

SECTION 16510 - INTERIOR LUMINAIRES

GENERAL

1.1 SECTION INCLUDES

- A. Interior luminaires and accessories.
- B. Ballasts.
- C. Lamps.

1.2 RELATED SECTIONS

- A. Section 16130 – Boxes

1.3 REFERENCES

- A. ANSI C82.1 - Ballasts for Fluorescent Lamps - Specifications.
- B. ANSI/NFPA 70 - National Electrical Code.
- C. ANSI/NFPA 101 - Life Safety Code.

1.4 SUBMITTALS

- A. Submit under provisions of Section 16010.
- B. Shop Drawings: Indicate dimensions and components for each luminaire that is not a standard product of the manufacturer.
- C. Product data: Provide dimensions, ratings and performance data.

1.5 OPERATION AND MAINTENANCE DATA

- A. Submit under provisions of Section 16000.
- B. Maintenance data: Include replacement parts list.

1.6 REGULATORY REQUIREMENTS

- A. Conform to requirements of ANSI/NFPA 70.
- B. Conform to requirements of NFPA 101.
- C. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

PRODUCTS

2.1 INTERIOR LUMINAIRES

- A. Furnish products as specified in schedule on Drawings.
- B. Install Owner supplied lamps for all luminaires.

2.2 T8 FLUORESCENT BALLASTS

- A. Manufacturers:
 - 1. *Osram-Sylvania.*
 - 2. *Advance.*
 - 3. Substitutions: Or Approved Equal.
- B. Description: ANSI C82.1, electronics, rapid-start type.
- C. Voltage: 277 volts (or 120 volts as indicated in the Lighting Fixture Schedule).
- D. Performance:
 - 1. Power Factor: > .99
 - 2. THD: < 10%
 - 3. 3rd Harmonic Distortion: <6%
 - 4. Lamp Flicker: < 2%
 - 5. Lamp Crest Factor: < 1.5
 - 6. Lamp Current Frequency: >25 kHz
 - 7. Sound Rating: Class A
 - 8. UL Listing: Class P

2.3 LAMPS

- A. Except where lamps are specifically noted in the Lighting Fixture Schedule to be furnished by the luminaire manufacturer, all lamps shall be supplied by the Contractor and installed under Division 16.

2.4 EMERGENCY LIGHTING BYPASS SWITCH

- A. Sequence of Operation: When normal power is interrupted, the Emergency Lighting Bypass Switch shall automatically connect the emergency lights to an emergency powered circuit that bypasses both local switching and automatic time control switching at the Lighting Control Panel.
- B. Manufacturer:
 - 1. *Bodine, model GTC20.*
 - 2. Substitutions: Or Approved Equal.

- C. Description: Switch device consisting of relay switching circuitry, a test switch, a normal power indicator light and an emergency power indicator light. Provide a NEMA 1 enclosure.
 - 1. Input Rating: 277 VAC, 60 Hz.
 - 2. Load Rating: 20 amperes.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrate and supporting grids for luminaires.
- B. Examine each luminaire to determine suitability for lamps specified.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install suspended fluorescent luminaires using adjustable aircraft cable hangers. Provide pendant length required to suspend luminaire at height indicated in lighting fixture schedule.
- C. Locate recessed ceiling luminaires as indicated on Architectural reflected ceiling plan.
- D. Install surface mounted luminaires plumb and adjust to align with building lines and with each other. Secure to prohibit movement.
- E. Install recessed luminaires to permit removal from below.
- F. Install wall mounted luminaires at height as scheduled.
- G. Connect luminaires to branch circuit outlets provided under Section 16130 using flexible conduit. Make wiring connections to branch circuit using building wire with insulation suitable for temperature conditions within luminaire.
- H. Bond products and metal accessories to branch circuit equipment grounding conductor.
- I. Install specified lamps in each luminaire.
- J. Install Emergency Bypass Switches above ceiling directly over the light switch being served.

3.3 FIELD QUALITY CONTROL

- A. Operate each luminaire after installation and connection. Inspect for proper connection and operation.

3.4 ADJUSTING

- A. Aim and adjust luminaires as directed.
- B. Re-lamp luminaires that have failed lamps at Substantial Completion.

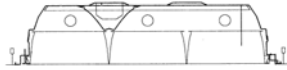
3.5 CLEANING

- A. Clean electrical parts to remove conductive and deleterious materials.
- B. Remove dirt and debris from enclosure.
- C. Clean photometric control surfaces as recommended by manufacturer.
- D. Clean finishes and touch up damage.

