Fire Station 4 Lighting Retrofit

Sheetlist

Sheet Number	Sheet Name
G 01	Cover
EL 001	General Lighting
EL 200	Demolition
EL 210	Lighting
EL 220	Lighting
EL 300	Details and Schedules

The above sheets were provided and certified by Kay Schindel, P.E.

A. General Conditions:
1. All scheduled numbers and amounts of material and equipment are for contractor's convenience only. Contractor shall count and measure independently for bidding and ordering purposes. All scheduled numbers, lengths and other amounts may be incorrect and owner is not liable for mismatch.
2. Notes applied to single items may apply to all like items on view.
3. Before bidding contractor shall familiarize with existing conditions, scope of work and means and methods required. Contractor shall inquire about any missing or apparently incomplete details and specifications before bidding.
4. Entire contract includes all specifications, plan sheets and other documents issued by owner. Bid documents don't intend to detail which subcontractor is responsible for what type of work. Any trade shall be familiar with the entire contract. Division of work is responsibility of contractor.
5. UTILITY CONNECTIONS: where work indicated includes installation of utilities (Gas, Power, Water, Sewer, Phone etc.) provide all the required work that normally is not done by the Utility. Contractor shall inquire with Utilities to learn about the Scope of the Utility's work.

B. Drawing Conventions
1. To be demolished items are shown in dashed line and/or colored. Some items necessary for removal may not be shown and removal is part of the contract.
2. Count of devices. lengths, areas and volumes are given for convenience only. Actually required numbers may be different and contractor is responsible to determine the actual need prior bidding.
3. Details will require items that will not be shown for every instance in the model. For example, a shut-off valve may be shown for a specific detail but the plans don't show this valve for every single instance - this valve will be required for each such device.
4. Sheet and view Naming:
G - General
H - Hazardous Material
S - Structural
AD - Architectural Demolition
A - Architectural
FA - Fire Detection and Alarm
PD - Plumbing Demolition
P - Plumbing
MD - Mechanical Demolition
M - Mechanical
ED - Electrical Demolition
EL - Electrical Lighting
EP - Electrical Power

A. PROJECT DESCRIPTION:
1. Replace existing interior lighting with new lighting fixtures and controls.

B. SPECIAL SITE CONDITIONS:
1. Fire Station is occupied by staff. Contractor shall schedule work with least imapct on occupants.

C. WORK HOURS
1. Meet requirements of local ordinances, rules and laws.
2. Hours of operation are limited to 7 a.m. to 7 p.m. Monday through Saturday and Sunday 10 a.m. through 7 p.m. unless approved otherwise.

D. WORK PROVIDED BY OWNER (DON'T INCLUDE IN BID PRICE):
1. NA

E. EQUIPMENT PROVIDED BY OWNER (DON'T INCLUDE IN BID PRICE):
1. NA

F. SPECIAL WARRANTIES:
1. NA

G. PROVISIONS FOR FUTURE WORK
1. NA

H. PROVISIONS FOR RETROFIT INSTALLATIONS
1. NA

I. PERMIT REQUIREMENTS:
1. Contractor is responsible to obtain all permits. See specification section 00 31 46 for details.

J. UTILITIES:
1. Contractor may use owner's power and water at no cost.

K. CONTINUITY OF SERVICE:
1. NA

L. SEQUENCING REQUIREMENTS:
1. NA

M. ALTERNATES:
1. NA

General Abbreviations

AFF	Above Finished Floor
ACT	Acoustical Ceiling Tile
ADDL	Additional
AFC	Above Finished Counter
AFG	Above Finished Grade
ALUM	Aluminum
APPD	Approved
ASC	Above Suspended Ceiling
BB	Basebaord
BFF	Below Finished Floor
BFG	Below Finished Grade
BLDG	Building
BLW	Below
BO	Bottom of
BOC	Bottom of Concrete
BOS	Bottom of Steel
BPL	Base Plate
CB	Catch Basin
CBT	Ceramic Tile Base
CF/CI	Contractor Furnished / Contractor Installed
CF/OI	Contractor Furnished / Owner Installed
CG	Corner Guard
CIP	Cast-In-Place
CJ	Control Joint
CL	Center Line
CLG	Ceiling
CMU	Concrete Masonry Unit
CO	Cleanout
COL	Column
CONC	Concrete
CONT	Continuous
CORR	Corridor
CPT	Carpet
CSWK	Casework
CT	Ceramic Tile
CW	Cold Water
DEMO	Demolition
DF	Drinking Fountain
DIA	Diameter
DR	Door
DS	Downspout
DW	Dishwasher
DWG	Drawing
E	East
EA	Each
EJ	Expansion Joint
EL	Elevation
ELEV	Elevator
EPS	Expanded Polystyrene Board
EQ	Equal (Distance)
EST	Estimated
EXP	Expand, Expansion
EXT	Exterior
F	Female
FA	Fire Alarm
FAB	Fabric
FD	Floor Drain
FEC	Fire Extinguisher Cabinet
FHC	Fire Hose Cabinet
FLR	Floor
FM	Floormat
FND	Foundation
FO	Finished Opening
FP	Fire Protection
FTG	Footing
GA	Gauge
GALV	Galvanized
GB	Grab Bar
GR	Grade
GT	Grout
GYP	Gypsum Board
HB	Hose Bib
HC	Hollow Core
HGT	Height
HM	Handicapped
HM	Hollow Metal
HVAC	Heating, Ventilation & Air Conditioning
HW	Hot Water
ID	Inside Diameter
INT	Interior
JHA	Jurisdiction Having Authority
LAV	Lavatory
LL	Live Load
M	Male
MAX	Maimum
MFR	Manufacturer
MIN	Minimum
MISC	Miscellaneous
MO	Masonry Opening
N	North
NA	Not Applicable
NIC	Not in Contract
NM	Nominal
NTS	No To Scale
OC	on center
OD	Outside Diameter
OF / CI	Owner Furnished / Contractor Installed
OF / OI	Owner Furnished / Owner Installed
OHD	Over Head Door
OPNG	Opening
OPP	Opposite
PERP	Perpendicular
POLYISO	Polyisocyanurate Board
PT	Paint, Painted
PTN	Partition
RCP	Reflected Ceiling Plan
RD	Roof Drain
REBAR	Reinforcing Steel Bars
REF	Reference
REV	Revision
RO	Rough Opening
S	South
SAN	Sanitary
SST	Stainless Steel
TEMP	Temperature
TFF	Top of Finsihed Floor
TO	Top of
TOB	Top of Beam
TOC	Top of Concrete
TOJ	Top of Joist
TYP	Typical
UNO	Unless Noted Otherwise
VIF	Verified in Field
W	West
W	With
W/O	Without
WC	Water Closet
WD	Wood
WH	Water Heater
XPS	Extruded Polystyrene Board
XTG	Existing

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Facilities Management
City-County Building, Room 115
210 Martin Luther King Jr. Boulevard
Madison, WI 53703

