

Electrical and Lighting Program Means of Egress Illumination 2009 IBC 1006

Developed by:
Electrical & Lighting Unit
Division of Industry Services
WI Department of Safety & Professional Services

<http://dsps.wi.gov>

Means of Egress Illumination Seminar Objectives

- Review Basic Egress Illumination Requirements
 - Normal Source
 - Emergency Standby Source
- Documentation for Required Emergency Lighting Plan Review
- Testing Emergency Lighting Systems

Basic Requirements

2009 IBC

Section 1006

(No changes from 2006 IBC)

Means of Egress Illumination

Basic Requirements

- Section 1006
- Requirements for Means of Egress Illumination
- Two types of requirements:
 - Normal (utility power)
 - Emergency (standby power)

Means of Egress Illumination

Key Definitions

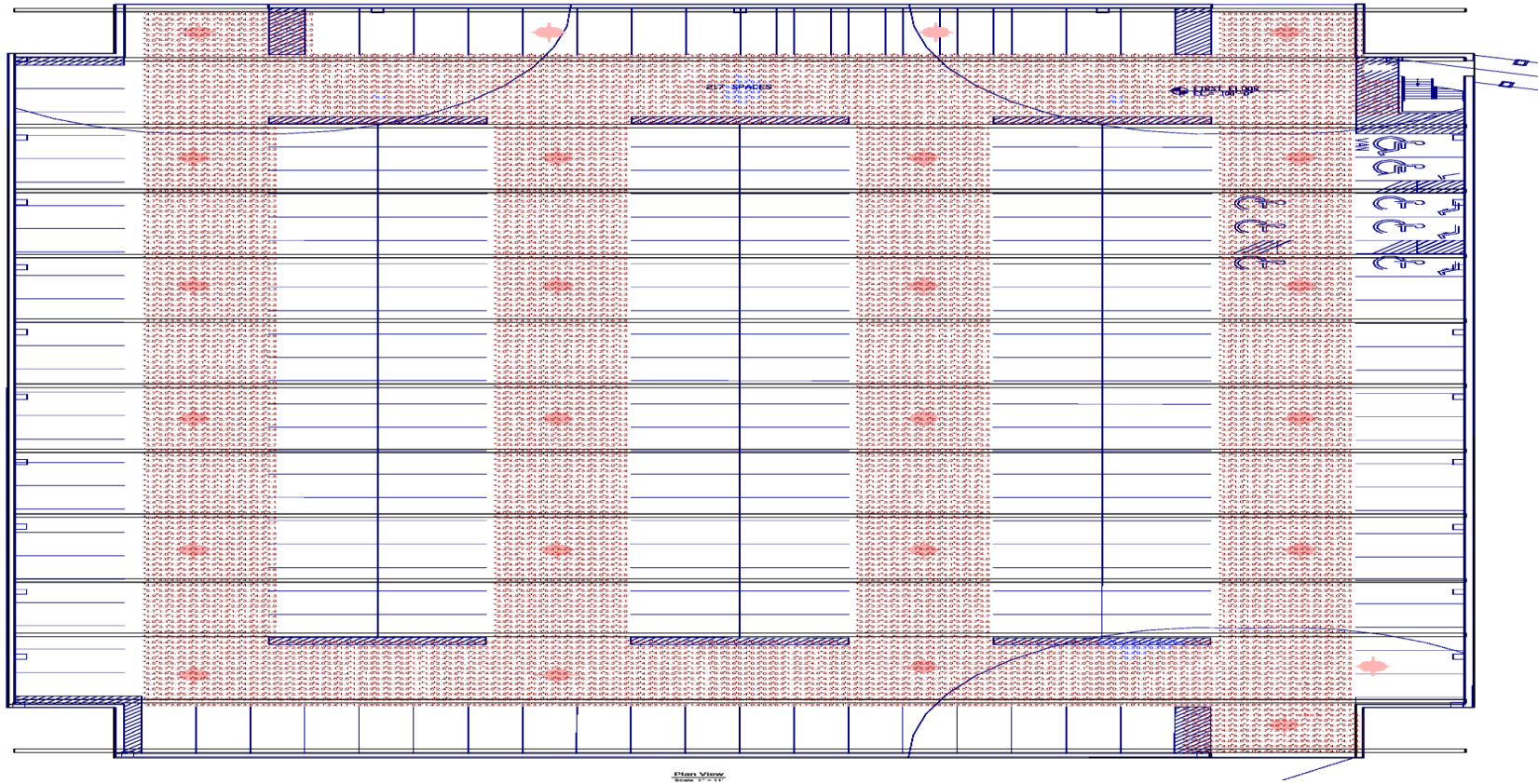
- Means of Egress
 - “A continuous and unobstructed path of vertical and horizontal egress travel from any occupied portion of a building or structure to a public way.”
- Consists of three parts:
 - Exit Access
 - The Exit
 - Exit Discharge

Means of Egress Illumination

Key Definitions

- Exit Access:
 - “That portion of a means of egress system that lead from any occupied portion of a building to an exit.”
- Examples:
 - Access isles
 - Interior corridors that are not fire rated
 - The entire floor area in open room

Access Isles



STATISTICS						
Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
LUMINAIRE @ FLOOR	■	3.7 fL	10.0 fL	0.3 fL	35.0:1	12.2:1

LUMINAIRE SCHEDULE							
Symbol	Label	Qty	Catalog Number	Description	Lamp	File	Lumens, LLP, Watts
■	EDGES	26	QWT-qs-150MM	CLEAR ACRYLIC LENS	CLEAR T8/28W/840	QWT	11000 1.00 210

Means of Egress Illumination

Key Definitions

- **The Exit:**
 - **“That portion of a means of egress system which is separated from other interior spaces by fire resistive rated construction.”**
- **Examples:**
 - **Exterior doors at ground level**
 - **Exit enclosures**
 - **Exit passageways**
 - **Exterior exit stair and ramps**
 - **Horizontal exits**

Stair Enclosure



Means of Egress Illumination

Key Definitions

- Exit Discharge:
 - “That portion of a means of egress system between the termination of an exit and a public way.”
- Examples:
 - Exterior landings
 - Exterior sidewalks
 - Exterior courts that lead to the public way

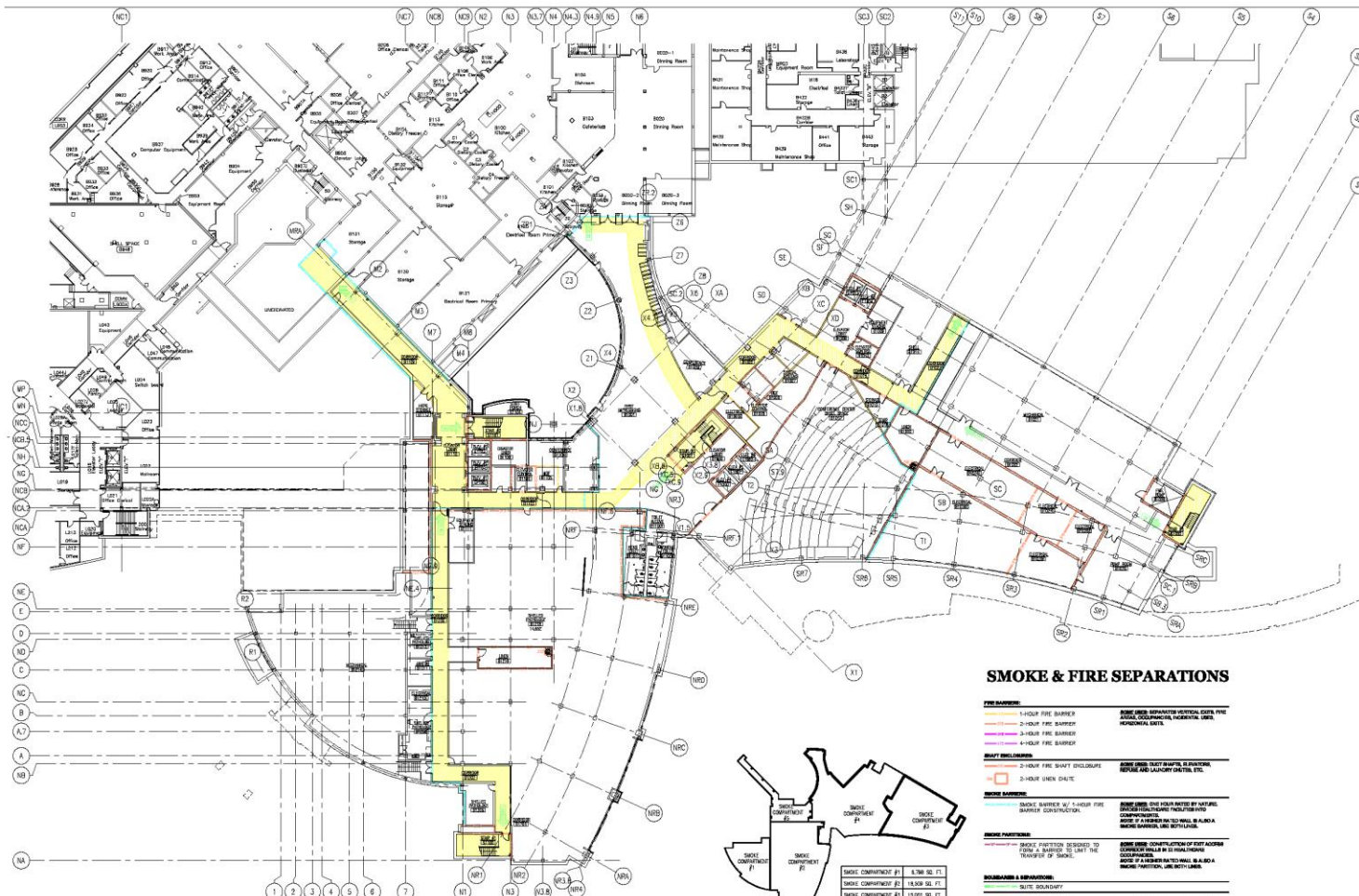
Exit Discharge



Means of Egress Illumination

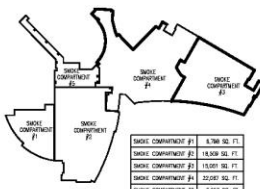
Basic Requirements

- These elements typically shown on a “Life Safety” Egress Plan
- Type of floor plan
- Required to be prepared for all building plans that require approval by DSPS or Delegated Agents
- Used by local officials



SMOKE & FIRE SEPARATIONS

- FIRE BARRIERS**
- 1-HOUR FIRE BARRIER
 - 2-HOUR FIRE BARRIER
 - 3-HOUR FIRE BARRIER
 - 4-HOUR FIRE BARRIER
- SMOKE BARRIERS**
- SMOKE BARRIER W/ 1-HOUR FIRE BARRIER CONSTRUCTION
- SMOKE PARTITIONS**
- SMOKE PARTITION DESIGNED TO PREVENT THE SPREAD OF SMOKE
- SEPARATIONS & ENCLOSURES**
- SMOKE SEALS
 - SMOKE SEALING
 - SMOKE SEALING
- NUMBER OF BARRIERS**
- EXIT PASSAGEWAY
 - EXIT ACCESS CORRIDOR



SMOKE COMPARTMENT #1	4,766 SQ. FT.
SMOKE COMPARTMENT #2	14,008 SQ. FT.
SMOKE COMPARTMENT #3	13,051 SQ. FT.
SMOKE COMPARTMENT #4	22,665 SQ. FT.
SMOKE COMPARTMENT #5	5,842 SQ. FT.

