

Appendix 6-C: Lighting Plan

EXTERIOR ILLUMINATION & GLARE MITIGATION PLAN

Due to

OUTDOOR LIGHTING

At the

CRICKET VALLEY ENERGY CENTER TOWN OF DOVER, DUTCHESS COUNTY, NEW YORK

Prepared by



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Revision	Date	Issued for	Prepared By	Technical Approval	Project Approval
A	07/21/10	Comment	T. Ruggiero	R. Saini	J. Chiappinelli
B	08/05/10	Permitting	T. Ruggiero	R. Saini	J. Chiappinelli

DOCUMENT No. 0300-E600

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DRAWINGS AND ATTACHMENTS

DRAWINGS:

E600, Rev B: Outdoor Lighting Plan with Full Lighting Levels

E601, Rev A: Outdoor Lighting Plan with Reduced Lighting Levels During Normal Plant Operation

ATTACHMENTS:

Attachment-A: Holophane Lighting Catalogue: G-250-HP-00-HDC-HGP Mongoose Style

Attachment-B: GE Lighting System Catalogue: Filter Gard H2 and H2U Luminaire

Attachment-C: GE Lighting System Catalogue: Wallighter 250 Cutoff Luminaire

Attachment-D: Lighting Pole Detail.

DOCUMENT No 03000-E600

EXTERIOR ILLUMINATION & GLARE MITIGATION PLAN

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REVISION SUMMARY

Rev. No	Date	Description	Affected pages

DOCUMENT No. 03000-E600

EXTERIOR ILLUMINATION & GLARE MITIGATION PLAN

Due to

OUTDOOR LIGHTING

1.0 INTRODUCTION

This document describes the design criteria used to mitigate effects of exterior illumination and glare associated with the outdoor lighting system at the Cricket Valley Energy Center (CVE) Power Plant to be located at the Town of Dover, Dutchess County, New York.

2.0 POWER PLANT DESCRIPTION

The power plant will comprise of three (3) sets of Combustion Turbine and Steam Turbine Generator Units, installed in a 1x1 combined cycle configuration. The generators will be connected by isolated phase bus ducts to their associated generator circuit breakers and step up transformers, which will feed power to an on-site 345 kV Gas Insulated Switchgear (GIS) substation, to be owned and operated by Con-Edison. The power plant equipment will be installed within the power plant building and a number of pre-fabricated equipment enclosures, located strategically within the power plant boundary. The outdoor areas surrounding the major equipment and enclosures, described below, will be provided with outdoor lighting:

- a) Transformer Yard (GSUTs) and (UATs)
- b) Heat Recovery Steam Generator (HRSG) Enclosure
- c) Air-cooled Condenser
- d) Closed Cooling Water Pumps
- e) Aqueous Ammonia Unloading Area
- f) Fuel Gas Conditioning and Metering Station
- g) Water Treatment, Waste Water Holding Tank, Potable Water Tank and Fire Protection Areas
- h) Balance of Plant (BOP) Equipment at the back of Turbine Building
- i) GIS Substation
- j) Administration and Maintenance Buildings
- k) Laydown Area
- l) Plant Roadways and Parking Lots

3.0 LIGHTING DESIGN CRITERIA

3.1 General Criteria

The outdoor areas surrounding the major equipment and enclosures, identified in Section 2.0 above, will be provided with two (2) levels lighting system with illumination levels as shown in Section 3.4.

1. Full lighting levels in all areas.

2. Reduced lighting levels that are adequate during normal operation, maintenance and inspection of power plant. Manual/automatic controls will be provided on the lighting circuits, to control lighting levels from zero to 50 percent in the pre-selected areas. Other areas will continue to have 100% lighting levels.

3.2 Codes and Standards

The outdoor lighting system will be designed in compliance with industry Codes and Standards including Town of Dover Zone Code and Illuminating Engineering Society (IES) Lighting Handbook.