LIGHTING FIXTURE SCHEDULE

Lamp numbers refer to General Electric designations. Also approved are equal lamps manufactured by Osram Sylvania, and Philips.

All lighting fixtures shall be 277 volts except as specifically noted herein.
Only those lighting fixtures listed in this schedule will be considered for approval.



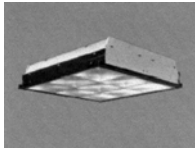
Dimensions: Width = 23-3/4" Length = 48" Recess Height = 6-5/8"

Type: A1

Description: Recessed 2 x 4 static fluorescent troffer with grid ceiling frame, an 18 cell semi specular, low-brightness 4 inch deep parabolic louver, and electronic, low harmonic ballasts.

Lamps: (3) F32T8/SPX35

Manufacturers: *Metalux* # 2PGX-332S36-277EB82
Columbia # 4524-332G-LD3X6-S-277-EB8LH
Lithonia # 2PM4 G B 3 32 32LD 277 GEB10
Lightolier # PLA2G18LS340277SO



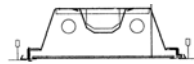
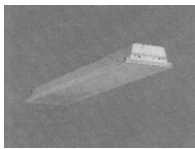
Dimensions: Width = 23-3/4" Length = 23-3/4" Recess Height = 6-5/8"

Type: A2

Description: Similar to Type A1 except 2 x 2 with 9-cell louver and three compact fluorescent lamps.

Lamps: (3) F40/30BX/SPX35

Manufacturers: *Metalux* # 2PGX-3BX40S33-277EB82
Columbia # 4522-340TTG-LD3X3-S-277-EB8LH
Lithonia # 2PM4 G B 3 CF40 9LD 277 GEB10
Lightolier # DPS2G9LP32U-277-I3



Dimensions: Width = 11-3/4" Length = 48" Recess Height = 3-3/4"

Type: A3

Description: Recessed 1 x 4 static fluorescent troffer with flush frame for grid ceilings, an acrylic prismatic lens diffuser and electronic, low harmonic ballast.

Lamps: (2) F32T8/SPX35

Manufacturers: *Metalux* # GP-232A-277V-EB81
Columbia # 4PS14-232G-FSA12-EB8LH277
Lithonia # SP G 2 32 A12 277 GEB10-LG
Lightolier # SPS1GFSVA240-277-S0



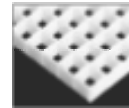
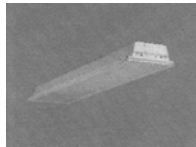
Dimensions: Width = 23-3/4" Length = 48" Recess Height = 3-3/4"

Type: A4

Description: Recessed 2 x 4 static fluorescent troffer with flush frame for suspended grid ceilings, an acrylic prismatic diffuser, and electronic, low harmonic ballasts.

Lamps: (3) F32T8/SPX35

Manufacturers: *Metalux* # 2GC8/332A/277EB81/G2
Columbia # 4PS24-332G-FSA12-EB8LH277-G2
Lithonia # 2SP G 3 32 A12 277 GEB10-LG_
Lightolier # SPS2GFSVA340277SO



Dimensions: Width = 11-3/4" Length = 48" Recess Height = 3-3/4"

Type: A5

Description: Recessed 1 x 4 static fluorescent troffer with flush frame for suspended grid ceilings, a 1/2" square white eggcrate louver, and electronic, low harmonic ballasts.

Lamps: (2) F32T8/SPX35

Manufacturers: *Metalux* # GP-232PLA-277V-EB81
Columbia # 4PS14-232G-FSPLA-EB8LH277
Lithonia # SP G 3 32 PL 120 GEB10
Lightolier # SPS1GFSBP240-277-S0



Dimensions: Width = 25-1/2" Length = 49" Recess Height = 3"

Type: A6

Description: Recessed 2 x 4 static fluorescent vandal-resistant troffer with flush frame for gypsum ceilings, an acrylic prismatic diffuser, and electronic, low harmonic ballasts.

Lamps: (3) F32T8/SPX35

Manufacturers: *Kenall* # RCD-4-2/3-32-PB-2-277-1/2-PF
Morelite # FHM-24-332-1/B-F1-PF-277
Lightron # 6OF-2X4-332-18GA-20-5-CPA-277

Type: A7

Description: Similar to Type A6 except 1 x 4 with 2 lamps.