BASEMENT LIFE SAFETY FLOOR PLAN
1-10-2018

85% CONSTRUCTION DOCUMENTS - CA/CC FOR REFERENCE ONLY NOT FOR CONSTRUCTION

August 14, 2018

Key Plan



Luther Midelfort
Bed Tower Expansion

Essy Circle, WI

Project No. 206700

Sheet Title
LIFE SAFETY BASEMENT FLOOR PLAN

Sheet No.
A1-08-LS

Means of Egress Illumination

Normal Power

- Illumination for means of egress
 - Required all times the building occupied
- Exceptions:
 - Occupancies in group U (Utility)
 - Aisle accessways in Group A
 - Dwelling and sleeping units in R-1, R-2, and R-3 occupancies
 - Sleeping Units of Group I occupancies

Means of Egress Illumination

Normal Power

- Illumination level
 - Minimum 1 foot-candle (fc)
 - Measured at walking/floor level
- Exception:
 - Auditoriums, theaters, concert halls, etc
 - May reduce to 0.2 fc during a show
 - Auto-restore to normal levels upon activation of fire alarm system

Means of Egress Illumination Emergency Standby Power

- **Illumination level**
 - **Measured at floor level**
 - **1 foot-candle (fc) Average**
 - **Minimum of 0.1**
 - **Maximum to minimum ratio not to exceed 40:1**
- **Exception:**
 - **Average permitted to decline to 0.6 fc at end of required duration.**
 - **Minimum permitted to decline to 0.06 fc at end of required duration**
 - **Example: Unit equipment with required duration of 90 minutes.**

Means of Egress Illumination Emergency Standby Power

- Areas requiring Emergency Illumination:
 - Applies only to buildings or spaces that require two (2) or more exits
 - Look for Exit Signs

Means of Egress Illumination Emergency Standby Power

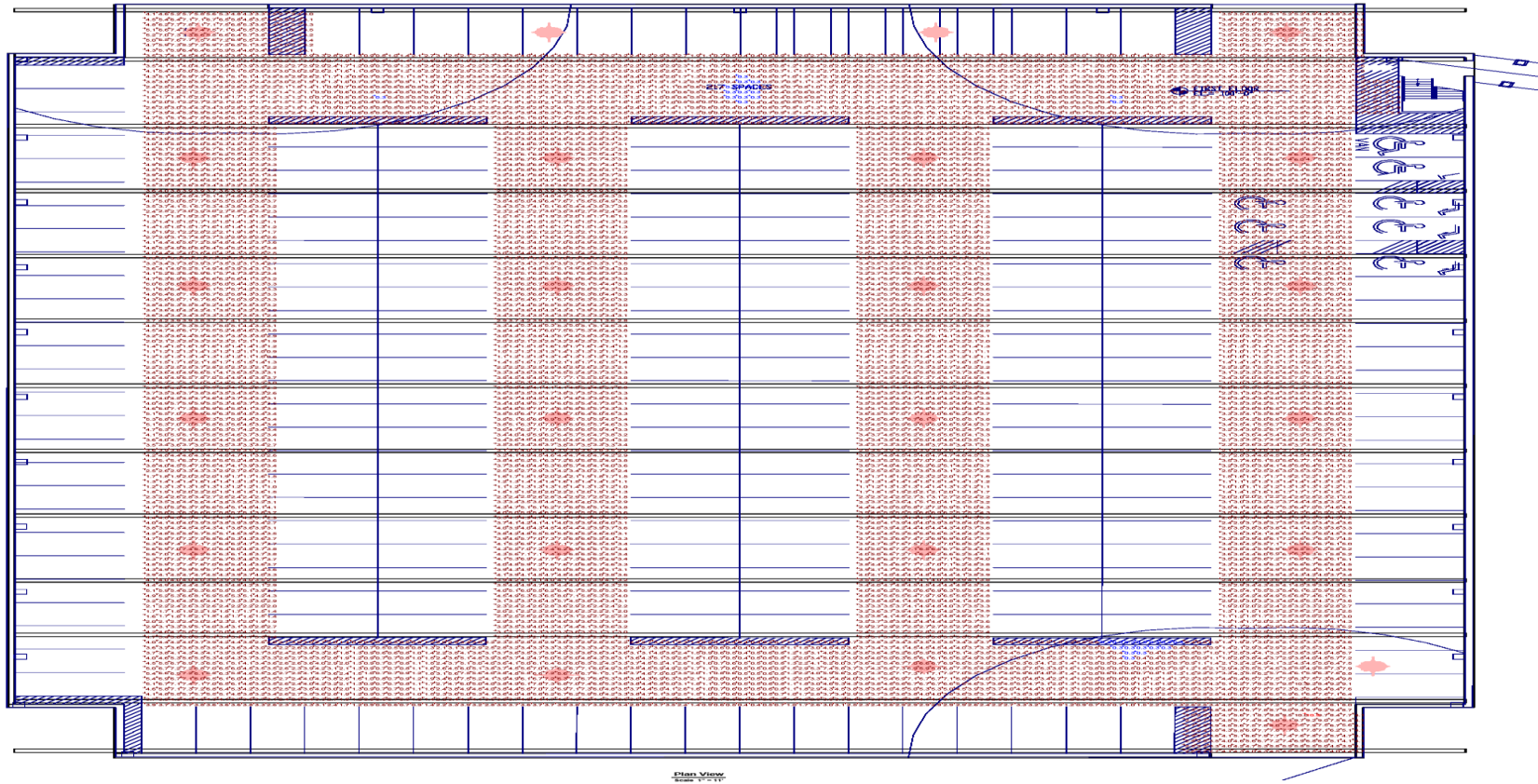
- Why might a bldg or space REQUIRE 2 or more exits? Reference IBC 1015
- If the room, space or building exceeds the limits listed

OCCUPANCY	MAXIMUM OCCUPANT LOAD
A, B, E ^a , F, M, U	49
H-1, H-2, H-3	3
H-4, H-5, I-1, I-3, I-4, R	10
S	29

Means of Egress Illumination Emergency Standby Power

- Areas requiring Emergency Illumination:
 - 2) Elements:
 - Aisles and unenclosed stairways
 - Corridors, exit enclosures and passageways
 - Exterior egress components at other than level of discharge

Access Isles



STATISTICS						
Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
LUMINAIRE @ FLOOR	■	3.7 lx	10.0 lx	0.3 lx	35.0:1	12.2:1

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Symbol	Label	Qty	Catalog Number	Description	Lamp	File	Lumens, LLP, Watts
■	EDGES	26	QWT-qs-150MM	CLEAR ACRYLIC LENS	CLEAR T8/24W/840	QWT-qs-150MM	11000 1.00 210

Exit Corridor



Exterior Egress Components



Means of Egress Illumination Emergency Standby Power

- Elements:
 - Interior exit discharge elements per 1024.1
 - Vestibules
 - Some open parking garages
 - Exterior landings required by 1008.1.5
 - **Minimum of 44-inches in the direction of travel**
 - Exception: Minimum of 36-inches in the direction of travel for R-3 and individual units of R-2 Occupancies

Vestibule



Documentation for Required Emergency Lighting

Emergency Lighting Plans

- Plans No longer required to be submitted to DSPS as of 5/1/2012.
- Submit to Delegated Agents as part of permitting process.
- Was Part of Building Plan Review, now part of Field Inspection
- Examines Key Elements of Emergency Lighting

Emergency Lighting Plans

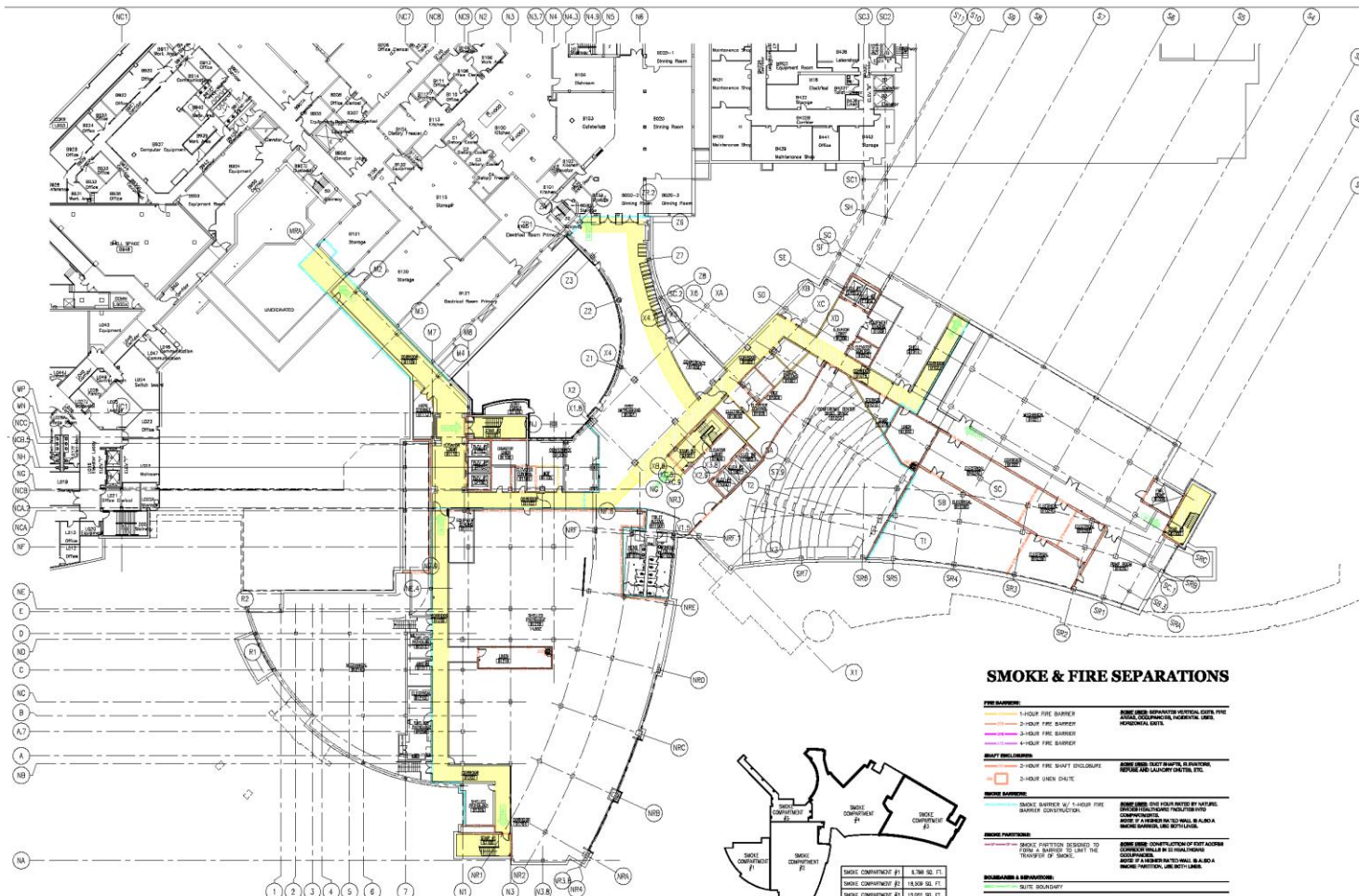
- DSPS Requires Plans to be On-site for:
 - New Buildings
 - Building Additions
 - Initial Tenant Space Build-out
- Local Communities or Other Agencies may require plan submittal for other projects.

Emergency Lighting Plan Checklist

- Egress Plan
- Photometric Study
 - Option for Unit Equipment
- One-line Diagram of Emergency System
- Load Calculations

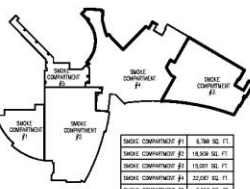
Emergency Lighting Plan Checklist

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SMOKE & FIRE SEPARATIONS

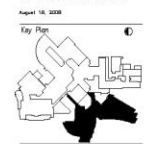
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- SMOKE PARTITIONS**
- SMOKE PARTITION DESIGNED TO PREVENT THE SPREAD OF SMOKE
- SEPARATIONS & ENCLOSURES**
- GLASS ENCLOSURE
 - GLASS PARTITION
 - GLASS WALL
 - GLASS DOOR
 - GLASS WINDOW
 - GLASS CURTAIN WALL
 - GLASS SKYLIGHT
 - GLASS ROOF
 - GLASS FLOOR
 - GLASS BALCONY
 - GLASS STAIR
 - GLASS ELEVATOR
 - GLASS RAMP
 - GLASS PORCH
 - GLASS TERRACE
 - GLASS PATIO
 - GLASS PERGOLA
 - GLASS GALLERY
 - GLASS LOBBY
 - GLASS RECEPTION
 - GLASS CONFERENCE
 - GLASS OFFICE
 - GLASS LABORATORY
 - GLASS CLEAN ROOM
 - GLASS PHARMACY
 - GLASS STORE
 - GLASS RESTAURANT
 - GLASS BAR
 - GLASS CAFE
 - GLASS KITCHEN
 - GLASS PANTRY
 - GLASS BREAK ROOM
 - GLASS STORAGE
 - GLASS MEETING
 - GLASS TRAINING
 - GLASS SEMINAR
 - GLASS CLASSROOM
 - GLASS LECTURE
 - GLASS THEATRE
 - GLASS AUDITORIUM
 - GLASS CONCERT
 - GLASS GYMNASIUM
 - GLASS GYM
 - GLASS JUDO
 - GLASS KARATE
 - GLASS KICK BOXING
 - GLASS MOUNTAIN CLIMBING
 - GLASS ROCK CLIMBING
 - GLASS BOWLING
 - GLASS BILLIARDS
 - GLASS SNOW GLOBE
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BASEMENT LIFE SAFETY FLOOR PLAN
11/20/11