Client:
Madison Fire Department

Fire Station 4
Lighting Retrofit

Location:
1437 Monroe St.
Madison, WI 53711

Contract: 9240
Project: 14245

Revisions

No.	Description

Cover

G 01

Print Date:
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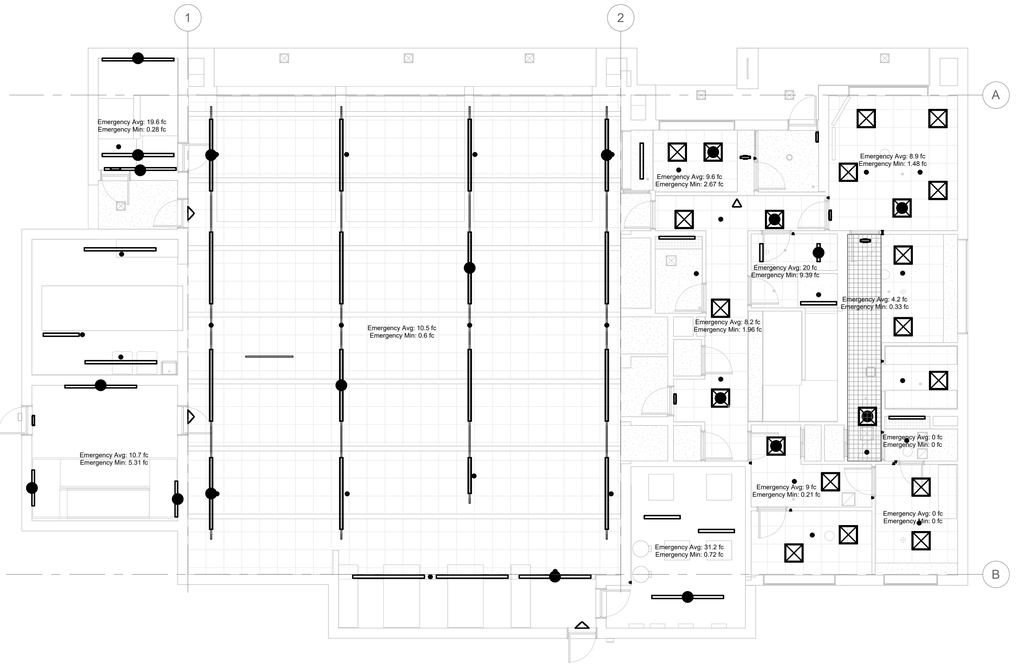
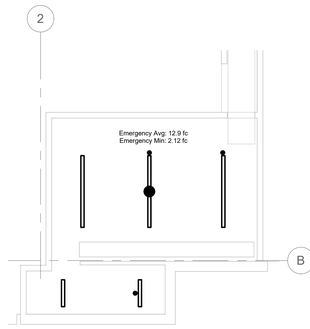


1 EL Egress - Level 1 1/8" = 1'-0"



2 EL Egress - Level 0 1/8" = 1'-0"

Emergency Lighting Load

Type Mark	Space: Number	Space: Name	Apparent Load	Estimated UL 924 Relays required
EX-2-AC	100	Garage	4 VA	
EX-2-AC	100	Garage	4 VA	
EX-2-AC	107A	Corridor	4 VA	
EX-2-AC	100	Garage	4 VA	
EX-2-AC	304A	Corridor	4 VA	
EX-3-AC	112	Hallway	4 VA	
EX-AC	122	Tower Stair Level 1	1 VA	
EX-AC	117	Bedroom	1 VA	
EX-AC	116	Office	1 VA	
EX-AC			1 VA	
EX-AC	111	Reception Office	1 VA	
EX-AC	112	Hallway	1 VA	
EX-AC	304B	Corridor	1 VA	
EX-AC	304B	Corridor	1 VA	
EX-AC	309	Locker	1 VA	
EX-AC	309	Locker	1 VA	
EX-AC	309	Locker	1 VA	
EX-AC	304A	Corridor	1 VA	
EX-AC	304A	Corridor	1 VA	
EX-AC	204	Stairwell	1 VA	
EX-AC	121	Back Stair Level 1	1 VA	
PR22-2K	112	Hallway	16 VA	1
PR22-2K	117	Bedroom	16 VA	1
PR22-2K	107A	Corridor	16 VA	1
PR22-2K	304A	Corridor	16 VA	1
PR22-2K	304A	Corridor	16 VA	1
PR22-2K	310	Bathroom	16 VA	1
PR22-2K	309	Locker	16 VA	1
PR22-2K	111	Reception Office	16 VA	1
PR22-2K	304B	Corridor	16 VA	1
PR22-3.4K	112	Hallway	27 VA	1
PR22-3.4K	116	Office	27 VA	1
PR22-3.4K	309	Locker	27 VA	1
PR22-3.4K	200A	Kitchen	27 VA	1
PR22-3.4K	203	Stairwell	27 VA	1
S2-2.5K	109	Storage	17 VA	1
S3-3K	204	Stairwell	20 VA	1
S4-4K	330	Back Stair Level 3	25 VA	1
S4-4K	400	Tower Stair Level 3	25 VA	1
S4-4K	204	Stairwell	25 VA	1
S4-5K	122	Tower Stair Level 1	32 VA	1
S4-7K	122	Tower Stair Level 1	45 VA	1
S4-7K	240	Tower Stair Level 2	45 VA	1
S8-6K	122	Tower Stair Level 1	36 VA	1
S8-6K	121	Back Stair Level 1	36 VA	1
S8-6K	230	Back Stair Level 2	36 VA	1
S8-6K	330	Back Stair Level 3	36 VA	1
S8-6K	230	Back Stair Level 2	36 VA	1
S8-6K	001	Basement	36 VA	1
S8-8K	100	Garage	49 VA	1
S8-8K	400	Tower Stair Level 3	49 VA	1
S8-8K	100	Garage	49 VA	1
S8-8K	100	Garage	49 VA	1
S8-8K	100	Garage	49 VA	1
S8-8K	100	Garage	49 VA	1
S8-10K	108	Mechanical	61 VA	1
S8-10K	100	Garage	61 VA	1
SS-12-1.3K	205	Intermediate Stair	15 VA	1
			1183 VA	37