Lamps: (2) F32T8/SPX35

Manufacturers: *Kenall* # RCA-4-2/2-32-PB-2-277-1/2-PF
Morelite # FHM-14-232-1/B-F1-PF-277
Lightron # 6OF-1X4-232-18GA-20-5-CPA-277

Type: A8

Description: Similar to type A4 except 2 x 2 with three compact fluorescent lamps.

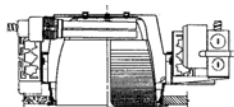
Lamps: (3) F40/30BX/SPX35
Manufacturers: *Metalux* # 2GC8/340BX/277EB81/G2
Columbia # 4PS22-340TTG-FSA12-EB8LH277-G2
Lithonia # 2SP G 3 CF40 A12 277 GEB10-LG_
Lightolier # SPS2GFVA3FT277SO

Type: **A9**
Description: Similar to Type A1 except 120 volts and with frame for gypboard ceiling.
Lamps: (3) F32T8/SPX35
Manufacturers: *Metalux* # 2PFX-332S36-120EB82
Columbia # 4524-332F-LD3X6-S-120-EB8LH
Lithonia # 2PM4 F B 3 32 32LD 120 GEB10
Lightolier # PLA2F18LS340120SO

Type: **A10**
Description: Similar to Type A2 except 120 volts and with frame for gypboard ceiling.
Lamps: (3) F40/30BX/SPX35
Manufacturers: *Metalux* # 2PFX-3BX40S33-120EB82
Columbia # 4522-340TTF-LD3X3-S-120-EB8LH
Lithonia # 2PM4 F B 3 CF40 9LD 120 GEB10
Lightolier # DPS2F9LP32U-120-I3

Type: **A11**
Description: Similar to Type A3 except 120 volts and with frame for gypboard ceiling.
Lamps: (2) F32T8/SPX35
Manufacturers: *Metalux* # FP-232A-120V-EB81
Columbia # 4PS14-232F-FSA12-EB8LH120
Lithonia # SP F 2 32 A12 120 GEB10-LG
Lightolier # SPS1FFSVA240-120-S0

Type: **A12**
Description: Similar to Type A3 except 120 volts and 2 X 2.
Lamps: (3) F40/30BX/SPX35
Manufacturers: *Kenall* # RCD-2-2/3-40B-PB-2-120-1/2-PF



Dimensions: Aperture Diameter = 7-3/8" Recess Height = 6-13/16"

Type: **B1**
Description: Recessed wall wash accent fixture with 8" (nom.) diameter open reflector cone with low iridescent finish. Provide electronic, non-dimming ballast.
Lamps: (2) F26DBXT4/SPX27/4P
Manufacturers: *Cooper Portfolio* # C7226E-7210LI-TRM7-P
Prescolite # CFR826UEB-ST492A-WW
Lithonia # AFW 2 26DTT 8AR LD 120 GEB10

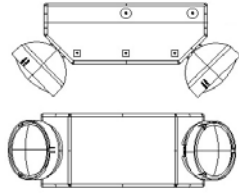


Type: **B2**

Description: Recessed downlight with 4-1/4" (nom.) diameter open aperture with white regressed baffle and white metal trim ring. Maximum recess height of fixture shall be 6-1/4". Fixtures shall be 120 volts.

Lamps: (1) 50PAR/H/FL25

Manufacturers: *Ardee Lighting # DL58WW/A435-120V*
Prescolite # LV4H-LV1-120V
Con-Tech Lighting # CTR301-WHT LVR316 120V



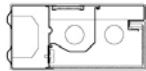
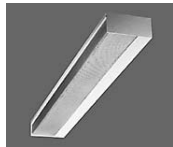
Dimensions: Length = 19-1/4" Height = 5-3/4" Projection = 7-15/16"

Type: **E1**

Description: 12 Volt, self-contained emergency light with two lamps (minimum 7.2 watts each) and integral battery rated to operate fixture for 90 minutes upon loss of normal power.

Lamps: (2) By Manufacturer

Manufacturers: *Sure-Lites # CC-7/WH*
DualLite # LZ35-12V
Lightalarms # CA-2
Lithonia # ELM4 SSB



Dimensions: Length = 48" Height = 3-1/2" Projection = 7-1/2"

Type: **E2**

Description: 4 ft. wall light with direct/indirect distribution. Provide acrylic lenses and white fixture housing. Mount fixture at height as directed by Architect.