3.2.1 Town of Dover Zone Code

Town of Dover Zone Code includes the following requirements for outdoor lighting system:

3.2.1.1 Environmental Performance Standard, Section 145-40 (L)

Exterior Illumination and Glare

“No use shall produce glare so as to cause illumination beyond the boundaries of the property on which it is located in excess of 0.5 footcandle. All exterior lighting, including security lighting, in connection with all buildings, signs or other uses shall be directed away from adjoining streets and properties. The Planning Board may require special efforts to reduce the impacts of exterior lighting, such as limiting hours of lighting, planting screening vegetation, or installing light shields to alleviate the impact of objectionable or offensive light and glare on neighboring residential properties and public thoroughfares”.

3.2.1.2 Off - Street Parking and Loading, Section 145-38 (A) 4.d

Lighting

“Lighting within parking lots shall be on low poles of 12 feet to 15 feet maximum height, with color-corrected lamps and cutoff luminaires designed to minimize glare and light pollution. Design of poles and luminaires shall be compatible with the style of the architecture and adjoining streetscape treatment. Sidewalks leading from parking lots shall be lit with bollard lighting and indirect illumination of buildings and vegetation”.

3.2.1.3 Site Plan Review, Section 145-65

(B) 7: Major project site plans shall be prepared by a licensed professional engineer, architect, or landscape architect and shall include the following (unless waived): The location, height, intensity, and bulb type (sodium, incandescent, etc.) of all external lighting fixtures. The direction of illumination and methods to eliminate glare onto adjoining properties must also be shown.

(D) 5.b: Exterior lighting fixtures shall be shielded to prevent light from shining directly onto neighboring properties or public ways.

3.2.1.4 Density and Dimensional Regulations, Section 145-11

(B): Dimensional Table. The following table is hereby adopted and will be referred to as the "Dimensional Table."

Maximum height (above grade): 35 feet (this value is to be used as the maximum height of lighting poles).

3.2.2 Illuminating Engineering Society (IES) Lighting Handbook

The outdoor lighting will be designed in accordance with the IES Lighting Handbook.

3.3 General Consideration

The outdoor lighting design will consider the following factors so as to minimize the light pollution during construction phase of the project as well as during plant operations:

- a) Light trespass
- b) Glare and reflected glare
- c) Over illumination
- d) Night sky friendly lighting

3.3.1 Construction Lighting

The lighting during construction will be used in a manner to minimize the following night lighting impacts:

- a) All lighting will be of minimum brightness consistent with work safety and security, as defined in the IES Lighting Handbook and with respect to specific outdoor tasks.
- b) All fixed position lighting will be shielded/hooded, and directed downward and toward the area to be illuminated to prevent direct illumination of the night sky and direct light trespass (i.e., direct light extending outside the boundaries of the property line at the Power Plant including any security related boundaries).
- c) Wherever feasible, any lights not necessary for safety or security will be turned off when not in use.
- d) The lighting fixtures will be located within the plant at strategic location to facilitate security and construction requirement, and 1000 watt (W) metal halide light fixtures will be used.

3.3.2 Permanent Outdoor Lighting

The permanent outdoor area lighting will provide illumination that meets OSHA requirements, consistent with the safety and security considerations. The permanent exterior lighting design will include the following features:

- a) Light fixtures that will not cause direct light trespass beyond the project site, per Dover Zone Code section 145- 40 (L).
- b) Lighting will not cause excessive reflected glare.
- c) Direct lighting will not illuminate the night sky.

- d) High Pressure Sodium vapor (HPS) fixtures will be used with light directed downward or toward the area to be illuminated.
- e) Lighting fixtures will be of minimum brightness consistent with operational safety and security of power plant operation.
- f) Switchable lighting fixtures will be provided in the laydown area located within the property line.
- g) The plant road lighting will be provided by HPS light fixtures mounted on 25 ft high street light poles. Parking lot lighting will be provided by HPS light fixtures mounted on 15 ft high street poles. The spacing will be determined based upon a 2 footcandle illumination level and the photometric characteristics of the light fixtures. The street light fixtures will be a full cut off type to achieve night sky friendly lighting.
- h) Suitable types of lighting fixtures shall be used in the classified areas.
- i) Lights on maintenance platforms will be provided with switches at the ground level so that the lights can be operated only when the area is occupied.

