SYSTEM DESCRIPTION

Furnish emergency lighting units completely assembled with wiring and mounting devices, ready for installation at the locations indicated. Equip fixtures with lamps. Provide units that operate on [120] [277] volts AC.

2.1.1 Performance Requirements

Provide emergency lighting units conforming to UL 924 and NFPA 101.

2.2 MANUFACTURED UNITS

2.2.1 Emergency Lighting Egress Units

Provide a complete self-contained emergency lighting unit with batteries, battery charger, one or more local or remote lamp heads with lamps, undervoltage relay, indicator lights, [on/off switch,] and test switch, in accordance with UL 924 for Type I (emergency light set), Class I [rechargeable storage-battery-powered unit] [_____], Style D battery type as indicated herein. Provide units that are [NEMA 1] [NEMA 3R] [NEMA 4X] [NEMA 12] rated. [Provide integrated emergency and exit light units].

Provide unit that will operate on both 120VAC and 277VAC. Provide all mounting hardware required to install the units. [Provide units that have self-diagnostic function. The self diagnostic function must monitor the status of the lamps, battery charger circuit, and batteries and provide visual and/or audio indication of failure or fault.]

2.2.1.1 Batteries

Provide unit with [lithium ion][nickel-cadmium][sealed lead acid] batteries in accordance with [IEC 62133-1][IEC 62133-2]. Battery capacity must provide a level of 1 foot-candle (fc) average illumination upon initial activation and must provide a minimum of 0.6 fc average illumination after 90 minutes of continuous operation.. Provide maintenance-free batteries with a minimum normal life of [10] [_____] years.

2.2.1.2 Battery Charger

Provide a unit with a battery charger suitable for the type of batteries installed. The battery charger must be a two-rate unit with both battery maintence charging when batteries are fully charged and a battery recharge rate that will bring depleted batteries to full charge within [12] [24] [_____] hours.

2.2.1.3 Unit Enclosure

For wall mounted emergency light units provide the unit with the manufacturer's standard enclosure with a NEMA rating as defined herein..

2.2.1.4 Lamp Heads, Lamps, and Indicating Lights

Provide units with [LED][halogen][incandescent] lamps.M

Provide units with indicating lights and test switch. Indicating lights must provide indication of emergency light unit status. Status indications are that the unit is electrically connected to the normal AC supply source and that the battery is fully charged, battery is being recharged, and unit has a fault.

2.2.1.5 Relays and Switches

Provide a unit that has an undervoltage relay that automatically connects the lampload to the battery supply upon failure of the AC input voltage. Provide unit that has an on-off toggle switch inside the unit enclosure to disconnect the battery from the lamp load when the unit is taken out of service. The relay energizes when the AC input voltage falls to [70] [_____] percent of normal voltage.

[2.2.2 Emergency Fluorescent Lighting

Where indcated in the drawings, provide fluorecent emergency lighting units of the size listed. Each unit must be provided with batteries, charger circuit, and monitor circuit that switches to battery power upon loss of AC input power. Provide [troffer mounted][ceiling mounted][suspended] type units with all mounting and installation hardware.

Provide unit that is [NEMA 1] [NEMA 3R] [NEMA 4X] [NEMA 12] rated.

Batteries provided with the unit are to be [lithium-ion][nickel-cadmium][sealed lead acid] [_____]. [Provide unit that has self-diagnostic function. The self diagnostic function must monitor the status of the lamps, battery charger circuit, and batteries and provide visual and/or audio indication of failure or fault.] Provide units with indicating lights and test switch. Indicating lights must provide indication of emergency light unit status. Status indications are that the unit is electrically connected to the normal AC supply source and that the battery is fully charged, battery is being recharged, and unit has a fault.

Provide a unit with a battery charger suitable for the type of batteries installed. The battery charger must be a two-rate unit with both battery maintence charging when batteries are fully charged and a battery recharge rate that will bring depleted batteries to full charge within [12] [24] [_____] hours. Battery capacity must provide a level of 1 foot-candle (fc) average illumination upon initial activation and must provide a minimum of 0.6 fc average illumination after 90 minutes of continuous operation.

][2.2.3 Troffer Mounted LED Emergency Lighting

Where indcated in the drawings, provide troffer mounted emergency lighting units of the size listed. Each unit must be provided with batteries, charger circuit, and monitor circuit that switches to battery power upon loss of AC input power. Provide all mounting and installation hardware.

Provide unit that is [NEMA 1][NEMA 12] rated. Batteries provided with the unit are to be [lithium-ion] [nickel-cadmium] [sealed lead acid] [_____]. [Provide unit that has self-diagnostic function. The self diagnostic function must monitor the status of the lamps, battery charger circuit, and batteries and provide visual and/or audio indication of failure or fault.]