Lamps: (2) F32T8/SPX35

Manufacturers: *Metalux # BEU-232-277-EB81*
Columbia # WAL4-1UD32-EB8LH277
Lithonia # WP 2 32 277



Dimensions: Length = 16" Height = 8" Projection = 10"

Type: **F1**

Description: Wall mounted adjustable accent uplight with remote ballast kit (mount ballast beside fixture on wall) Mount fixture at height as directed by Architect.

Lamps: (1) MVR250/HOR

Manufacturers: *SPI Lighting* # EDR-2503-120/277-BFT-RPI
Insight # TS922-WBR-SA
Winona # P1-LS-M250-LS8-SGB-



Dimensions: Length = 48" Height = 2-7/8" Width = 12"

Type: J1

Description: Surface ceiling fluorescent fixture with prismatic acrylic lens. Provide electronic ballast.

Lamps: (2) F32T8/SPX35

Manufacturers: *Metalux* # WB-432A-120-TEB81
Columbia # WP4-432-4EB8120
Lithonia # LB 2 32 120 GEB10



Dimensions: Length = 48" Height = 5" Width = 7"

Type: J2

Description: Surface ceiling fluorescent fixture with fiberglass housing and acrylic lens. Provide electronic ballast.

Lamps: (2) F32T8/SPX35

Manufacturers: *Metalux* # VT2-232-DR-277V-TEB81
Columbia # LUN4-232-EB8LH277
Lithonia DM 2 32 AR 277 GEB10



Dimensions: Length = 36" Height = 4-1/4" Projection = 4-1/4"

Type: K1

Description: 3 ft. wall light with direct/indirect distribution. Provide acrylic lenses and white fixture housing. Provide electronic ballast. Mount fixture on wall immediately above vanity mirror.

Lamps: (2) F25T8/SPX35

Manufacturers: *Metalux* # 6333-227V
Columbia # TL20-2T8-OA-EB8277-MW-3'
Lithonia # WC 2 17 277 GEB

Type: K2

Description: Similar to Type K1 except 120 volt.

Lamps: (2) F25T8/SPX35

Manufacturers: *Metalux* # 6333-120V

Columbia # TL20-2T8-OA-EB8120-MW-3'
Lithonia # WC 2 17 120 GEB



Dimensions: Width = 5.22" Height = 10.69" Projection = 2"

Type: **L1**

Description: Thin profile surface wall fixture, UL listed for damp locations with polycarbonate diffuser. Mount in elevator pit 24" above pit floor.

Lamps: (1) F13BX/SPX27/827

Manufacturers: *Kenall # 20-40-13*
Luraline # M3384 WAC WH 13H
Lithonia # TWL-13TT-120



Dimensions: Diameter = 15" Height = 21.5" Pendant Length = 36"

Type: **R1**

Description: Pendant mounted fixture with die-cast aluminum housing, integral ballast and a 36" long cable suspension system. Fixture shall include a ribbed frosted diffuser and a frosted bottom disk lens.

Lamps: (1) MXR150/U/MED/0

Manufacturers: *Lutrex # KR1508-M150-MST-277-SPB*

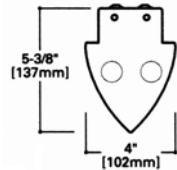


Type: **R2**

Description: Pendant compact fluorescent fixture with frosted glass diffuser and satin finish trim. Suspend fixtures with variable length cables to a height of 78" AFF to bottom of fixture. Provide ballast integral to ceiling canopy.

Lamps: (1) F13BX/SPX27/827

Manufacturers: *Eureka # E4034C-WP-F / S C / FRO*
Hessamerica # MS80P
Winona Lighting # 4608 MOD STD P



Dimensions: Height = 5-3/8" Length = 48"

Type: **R3**

Description: Pendant mounted fixture with cable suspension system and frosted acrylic diffuser. Pendant hang fixtures in line directly above HVAC duct. Provide 96" adjustable suspension cables.

Lamps: (2) F32T8/SPX35

Manufacturers: *Metalux* # BSX-TD-232-277-EB18-CCA-96-PFS

Type: **R4**

Description: Similar to Type R1 except with semi-specular reflector rather than frosted diffuser.