3.4 Illumination Levels

The lighting illumination levels in various areas of the plant for the two (2) difference lighting level scenarios described in Section 3.1 will be as follows:

Area	Illumination Level (fc)	
	Full Lighting	Reduced Lighting (0, 50%, and 100%)
Transformer Yard (inside/outside firewall)	2/5	2/5
Outside of HRSG Enclosure	2	2
Air-cooled Condenser	2	0
Closed Cooling Water Pumps	2	0
Aqueous Ammonia Unloading Area	5	0
BOP Equipment at the back of the Turbine Bldg	2	0
Electrical PCC/SWGR Bldg Platform & stairs	5	0
Tank Area and Water Treatment Bldg	2	2
Plant Road & Parking Area	2	2
Administration and Maintenance Buildings	2	2
Fuel Gas Conditioning and Metering Station	2	1
Black Start Diesel Generator Area	2	0
GIS Substation	2	1

4.0 LIGHTING FIXTURE SCHEDULE

The following types of lighting fixtures will be used in the design of outdoor lighting system:

Area	Fixture Type	Description
Plant Roads	D Attachment-A	HPS Street light Luminaire-Holophane fixture type G-250-HP-00-HDC-HGP Mongoose Style with 250W HPS lamp Mounting: Fixture will be mounted on 25' pole
Parking Lots	C Attachment-A	HPS Street light Luminaire-Holophane fixture type G-250-HP-00-HDC-HGP Mongoose Style with 250W HPS lamp Mounting: Fixture will be mounted on 15' pole
Fuel Gas Conditioning and Metering Station	D Attachment-A	HPS Street light Luminaire-Holophane fixture type G-250-HP-00-HDC-HGP Mongoose Style with 250W HPS lamp Mounting: Fixture will be mounted on 25' pole
HRSB Enclosure Area	W1 Attachment-C	GE Lighting System fixture type Wallighter, 250 cut off Luminaire, with 100W HPS lamp. Mounting: Fixture will be mounted at 8' elevation.
Cooled Condenser, Closed Cooling Water Pumps,	G2 (Attachment-B)	GE Lighting System fixture type H2 with 100W HPS lamp. Mounting: Fixture will be mounted on 8' high Stanchion. With Hood Options
Black Start Diesel Generator	G2 (Attachment-B)	GE Lighting System fixture type H2 with 100W HPS lamp suitable for installation in classified area. Mounting: Fixture will be mounted on 8' high Stanchion. With Hood Options
Transformer area (on the transformer fire wall, inside face)	W1 (Attachment-C)	GE Lighting System fixture type Wallighter 250 cut off Luminaire, with 100W HPS lamp. Mounting: Fixture will be mounted at 8' elevation.
Transformer Yard (on the transformer fire wall, outside face)	W2 (Attachment-C)	GE Lighting System fixture type Wallighter 250 cut off Luminaire, with 200W HPS lamp. Mounting: Fixture will be mounted at 12' elevation.
BOP equipment at the back of the Turbine Bldg	G2 Attachment-B	GE Lighting System fixture type H2 with 100W HPS lamp. Mounting: Fixture will be mounted on 8' high Stanchion. With Hood Option
Electrical PCC/SWGR Bldg Platform & stairs	W2 Attachment-C	GE Lighting System fixture type Wallighter 250 cut off Luminaire, with 200W HPS lamp. Mounting: Fixture will be mounted on the building at 12' elevation.
Aqueous Ammonia Unloading Area	W2 Attachment-C	GE Lighting System fixture type Wallighter 250 cut off Luminaire, with 200W HPS lamp. Mounting: Fixture will be mounted on the ammonia