IECC 2015 Lighting Levels

Space Number	Space Name	Area	Space Type	Workplane Height	Min. Required Avgerage Illumination	Actual Average Illumination	Illumination Goal	Max. Allowed Power Density IECC 2015	Actual Power Density	Actual Power Density compared to Code	Allowed Lighting Load	Actual Lighting Load
001	Basement	452 ft²	Warehouse - bulky items palletized	2' - 6"	20 fc	35.3 fc	177%	0.58 W/ft²	0.32 W/ft²	56%	262 VA	147 VA
100	Garage	2,878 ft²	Emergency Vehicle Garage	2' - 6"	30 fc	33.4 fc	111%	0.56 W/ft²	0.32 W/ft²	58%	1,612 VA	935 VA
101	Shop	258 ft²	Workshop	2' - 6"	40 fc	41.9 fc	105%	1.59 W/ft²	0.5 W/ft²	31%	410 VA	129 VA
106	Bathroom	36 ft²	Restroom - otherwise	2' - 6"	20 fc	23.2 fc	116%	0.98 W/ft²	0.68 W/ft²	69%	36 VA	25 VA
107A	Corridor	89 ft²	Corridor - otherwise	2' - 6"	10 fc	19.7 fc	197%	0.66 W/ft²	0.37 W/ft²	56%	59 VA	33 VA
107B	Bedroom	97 ft²	Dormitory - Living Quarters	2' - 6"	20 fc	21.2 fc	106%	0.38 W/ft²	0.32 W/ft²	85%	37 VA	31 VA
108	Mechanical	244 ft²	Electrical / Mechanical	2' - 6"	30 fc	53.6 fc	179%	0.95 W/ft²	0.51 W/ft²	54%	232 VA	124 VA
109	Storage	40 ft²	Electrical / Mechanical	2' - 6"	30 fc	30.4 fc	101%	0.95 W/ft²	0.87 W/ft²	91%	38 VA	35 VA
110	Bathroom	45 ft²	Restroom - otherwise	2' - 6"	20 fc	24.7 fc	123%	0.98 W/ft²	0.7 W/ft²	72%	44 VA	32 VA
111	Reception Office	95 ft²	Office - enclosed	2' - 6"	40 fc	42.6 fc	107%	1.11 W/ft²	0.71 W/ft²	64%	105 VA	67 VA
112	Hallway	276 ft²	Corridor - otherwise	0' - 0"	10 fc	15.6 fc	156%	0.66 W/ft²	0.27 W/ft²	40%	182 VA	73 VA
116	Office	217 ft²	Office - enclosed	2' - 6"	40 fc	43.2 fc	108%	1.11 W/ft²	0.64 W/ft²	58%	241 VA	139 VA
117	Bedroom	199 ft²	Dormitory - Living Quarters	2' - 6"	20 fc	21.6 fc	108%	0.38 W/ft²	0.35 W/ft²	93%	76 VA	71 VA
117	Bedroom	199 ft²	(none)	0' - 0"		0 fc			0.35 W/ft²			71 VA
118	Linen Closet	59 ft²	Warehouse - small Items hand-carried	2' - 6"	30 fc	30.5 fc	102%	0.95 W/ft²	0.62 W/ft²	65%	56 VA	36 VA
119	Bedroom	114 ft²	Dormitory - Living Quarters	2' - 6"	20 fc	23.9 fc	120%	0.38 W/ft²	0.37 W/ft²	97%	43 VA	42 VA
120	Stair Basement	38 ft²	Corridor - otherwise	0' - 0"	10 fc	15.1 fc	151%	0.66 W/ft²	0.66 W/ft²	100%	25 VA	25 VA
121	Back Stair Level 1	112 ft²	Stairwell	0' - 0"	10 fc	19.6 fc	196%	0.69 W/ft²	0.32 W/ft²	46%	77 VA	36 VA
122	Tower Stair Level 1	247 ft²	Storage	0' - 0"	10 fc	10.7 fc	107%	0.63 W/ft²	0.45 W/ft²	72%	155 VA	112 VA
200A	Kitchen	189 ft²	Food Preparation	2' - 6"	50 fc	59.7 fc	119%	1.21 W/ft²	0.8 W/ft²	66%	228 VA	152 VA
200B	Dining	223 ft²	Lounge / Breakroom	2' - 6"	20 fc	39 fc	195%	0.73 W/ft²	0.36 W/ft²	49%	163 VA	80 VA
201	Bathroom	46 ft²	Restroom - otherwise	2' - 6"	20 fc	26.3 fc	131%	0.98 W/ft²	0.76 W/ft²	77%	45 VA	35 VA
202	TV	374 ft²	Lounge / Breakroom	2' - 6"	20 fc	32.3 fc	162%	0.73 W/ft²	0.37 W/ft²	50%	273 VA	137 VA
203	Stairwell	111 ft²	Stairwell	0' - 0"	10 fc	19.7 fc	197%	0.69 W/ft²	0.48 W/ft²	69%	76 VA	53 VA
204	Stairwell	135 ft²	Stairwell	0' - 0"	10 fc	17.1 fc	171%	0.69 W/ft²	0.52 W/ft²	75%	93 VA	69 VA
205	Intermediate Stair	36 ft²	Stairwell	0' - 0"	10 fc	11 fc	110%	0.69 W/ft²	0.42 W/ft²	61%	25 VA	15 VA
230	Back Stair Level 2	112 ft²	(none)	0' - 0"		19.6 fc			0.64 W/ft²			71 VA
240	Tower Stair Level 2	247 ft²	Stairwell	0' - 0"	10 fc	13.6 fc	136%	0.69 W/ft²	0.18 W/ft²	26%	170 VA	45 VA
301	Gym	430 ft²	Fitness Exercise Area	2' - 6"	30 fc	40.9 fc	136%	0.72 W/ft²	0.5 W/ft²	70%	310 VA	216 VA
302	Dorm	177 ft²	Dormitory - Living Quarters	2' - 6"	20 fc	22.3 fc	111%	0.38 W/ft²	0.35 W/ft²	93%	67 VA	62 VA
303	Dorm	169 ft²	Dormitory - Living Quarters	2' - 6"	20 fc	25.1 fc	126%	0.38 W/ft²	0.37 W/ft²	97%	64 VA	62 VA
304A	Corridor	318 ft²	Corridor - otherwise	0' - 0"	10 fc	10.6 fc	106%	0.66 W/ft²	0.3 W/ft²	46%	210 VA	96 VA
304B	Corridor	168 ft²	Corridor - otherwise	0' - 0"	10 fc	11.6 fc	116%	0.66 W/ft²	0.34 W/ft²	52%	111 VA	58 VA
305	Dorm Office	129 ft²	Office - enclosed	2' - 6"	40 fc	42.9 fc	107%	1.11 W/ft²	0.76 W/ft²	69%	144 VA	99 VA
306	Office	285 ft²	Office - open	2' - 6"	40 fc	44.3 fc	111%	0.98 W/ft²	0.63 W/ft²	64%	279 VA	178 VA
307	Dorm	247 ft²	Dormitory - Living Quarters	2' - 6"	20 fc	24.4 fc	122%	0.38 W/ft²	0.38 W/ft²	100%	94 VA	94 VA
308	Bathroom	59 ft²	Restroom - otherwise	2' - 6"	20 fc	29.9 fc	150%	0.98 W/ft²	0.77 W/ft²	78%	58 VA	46 VA
309	Locker	443 ft²	Locker	2' - 6"	20 fc	34.9 fc	174%	0.75 W/ft²	0.43 W/ft²	57%	332 VA	190 VA
310	Bathroom	208 ft²	Restroom - otherwise	2' - 6"	20 fc	33 fc	165%	0.98 W/ft²	0.55 W/ft²	56%	203 VA	113 VA
311	Closet	15 ft²	Electrical / Mechanical	2' - 6"	30 fc	32.4 fc	108%	0.95 W/ft²	1.14 W/ft²	120%	14 VA	17 VA
330	Back Stair Level 3	112 ft²	Stairwell	0' - 0"	10 fc	19.6 fc	196%	0.69 W/ft²	0.54 W/ft²	78%	77 VA	60 VA
400	Tower Stair Level 3	247 ft²	Stairwell	0' - 0"	10 fc	11.9 fc	119%	0.69 W/ft²	0.3 W/ft²	43%	170 VA	73 VA
		10,172 ft²									6,897 VA	4,183 VA

3 EL Egress - Level 3 1/8" = 1'-0"

A. Demolition:
1. Demolish all existing lighting fixtures and controls. This includes all items not needed for new installation to function. This includes, but is not limited to, emergency, exit, track, architectural and spot lights, switches, sensors, inverters, batteries and control panels. Demolition drawings may not show all existing items.
2. Remove all unused raceways, boxes, conduit and wiring
3. Patch wall, ceiling and other surfaces damaged by removal of XTG elements. Use adjacent surface matching cover for electrical boxes that remain.