Lamps: (1) MXR150/U/MED/0

Manufacturers: *Lutrex* # KR1506-M150-MST-277-SPB



Type: **S1**

Description: Single pole mounted cut-off type area light with flat flush glass lens and reflector to provide a forward-throw distribution pattern. Pole shall be 24 foot, round tapered steel. Fixture and pole finish shall be black. Provide integral photocell with fixture. Fixture shall be UL listed for wet locations.

Lamps: (1) MVR250/HOR

Manufacturers: *McGraw-Edison* # GSM-AM-250-MH-MT-FT-FG-BK-R-OA1027-MA1010 (fixture)
TRS8A24SF-BK-3 (pole)

Type: **S2**

Description: Identical to Type S1 except with two lighting fixtures mounted at 180 degrees apart and 20 foot pole height.

Lamps: (2) MVR250/HOR

Manufacturers: *McGraw-Edison* # GSM-AM-250-MH-MT-FT-FG-BK-R-OA1027-MA1011 (fixture)
TRS8A20SF-BK-3 (pole)

Type: **S3**

Description: Identical to Type S1 except with two lighting fixtures mounted at 90 degrees apart.

Lamps: (2) MVR250/HOR

Manufacturers: *McGraw-Edison* # GSM-AM-250-MH-MT-FT-FG-BK-R-OA1027-MA1014 (fixture)
TRS8A24SF-BK-3 (pole)

Type: **S4**

Description: Identical to Type S1 except with three lighting fixtures mounted at 90 degrees apart and 20 foot pole height.

Lamps: (3) MVR250/HOR
Manufacturers: *McGraw-Edison* # GSM-AM-250-MH-MT-FT-FG-BK-R-OA1027-MA1016 (fixture)
TRS8A20SF-BK-3 (pole)

Type: S5
Description: Identical to Type S1 except with a reflector to provide a type III distribution pattern.
Lamps: (1) MVR250/HOR
Manufacturers: *McGraw-Edison* # GSM-AM-250-MH-MT-3F-FG-BK-R-OA1027-MA1010 (fixture)
TRS8A24SF-BK-3 (pole)

Type: S6
Description: Identical to Type S1 except with a spider arm post-top mount and a reflector to provide a type IV square distribution pattern.
Lamps: (1) MVR250/U
Manufacturers: *McGraw-Edison* # GSM-SM1-250-MH-MT-AS-FG-BK-R-OA1027-MA1010 (fixture)
TRS8A24SF-BK-3 (pole)



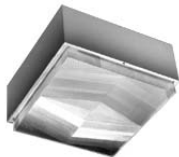
Type: S7
Description: Floodlight with slipfitter mount and .90 degree wall mount bracket arm. A total of ten of these fixtures shall be relocated from the City's existing Marine Terminal facility. All others shall be provided new under this contract. Fixtures shall be aimed at the vehicle pavement as directed on site by the Engineer. Provide new double side shielding visors for all fixtures (both existing and new).

Lamps: (1) MVR400/U
Manufacturers: *Lumark* # MHNK-S76-400-MT-SV/NK (fixture)
109W14 (bracket arm)



Type: S8
Description: Floodlight with 1/2" NPS mount. Install under vehicle canopy, aimed downward at each vehicle bay. Fixtures shall be aimed at the vehicle pavement as directed on site by the Engineer. 120 Volts.

Lamps: (1) Q500T3/CL
Manufacturers: *Lumark* # QZ5L



Type: S9

Description: Canopy light with flush, flat prismatic diffuser lens. Provide steel channel frame at top of fixture with a 12 inch long RGS conduit stem hanger to pendant hang fixtures plumb from the sloped canopy roof at each vehicle bay.

Lamps: (1) MVR400/HOR

Manufacturers: Lumark # MHCL-400-MT-C73



Type: S10

Description: Single pole mounted cut-off type roadway light with flat flush glass lens and reflector to provide a type III distribution pattern. Pole height (including bracket arm) shall be 24 foot, and shall be round tapered aluminum. Provide integral photocell with fixture. Fixture shall be UL listed for wet locations.

Lamps: (1) LU100

Manufacturers: Lumark # HPRY-FL-3-100-MT-PER-OA1027 (fixture)
RTA7L24AAS14-G (pole)

Type: S11

Description: Identical to Type S10 except with two lighting fixtures mounted at 180 degrees apart.

Lamps: (2) LU100

Manufacturers: Lumark # HPRY-FL-3-100-MT-PER-OA1027 (fixture)
RTA8L24AAS24-G (pole)

Type: S12

Description: Identical to Type S11 except with a reflector to provide a type III distribution pattern, and with a 150 watt high pressure sodium lamp.