85% CONSTRUCTION DOCUMENTS - OAC/C FOR REFERENCE ONLY NOT FOR CONSTRUCTION



Luther Midelfort
Bed Tower Expansion

Essy Circle, WI
Project No. 206200

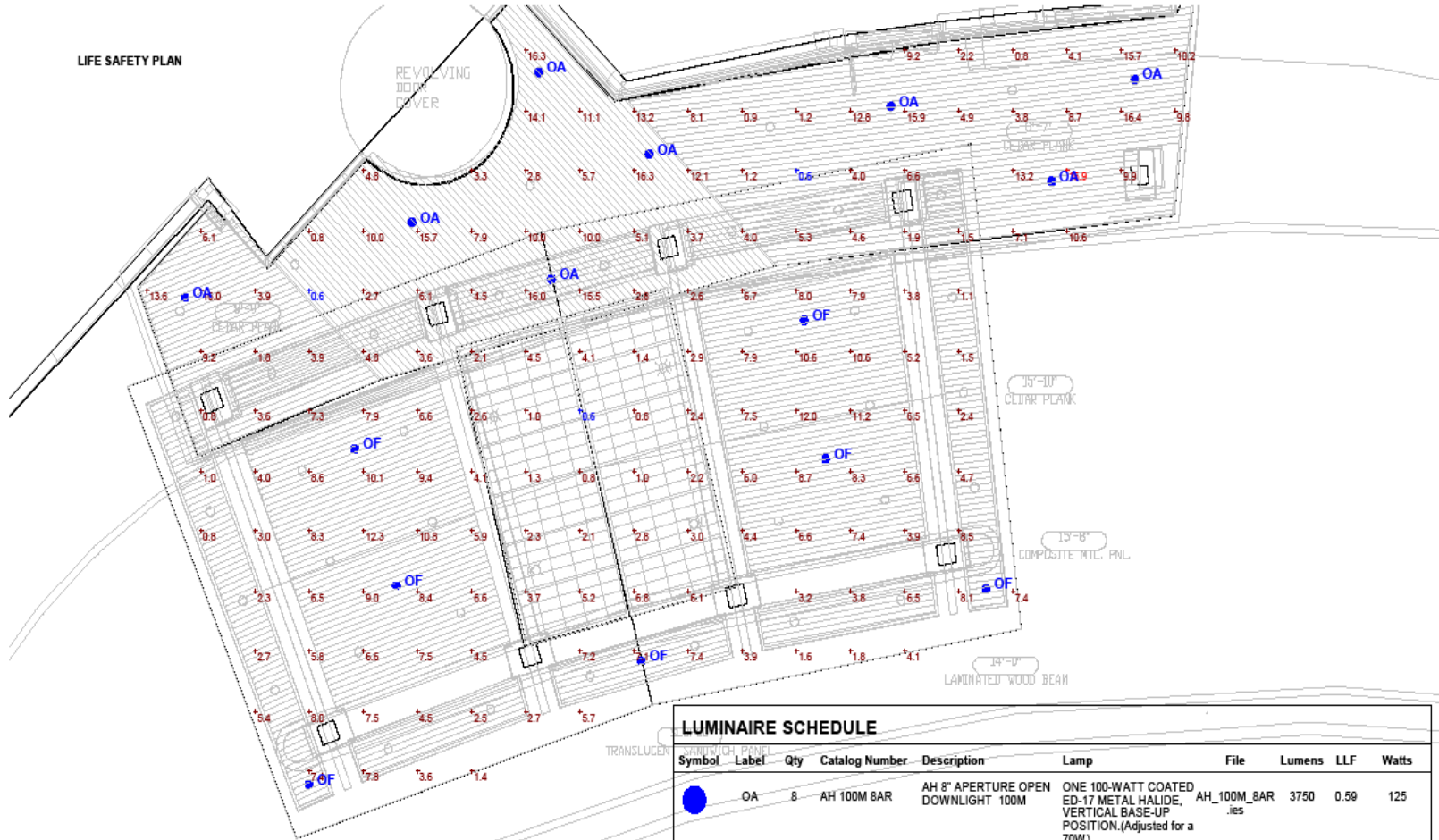
Sheet Title
**LIFE SAFETY
BASEMENT FLOOR
PLAN**

Sheet No.
A1-08-LS

Emergency Lighting Plan Checklist

- Egress Plan
- **Photometric Study**
 - Additional Option for Unit Equipment
- One-line Diagram of Emergency System
- Load Calculations

LIFE SAFETY PLAN



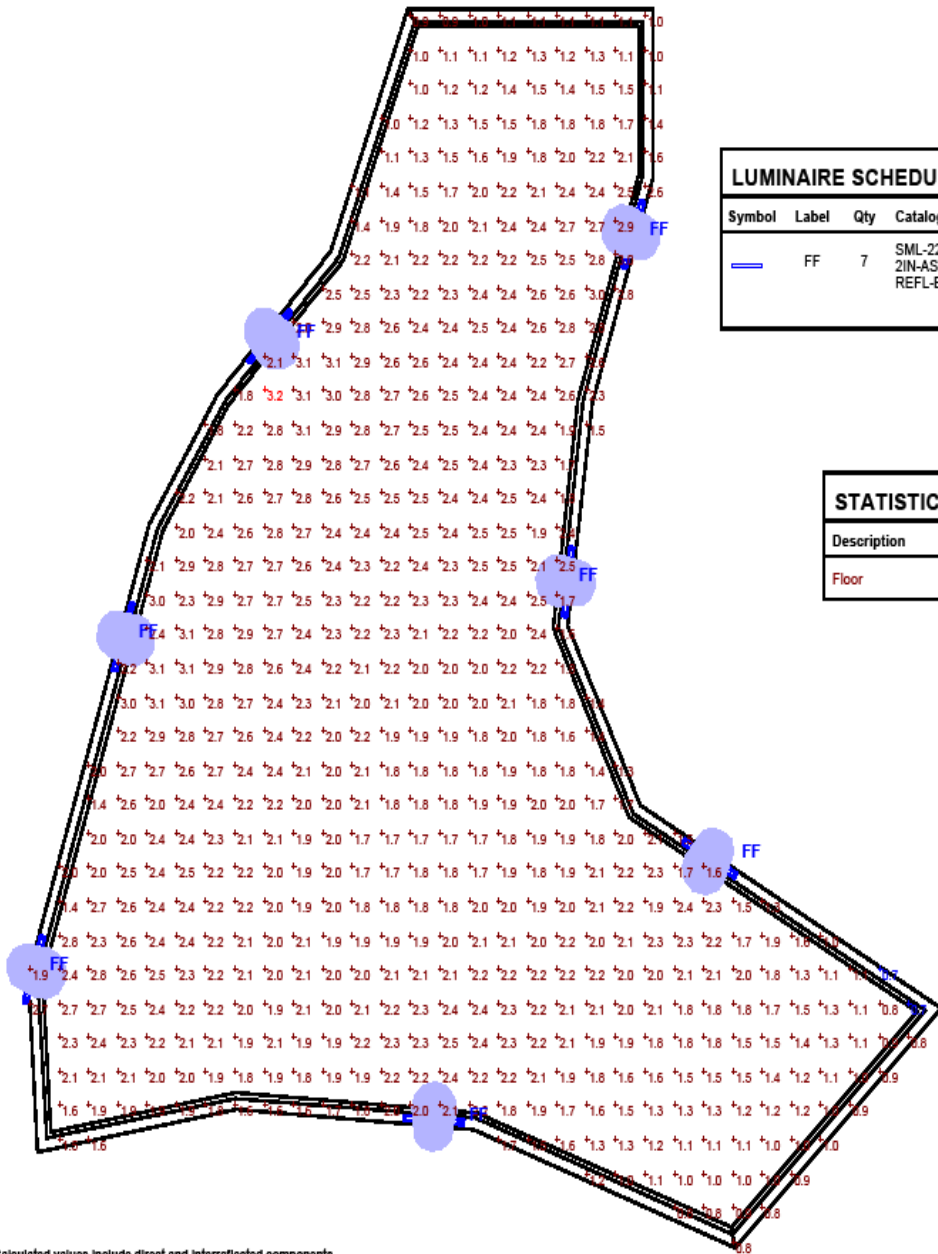
STATISTICS

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Ground	+	6.2 fc	16.9 fc	0.6 fc	28.2:1	10.3:1

Calculated values include direct and interreflected components.

LUMINAIRE SCHEDULE

Symbol	Label	Qty	Catalog Number	Description	Lamp	File	Lumens	LLF	Watts
●	OA	8	AH 100M 8AR	AH 8" APERTURE OPEN DOWNLIGHT 100M	ONE 100-WATT COATED ED-17 METAL HALIDE, VERTICAL BASE-UP POSITION.(Adjusted for a 70W)	AH_100M_8AR .ies	3750	0.59	125
●	OF	7	AH 100M 8AR	AH 8" APERTURE OPEN DOWNLIGHT 100M	ONE 100-WATT COATED ED-17 METAL HALIDE, VERTICAL BASE-UP POSITION.(Adjusted for a 150W)	AH_100M_8AR .ies	5500	0.59	125
■	OG	0	E1WT1002-1M150-	EXTRUDED METAL HOUSING WITH CAST WHITE PAINTED METAL END PLATES, FABRICATED PREMIUM SPECULAR TEXTURED	ONE 150-WATT CLEAR T-8 CERAMIC METAL HALIDE, PHILIPS CDM150/T8/830, HORIZONTAL POSITION.	OG - ITL56041.IES	14000	0.59	150



LUMINAIRE SCHEDULE									
Symbol	Label	Qty	Catalog Number	Description	Lamp	File	Lumens	LLF	Watts
—	FF	7	SML-228T5 (SML-2IN-ASY-4FT-2LT-REFL-B)	SML Series Staggered Commercial Micro-Striplight with a solid asymmetrical reflector.	Two - F28T5/835 - 2000 Lumens ea. - 28 Watts ea. (LUMENS ADJUSTED TO REPLICATE (1) 24W T5HO)	SML-228T5 (SML-2IN-ASY-4FT-2LT-REFL-B).ies	2000	0.73	65

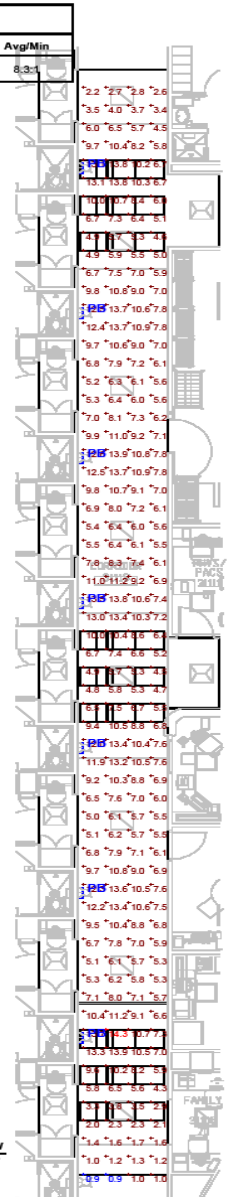
STATISTICS						
Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Floor	+	2.0 fc	3.2 fc	0.7 fc	4.6:1	2.8:1

Calculated values include direct and interreflected components.

STATISTICS						
Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Floor	+	7.5 fc	14.3 fc	0.9 fc	15.9:1	8.3:1

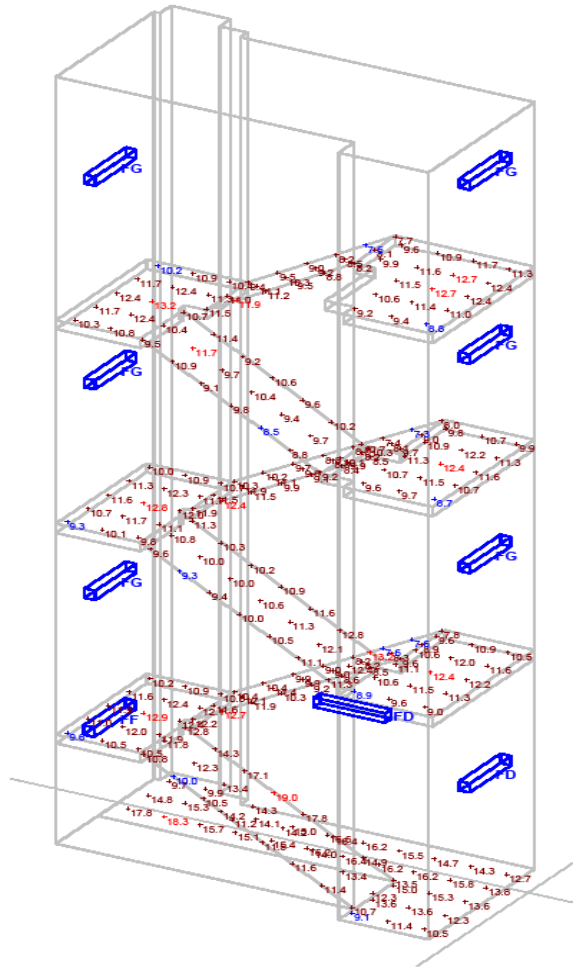
NOTES




1. This light level calculation is typical for all patient wing corridors. Refer to sheets EL1-02-01, EL1-02-02, EL1-03-01, and EL1-03-02 for patient wing lighting plans.
2. Refer to Light Fixture Schedule on sheets E5-00 and E5-01 for luminaire description.
3. The calculation points are a 2' x 2' grid.
4. Reference Comm 63 2008, 63.0505 2008 and NFPA 101 2008, 7.9.2.1.



