SETION 16420

EMERGENCY LIGHTING

PART 1 - GENERAL

1.01 <u>REFERENCES</u>

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 (NEPA)

NFPA 101 (2006) Life Safety Code, 2006 Edition

NFPA 70 (2005; TIA 2005) National Electrical Code

UNDER WRITERS LABORATORIES (UL)

UL 924 (2001; R 2005 e8) Standard for Emergency Lighting and Power Equipment

1.02 <u>GENERAL REQUIREMENTS</u>

Material, Equipment, and fixture Lists shall be submitted showing manufacturer's style or catalog numbers, specification and drawing reference numbers, warranty information, and fabrication site.

1.03 <u>SUBMITTALS</u>

Ministry approval is required for submittals with a "G" designation; submittals not having a "G" designation is for contractor Quality Control approval and for information only. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD -01 Preconstruction Submittals

Material, Equipment, and Fixture Lists shall be submitted in accordance with paragraph entitled, General Requirements, "of this section.

SD-02 Shop Drawings

Installation drawing shall be submitted for the Central Emergency Lighting System indicating location of installed fixture. SD-03 Product Data

Manufacturer's catalog data shall be submitted for the following items:

Emergency Lighting Egress Units Emergency Fluorescent Lighting

Central Emergency Lighting Systems

Accessories

SD-06 Test Reports Test reports shall be submitted showing result of system Operational tests for emergency lighting systems.

SD-07 Certificates

Certificates shall be submitted for the following conformance with the referenced Standards contained in this section.

Emergency Lighting Egress Units Emergency fluorescent lighting Central Emergency Lighting Systems Accessories

PART 2 - PRODUCTS

2.01 **PRODUCT STANDARDS**

Emergency lighting units shall conform to UL 924 and NFPA 101. Emergency lighting units shall be furnished completely with wiring and mounting devices and ready for installation at the locations indicated. Fixtures shall be equipped with lamps.

2.02 EMERGENCY LIGHTING EGRESS UNITS

Emergency lighting units shall be complete self-contained units with batteries, battery charger, one or more local or remote lamp heads with lamps, under-voltage 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) or style D (non-refillable nickel-cadmium battery), as indicated.

Batteries shall be rated not less 12 volts.

Battery charger shall include a dry-type 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 continuous discharge of 1 ½ hours though the connected lamp load.

Batteries shall have capacity and rating to supply the lamp load with maintained 87.5 percent power, minimum, for 1.5 hours, or the battery-lamp combination shall maintain 60 percent, minimum, illumination. Batteries shall be maintenance-free nickel cadmium type. Minimum normal life shall be 10 years.

Unit enclosure shall be fabricated from sheet steel not less than 1.3 millimeter. Cover shall provide access to the battery and battery-charger compartments and shall have a full-length piano hinge and a latching device. Component parts within the enclosure shall be protected from dust, moisture, and oxidizing fumes from the battery. Interior surfaces of enclosure shall be coated with a corrosion-resistant gray baked-enamel finish.

Lamp heads shall be mounted on the top or wall mounted, of the unit enclosure except where otherwise indicated and shall be fully adjustable in the horizontal and vertical planes. The lamp head mounting assembly shall be steel construction with nickel or chromium plating. Exterior housing of the lamp shall be formed from nickel or cadmium-plated sheet steel.

Lamp shall be the sealed-beam type halogen, rated not less than 12 watts at the specified dc voltage.

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 shall be mounted on the cover of the unit enclosure. The amber indicating light shall indicate, when illuminated, that the unit is electrically connected to the normal ac supply source and that the battery is fully charged. The momentarycontact pushbutton test switch shall transfer unit from normal supply to battery supply and shall test operation of equipment under simulated ac source power failure.

The under-voltage relay shall be the self-clearing type and shall automatically connect the lamp load to the battery supply upon failure of the alternating current supply. An on off toggle switch shall be mounted inside the unit enclosure to disconnect the battery from the lamp load when the units is taken out service for maintenance purposes. The relay shall energize when the ac supply falls to 70 percent of normal voltage.

Emergency lighting units shall be provided with angle iron mounting shelves and with a protective screen designed by the equipment manufacturer for this purpose. The mounting shelf and screen shall be coated with a corrosion-resistant finish in accordance with manufacture's standard practice.

Emergency lighting units shall be suitable for operation on the ac supply circuit to which they are to be electrically connected.

2.03 EMERGENCY FLUORESCENT LIGHTING

Each unit shall have 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. The battery shall be sealed-wet type with capacity as required to supply power to provide a minimum of 6500 lumens per square meter using a 40-watt rapid start lamp. The battery shall be sealed and maintenance-free for a period of not less than 15 years under normal operating conditions.

2.04 CENTRAL EMERGENCY LIGHTING SYSTEMS

A central power system shall provide emergency power at 230 volts, 60 hertz, for a minimum period of 90 minutes. The system shall be designed to handle surges during loss and recovery of the voltage. The system shall deliver its full rated output to designated lamp load. The power source shall be batteries or backup ac source.

2.4.1 <u>Operation</u>

Upon loss of normal supply voltage, the system shall automatically disengage itself from the normal input line, switching to a self-contained inverter with built-in protection when the output is shorted or overloaded. When normal line voltage resumes, the emergency system shall automatically switch back to normal operation. The transfer switch for this function shall be sized to handle 125 percent of full load. Battery systems shall include self-contained inverters with overload protection.

2.4.2 <u>Charger</u>

The battery charger shall be completely automatic, maintaining the batteries in a fully charged condition, and shall recharged the batteries to full capacity within 24-hours after full discharge in accordance with UL 924.

2.4.3 <u>Batteries</u>

The batteries shall be sealed nickel-cadmium type and shall be maintenance-free for a period of not less than 15 years under normal operating conditions.

2.4.4 <u>Accessories</u>

Visual indicators shall be provided to indicate power, inverter power, and battery charger operation. Low-voltage test switches to simulate power failure by interrupting the input line, voltage meter, electrolyte detector to automatically disable the charging circuit in the event of a fault, and law voltage cutoff to prevent extreme battery power dissipation shall be provided.

2.4.5 <u>Enclosure</u>

A free standing cabinet shall be provided with floor stand and shall be constructed of 2.7 millimeter sheet steel with baked-on enamel finish and locking type latch.

PART 3 - EXECUTION

3.01 <u>INSTALLATION</u>

Emergency lighting unit shall be permanently fixed in place and shall have wiring to each unit installed in accordance with NFPA 70 The branch circuit feeding the unit equipment shall be the same panel bus or branch circuit as that serving the normal lighting in the area and shall be connected ahead of area switches. Emergency lighting fixtures that are remotely connected to the emergency lighting unit shall have circuit wiring kept independent of all other wiring and equipment and shall not enter the same conduit, cable, box, or cabinet with other wiring unless the fixture is supplied from two sources.

Mounting heights of emergency lighting units and remote lamps shall be a minimum of 2100 millimeter above the finished floor.

3.02 <u>FIELD TESTING</u>

Emergency lighting units shall be demonstrated to operate satisfactorily in the presence of the contracting officer.

System operational tests shall be performed in accordance with referenced standards in this section.

END OF SECTION