B. Installation:
1. Install new raceways, boxes, conduit and wiring as required for new lighting fixtures and controls.
2. Locations shown are approximate only. Install as required to coordinate with tile patterns, architectural features, sprinklers, mechanical equipment and other obstacles. Center Fixtures and provide even grid wherever possible. Review deviations from plan with designer prior installation.
3. Install fixtures at indicated height. Provide required suspension. A noted height typically applies to all fixtures in a space, even if only a single fixture has an indicated height shown. If no height is given, ceiling surface height can be assumed.
4. Surface wiring raceway in finished areas is only allowed where the structure does not allow installation inside ceiling or wall. Raceway shall be neatly routed and hidden in corners to the greatest extend possible. In finished spaces use surface wire molding instead of conduit. Wiremold shall be factory painted to match wall surface. Where matching factory paint is not available, use field-painting.
5. Support all lighting fixtures adequately and provide all extra support.
6. All conduit except at fixture entrance shall be 3/4" or larger. Turns between access boxes should not be more than 270°.
7. Grid Ceilings:
   a. use flexible metal conduit from a J-box in enough length to allow lifting and 2' lateral move of fixture
   b. Move flexible head sprinklers where required for even layout pattern.
8. Suspended Strip Light Fixtures: use rigid type hangers every 4'or less. Mount multiple fixtures in a row on a uni-strut structure.
9. Cord & Plug Fixtures: Mount on hook for easy replacement and install safety wire. Provide plug within reach of fixture

C. Retrofit Installation:
1. Maintain all fire ratings while penetrating plenums, walls or ceilings.
2. Install all wiring inside ceiling and wall. If wiring cannot be fished through, provide surface mounted conduit or wire molding in finished spaces.
3. Modify Grid Ceiling to accommodate new fixtures. Fill in openings with new tiles of existing type. Contractor shall provide tiles and grid elements. Review Special site conditions for information on type of tile. Where sprinkler, diffuser or other permanent obstruction prevents even layout, relocate after consultation with engineer.
4. Prevent dirt and dust polluting occupied areas and take special care while working in occupied areas and cover equipment and furniture as needed.
5. Canopy: Provide retrofit version of fixtures and/or all retrofit accessories for installing over existing fixture locations. Ensure existing opening is fully covered. Build cover matching surrounding surface.

D. Control:
1. Locate sensors to enable good detection within controlled zone and in between partitions. In enclosed rooms minimize detection of motion in adjacent rooms.
2. Lighting zones are indicated by wire annotations and/or switchleg (SL) numbering. Wire annotations are schematic only to indicate control relationships and don't necessarily equal actually required physical wire runs. Lighting zones can be shown by proximity of sensor and light fixture without wire or switchleg annotation (for example, garage lighting where each fixture has one sensor)
3. Spaces with electrical panels shall have at least one light be controlled by a manual switch only (no automatic control) per code-requirement.
4. Fixture-mounted sensors shall be installed to allow 360° detection and bottom of sensor lens shall be at or below bottom of fixture.
5. Size analog 0-10V wiring to limit voltage drop. At 100% position the light fixture shall be 100% bright.

E. Emergency Lighting:
1. Light fixtures with a black dot indicate emergency lights.
2. Control fixtures from central inverter or generator. Provide all wiring to emergency power source.

Designed by:
City of Madison
Facilities Management
City-County Building, Room 115
210 Martin Luther King Jr. Boulevard
Madison, WI 53703

Client:
Madison Fire Department

Fire Station 4 Lighting Retrofit

Location:
1437 Monroe St.
Madison, WI 53711

Contract: 9240
Project: 14245

Revisions

No.	Description

General Lighting

EL 001

Print Date:
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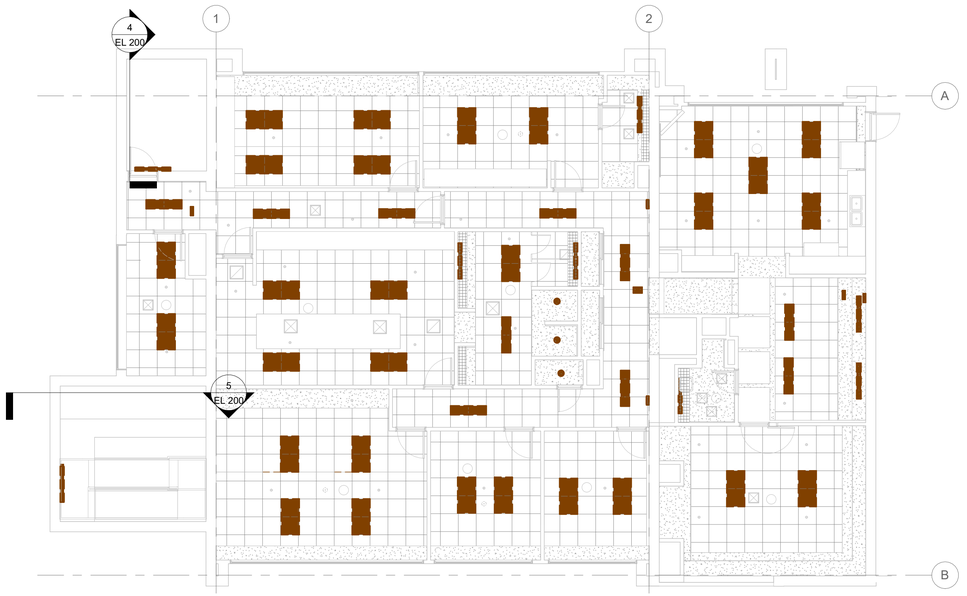
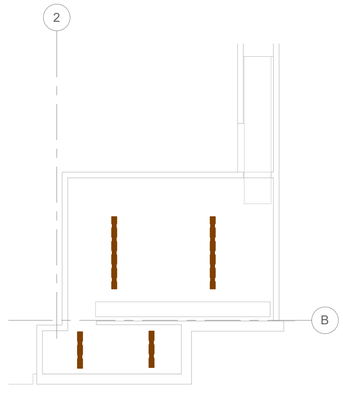
Print in color on 24" x 36"

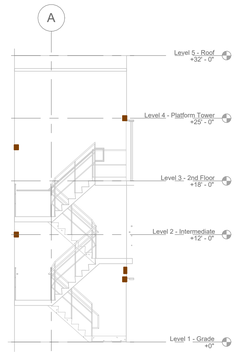
1 ED - Level 1 1/8" = 1'-0"



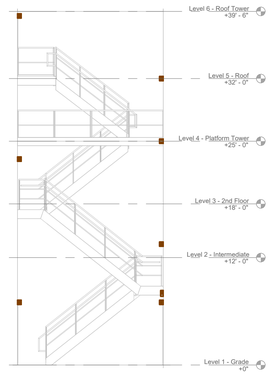
2 ED - Level 3 1/8" = 1'-0"



3 ED - Level 0 1/8" = 1'-0"



4 ED Section - Stair Tower 1/8" = 1'-0"



5 ED Section - Hose Tower 1/8" = 1'-0"

2 0 2 4 6 8 10
1/4" = 1'-0" FEET

2 0 2 4 6 8 10 12 14
3/16" = 1'-0" FEET

5 0 5 10 15 20
1/8" = 1'-0" FEET

5 0 5 10 15 20 25 30
3/32" = 1'-0" FEET

5 0 5 10 15 20 25 30 35 40 45
1/16" = 1'-0" FEET

20 0 20 40
1" = 20'-0" FEET

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Facilities Management
City-County Building, Room 115
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Madison, WI 53703