Area	Fixture Type	Description
		storage tank building at 12' elevation.
GIS Substation	W1 Attachment-C	GE Lighting System fixture type Wallighter 250 cut off Luminaire, with 100W HPS lamp, suitable for classified areas. Mounting: Fixture will be mounted on the outside surface of the building at 12' elevation.
Admin & Maintenance Buildings	W1 Attachment-C	GE Lighting System fixture type Wallighter 250 cut off Luminaire, with 100W HPS lamp. Mounting: Fixture will be mounted on the outside surface of the building at 12' elevation.
Laydown Areas	D Attachment-A	HPS Street light Luminaire - Holophane fixture type G-250-HP-00-HDC-HGP Mongoose Style with 250W HPS lamp Mounting: Fixture will be mounted on 25' pole
Tank area and Water Treatment Building	W1 Attachment-C	GE Lighting System fixture type Wallighter 250 cut off Luminaire, with 100W HPS lamp. Mounting: Fixture will be mounted on the outside surface of the building or structure at 12' elevation.

5.0 LIGHTING CALCULATIONS

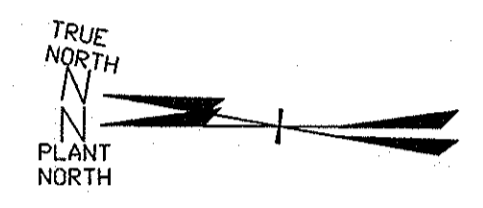
Computer software for lighting design known as “Acuity’s Visual Professional”, Version 2.06 has been used to model the major power plant equipment and enclosures, and the types of lighting fixtures used in various areas of the plant. Each lighting fixture has specific photometric characteristics based on its aim, orientation, and height. The software compiles all of the photometric characteristics of each lighting fixture based on their locations and displays the illumination levels in foot candles at each modeled location. The results of software calculations have been plotted on Lighting Plan drawings for both “Full Light” and “Reduced Lighting” conditions.

6.0 RESULTS OF CALCULATIONS

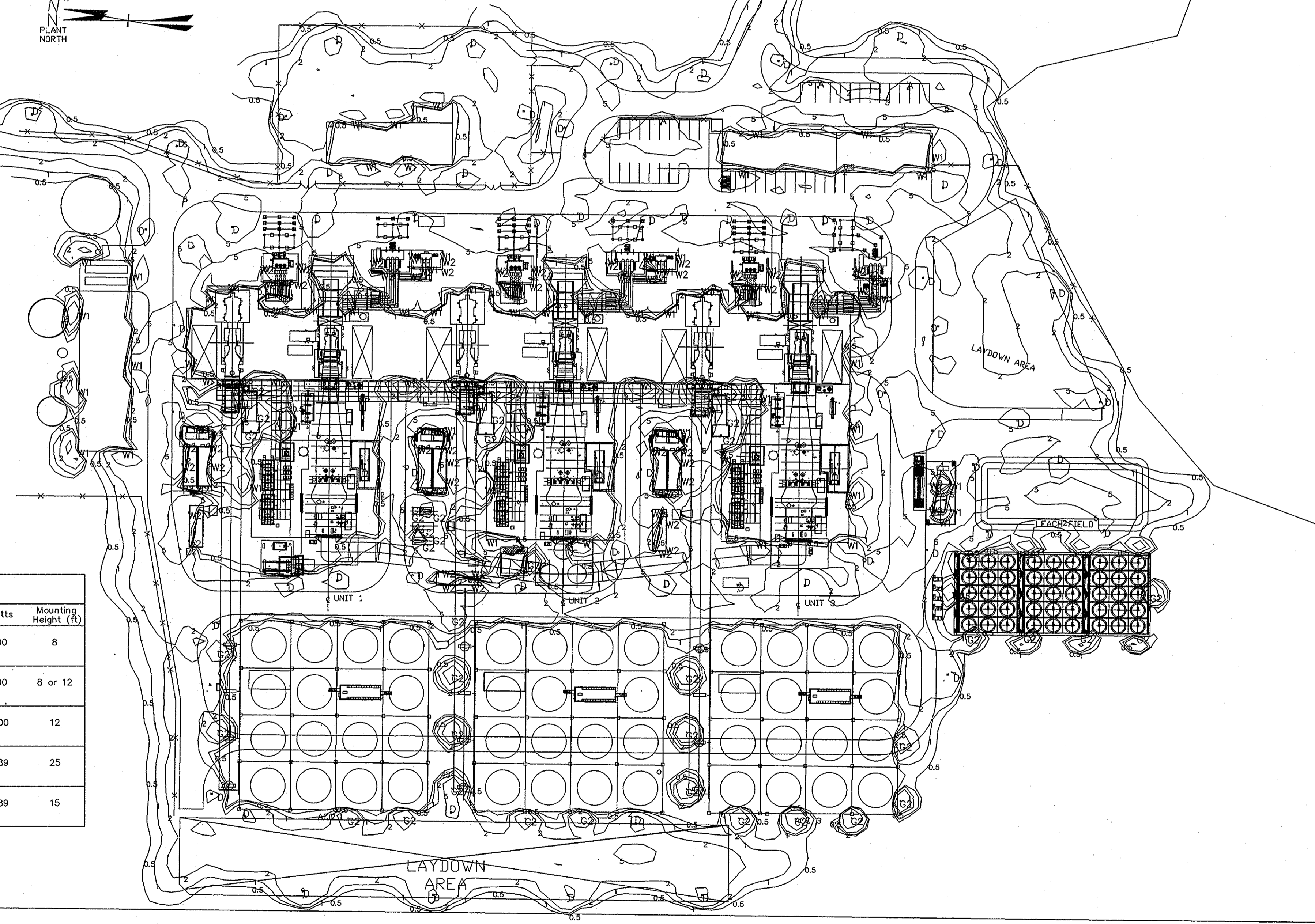
Review of lighting plan drawings show that:

