UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated January 2021
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USACE / NAVFAC / AFCEC / NASA | **UFGS-26 52 00.00 40 (November 2017)**

Preparing Activity: NASA | **Superseding UFGS-26 52 00.00 40 (August 2014)**

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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.

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(2020; ERTA 20-1 2020; ERTA 20-2 2020; TIA 20-1; TIA 20-2; TIA 20-3; TIA 20-4) National Electrical Code
NFPA 101	(2021) Life Safety Code

UNDERWRITERS LABORATORIES (UL)

UL 924	(2016; Reprint May 2020) 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[, [____]]

SD-06 Test Reports

System Operational Tests; G[, [____]]

SD-07 Certificates

Certificates of Conformance

SD-11 Closeout Submittals

Warranty

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. Ensure that emergency lighting units are suitable for operation on the ac supply circuit to which they are to be electrically connected.

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 [nonrefillable nickel-cadmium battery] [_____], as indicated.

2.2.1.1 Batteries

Provide batteries rated [6-12] [_____] volts. Provide batteries with the capacity and rating to supply the lamp load while maintaining a minimum [87.5] [_____]-percent power for [1.5] [_____] hours, or the battery-lamp combination maintaining [60] [_____]-percent, minimum, illumination. Provide maintenance-free [lead-acid] [nickel-cadmium] type batteries, with a minimum normal life of [10] [_____] years.

2.2.1.2 Battery Charger

Provide a battery charger with a dry full-wave rectifier with two charging rates: one to automatically maintain the battery in a fully charged state under normal conditions and the other to automatically recharge the battery to a fully charged state within [12] [_____] hours after a continuous discharge of [1-1/2] [_____] hours through the connected lamp load.

2.2.1.3 Unit Enclosure

Fabricate the unit enclosure with at least [18] [_____]-gage sheet steel. Design the cover to provide access to the battery and battery-charger compartments and to have a full-length piano hinge and a latching device. Protect component parts within the enclosure from dust, moisture, and oxidizing fumes from the battery. Coat the interior and exterior surfaces of the enclosure with a corrosion-resistant gray baked-enamel finish.

2.2.1.4 Lamp Heads, Lamps, and Indicating Lights

Mount the lamp heads on the top of the unit enclosure, or wall-mount the lamp heads. Except where otherwise indicated, ensure that the lamp heads are fully adjustable in the horizontal and vertical planes. Provide a steel lamp head assembly with [nickel] [chromium] plating. Form the exterior housing of the lamp from [nickel] [cadmium]-plated sheet steel.

Provide sealed-beam lamps, [PAR-36] [halogen], rated not less than [12] [_____] watts at the specified dc voltage.

Mount an amber "ready-for-use on alternating current" indicating light, a red "recharging on alternating current" indicating light, and a momentary-contact pushbutton test switch on the cover of the unit enclosure. The amber light, when illuminated, indicates that the unit is electrically connected to the normal ac supply source and that the battery is fully charged. The red light, when illuminated, indicates that the battery is being recharged. The momentary-contact pushbutton test switch transfers the unit from normal supply to battery supply and tests operation of equipment under simulated ac source power failure.

2.2.1.5 Relays and Switches

Provide a self-cleaning undervoltage relay that automatically connects the lampload to the battery supply upon failure of the ac supply. Mount 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 supply falls to [70] [_____] percent of normal voltage.

2.2.1.6 Mounting Shelves

Provide the emergency lighting units with [angle iron] [_____] mounting shelves[and with a protective screen designed by the equipment manufacturer for this purpose]. Coat the mounting shelf[and screen] with a corrosion-resistant finish in accordance with the manufacturer's standard practice.

[2.2.2 Emergency Fluorescent Lighting

Provide each unit with an automatic power failure device, test switch, pilot light, and fully automatic high/low trickle charger in a self-contained solid-state, temperature-compensated power pack. Provide a [sealed-wet] [gelled-electrolyte] battery with sufficient capacity to supply power to provide a minimum of [6500] [_____] lumens per square meter [600] [_____] lumens using a [40] [_____]-watt rapid-start lamp. Provide a sealed and maintenance-free battery, with an active life of not less than [10] [_____] years under normal operating conditions.

]2.2.3 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. 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.

2.2.3.1 Operation

Ensure that, when the system loses normal supply voltage, it automatically disengages itself from the normal input line, and switches to a self-contained inverter with built-in protection when the output is shorted or overloaded. Ensure that, when normal line voltage resumes, the emergency system 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.

2.2.3.2 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.

2.2.3.3 Batteries

Provide sealed [lead-acid] [nickel-cadmium] batteries, maintenance-free for a period of not less than [10] [_____] years under normal operating conditions.

2.2.3.4 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.

2.2.3.5 Enclosure

Provide a free-standing cabinet with floor stand and constructed of [2.7] [_____] millimeter [12] [_____]-gage sheet steel with baked-on enamel finish and a locking latch.

2.2.4 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 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.

Perform and submit System Operational Tests in accordance with referenced standards in this section.

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 --