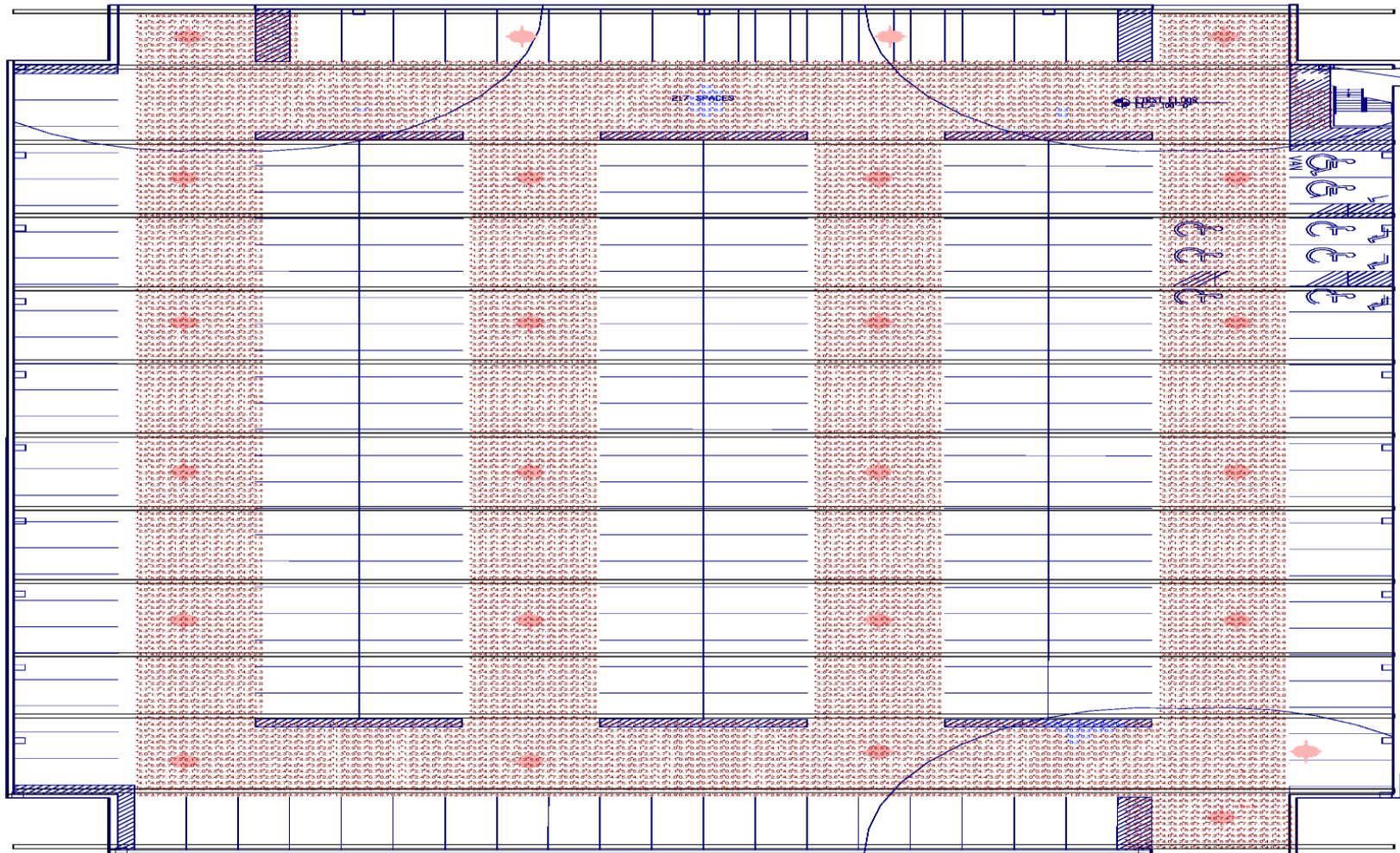
Plan View
Scale 1" = 8'

Calculated values include direct and interreflected components.



LUMINAIRE SCHEDULE									
Symbol	Label	Qty	Catalog Number	Description	Lamp	File	Lumens	LLF	Watts
	FD	2	LADA-SERIES - 1-UP & 2-DN	LIFE SAFETY - 2-DN		FD-BAL12183.IES	1900	0.72	61
	FG	6	LADA-SERIES - 2-UP & 2-DN	LIFE SAFETY - 2-DN		BAL11556.IES	1900	0.72	61
	FF	1	LADA-SERIES - 2-DN	LIFE SAFETY - 2-DN		FD-BAL12183.IES	1900	0.72	61

Calculated values include direct and interreflected components.



Plan View
Scale 1"=11'

STATISTICS						
Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
EGRESS @ FLOOR	+	3.7 fc	10.5 fc	0.3 fc	35.0:1	12.2:1

LUMINAIRE SCHEDULE							
Symbol	Label	Qty	Catalog Number	Description	Lamp	File	Lumens L.F. Watts
■	EGRES	25	OP1-ss 150MH	CLEAR ACRYLIC LENS	CLEAR 150MH/UMED ps	11000 OP175B.GD	1,000 210

STATISTICS						
Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Calc Zone #2	+	13.3 fc	19.0 fc	10.0 fc	1.9:1	1.3:1
Calc Zone #3	+	9.7 fc	12.7 fc	7.6 fc	1.7:1	1.3:1
Calc Zone #4	+	10.9 fc	13.2 fc	9.3 fc	1.4:1	1.2:1
Calc Zone #5	+	9.6 fc	12.4 fc	7.3 fc	1.7:1	1.3:1
Calc Zone #6	+	10.0 fc	11.7 fc	8.5 fc	1.4:1	1.2:1
Calc Zone #7	+	9.5 fc	11.9 fc	7.6 fc	1.6:1	1.3:1
Calc Zone #8	+	11.5 fc	13.2 fc	10.2 fc	1.3:1	1.1:1
Calc Zone #9	+	11.0 fc	12.7 fc	8.8 fc	1.4:1	1.3:1
Calc Zone #10	+	10.7 fc	12.4 fc	8.7 fc	1.4:1	1.2:1
Calc Zone #11	+	11.1 fc	12.8 fc	9.3 fc	1.4:1	1.2:1
Calc Zone #12	+	10.8 fc	12.4 fc	8.9 fc	1.4:1	1.2:1
Calc Zone #13	+	11.4 fc	12.9 fc	9.6 fc	1.3:1	1.2:1
Calc Zone #21	+	14.4 fc	18.3 fc	9.1 fc	2.0:1	1.6:1

Emergency Lighting Plan Checklist

- Egress Plan
- Photometric Study
 - Option for Unit Equipment
- One-line Diagram of Emergency System
- Load Calculations



- BEST COPY**
1. TO THE ARCHITECT AND TO THE CONTRACTOR.
 2. FOR THE ARCHITECT'S USE ONLY. TO BE KEPT IN THE ARCHITECT'S OFFICE FOR THE LIFE OF THE PROJECT.
 3. NOT TO BE LOANED, REPRODUCED, COPIED, OR IN ANY MANNER DISTRIBUTED OUTSIDE OF THE ARCHITECT'S OFFICE.
 4. NOT TO BE USED FOR ANY OTHER PROJECT.
 5. NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM.

- OWNER NOTICE**
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STAIR 1 - ELECTRICAL

DATE: 01/15/2010

PROJECT: MARTHA JEFFERSON HOSPITAL

REVISIONS:

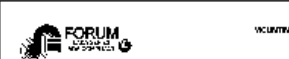
NO.	DATE	DESCRIPTION
1	01/15/2010	ISSUED FOR PERMIT

NOTES:

1. SEE ELECTRICAL SCHEDULE FOR EQUIPMENT SCHEDULE.
2. SEE ELECTRICAL SCHEDULE FOR PANEL SCHEDULE.
3. SEE ELECTRICAL SCHEDULE FOR CONDUIT SCHEDULE.
4. SEE ELECTRICAL SCHEDULE FOR WIRING SCHEDULE.
5. SEE ELECTRICAL SCHEDULE FOR TRAY SCHEDULE.
6. SEE ELECTRICAL SCHEDULE FOR RACEWAY SCHEDULE.
7. SEE ELECTRICAL SCHEDULE FOR CABLE TRAY SCHEDULE.
8. SEE ELECTRICAL SCHEDULE FOR BUSWAY SCHEDULE.
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14. SEE ELECTRICAL SCHEDULE FOR CONTROL PANEL SCHEDULE.
15. SEE ELECTRICAL SCHEDULE FOR TELEPHONE SCHEDULE.
16. SEE ELECTRICAL SCHEDULE FOR DATA SCHEDULE.
17. SEE ELECTRICAL SCHEDULE FOR VIDEO SCHEDULE.
18. SEE ELECTRICAL SCHEDULE FOR AUDIO SCHEDULE.
19. SEE ELECTRICAL SCHEDULE FOR LIGHTING SCHEDULE.
20. SEE ELECTRICAL SCHEDULE FOR POWER SCHEDULE.

LEGEND:

SYMBOL	DESCRIPTION
(Symbol)	CONDUIT
(Symbol)	TRAY
(Symbol)	RACEWAY
(Symbol)	CABLE TRAY
(Symbol)	BUSWAY
(Symbol)	SWITCHGEAR
(Symbol)	TRANSFORMER
(Symbol)	GENERATOR
(Symbol)	UPS
(Symbol)	BATTERY
(Symbol)	CONTROL PANEL
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(Symbol)	VIDEO
(Symbol)	AUDIO
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(Symbol)	POWER



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STAIR 1 - ELECTRICAL

DATE: 01/15/2010

PROJECT: MARTHA JEFFERSON HOSPITAL

WIRING

Individual Wiring Detail for DK, TS, or T3 Lamps

NO.	DATE	DESCRIPTION
1	01/15/2010	ISSUED FOR PERMIT

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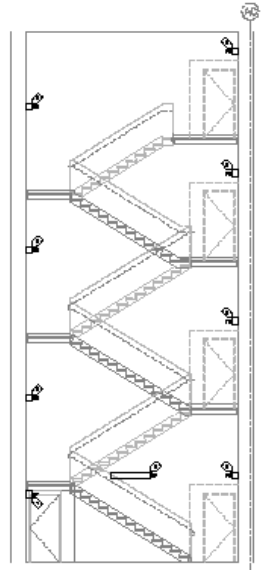
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(Symbol)	POWER

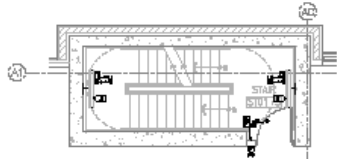
SCOPE DOCUMENTS



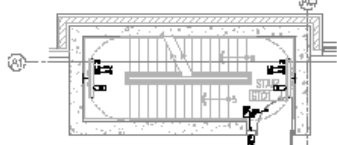
Project No. 0001001
Sheet No. STAIR 1 - ELECTRICAL
E-STAIR 1



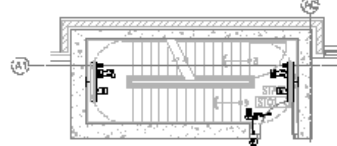
STAIR PLAN - STAIR 1 SECTION - ELECTRICAL
DATE: 01/15/2010



STAIR PLAN - STAIR 1 LEVEL 5 - ELECTRICAL
DATE: 01/15/2010



STAIR PLAN - STAIR 1 LEVEL 4 - ELECTRICAL
DATE: 01/15/2010



STAIR PLAN - STAIR 1 LEVEL 3 - ELECTRICAL
DATE: 01/15/2010



STAIR PLAN - STAIR 1 LEVEL 2 - ELECTRICAL
DATE: 01/15/2010

Die-Cast Architectural Emergency Lighting Units

Affinity®



Intended Use

Provides a minimum of 90 minutes illumination for the rated wattage upon loss of AC power. Ideal for applications requiring attractive unit equipment.