- The average illumination level, with full lighting covering all areas of power plant, will be 2.2 footcandles (fc).
- The average illumination level, with reduced lighting required during normal operation, maintenance and inspection at the required areas of the power plant will be 1.4 footcandles (fc).
- The maximum illumination level outside the lighting zone, for both full lighting and reduced lighting cases, will be 0.5 footcandles (fc).

ROUTE 22



FG METERING STATION



PROPERTY LINE

NOTES
1. Locations of fixture types stated under Luminaire Schedule are shown on this drawing.

Label	Qty	Catalog Number	Description	Lamp	File	Lumens	LLF	Watts	Mounting Height (ft)
G2	46	H2210S5SGGQ	FILTER-GARD H2	1; 100W HPS, CLEAR ED23.5, VBU	GE177024.IES	9500	0.86	100	8
W1	91	W25C10S2M1GM GLDB	WALLLIGHTER 250 CUTOFF	1; 100W HPS, CLEAR ED23.5, VBU	GE178825.IES	9500	0.86	100	8 or 12
W2	54	W25C20S2M1GM GLDB	WALLLIGHTER 250 CUTOFF	1; 200W HPS, CLEAR ED18, HORZ	GE178830.IES	22000	0.86	200	12
D	73	G250HP00HDCXXX	MONGOOSE	250W CLEAR HPS	G250HP00HD CXXX.ies	28000	1.00	289	25
A	3	G250HP00HDCXXX	MONGOOSE	250W CLEAR HPS	G250HP00HD CXXX.ies	28000	1.00	289	15

\$1000000.00 \$1000000.00 \$1000000.00 \$1000000.00

Rev No	Revision	Date	Dwn	Chkd	Approved Chief Engr	Rev No	Revision	Date	Dwn	Chkd	Approved Chief Engr	Rev No	Revision	Date	Dwn	Chkd	Approved Chief Engr	
													A	ISSUED FOR COMMENT	7/9/10	TR	RS	RS
													B	ISSUED FOR PERMITTING	7/13/10	TR	RS	RS