Client:
Madison Fire Department

Fire Station 4 Lighting Retrofit

Location:
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Madison, WI 53711

Contract: 9240
Project: 14245

Revisions

No.	Description

Project North
TRUE

Demolition

EL 200

Print Date:
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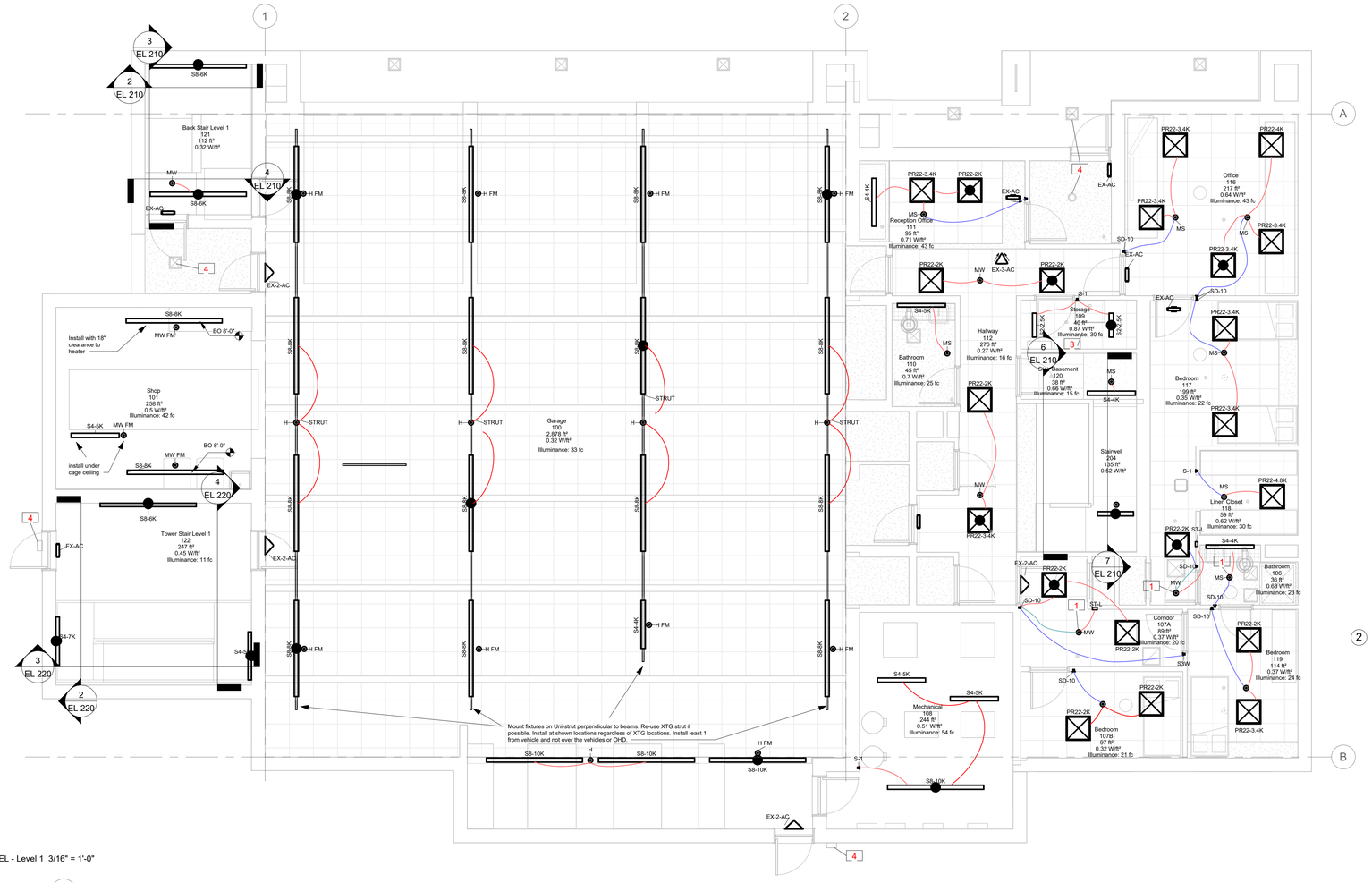
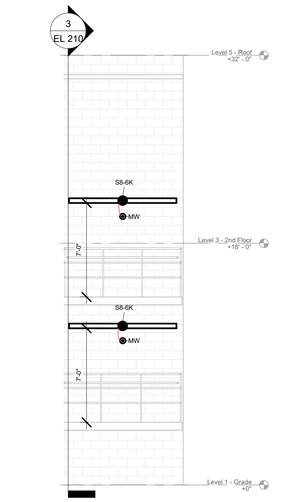
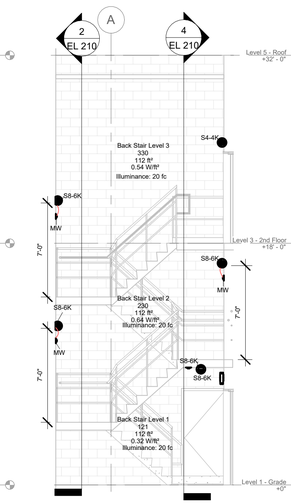
Print in color on 24" x 36"



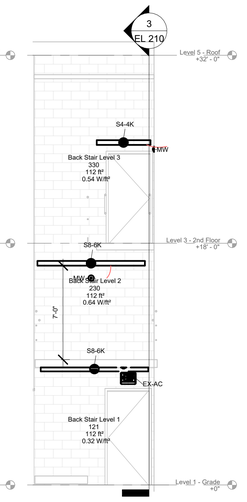
1 EL - Level 1 3/16" = 1'-0"



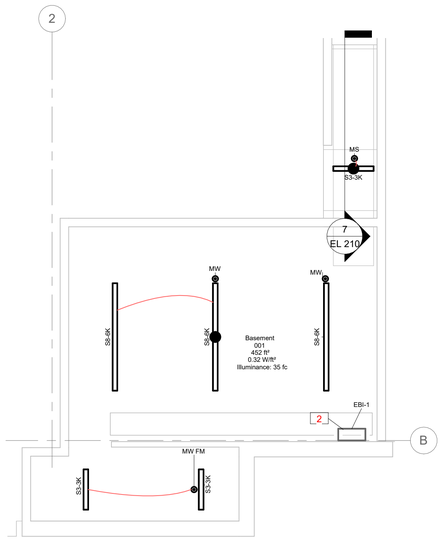
2 EL Section - Back Stairs from South 3/16" = 1'-0"



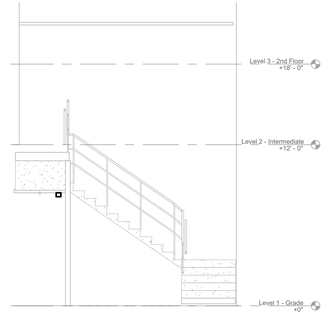
3 EL Section - Back Stairs from West 3/16" = 1'-0"



4 EL Section - Back Stairs from North 3/16" = 1'-0"



5 EL - Level 0 - Basement 3/16" = 1'-0"



6 EI Section - Center Stairs 3/16" = 1'-0"

7 EI Section - Basement Stairs 1/8" = 1'-0"

Keynote Legend

Key Value	Keynote Text
1	Motion sensor upstream of switch. Don't wire sensor dimming. All dimming by manual dimmer only.
2	Power all emergency lighting fixtures and exit signs from this battery power inverter.
3	XTG Fire Alarm Panel. Wire from here to the UL 924 relays in the spaces.
4	Connect XTG light to emergency lighting system.

2 0 2 4 6 8 10
1/4" = 1'-0" FEET

2 0 2 4 6 8 10 12 14
3/16" = 1'-0" FEET

5 0 5 10 15 20
1/8" = 1'-0" FEET

5 0 5 10 15 20 25 30
3/32" = 1'-0" FEET

5 0 5 10 15 20 25 30 35 40 45
1/16" = 1'-0" FEET

20 0 20 40
1" = 20'-0" FEET

Designed by:
City of Madison
Facilities Management
City-County Building, Room 115
210 Martin Luther King Jr. Boulevard
Madison, WI 53703