Features

Compact, low-profile, architectural design with die-cast aluminum housing that has a contemporary brushed nickel-plated finish. Other available finishes are textured polyester powder coat paint in white, black and dark bronze.

U.S. Patent No. D468,046.

Two 6W wedge-base xenon lamps offer 55 percent more light output than standard incandescent lamps.

Patent-pending reflector/refractor design features superior vac-metalized, die-casted reflectors and multi-faceted, highly transmissive refractor that significantly improve photometrics.

Maintenance-free lead-calcium battery (as a standard), Nickel-cadmium optional.

Dual-voltage input capability (120/277V).

Low-profile, integrated test switch/pilot light located below the lens.

Rigid conduit entry provision on top of the unit.

Remote version available for exterior use. Ideal for exit discharge applications.

Listings

UL Listed, Wet location (EXT) listed, Damp location (PREM, EXT) listed, Cold Weather (EXT) listed, Meets UL 924, NFPA 101, NFPA 70-NEC and OSHA illumination standards.

Ordering Information

Family	Input voltage	Finish	Option packages
AFN	(Blank) 120/277V	W White B Black BN Brushed nickel DB Dark bronze*	(Blank) Features lead-calcium battery PREM Features nickel-cadmium battery, self-diagnostics and damp location (0° to 50°C (32° to 122°F)) EXT Features high-temperature nickel-cadmium battery listed from -18° to 50°C (0° to 122°F), self-diagnostics, damp and wet location

Example: **AFN BN PREM**

NOTES

* In alternate case and cylindrical with decorative package. This finish is not used in alternate case.

For fixture performance data, see page 458.

Accessories

(Order separately)

ELA/RNR/DB Remote kit in (two batteries and electronics) to be powered by 6V battery equipment as part of an emergency lighting system (listed from -40°C to 60°C)



Width: 6-1/2 (166)
Depth: 2-7/16 (66)
Height: 9-1/2 (241)
Weight: 3.5 lbs. (1.59 kg)

Dimensions are shown in inches (in all brackets) unless otherwise noted.

LITHONIA LIGHTING

www.lithonia.com, keyword: **ARJ**

PSG9

MR24 Lamp Head Performance

High-Capacity Quantum® MR24 Lamp Head

ELM6 PERFORMANCE ADVANTAGE¹

- 6-volt, 9-watt krypton lamp
- Typical 10' mounting height delivers 31 feet center-to-center spacing

ELM12 PERFORMANCE ADVANTAGE¹

- 12-volt, 9-watt krypton lamp
- Typical 12' mounting height delivers 33 feet center-to-center spacing

ELM6 HALOGEN PERFORMANCE ADVANTAGE¹

- 6-volt, 20-watt halogen lamp
- Higher mounting heights deliver 50+ feet center-to-center spacing

MR24 Lamp Head Recommended Center-to-Center Spacing Chart

Lamp type	Lamp voltage/wattage	Quantum® unit lamp is used on	7.5' mounting height	10' mounting height	12' mounting height	16' mounting height	20' mounting height
K0606	6V/5.4W	ELM2 ²	25'	N/A	N/A	N/A	N/A
K0906	6V/9W	ELM618 ¹ , ELM27 ² , ELM654 ¹	25'	31'	29'	27'	23'
K0912	12V/9W	ELM1254 ¹ , ELM1272 ²	25'	33'	30'	29'	28'
H1206	6V/12W	ELM627, ELM654	N/A	29'	N/A	22'	N/A
H1212	12V/12W	ELM1254, ELM1272	N/A	31'	33'	39'	41'
H2006	6V/20W	ELM654	N/A	35'	37'	52'	49'
H2012	12V/20W	ELM1254, ELM1272	N/A	43'	41'	38'	32'

NOTE:
 1. Mount L&L Safety Code® models minimum 8 inches over 1FC and average luminance of 10FC. Assume space from 18" socket section, 5-foot-wide path of egress, and reflectance of 80/50/50.
 2. Standard lamp for this unit.

MR24 Lamp Head Performance

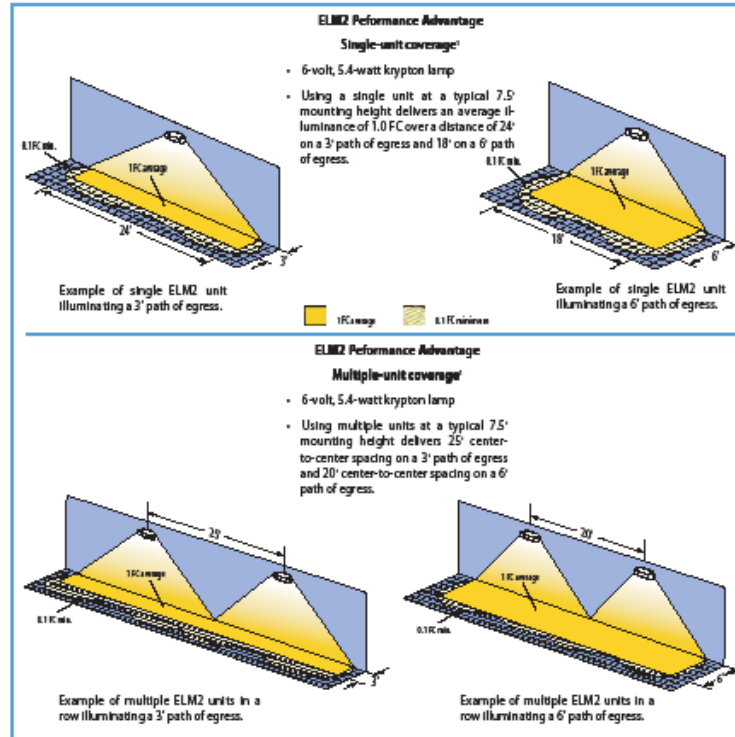
As Lithonia Lighting continues to improve the performance of its emergency lighting products, we also continue to improve the manner in which we communicate our products' performance. Instead of relying on lamp-to-footcandle diagrams to compare one source to the next, we now perform point-by-point illuminance calculations to more accurately depict how our products will perform in real commercial or industrial applications.

Point-by-point calculations depict illuminance coverage of an individual unit and/or multiple units in a space. Graphical representation of point-by-point for both a 3' and 6' path of egress are highlighted throughout the next few pages.

In the graphical representation, the rectangle depicts the area where an average of one foot-candle (FC) is maintained. The surrounding curve represents the minimum 0.1 FC isocontour along

the floor. The coverage of an individual unit, as well as the maximum spacing that can be achieved with multiple units is depicted in feet. The footnotes detail all the relevant information necessary to replicate each layout using your own lighting analysis software and IESNA format photometrics.

ELM2 MR24 Lamp Head



NOTES

* Based on a 7.5' mounting height. Actual performance may vary based on mounting height, beam angle, and room reflectance. Analysis based on IESNA format photometrics.

Power Sentry® Fluorescent Battery Pack Performance

Power Sentry Performance

Corridor Spacing

1 FC average
 0.1 FC minimum

PS600QD Recommended Spacing
 Fluorescent battery pack: PS600QD
 Fluorescent fixture: Lensed troffer
 Lamp type: F32T8

Power Sentry® Recommended Center-to-Center Spacing Chart
 One Footcandle Average Spacing Guidelines – Corridor

	T8 lensed troffer	T8 direct/indirect	T8 parabolic
PS300QD	24"	18"	21"
PS600QD	35"	28"	32"
PS800QD	43"	34"	40"
PS1400QD	57"	59"	53"

NOTE:
 Mean LFC (Lighting Code) standard minimum illuminance (fc) and average illuminance (1.0 FC footcandle) for lamps in each fixture, 100 W/100 Lumen efficacy, ceiling height 8'9" and reflectance of 80%/70%.

Open Office Spacing

1 FC average
 0.1 FC minimum

PS1400QD Recommended Spacing
 Fluorescent battery pack: PS1400QD
 Fluorescent fixture: 2 x 4 parabolic
 Lamp type: F32T8

Power Sentry® Recommended Center-to-Center Spacing Chart
 One Footcandle Average Spacing Guidelines – Open Office

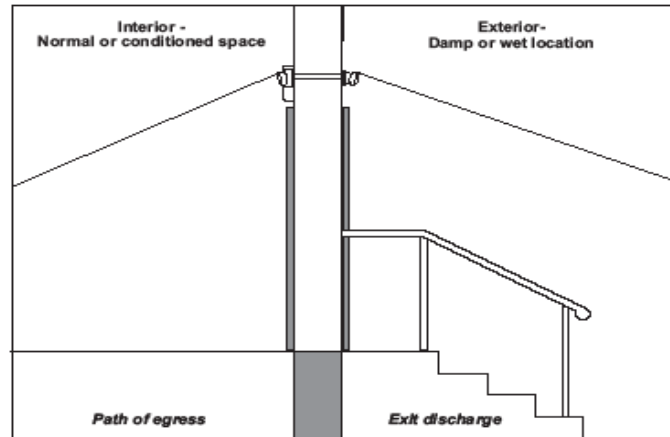
	T8 lensed troffer	T8 direct/indirect	T8 parabolic
PS300QD	16"	13"	17"
PS600QD	29"	21"	27"
PS800QD	35"	28"	34"
PS1400QD	47"	47"	45"

NOTE:
 Mean LFC (Lighting Code) standard minimum illuminance (fc) and average illuminance (1.0 FC footcandle) for lamps in each fixture, 100 W/100 Lumen efficacy, ceiling height 8'9" and reflectance of 80%/70%.

Exit Discharge Application Guide

for Normally-off Fixtures

Traditional emergency lighting and exit signs were primarily focused on guiding occupants to the exterior of a building. Today, an additional focus is being placed on getting occupants to an exit safely and down a path of safety once they are out of the building. This guide will help define the exit discharge, reference code requirements for the exit discharge, and identify products that can be applied to meet exit discharge requirements. Either *normally-on* or *normally-off* fixtures can provide exit discharge illumination. However, this guide will only cover *normally-off* remote fixtures.



Exit Discharge

The exit discharge is the portion of the means of egress between the building exit and the public way. According to the 2003 Life Safety Code, section 3.3.175, a public way is defined as "A street, alley or other similar parcel of land essentially open to the outside air deeded, dedicated, or otherwise permanently appropriated to the public for public use and having a clear width and height of not less than 30ft (50mm) (120in)."

See page 4 for Code information.

Description

Since the nature of the exit discharge is outdoor applications, standard luminaires may not be suitable. Outdoor applications fall into two categories: *damp location* or *wet location*. According to chapter one, article 100, of the 2002 National Electrical Code, *damp locations* include "...partially protected locations under canopies, marquees, roofed open porches, and like locations. ..." *Wet location* is partially defined as "...locations subject to saturation with water or other liquids, such as vehicle washing areas; and in unprotected locations exposed to weather."

NEMA 4X Industrial Emergency Lighting Units

Intended Use

Provides a minimum of 90 minutes of illumination for the rated wattage upon loss of AC power. Unique design for heavy and demanding industrial applications such as manufacturing plants, refineries, chemical plants, wastewater treatment facilities, food processing facilities, breweries, loading docks and other applications subject to hose-down or industrial conditions. Superior-performance lamp heads are ideally suited for higher mounting heights. Perfect for pole and column mounting.

Features

Rugged, heavy-duty polycarbonate housing is sealed, gasketed and corrosion resistant.

Vertical orientation – designed especially for pole or column mounting. Also suitable for wall and I-beam mounting.

Easy-mount installation with one epoxy-coated galvanized, 12-gauge steel mounting bracket shipped standard. Conduit entry points are located on top and both sides of the unit. Maintenance is made easy by tool-less re-lamp, single tool entry, hinging front cover, printed circuit board mounting shelf and battery belt.

Sealed maintenance-free, lead-calcium battery with wattage capacities from 18 to 125W for 90 minutes of emergency operation. Available in 6, 12 and 24V.

Dual-voltage input (120/277V). U.S. Patent No. D419,097, 6,135,624 and 6,193,396.

Listings

UL Listed. Cold weather (ULT) listing. Meets UL 924, NFPA 101, NEC and OSHA illumination standards. NOM Certified units available (consult factory). NEMA 4X; 4X Rated. IP66 and NSF listed.