Provide a unit with a battery charger suitable for the type of batteries installed. The battery charger must be a two-rate unit with both battery maintence charging when batteries are fully charged and a battery recharge rate that will bring depleted batteries to full charge within [12] [24] [_____] hours. Battery capacity must provide a level of 1 foot-candle (fc) average illumination upon initial activation and must provide a minimum of 0.6 fc average illumination after 90 minutes of continuous operation.

]2.2.4 Central Emergency Lighting Systems

Provide a central power system providing emergency power at [277] [120] volts, 60 hertz, for a minimum period of [90] [_____] minutes to emergency lighting units. Design the system to handle surges during loss and recovery of the voltage, and to deliver its full rated output to the designated lamp load. Provide [batteries] [backup ac source] for power.

2.2.4.1 Operation

Provide emergency lighting that, when the system loses normal supply voltage, automatically disengages itself from the normal input line, and switches to a self-contained battery-powered inverter with built-in protection when the output is shorted or overloaded. When normal line voltage resumes, the emergency lighting automatically switches back to normal operation. Size the transfer switch for this function to handle

[125] [_____] percent of full load. Provide the battery system with self-contained inverters with overload protection.

2.2.4.2 Charger

Provide a completely automatic battery charger that maintains the batteries in a fully charged condition and recharges the batteries to full capacity within [24] [_____] hours after full discharge in accordance with UL 924.

2.2.4.3 Batteries

Provide [lithium-ion][sealedlead-acid] [nickel-cadmium] batteries, maintenance-free for a period of not less than [10] [_____] years under normal operating conditions. Battery capacity must provide a level of 1 foot-candle (fc) average illumination upon initial activation and must provide a minimum of 0.6 fc average illumination after 90 minutes of continuous operation at each emergency light location.

2.2.4.4 Accessories

Provide visual indicators to indicate normal power, inverter power, and battery-charger operation. Provide a low-voltage test switch to simulate power failure by interrupting the input line, voltage meter, electrolyte level detector to automatically disable the charging circuit in the event of a fault, and low-voltage cutoff to prevent extreme battery power dissipation.

2.2.4.5 Enclosure

Provide a free-standing cabinetthat is [NEMA 1] [NEMA 3R] [NEMA 4X] [NEMA 12] rated with floor stand and constructed of [2.7] [_____] millimeter [12] [_____]-gage sheet steel with [baked-on enamel finish] [manufacturer's standard finish] and a locking latch.

2.2.5 Self-Testing Module

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NOTE: Activity and designer are to decide on appropriate usage of self-testing module. The self-testing module can significantly increase emergency lighting pricing. If a self-testing module is not used, perform testing in accordance with references cited in this section.

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Provide a self-testing module for the emergency lighting equipment that performs the following functions:

a. Continuous monitoring of charger operation and battery voltage with visual indication of normal operation and of malfunction.

b. Monthly discharge cycling of battery with monitoring of transfer circuit function, battery capacity, and emergency lamp operation with visual indication of malfunction. Conduct the battery capacity test using a synthetic load.

c. Manual test switch to simulate a discharge test cycle.

d. Low-voltage battery disconnect (LVD) and brown-out protection circuit.

PART 3 EXECUTION

3.1 INSTALLATION

Permanently fix in place the emergency lighting unit and install wiring for each unit in accordance with NFPA 70. Use the same panel bus or branch circuit as that serving the normal lighting in the area for the branch circuit feeding the unit equipment, and connect ahead of the area switches. Keep remotely connected emergency lighting circuit wiring independent of all other wiring and equipment, and do not enter the same conduit, cable, box, or cabinet with other wiring unless the fixture is supplied from two sources.

Mount emergency lighting units and remote lamps [at heights and locations indicated in the drawings] [at a minimum of [2100] [_____] millimeter [7] [_____]-feet above the finished floor.]

3.2 FIELD QUALITY CONTROL

Demonstrate emergency lighting units to operate satisfactorily in the presence of the Contracting Officer by performing System Operational Tests. Generate a written Test Plan for performing System Operational Tests. The system operational tests must demonstrate [the central emergency lighting system] [each indivdual emergency light] meets the requirements of the referenced standards in this section. Prior to performing the System Operational Tests, submit the Test Plan to the Contracting Officer for review and approval by the Goverment. The Test PLan must be submitted a minimum of [30] [_____] calendar days before the test is planned to be conducted. Do not conduct the test without Government approval.

Perform and submit System Operational Tests in accordance with referenced standards in this section. Record test results in writing on the Test Plan and submit to the Goverment as the System Operational Test Report.

3.3 WARRANTY

Submit [[_____] copies of]warranty, signed by an authorized representative, designating the Government as warrantee, to the Contracting Officer, [5] [_____] days before project closeout.

-- End of Section --