Client:
Madison Fire Department

Fire Station 4 Lighting Retrofit

Location:
1437 Monroe St.
Madison, WI 53711

Contract: 9240
Project: 14245

Revisions

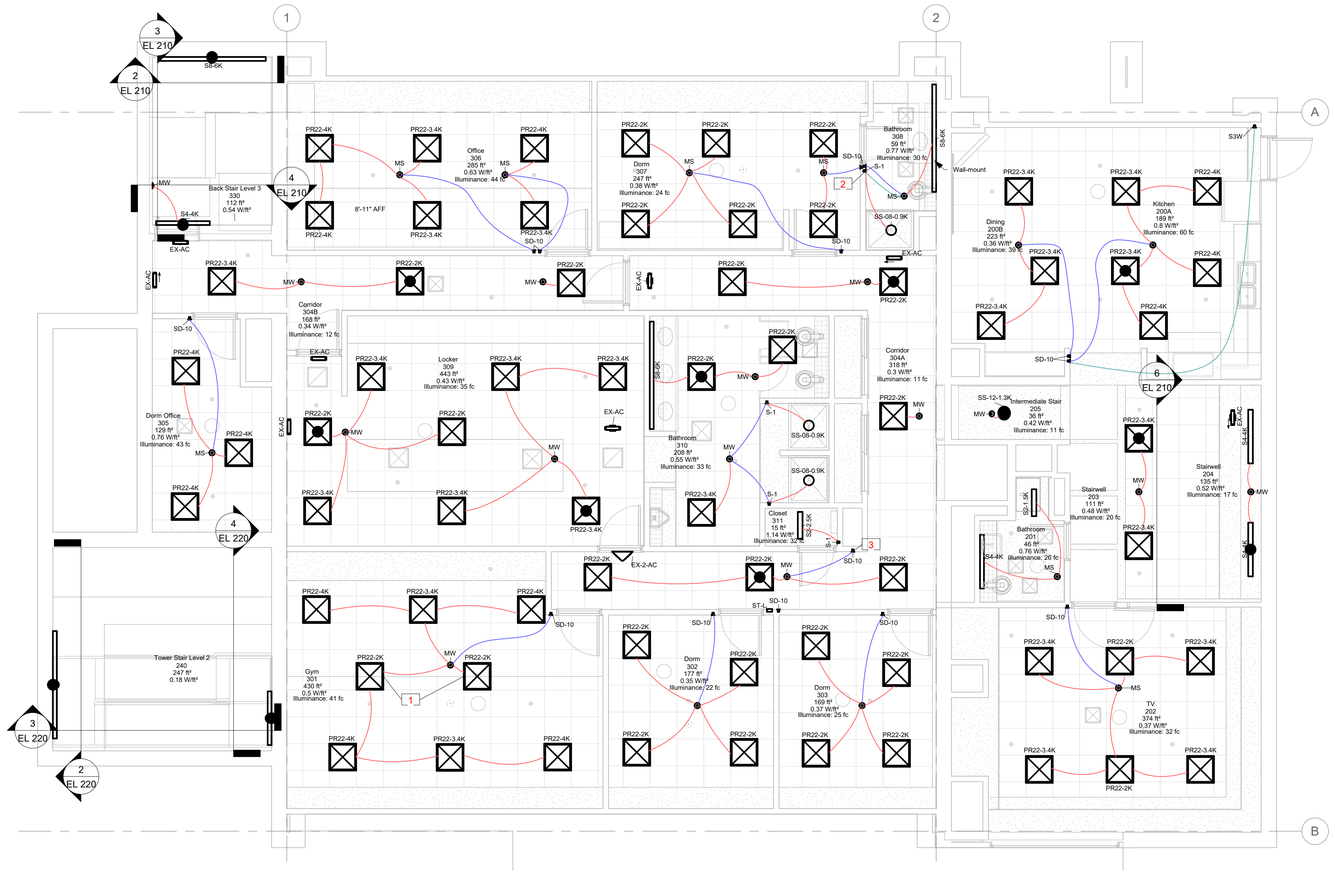
No.	Description

Project North
TRUE

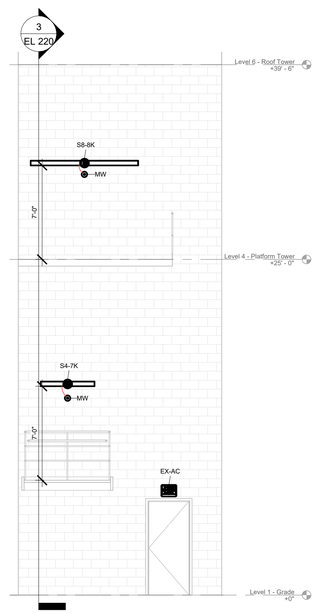
Lighting

EL 210

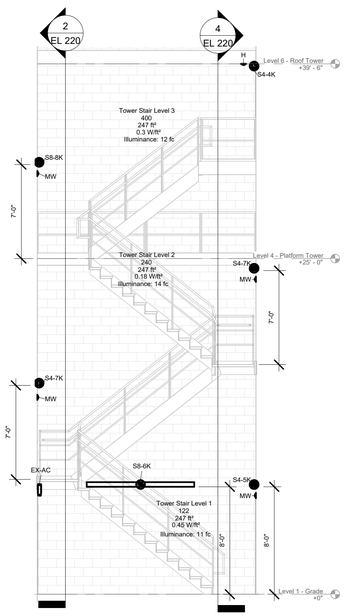
Print Date:
1/11/2023 8:25:47
Print in color on 24" x 36"



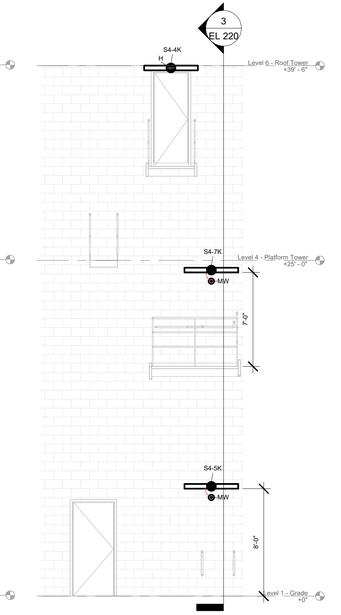
1 EL - Level 3 - 2nd Floor 3/16" = 1'-0"



2 EL Section - Hose Tower from East 3/16" = 1'-0"



3 EL Section - Hose Tower from South 3/16" = 1'-0"



4 EL Section - Hose Tower from West 3/16" = 1'-0"

Keynote Legend

Key Value	Keynote Text
1	Re-work ceiling grid to install fixtures as indicated.
2	Switch downstream of sensor.
3	Disable switchleg in dimmer switch. Dimming function only. Occupant shall not be able to fully turn off lights manually.

2 0 2 4 6 8 10
1/4" = 1'-0" FEET

2 0 2 4 6 8 10 12 14
3/16" = 1'-0" FEET

5 0 5 10 15 20
1/8" = 1'-0" FEET

5 0 5 10 15 20 25 30
3/32" = 1'-0" FEET

5 0 5 10 15 20 25 30 35 40 45
1/16" = 1'-0" FEET

20 0 20 40
1" = 20'-0" FEET

Designed by:
City of Madison
Facilities Management
City-County Building, Room 115
210 Martin Luther King Jr. Boulevard
Madison, WI 53703

Client:
Madison Fire Department

Fire Station 4 Lighting Retrofit

Location:
1437 Monroe St.
Madison, WI 53711

Contract: 9240
Project: 14245

Revisions

No.	Description

Project North
TRUE

Lighting

EL 220

Print Date:
1/11/2023 8:25:50
Print in color on 24" x 36"