INDX



Example: **INDX12100 H1212 ULT**

Ordering Information

Family	Housing color (Color) Gray W White	Lamp type (2 heads)	
		6 volt	12 volt / 24V ¹
IND0518 18W		PAR38 compact (240V) 8W/6V halogen	PAR38 sealed-beam H35125 35W/12V halogen H50125 50W/12V halogen
IND0654 54W		PAR38 compact (240V) 8W/12V halogen H2006 20W/6V halogen	24 volt PAR38 compact (240V) 8W/12V halogen H1212 12W/12V halogen H2012 20W/12V halogen
IND06100 100W		12 volt	PAR38 compact (240V) 8W/12V halogen H2424 20W/24V halogen PAR38 sealed-beam H50245 50W/24V incand.
IND01234 34W		12 volt	
IND01254 54W		12 volt	
IND012100 100W ²		12 volt	
IND012125 125W		12 volt	
IND024100 100W		24 volt	

Option packages

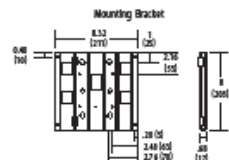
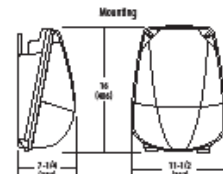
- (Note) UL Listed to 4X standards.
- XTRA** Extra package features remote test and time delay. UL Listed for 18°C to 40°C (50°F to 104°F)¹
- SEL** Select package features self-diagnostics, time delay and audible failure indicator. UL Listed for 18°C to 40°C (50°F to 104°F).
- PREM** Premium package features high temperature nickel-cadmium battery (IND0518 or IND01254 only) or high ambient lead-cadmium battery (IND012100 only), self-diagnostics, time delay and audible failure indicator. UL Listed for 18°C to 55°C (32°F to 131°F)¹
- ULT** Ultimate package features heater, thermostat and battery blanket with a high temperature nickel-cadmium battery (IND0518 or IND01254 only) or high ambient lead-cadmium battery (IND012100 only), self-diagnostics, time delay and audible failure indicator. UL Listed for -40°C to 55°C (-40°F to 131°F)¹

Electrical Application Data								
Type	AC Input		Output					
	Volts	Amps	Volts	1-1/2 hrs.	2hr.	3hrs.	4hrs.	
Primary Circuit								
IND0518	120	.093	19.56	6	18	13.5	9	6
	277	.41	10.11	6	18	13.5	9	6
IND0654	120	.171	23.64	6	5.4	40	27	20
	277	.073	20.70	6	5.4	40	27	20
IND06100	120	.144	20.52	6	1.00	75	50	37.5
	277	.062	20.22	6	1.00	75	50	37.5
IND01254	120	.174	18.24	12	3.6	27	18	13
	277	.078	17.73	12	3.6	27	18	13
IND01254	120	.174	20.88	12	5.4	40	27	20
	277	.078	21.61	12	5.4	40	27	20
IND012100 ¹	120	.160	20.88	12	1.00	75	50	37.5
	277	.072	20.55	12	1.00	75	50	37.5
IND012125	120	.160	20.88	12	1.25	60	42	46
	277	.072	20.55	12	1.25	60	42	46
IND024100	120	.33	39.6	24	1.00	75	50	37
	277	.15	41.55	24	1.00	75	50	37

Accessories (Order separately)

- ELARHT** Remote test transmitter³ (for use with XTRA package, remote testing option).
- ELA BS** Banding strap
- ELA INDX CM2** Ceiling mount kit for IND0654/1236/1254
- ELA W640** Wingguard

Dimensions are shown in inches (millimeters) unless otherwise noted.



- NOTES:**
- IND012100 is available with either the PREM or ULT package only.
 - Must order a remote transmitter (ELARHT). One package required.
 - Only available on IND0518, IND01254 or IND012100.

For packaging and performance guidelines, please see page 459.

www.lithonia.com, keyword: **INDX**



EMERGENCY LIGHTING UNITS

LITHONIA EMERGENCY

443

PSG9

NEC 700.16

- Failure of any individual lighting elemental... cannot leave in total darkness any space that requires emergency illumination



Using Remote Heads?

- Voltage Drop
- Wiring Method
- SPS 316.700

Remote Heads

Voltage Drop Tables

The following information is provided to assist in planning layouts for emergency lighting systems. The National Electrical Code® limits voltage drop to a maximum of 5 percent of nominal. Thus, circuit runs must be of sufficient size to maintain operating voltage when remote fixtures and/or exit signs are connected to the emergency lighting equipment. The table below shows the length of wire run based on system voltage, wire gauge and total wattage on the run.

Formula: As per NEC® standards,

$$V_v = \frac{2 \times L \times I \times R}{1000}$$

Where: L = length of run in feet

I = current

R = resistance of material at 75°C

V_v = voltage drop

Example 1:

A 12-volt system using a 10-gauge wire will operate four 12-watt lamps. Total watts on the wire run is 48, length of run from table is 70 feet.

Longer Wire Runs

If loads are uniformly spaced along circuit path (equal watts, equal distances), lengths in the table can be increased by certain values.

Example 2:

Remote heads from Example 1 will be uniformly spaced. Multiplier is 1.6 for four fixtures. Maximum permissible length of wire run is 70 x 1.6 or 112.

Number of fixtures: 2 3 4 5

Multiplier: 1.33 1.5 1.6 1.67

To determine multiplier for six or more fixtures, use the following formula:

Number of fixtures = n

$$\text{Multiplier} = \frac{2n}{n+1}$$

Total watts	Wire size length of wire run (feet)			
	12	10	8	6
8	67	86	109	138
10	51	65	82	104
12	44	56	70	89
15	41	51	65	82
16	38	46	60	76
18	33	41	54	69
20	28	36	47	60
21	25	32	42	54
24	22	28	36	47
25	21	27	35	45
30	18	23	30	39
35	15	19	25	32
36	15	19	25	32
40	13	17	22	28
48	9	12	16	20
54	8	10	14	18
60	7	9	12	16
75	5	7	9	12
100	4	5	7	9
125	3	4	5	7
150	3	4	5	7
175	3	4	5	7
200	3	4	5	7
225	2	3	4	5
250	2	3	4	5
300	1	2	3	4
400	1	1	2	3

Total watts	Wire size length of wire run (feet)			
	12	10	8	6
8	267	425	605	827
10	213	339	488	666
12	178	285	408	558
15	165	260	375	509
16	152	242	355	475
18	133	212	317	431
20	119	190	286	393
21	116	186	281	387
24	101	161	237	348
25	99	161	237	348
28	86	141	205	306
30	81	137	198	295
35	61	107	154	230
36	61	107	154	230
40	51	88	125	194
48	36	63	92	136
54	32	57	84	123
60	28	51	75	109
75	20	46	57	81
100	14	34	43	59
125	11	27	35	47
150	10	25	33	44
175	9	23	31	41
200	8	21	29	38
225	7	19	27	35
250	6	17	25	32
300	5	14	20	26
400	4	11	15	20
480	4	9	12	16

Total watts	Wire size length of wire run (feet)			
	12	10	8	6
8	1,050	1,698	2,411	3,205
10	854	1,358	1,911	2,545
12	712	1,132	1,581	2,062
15	660	1,048	1,468	1,940
16	630	1,000	1,400	1,850
18	554	848	1,200	1,615
20	480	738	1,050	1,400
21	467	718	1,000	1,350
24	407	618	860	1,135
25	394	600	820	1,090
28	354	540	750	1,000
30	341	520	730	970
35	284	438	618	830
36	282	434	615	825
40	233	378	540	720
48	178	282	402	535
54	162	257	360	480
60	148	238	330	440
75	116	188	268	360
100	84	138	198	265
125	68	118	172	230
150	60	102	148	200
175	54	92	138	185
200	48	82	128	170
225	43	75	118	158
250	39	68	108	145
300	31	54	84	115
350	25	44	68	92
400	21	36	57	77
450	18	30	49	66
500	16	27	45	60
600	12	20	36	48
700	10	17	31	41
800	9	15	28	38
900	8	14	26	35
1000	7	13	24	32
1200	6	11	20	28
1400	5	9	17	24
1600	4	8	15	21
1800	4	7	13	19

Emergency Lighting Plan Checklist

- Egress Plan
- Photometric Study
 - Option for Unit Equipment
- **One-line Diagram of Emergency System**
- Load Calculations

ONE LINE DIAGRAM GENERAL NOTES:

- ALL ITEMS REQUIRED BY A DASH-SOLID LINE AS SHOWN ABOVE ARE NEW.
- ALL ITEMS REQUIRED BY A LIGHT-SOLID LINE AS SHOWN ABOVE ARE EXISTING TO REMAIN.
- ALL ITEMS REQUIRED BY A DASH-DOTTED LINE AS SHOWN ABOVE ARE EXISTING TO BE REMOVED.
- ALL ITEMS REQUIRED BY A LIGHT-DOTTED LINE AS SHOWN ABOVE ARE FUTURE WORK.
- ALL ITEMS REQUIRED BY DASH-DOT-DASH LINE AS SHOWN ABOVE IS TYPICAL EQUIPMENT DRIVING.
- ALL DRIVING SHALL BE COORDINATED WITH THE OWNER AND CIRCULAR LINE AND SHALL BE REFER TO AN ABSOLUTE MANUAL.
- LETTER BELOW AND EXTENSION NUMBER BELOW INDICATE THE LINE OF ATTACHMENT TO THE MAIN SYSTEM. REQUIREMENTS FOR THESE DEVICES, THEIR DESCRIPTIONS ARE AS FOLLOWS:
 - 1. ELECTRICAL OVERLOAD
 - 2. UNDERVOLTAGE TRIP
 - 3. SHORT CIRCUIT
 - 4. ALARM BY SOUND
 - 5. ALARM BY LIGHT
 - 6. ALARM BY BELL
 - 7. LOCK SELECTIVE INTERLOCKING
 - 8. LOCK SELECTIVE TRIP UNIT

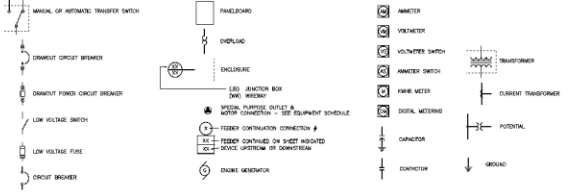
CIRCUIT BREAKER TYPE

- MP - MOLDED CASE
- MP - MOLDED CASE PROTECTOR
- MP - MOLDED CASE
- MP - MOLDED CASE
- MP - MOLDED CASE
- MP - MOLDED CASE
- MP - MOLDED CASE
- MP - MOLDED CASE

CIRCUIT BREAKER OPTIONS/ACCESSORIES

- 1. ALARM BY SOUND
- 2. ALARM BY LIGHT
- 3. ALARM BY BELL
- 4. UNDERVOLTAGE TRIP
- 5. SHORT CIRCUIT
- 6. LOCK SELECTIVE INTERLOCKING
- 7. LOCK SELECTIVE TRIP UNIT
- 8. LOCK SELECTIVE TRIP UNIT
- 9. LOCK SELECTIVE TRIP UNIT
- 10. LOCK SELECTIVE TRIP UNIT

ONE LINE SYMBOLS



GENERAL NOTES

SHEET NOTES

- COORDINATE WORKING OF THESE WITH E.E. AND THE ENGINEER.
- VERIFY INSTALLATION OF MATERIAL WITH ME GENERAL, FROM THE ELECTRICAL WORK PART OF THE PROJECT.
- PURCHASE INTERLOCKING PROTECTIVE DEVICES.
- BRANDS SHALL BE AS LISTED FOR USE AS GENERAL EXCEPTIVE CHANGE.
- COORDINATE LOCATION OF EXISTING WIRE EQUIPMENT WITH MECHANICAL CONTRACTOR.
- E.E. SHALL PROVIDE AN IDENTIFICATION PLATE AND THE SPECIAL BRACKET FOR THE PANEL OF THE EQUIPMENT TO BE INSTALLED. INDICATE THE LOCATION OF THESE WIRE EQUIPMENT TO BE INSTALLED. COORDINATE WITH MECHANICAL CONTRACTOR AND MECHANICAL CONTRACTOR FOR USE AS SERVICE EQUIPMENT FOR THE E.E. WORK.
- SUPPLIED BY MECHANICAL CONTRACTOR.
- RECORD EXISTING WORK TO BE DONE FIRST WITH 100% AS CIRCUIT PANEL. SEE PANEL SCHEDULE FOR ADDITIONAL INFORMATION.
- E.E. TO BE UP TO THE LINE USE OF THE PANEL TO MAKE FROM TO THE SERVICE EQUIPMENT.



DESIGNED BY WELMAN ARCHITECTS INC.