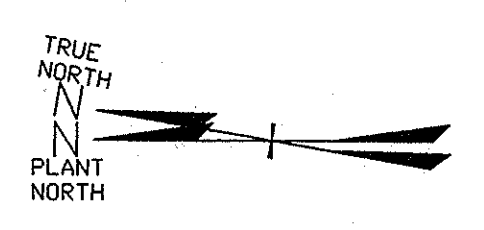
CRICKET VALLEY ENERGY
TOWN OF DOVER
DUTCHESS COUNTY, NEW YORK

OUTDOOR LIGHTING PLAN
WITH FULL LIGHTING LEVELS

BURNS AND ROE ENTERPRISES, INC.
Engineers and Constructors - Oradell, NJ
New York Certificate of Authorization No. 0004677

Lead Engineer	Date	Approved for Construction	Work Order	Drawing No	Sh	Rev
R. SAINI	7/21/10	Chief ELECTRICAL Engineer	3000	E600		B

ROUTE 22



PG METERING STATION

LAYDOWN AREA

PROPERTY LINE

LEACH FIELD

LAYDOWN AREA

NOTES
 1. Locations of fixture types stated under Luminaire Schedule are shown on this drawing.

LUMINAIRE SCHEDULE									
Label	Qty	Catalog Number	Description	Lamp	File	Lumens	LLF	Watts	Mounting Height (ft)
G2	0	H2210SSGGQ	FILTER-GARD H2	1; 100W HPS, CLEAR ED23.5, VBU	GE177024.IES	9500	0.86	100	8
W1	79	W25C10S2M1GM GLDB	WALLLIGHTER 250 CUTOFF	1; 100W HPS, CLEAR ED23.5, VBU	GE178825.IES	9500	0.86	100	8 or 12
W2	27	W25C20S2M1GM GLDB	WALLLIGHTER 250 CUTOFF	1; 200W HPS, CLEAR ED18, HORZ	GE178830.IES	22000	0.86	200	12
D	53	G250HP00HDCXXX	MONGOOSE	250W CLEAR HPS	G250HP00HD CXXX.ies	28000	1.00	289	25
C	3	G250HP00HDCXXX	MONGOOSE	250W CLEAR HPS	G250HP00HD CXXX.ies	28000	1.00	289	15

\$\$\$\$TIME\$\$\$

\$\$\$\$DATE\$\$\$

Rev No	Revision	Date	Dwn	Chkd	Approved Chief Engr	Rev No	Revision	Date	Dwn	Chkd	Approved Chief Engr	Rev No	Revision	Date	Dwn	Chkd	Approved Chief Engr
												A	ISSUED FOR PERMITTING	8/10	TR		Raman

Drawing Control				
Purpose	Approved By	Date	Released By	Date
For Information	Raman	8/5/10	Dum	8/6/10
For Comment				
For Bid				
For Fabrication				
For Construction				

Engineering Review		
Disc	Engr	Date
Mech		
Elec		
Civil		
Arch		
Instr		

Lead Engineer	Date	Approved for Construction	Work Order	Drawing No	Sh	Rev
R. SAINI	7/29/10	ChiefELECTRICAL Engineer	3000	E601		A

advanced power CRICKET VALLEY ENERGY
 TOWN OF DOVER
 DUTCHESS COUNTY, NEW YORK

OUTDOOR LIGHTING PLAN WITH REDUCED LIGHTING LEVELS DURING NORMAL PLANT OPERATION

BURNS AND ROE ENTERPRISES, INC.
 Engineers and Constructors - Oradell, NJ
 New York Certificate of Authorization No. 0004677

MONGOOSE[®]



The Mongoose Roadway and Area Lighting luminaire offers paramount versatility of applications with advanced optical systems and an aesthetically pleasing design. The ability to configure the Mongoose optics, tilt, and mounting method to meet specific applications enables it to be used in diverse applications ranging from interstates to parking lots. With fourteen optical configurations, including wide roadway,

narrow roadway, medium roadway, forward throw, wide flood, narrow flood, and square distributions and tilts ranging from 0° to 45°, it provides unparalleled solutions for a multitude of lighting requirements. The Mongoose has full cutoff through semi-cutoff distributions providing additional flexibility where required.

MONGOOSE[®]

The Mongoose luminaire is the ideal solution for all of your roadway lighting needs! The versatility in optics, mounting methods, and tilts allows it to be configured for applications ranging from expressways to residential neighborhoods. Up to 6 lanes of roadway can be illuminated from one side of the roadway utilizing Mongoose.