Lighting Device Schedule

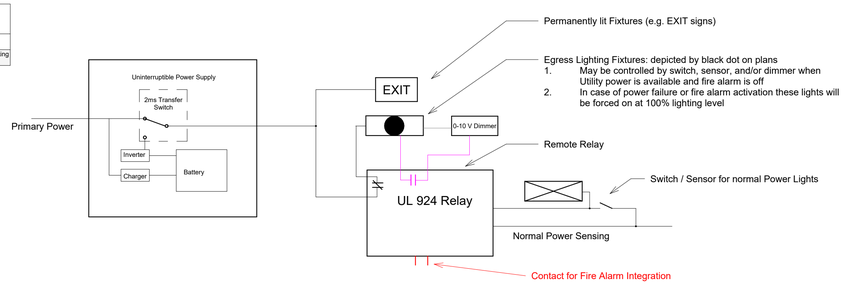
Type Mark	Description	Est Count	Model	URL	Type Remark	Specification
H	Motion Sensor High Bay	6	Sensorswitch CMR-6-D-P-VLP	www.acuitybrands.com		26 09 23 – Lighting Control Devices
H FM	Motion Sensor High-Bay; Fixture-mount	9	Sensorswitch LSXR-6-ADC-VLP	www.acuitybrands.com		26 09 23 – Lighting Control Devices
MS	Motion Sensor short Range	22	Sensorswitch CMR-9-PDT-ADC-VLP	www.acuitybrands.com		26 09 23 – Lighting Control Devices
MW	Motion Sensor wide Range	29	Sensorswitch CMR-10-PDT-ADC-VLP	www.acuitybrands.com		26 09 23 – Lighting Control Devices
MW FM	Motion Sensor wide Range; Fixture-mount	4	Sensorswitch LSXR-10-ADC-VLP	www.acuitybrands.com		26 09 23 – Lighting Control Devices
S3W	3-Way Switch	2				26 09 23 – Lighting Control Devices
S-1	Single Switch	7				26 09 23 – Lighting Control Devices
SD-10	Switch w/ 0-10V Dimmer	23	Wattstopper RH4FBL3PW	www.legrand.us		26 09 23 – Lighting Control Devices

Emergency Power Battery Inverters

Mark	Space Number	Space Name	Description	Manufacturer	Model	Remark	URL	Output Rating @ 90 Minutes	In / Out Voltage	Weight	Specific Remark	Specifications
EBI-1	001	Basement	Emergency Lighting Battery Inverter	Myers	EM-3-S-B	For floor mount: option -F. For wall-mount use option -W.	www.myerseps.com	2200 VA	120 V	494 lbf		26 52 00 – Safety Lighting

Lighting Fixture Schedule

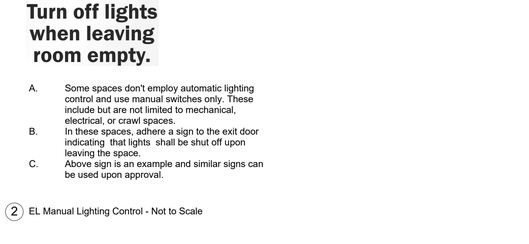
Type Mark	Type Comments	Description	Est Count	Model	URL	Apparent Load	Luminous Flux	Color Temperature	Efficacy	Lumen Maintenance	Environemntal Rating	Type Remark	Specification	Estimated requied UL 924 relays
EX-2-AC	Light Fixture Interior	Exit Sign Triangular - no Battery	5	Big Beam TRXL-ACLED-2-G-W	www.bigbeam.com	4 VA							26 50 00 - Lighting	0
EX-3-AC	Light Fixture Interior	Exit Sign Triangular - no Battery	1	Big Beam TRXL-ACLED-3-G-W	www.bigbeam.com	4 VA							26 50 00 - Lighting	0
EX-AC	Light Fixture Interior	Exit Sign - no Battery	15	Lithonia LQM-S-W-3-G-MVOLT	www.acuitybrandslighting.com	1 VA							26 50 00 - Lighting	0
PR22-2K	Light Fixture Interior	Panel Recessed 2x2	40	Lithonia EPANL-2x2-2000LMHE-40K-80CRI-MIN1-ZT-MVOLT	www.acuitybrands.com	16 VA	1972 lm	4000 K	126 lm/W	L91 @ 60K hours	IPX5; NSF Splash Zone		26 50 00 - Lighting	9
PR22-3.4K	Light Fixture Interior	Panel Recessed 2x2	33	Lithonia EPANL-2x2-3400LMHE-40K-80CRI-MIN1-ZT-MVOLT	www.acuitybrands.com	27 VA	3399 lm	4000 K	128 lm/W	L91 @ 60K hours	IPX5; NSF Splash Zone		26 50 00 - Lighting	5
PR22-4.8K	Light Fixture Interior	Panel Recessed 2x2	1	Lithonia EPANL-2x2-4800LMHE-40K-80CRI-MIN1-ZT-MVOLT	www.acuitybrands.com	36 VA	4697 lm	4000 K	129 lm/W	L91 @ 60K hours	IPX5; NSF Splash Zone		26 50 00 - Lighting	0
PR22-4K	Light Fixture Interior	Panel Recessed 2x2	14	Lithonia EPANL-2x2-4000LMHE-40K-80CRI-MIN1-ZT-MVOLT	www.acuitybrands.com	33 VA	4117 lm	4000 K	125 lm/W	L91 @ 60K hours	IPX5; NSF Splash Zone		26 50 00 - Lighting	0
S2-1.5K	Light Fixture Interior	Strip 2'	1	Lithonia CLX-L24-1500LM-HEF-RDL-MVOLT-EZ1-40K-80CRI	www.acuitybrands.com	10 VA	1436 lm	4000 K	138 lm/W	L70 @ 100K hours	Damp Location		26 50 00 - Lighting	0
S2-2.5K	Light Fixture Interior	Strip 2'	3	Lithonia CLX-L24-2500LM-HEF-RDL-MVOLT-EZ1-40K-80CRI	www.acuitybrands.com	17 VA	2508 lm	4000 K	144 lm/W	L70 @ 100K hours	Damp Location		26 50 00 - Lighting	1
S3-3K	Light Fixture Interior	Strip 3'	3	Lithonia CLX-L36-3000LM-HEF-RDL-MVOLT-EZ1-40K-80CRI	www.acuitybrands.com	20 VA	3004 lm	4000 K	150 lm/W	L70 @ 100K hours	Damp Location		26 50 00 - Lighting	1
S4-4K	Light Fixture Interior	Strip 4'	9	Lithonia CLX-L48-4000LM-HEF-RDL-MVOLT-EZ1-40K-80CRI	www.acuitybrands.com	25 VA	3868 lm	4000 K	156 lm/W	L70 @ 100K hours	Damp Location		26 50 00 - Lighting	3
S4-5K	Light Fixture Interior	Strip 4'	5	Lithonia CLX-L48-5000LM-HEF-RDL-MVOLT-EZ1-40K-80CRI	www.acuitybrands.com	32 VA	4839 lm	4000 K	152 lm/W	L70 @ 100K hours	Damp Location		26 50 00 - Lighting	1
S4-7K	Light Fixture Interior	Strip 4'	2	Lithonia CLX-L48-7000LM-HEF-RDL-MVOLT-EZ1-40K-80CRI	www.acuitybrands.com	45 VA	7009 lm	4000 K	157 lm/W	L70 @ 100K hours	Damp Location		26 50 00 - Lighting	2
S8-6K	Light Fixture Interior	Strip 8'	10	Lithonia CLX-L96-6000LM-HEF-RDL-MVOLT-EZ1-40K-80CRI	www.acuitybrands.com	36 VA	5697 lm	4000 K	160 lm/W	L70 @ 100K hours	Damp Location		26 50 00 - Lighting	6
S8-8K	Light Fixture Interior	Strip 8'	18	Lithonia CLX-L96-8000LM-HEF-RDL-MVOLT-EZ1-40K-80CRI	www.acuitybrands.com	49 VA	7602 lm	4000 K	157 lm/W	L70 @ 100K hours	Damp Location		26 50 00 - Lighting	6
S8-10K	Light Fixture Interior	Strip 8'	4	Lithonia CLX-L96-10000LM-HEF-RDL-MVOLT-EZ1-40K-80CRI	www.acuitybrands.com	61 VA	9404 lm	4000 K	154 lm/W	L70 @ 100K hours	Damp Location		26 50 00 - Lighting	2
SS-08-0.9K	Light Fixture Interior	Slim Surface - round - Wet Location	3	TGS 88-0810-RW-TM-CC4000K-90CRI	www.trulygreensolutions.com	10 VA	900 lm	4000 K	90 lm/W	36K hours	IP 44 / Wet Location		26 50 00 - Lighting	0
SS-12-1.3K	Light Fixture Interior	Slim Surface - round - Wet Location	1	TGS 88-1215-RW-TM-CC4000K-90CRI	www.trulygreensolutions.com	15 VA	1350 lm	4000 K	90 lm/W	36K hours	IP 44 / Wet Location		26 50 00 - Lighting	1
ST-L	Light Fixture Interior	Step Light w/ Lens; White	3	Contech STPL-4M-LS-P	www.contechlighting.com	2 VA	34 lm	1800 K	17 lm/W	50K hours	Wet Location		26 50 00 - Lighting	0
			171											37