ONCOLOGY ALLIANCE
1055 MAYFAIR RD.
WAUWATOSA, WI

- REVISIONS
- DATE
- BY
- REVISION
- DATE
- BY
- REVISION
- DATE
- BY

PROJECT NO: 22033.03

DATE: 03.28.03

DRAWING NAME: ONE LINE RIBB DIAGRAM

SHEET NO:

ONE LINE DIAGRAM

NOT TO SCALE



E3.0

1000.1

02

Emergency Lighting Plan Checklist

- Egress Plan
- Photometric Study
 - Option for Unit Equipment
- One-line Diagram of Emergency System
- **Load Calculations**

Emergency Lighting Plan Checklist

- Load Calculations for Emergency Lighting
 - Sum of emergency lighting load less than source capacity
- Battery Information for Unit Equipment
 - Ampere-hour rating sufficient for required duration

Reduced-Profile Fluorescent Battery Packs, Linear Fluorescent Fixtures

Power Sentry®

NEW



Ordering Information

PS300 QD	Reduced profile, Quick-Disconnect, 300 lumen output.
PS500 QD	Reduced profile, Quick-Disconnect, 15-minute test fixture, 500 lumen output.
PS600 QD	Reduced profile, Quick-Disconnect, 600 lumen output.
PS1400QD	Reduced profile, Quick-Disconnect, 1400 lumen output.



Lightquick XD
Express delivery products.

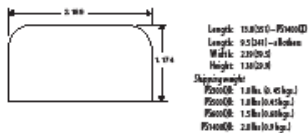
See page 11 for details about Lightquick XD.

Description
PS300 QD
PS500 QD
PS1400 QD

Dimensions are shown in inches (and millimeters) unless otherwise noted.

PS300 QD / PS500 QD / PS600 QD / PS1400 QD

Cross section and view



Intended Use

Factory- or field-installed inside or outside (field only) a fluorescent fixture to operate lamp(s) at an initial output of 10% to 95% of rated lamp lumens, providing optimum glare-free illumination for a minimum of 90 minutes upon interruption of normal power.

Features

Mounts concealed within fixture wireway for clean appearance and protection against vandalism.

Reduced-profile footprint fits in the tightest application. Durable thermoplastic/metal housing resists impact, scratches or corrosion.

Sealed, maintenance-free, high-temperature nickel-

cadmium batteries.

Patent-pending Quick-Disconnect connector system allows for quick and easy replacements at end of life without re-wiring.

Patents pending. U.S. patent No. 5,814,971.

Listings

UL Listed. Damp location listing available.

Example: PS1400QD SD

Options	Factory Installation ^{1,4}
SD Self-diagnostics ²	BL PS300QD installed ^{4,5}
DW UL Listed for use in damp or wet location listed fixtures 0-50°C (32-122°F) ³	BL5 PS500QD installed ^{4,5}
	BL6 PS600QD installed ^{4,5}
	ELA1FLP PS600QD one-lamp application installed ^{4,5}
	EL14 PS1400QD installed ^{4,5}
	EL14FLP PS1400QD one-lamp application installed ^{4,5}

NOTES:

- Self-diagnostics (SD) module ships separately. See PS500 specification for details. Not available on PS300QD.
- Not available with Quick-Disconnect hardware. See below for housing dimensions.
- To reduce factory cost but save space, add self-diagnostics to fixture catalog number.
- Add DW to factory part number to indicate wet or damp location listed, depending on the fixture. Applies to EL, BL, BL5, BL6, EL14. Example: EL14 DW.
- Add SD to the fixture model self-diagnostics number. Example: BL5SD. Applies to EL, EL5 and EL14.

Specify packages (temperature and lumen) with factory. For help, visit our website, see page 47. For application guidelines and fixture performance data, see page 48 and 49.

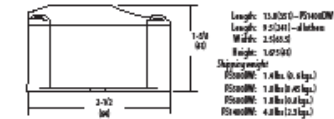
Type	Electrical Application Data		
	Volt	AC Input	Watts
PS300 QD	120/277	.30	2.5
PS500 QD	120/277	.30	2.5
PS600 QD	120/277	.30	3.0
PS1400 QD	120/277	.30	3.5

Accessories (Order separately)

PS5D	Field installable self-diagnostics module for PS300 QD, PS500 QD, PS600 QD, PS1400 QD DW or PS1400 QD.
BLATSFLP	Remote or replacement test switch/light kit and mounting plate for PS300, PS500 QD, PS600, PS600 QD, PS600, PS600 QD, PS600, PS600 QD, PS1400 and PS1400 QD.
ELA1FLP SD	Remote or replacement test switch/light kit and mounting plate for self-diagnostics PS300 QD, PS500 QD, PS600 QD, PS600 QD, PS1400 QD and PS1400 QD SD.
ELA1PSTS	Detachable, plug-in, in-the-test switch (no pilot light)
ELA1PSWK	External mounting kit
ELA1PSWSD	External mounting kit for self-diagnostics module
BLASDMT	External mounting tray

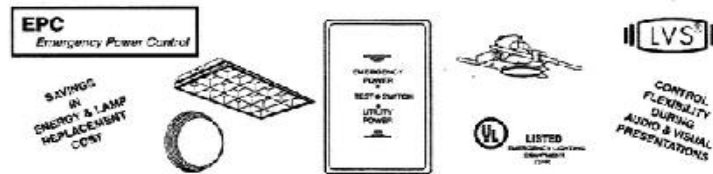
PS300 DW / PS500 DW / PS600 DW / PS1400 DW

Cross section and view



Emergency Lighting Plan Checklist

- Switching Emergency Lighting?
 - Use only UL 924 Listed control Modules
 - Submit control diagram



Applications and Instructions of Model EPC & EPC- PM

In the past all emergency lights had to be on 24 hours a day to meet safety codes. However, now you can specify and install a UL 924 listed emergency power control device that can convert and control up to 20 regular light fixtures to approved emergency lights, which can be turned on and off. The emergency power control Model EPC is and ceiling mounted in a single gang plaster ring and is usually located in the room or area where the emergency fixtures are, or you can use a device Model EPC-PM which is fast and simple to install in the appropriate junction box in the space above a suspended ceiling.

Method of control

The emergency light fixtures' power is supplied by a 24 hour emergency power distribution panel. The utility power company normally supplies the power to this panel, but during a utility power failure this panel is automatically switched over to a local generator source by means of a UL 1000 transfer switch. The standard room switch turns on and off both regular lights and emergency lights through the same switch leg by means of the Emergency Power Control that controls all the emergency light fixtures. You can save energy by using an EPC and turn on and off your room emergency lights manually with your room switch, or automatically with an occupancy sensor or energy management system. During local or general power failure these emergency fixtures will illuminate automatically, regardless of room switch on or off position, conforming to all life safety codes.

EPC Specifications and Features

■ Fail safe operation ■ Visible emergency power LED ■ Visible regular power LED ■ All components are protected with surge protectors. ■ Convenient to operate test switch ■ Fast to install ■ Short circuit proof output because EPC load relay is able to withstand 15 direct shorts on a 20 Amp circuit breaker without damage.

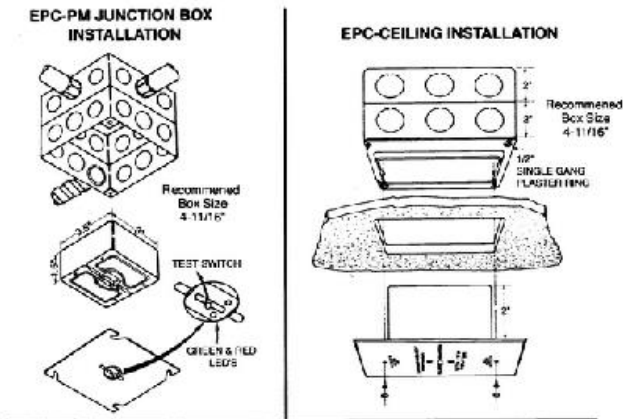
The EPC is equipped with a green LED which indicates if regular utility power is available and field wiring is connected correctly. The red LED on EPC has the same function for emergency power in a new installation. The above test will confirm the correct wire connections and continuity to branch panels and emergency panels.

Automatic Diagnostic Test Feature

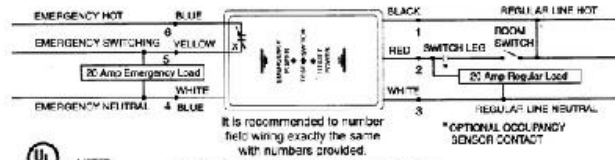
Model EPC is equipped with an automatic diagnostic test feature which is initiated when the room switch is momentarily turned on and then off. This simple, effortless test procedure will turn the emergency luminaires on for 5 seconds, indicating that an emergency power source is available and that the Model EPC, ballast, and lamp, are all functioning correctly. At all other times the room switch operates normally by turning both regular and emergency luminaires on at the same time. The unique advantage of the Model EPC leaves only the emergency luminaires on for an additional 5 seconds after regular luminaires are turned off, providing safety and convenience while leaving the area. In addition it eliminates the use of a ladder during the required every 30 days testing, which is usually done by a custodian.

1

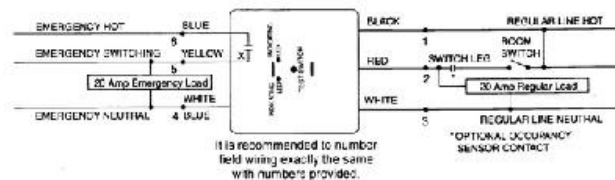
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MODEL EPC WIRING DIAGRAM



MODEL EPC-PM WIRING DIAGRAM

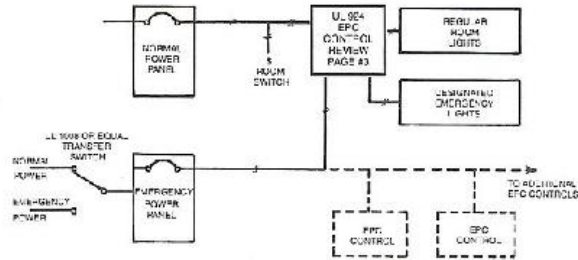


NOTE: Regular room lighting load does not affect E.P.C. current rating. Room switch is only used to control E.P.C. 50 milli amp relay current coils, and regular lighting load Regular line HOT connected to breaker and E.P.C. is only drawing milli amps to sense if normal power is available. See E.P.C. wiring diagram for clarification.

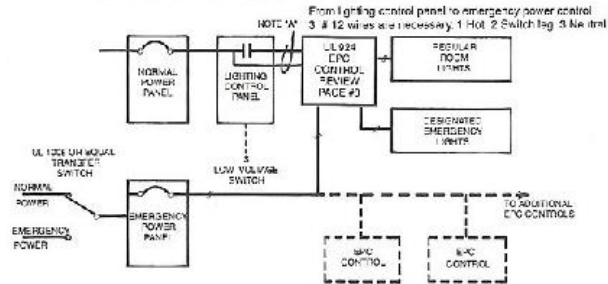
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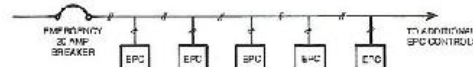
STANDARD LINE VOLTAGE SWITCHING LINE DRAWING



RELAY PANEL LOW VOLTAGE SWITCHING LINE DRAWING



On a 20 amp circuit emergency power control unit (Model EPC) can control up to 18 amp of emergency lighting load, or 18 emergency power controls can each control 1 amp of emergency lighting load.



NOTE: Regular room lighting load does not affect EPC current rating. Room switch is only to control EPC, EPC relay and relay current coil, and regular lighting load. Regular line NOT connected to breaker and EPC is only carrying full amperage to control if normal power is available. See LVS wiring diagram for clarification.