Lamps: (1) LU150

Manufacturers: McGraw-Edison # GSM-AM-150-HPS-MT-3F-FG-BK-R-OA1027-MA1011 (fixture)
TRS8A24SF-BK-3 (pole)

Type: S13

Description: Identical to Type S11 except with a spider arm post-top mount and a reflector to provide a type IV square distribution pattern, and with a 150 watt high pressure sodium lamp.

Lamps: (1) LU150

Manufacturers: McGraw-Edison # GSM-SM1-150-HPS-MT-AS-FG-BK-R-OA1027-MA1010 (fixture)
TRS8A24SF-BK-3 (pole)

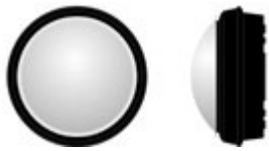


Type: S14

Description: Single pole mounted light with cast aluminum fixture (luminaire to be Holophane Hallbrook series leased under the Central Maine Power Company municipal street lighting lease program. Provide 18'-4" foot high, round tapered aluminum pole with 2'-8 1/2" long (center of pole to center of luminaire) straight bracket arm and with Hallbrook series clamshell base cover. Fixture and pole finish shall be a custom color to be selected by City. Pole and bracket arm shall be galvanized prior to final paint coat. Paint for pole, bracket arm and fixture shall be polyester powder coat paint. Provide integral photocell with fixture. Fixture shall be UL listed for wet locations.

Lamps: (1) MVR250/U

Manufacturers: *Holophane* # 180430505ST4 (pole and bracket arm)



Dimensions: Height = 6.4" Diameter = 13.2"

Type: S15

Description: Semi-recessed canopy light with cast aluminum fixture housing and impact resistant polycarbonate dome diffuser. Fixture finish shall be a custom color to be selected by architect. Fixture shall be UL listed for wet locations.

Lamps: (1) MXR50/U/MED

Manufacturers: *Kenall* # MR13FSR-S-CC-50M-1-120



Type: S16

Description: Surface mounted canopy light with cast aluminum fixture housing and guard, and borosilicate glass dome diffuser. Fixture finish shall be a custom color to be selected by architect. Fixture paint shall be polyester powder coat paint. Fixture shall be UL listed for wet locations.

Lamps: (1) MXR50/U/MED

Manufacturers: *Luminis* # SR510-M50-277-CM

Type: S17

Description: Similar to Type S14 except with a 14 foot high (including bracket arm) pole with and no Hallbrook clamshell base cover. The fixture shall be leased under the Central Maine Power Company municipal street lighting lease program.

Lamps: (1) MVR100/MED

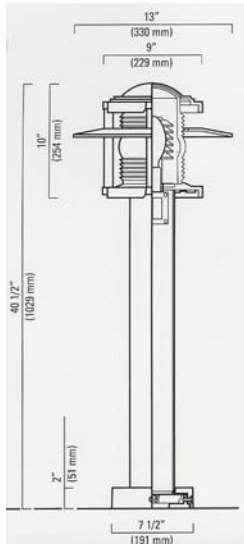
Manufacturers: *Holophane* # 140430505ST4 (pole and bracket arm)

Type: S18

Description: Floodlight with slipfitter mount and pole-mount bracket arm. Install fixtures at 20 ft. on Type S2 and S4 poles. Provide double side shielding visors for all fixtures

Lamps: (1) MVR250/U

Manufacturers: *Lumark* # MHNK-S76-250-MT-SV/NK (fixture)



Type: S19

Description: 40.5 inch high bollard light with internal shielding louver.

Lamps: (1) MVR100/MED

Manufacturers: Lumec # 100MH-CANDB4-FRN-277-SP

Type: S20

Description: Similar to Type S16 except with wall-mount bracket.

Lamps: (1) MXR50/U/MED

Manufacturers: Luminis # SR410T-277



Dimensions: Width = 13" Height = 7-1/2" Projection = 2-1/8"

Type: X1

Description: Single face die-polycarbonate exit sign with red letters.. Mount at height immediately above door frame. Provide directional arrows as indicated on plans.

Lamps: LED - By Manufacturer

Manufacturers: Sure-Lites # LPX 6 0 R WH

Type: X2

Description: Identical to Type X1 except ceiling mounted.

Manufacturers: Sure-Lites # LPX 6 0 R WH

END OF SECTION