Objective:
1. Emergency light fixtures (indicated by a black dot) and Exit signs will be powered by the Uninterruptible AC Power Supply (UPS). Wiring has to be extended from UPS to all devices.
2. When normal power is present and fire alarm is OFF, lighting will be controlled by lighting control system. Local switches, timers, dimmers and sensors control on/off and dimming.
3. When normal power is not present, the emergency fixtures and exit signs will be powered by the battery for over 90 minutes. These fixtures will be forced on at 100% (no dimming)
4. When fire alarm is active, all emergency light fixtures will be forced on at 100% (no dimming).
5. Contractor shall verify availability of contacts in fire alarm panel and add relay(s) if required.
6. Wiring shall meet NEC 700.10 requirements. This includes, but is not limited to:
   a. Separate emergency raceway. Raceway shall be marked.
   b. Any junctions shall be labeled "Warning - 2 power sources" or as required by code
   c. Label indicates panel, circuit, and voltage
7. Conduit for emergency lighting shall be color-coded as specified in Division 26
8. When accessible installation of UL 924 relay is not possible (e.g. drywall, exterior), install the relay in near-by accessible location. Verify location with engineer.
9. fixtures with built-in sensor shall be re-wired for UL 924 relay to bypass sensor (e.g. exterior fixture with included photocell)

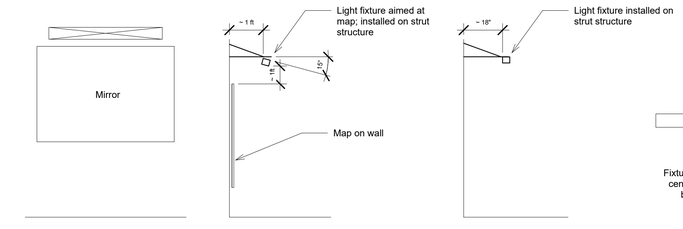
Testing:
1. Test by applying emergency power and normal power. Turn off local switch and set local dimmer to lowest dimming level.
   a. If no local switch is available, disconnect the appropriate wire to simulate light being turned off.
   b. If no local dimmer is available and dimming by sensor is scheduled, program sensor to dim to low level.
2. Disconnect normal sensing power and verify emergency light turns on to 100%
3. Re-instate normal power and activate fire alarm and verify emergency light turns on to 100%

5 EL Egress Lighting Control w/ UPS and Fire Alarm Integration - Not to Scale



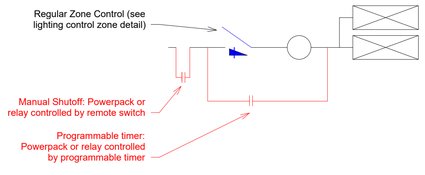
A. Lighting zones with lighting-devices and light-fixtures are indicated by wire lines and/or switch leg (SL) numbers.
B. Where devices allow, dimming shall be accomplished by 0-10V wiring of all devices.
C. Where shown on plans, a zone may have 3-way and 4-way switches. Enable 3-way function on dimmer switch and wire appropriately to enable control from all switch locations. Fixtures and devices in the same above zone are denoted by the same switchleg (SL) number.
D. Motion sensor with local switch will be de-energized when switch is off (sensor downstream of switch):
   1. Light will be on upon activation of local switch regardless of actual motion detection (sensor is ON upon power-up)
   2. Sensors will not click when local switch is off (nuisance avoidance in quiet rooms)
E. Line-voltage dimmers (i.e. track lighting) shall be downstream of local motion sensor.
F. Notes on plans or switchleg naming will indicate exceptions. For example:
   1. Disable Switchleg: A dimmer will only dim the lighting level to the allowable minimum. The line voltage switch in the dimmer will not be used. This prevents lights turning off entirely. Hallways are an example.
   2. One light fixture shall be controlled by switch only: Switchleg parameters indicate that some lights are controlled by switch and sensor, and some lights by switch only. This prevents the latter lights from turning off upon loss of motion detection. Electrical or mechanical rooms are examples.
G. Sensor Programming Instructions:
   1. The below is based on Sensorswitch Instructions at the time of design. Amend if different sensors are used or if manufacturer changes procedure. Confirm any deviation with engineer. Sensorswitch support#: 1-800-535-2465
   2. If sensors are equipped with VLC programming option, a smartphone app shall be used. Note that sensors needs to be initialized and set with a PIN within 45 minutes of powering up. Program is sent to sensor via flashlight. Lights will blink to acknowledge successful programming.
   3. Verify settings with engineer prior programming. Certain settings may be different in certain zones.
   4. Sensors shall be programmed depending on availability of daylight . Save presets to avoid deviations.
   5. No daylight available:
      a. Enable "Time Delay" - Set to 15 minutes
      b. Disable Trim
      c. Enable "Dim to Off Delay" - set to 5 minutes
      d. Disable Photocell
   6. Daylight available (inc. spaces with overhead doors, skylights, windows within 20' of sensor)
      a. Enable "Photocell" and set to "On/Off and Auto Dimming"
      b. Enable "Auto Set Point"
   7. After programming, all functions shall be tested to verify desired function. Adjust as required for intended function. Discuss problems with engineer.

4 EL Lighting Control Zone - Not to Scale



Fixture above Mirror | Fixture above Map | Fixture on bracket | Suspended Strip Fixture w/ Sensor | Multiple Suspended Strip Fixtures in a Row

1 EL Typical Installation Details - Not to Scale



Local Lighting Control Override
A. Plan will indicate which zones will be overriden.
B. Manual shut-off:
   1. Staff can remotely turn off selected zones regardless of local lighting control. the remote switch is shown on plans (typically in a non-public location)
C. Programmable timer:
   1. A central timer forces lights in zone on regardless of local control setting
D. Wiring from programmable timer and remote switch can be accomplished in line-voltage wiring or with low-voltage wiring and power-pack near lighting zone.

3 EL Local Lighting Control Overrides - Not to Scale

A. Some spaces don't employ automatic lighting control and use manual switches only. These include but are not limited to mechanical, electrical, or crawl spaces.
B. In these spaces, adhere a sign to the exit door indicating that lights shall be shut off upon leaving the space.
C. Above sign is an example and similar signs can be used upon approval.

2 EL Manual Lighting Control - Not to Scale

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City of Madison
Facilities Management
City-County Building, Room 115
210 Martin Luther King Jr. Boulevard
Madison, WI 53703

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Madison Fire Department

Fire Station 4 Lighting Retrofit

Location:
1437 Monroe St.
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Contract: 9240
Project: 14245

Revisions

No.	Description

Details and Schedules

EL 300

Print Date:
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