LVS, Inc. 2555 Nicholson St., San Leandro, CA 94577
Tel: 1-800-582-6987 Fax: 610-362-6707

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Testing Emergency Lighting Systems

Emergency Lighting-Testing

- Pre-test Coordination
- Running the Test
- Calculating the Results

Emergency Lighting-Testing Pre-test Coordination Meeting

- Who needs to participate?
 - Designer
 - Inspector
 - Installer

Pre-Test Coordination



Emergency Lighting-Testing Pre-test Coordination Meeting

- What needs to be present?
 - State Approved Plans
 - **Including Life Safety Plan**
 - Conditional Approval Letter
 - Floor Plans showing emergency fixture locations
 - Light meter or two

Emergency Lighting-Testing Pre-test Coordination Meeting

- When should the meeting take place?
 - Prior to testing

Emergency Lighting-Testing

Pre-test Coordination Meeting

- **Agenda Items:**
 - **Assign roles:**
 - Who will use light meter(s)?
 - Who will record results?
 - **Areas to be tested?**
 - Mark on floor plan
 - **Sequence that areas will be tested?**
 - Mark sequence on floor plan
 - **Does emergency source need to be active?**
 - Test generator start and run under full load at least once
 - Unit Equipment- Identify location of normal source circuit breaker

Emergency Lighting-Testing

Pre-test Coordination Meeting

- **Agenda Items:**
 - **Agree to Test Methodology for each area**
 - **Identify Unique Areas**
 - **Determine test pattern**
 - **Example: Atrium**
 - **Grid spacing?**
 - **Identify Similar Areas**
 - **Determine test pattern**
 - **Example: Corridors with similar characteristics**
 - **Width and height**
 - **Ceiling, wall, and floor reflectance**
 - **On center spacing?**

Emergency Lighting-Testing Pre-test Coordination Meeting

- Agenda Items:
 - Special Test Considerations:
 - **Stairways- Develop a systematic test pattern**
 - Test on nose of tread?
 - How many locations?
 - Test on each landing?
 - Occupancy Sensors?
 - **HID lighting with Quartz Lamp-**
 - Re-strike Interval? Test Quickly
 - Base results on Quartz Lamp

Emergency Lighting-Testing

Pre-test Coordination Meeting

- **Prior to Start:**
 - **Background lighting?**
 - **Exterior**
 - **Adjacent areas**
 - **Normal lighting**

Emergency Lighting-Testing Run Test

- Execute plan:
- Example: Atrium
 - Grid spacing- 25 foot on-center
 - Meter on Floor at grid-point
 - Record each result

Atrium



Emergency Lighting-Testing

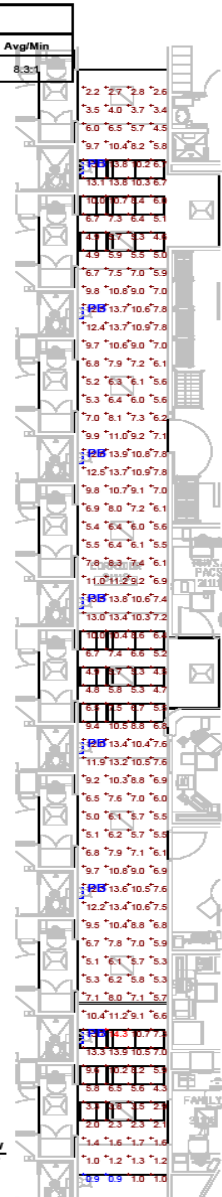
Run Test

- Execute plan:
- Example: Corridor
 - Test spacing- 15 foot on-center
 - Test down center-line for narrow corridors
 - Test using W-pattern for wide corridors
 - Meter on Floor at test-point
 - Record each result

STATISTICS						
Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Floor	+	7.5 fc	14.3 fc	0.9 fc	15.9:1	8.3:1

NOTES

1. This light level calculation is typical for all patient wing corridors. Refer to sheets EL1-02-01, EL1-02-02, EL1-03-01, and EL1-03-02 for patient wing lighting plans.
2. Refer to Light Fixture Schedule on sheets E5-00 and E5-01 for luminaire description.
3. The calculation points are a 2' x 2' grid.
4. Reference Comm 63 2008, 63.0505 2008 and NFPA 101 2008, 7.9.2.1.



Plan View
Scale 1" = 8'

Calculated values include direct and interreflected components.

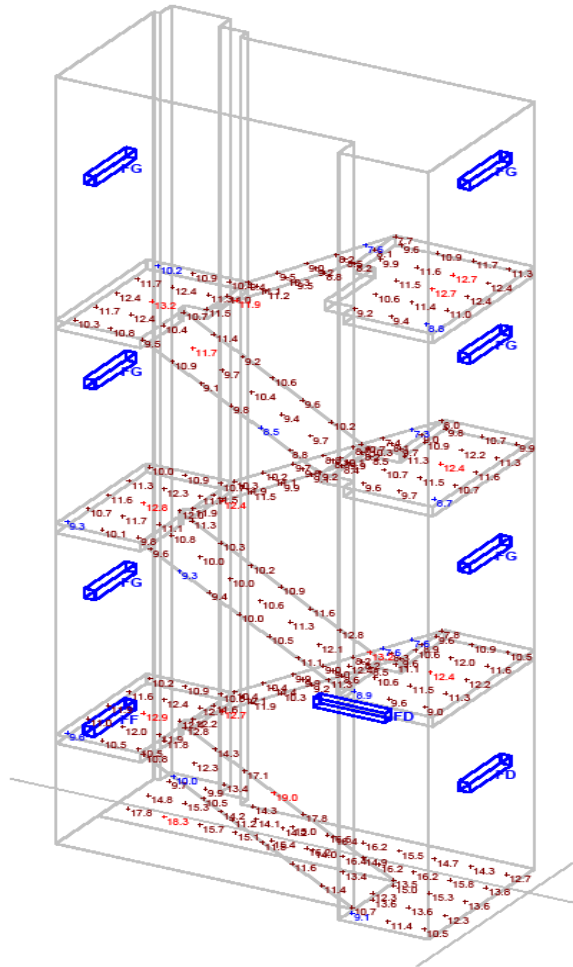
Corridor






Emergency Lighting-Testing

Run Test

- Execute plan:
- Example: Enclosed Stairway
 - **Test spacing**
 - Each landing
 - Each top step
 - $\frac{1}{2}$ way between landings
 - Each bottom step
 - Nose of tread
 - 1/3-center-1/3
 - **Take advantage of symmetry**
 - **Meter on Floor at test-point**
 - **Record each result**



LUMINAIRE SCHEDULE									
Symbol	Label	Qty	Catalog Number	Description	Lamp	File	Lumens	LLF	Watts
	FD	2	LADA-SERIES - 1-UP & 2-DN	LIFE SAFETY - 2-DN		FD-BAL12183.IES	1900	0.72	61
	FG	6	LADA-SERIES - 2-UP & 2-DN	LIFE SAFETY - 2-DN		BAL11556.IES	1900	0.72	61
	FF	1	LADA-SERIES - 2-DN	LIFE SAFETY - 2-DN		FD-BAL12183.IES	1900	0.72	61

Calculated values include direct and interreflected components.

Stair Landing



Stair Testing



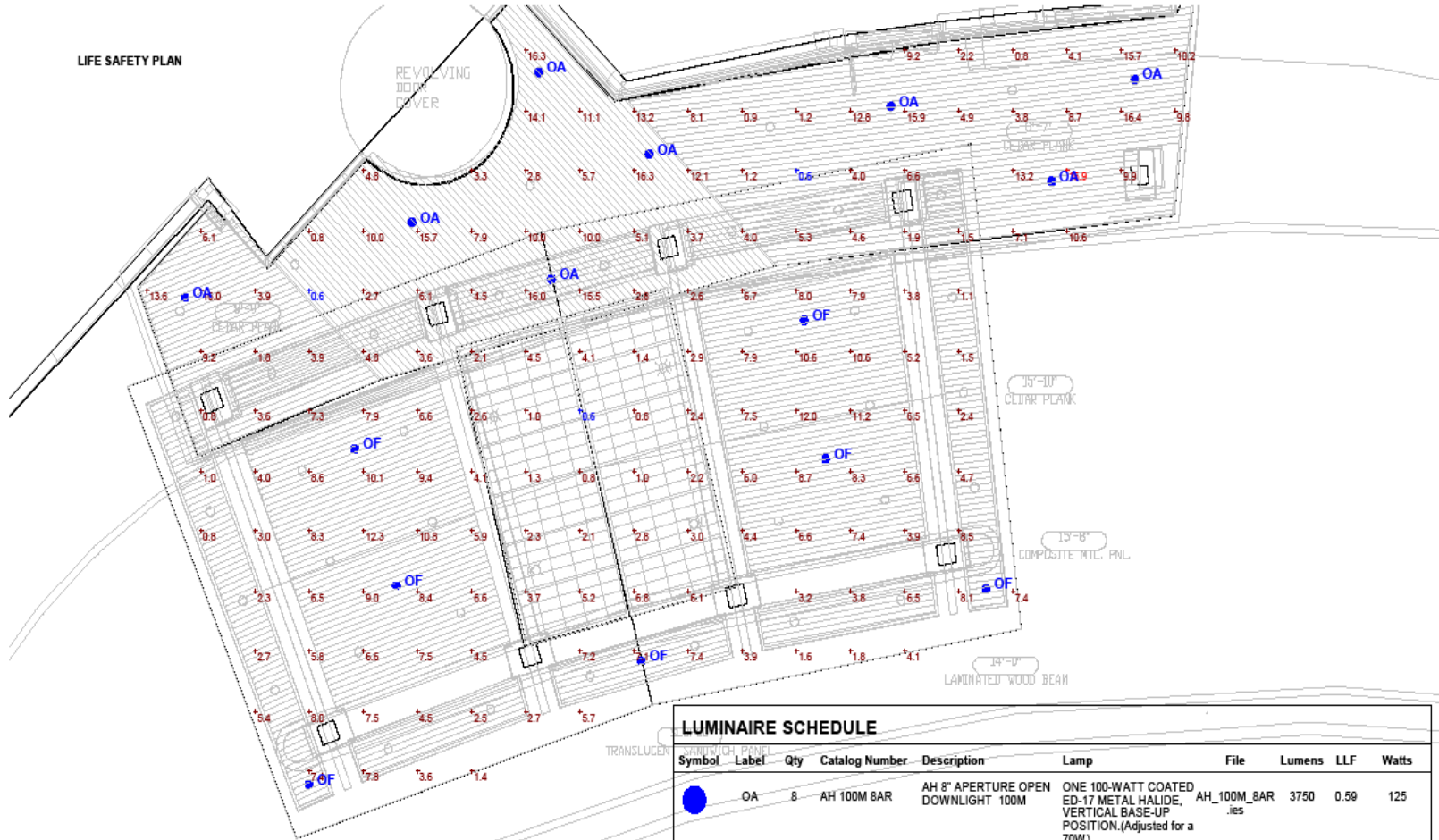
Emergency Lighting-Testing Run Test

- Execute plan:
- Example: Atrium
 - Grid spacing- 25 foot on-center
 - Meter on Floor at grid-point
 - Record each result

Atrium



LIFE SAFETY PLAN



STATISTICS

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Ground	+	6.2 fc	16.9 fc	0.6 fc	28.2:1	10.3:1

Calculated values include direct and interreflected components.

LUMINAIRE SCHEDULE

Symbol	Label	Qty	Catalog Number	Description	Lamp	File	Lumens	LLF	Watts
●	OA	8	AH 100M 8AR	AH 8" APERTURE OPEN DOWNLIGHT 100M	ONE 100-WATT COATED ED-17 METAL HALIDE, VERTICAL BASE-UP POSITION.(Adjusted for a 70W)	AH_100M_8AR .ies	3750	0.59	125
●	OF	7	AH 100M 8AR	AH 8" APERTURE OPEN DOWNLIGHT 100M	ONE 100-WATT COATED ED-17 METAL HALIDE, VERTICAL BASE-UP POSITION.(Adjusted for a 150W)	AH_100M_8AR .ies	5500	0.59	125
■	OG	0	E1WT1002-1M150-	EXTRUDED METAL HOUSING WITH CAST WHITE PAINTED METAL END PLATES, FABRICATED PREMIUM SPECULAR TEXTURED	ONE 150-WATT CLEAR T-8 CERAMIC METAL HALIDE, PHILIPS CDM150/T8/830, HORIZONTAL POSITION.	OG - ITL56041.IES	14000	0.59	150

Additional Requirements for Unit Equipment

- NEC 700.12(F)
- Unit equipment shall be on same branch circuit as normal lighting in area
- Connected ahead of any local switches
- Branch circuit breaker clearly identified
- Exception for open areas
- Exception for remote heads

Emergency Lighting-Testing

Calculate Results

- Means of Egress = “A continuous and unobstructed path of vertical and horizontal egress travel from any occupied portion of a building or structure to a public way.”
- Material used to calculate results
 - **Floor plan or life safety plan with recorded measurements**
 - **Floor plan with emergency fixtures shown**
 - **Calculator**

Emergency Lighting-Testing Calculate Results

- Example: Corridor
 - Pick the mid-point
 - Sum up the reading to the nearest exit discharge
 - Calculate
 - Average = 1.0 fc or better?
 - Pass
 - Minimum recorded measurement along that path = 0.1 fc or better?
 - Pass
 - Maximum to minimum measurement along that path = or less than 40:1?
 - Pass
 - Must pass all three criteria along each exit path.

Emergency Lighting-Testing Report Results

- Post Test Meeting
 - Testing done prior to occupancy
 - Key personal present
 - Identify areas that failed
 - **All emergency fixtures working?**
 - **Segments with less than 0.1 fc?**
 - Proposed solutions and re-test date?
- Written Correction Notice within acceptable time period.

Additional Information

- Check Industry Services website
 - Announcement
 - Submitter Checklist
 - Training Opportunities
- e-Mailbox for EM Lighting Questions
dspssbelectrictech@wi.gov
- Number for EM Lighting Questions
608-264-7823