Recommended optical choices for roadway applications include wide roadway, narrow roadway, forward throw, square distribution, and medium roadway.

Advanced optics and tilts ranging from 0° to 45° with setbacks up to 50 feet from the road allow flexibility in applications ranging from offset lighting to full cutoff, while providing optimal horizontal and vertical illumination.

The number of poles required are reduced due to the Mongoose superlative optics. Roadway clutter associated with arms required to support traditional luminaires is minimized.



Roadway Applications



EXPRESSWAYS

RESIDENTIAL STREETS

PARKWAYS

RAMPS

HIGHWAYS

INTERCHANGES

RURAL ROADS

Utilities and DOT's are finding that by using Mongoose over traditional lighting, they are able to reduce maintenance costs and minimize road closures. An interesting installation of the Mongoose consists of mounting on high mast poles in a staggered arrangement for interstates, interchanges, ramps, and highways eliminating knock down problems and costs associated with traffic control, while providing more uniform photometric distributions.



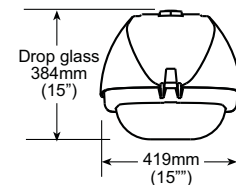
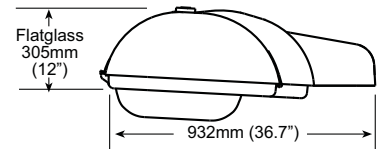
MONGOOSE[®]

MONGOOSE®

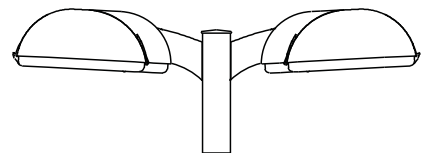
How to construct a catalog number for Mongoose® luminaire: Fixture type _____

EXAMPLE: G — 400HP — 24 — L — NC — V — Z — B
 1 2 3 4 5 6 7 8

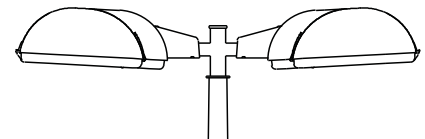
Catalog no.	Description
1	Luminaire type
___ G	Mongoose
2	Source and wattage
___ 100HP	100W HPS, mogul base
___ 15AHP	150W/55 volt, HPS, mogul base
___ 250HP	250W HPS, mogul base
___ 400HP	400W HPS, mogul base
___ 175MH	175W Metal halide, mogul base
___ 250MH	250W Metal halide, mogul base
___ 400MH	400W Metal halide, mogul base
___ 750MH	750W Metal halide, mogul base (Available through TSG with MM optics using compact lamps only)
3	Voltage
___ 12	120 volt
___ 20	208 volt
___ 24	240 volt
___ 27	277 volt
___ 34	347 volt
___ 48	480 volt
___ 08	208 volt, isolated secondary (Available through TSG)
___ 40	240 volt, isolated secondary (Available through TSG)
___ MT	Multi-volt (120, 208, 240, 277 volt)
___ MA	Multi-volt. Wired to 120V tap.
___ MB	Multi-volt. Wired to 208V tap.
___ MC	Multi-volt. Wired to 240V tap.
___ MD	Multi-volt. Wired to 277V tap.
___ VT	Vari-tap (120, 277, 347V); With 250HP, 400HP, 250MH & 400MH only
4	Tilt range
___ L	Low tilt, 0° to 18°
___ H	High tilt, 27° to 45°
5	Optics
___ DC	Medium roadway, clear drop glass (Available with "H" tilt range only)
___ DR	Medium roadway, prismatic refractor (Available with "H" tilt range only)
___ FC	Forward throw, clear drop glass (400W MH requires compact lamp); Available with "L" low tilt range only.
___ FF	Forward throw, flat glass (400W MH requires compact lamp); (Available with "L" low tilt range only)
___ NC	Narrow roadway, clear drop glass (Low tilt comes with shallow glass optic)
___ NF	Narrow roadway, flat glass (Available with "L" low tilt range only)
___ NR	Narrow roadway, prismatic refractor
___ ND	Narrow flood (Available with "H" high tilt range only)
___ WD	Wide flood (Available with "H" high tilt range only)
___ SC	Square distribution, clear drop glass (Available with "L" low tilt range only)
___ SF	Square distribution, flat glass (175W, 250W & 400W MH); 400W MH requires compact lamp. (Available with "L" low tilt range only)
___ WC	Wide roadway, clear drop glass (Low tilt comes with shallow glass optic)
___ WF	Wide roadway, flat glass (Available with "L" low tilt range Only)
___ WR	Wide roadway, prismatic refractor



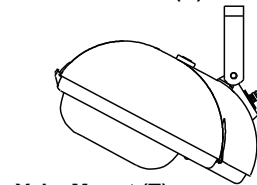
Vertical Tenon (V)



Architectural Arm (A)



Horizontal Arm (H)



Yoke Mount (T)

Ordering Data

Catalog no.	Description
6	Mounting
___ A	Architectural arm
___ H	Horizontal arm
___ T	Yoke mount (Available through TSG)
___ V	Vertical tenon
7	Finish
___ G	Gray
___ K	Black
___ N	Green
___ W	White
___ Z	Bronze
8	Options
___ B	Terminal block and NEMA decal (Not available with Option C)
___ C	NEMA decal (Not available with Option B)
___ P	Protected starter (HPS only)
___ R	NEMA twistlock photocontrol receptacle
___ T	Spade termination for ballast leads (Available with MT, MA, MB, MC, MD and VT ballasts only)
___ 3'	3" tenon adapter (Available with "V" mounting only)
___ 6	6' pigtail
Accessories	
___ F1	Single fuse kit (Available with 12, 24, 27, and 34V units)
___ F2	Double fuse kit (Available with 20, 24, and 48V units); NA with 08 and 40V
___ Lamp	Ship appropriate lamp as line item
___ BKT-5-G	Galvanized wood pole bracket
___ BR-1091-XX	3" to 2" tenon adapter bracket

- Notes: 1 Adapter will be painted same color as fixture finish in Step 6.
2 Insert GR-Gray, BK-Black, GN-Green, WH-White, BZ-Bronze for "XX" in catalog number.



Flat glass



Clear drop glass (regular)



*Clear drop glass (shallow glass optics)
Standard with low tilt NC and WC optics*

MONGOOSE®

MONGOOSE®

Photometric test number, IES distribution type, and cutoff classification

Watts/ Lamp	Narrow Roadway			Medium Roadway			Wide Roadway			Extra Wide Roadway	
	Flat Glass	Clear Drop	Prismatic Refractor	Flat Glass	Clear Drop	Prismatic Refractor	Flat Glass	Clear Drop	Prismatic Refractor	Flat Glass	Clear Drop
100 HPS	49293 I,FC	51853 II,C	49498 I,C				49416 III,FC	51851 III,C	49499 II,C		
150 HPS	49274 I,FC	51850 I,C	49506 I,C	51904 III,FC	51903 III,C		49419 III,FC	51854 III,C	49513 II,C	51889 IV,FC	51895 IV,C
175 MH	49488 I,FC	51876 I,C	49518 I,C	51880 II,FC	51879 II,C		49449 II,FC	51875 II,C			51894 IV,NC
250 HPS	49260 II,FC	51562 II,C	49527 II,C	51901 III,FC	51900 III,C	49524 II,C	49395 III,FC	51844 III,C		51890 IV,FC	51891 IV,SC
250 MH	49296 I,FC	51868 II,C		51905 III,FC	51906 III,C					51898 IV,FC	51893 IV,SC
400 MH COMPACT										51896 IV,FC	51892 IV,NC
400 HPS	49257 II,FC	51561 II,C	49482 II,C	51902 III,FC	50347 III,NC	50346 III,NC	49396 III,FC	51843 III,C	49484 II,C	51888 IV,FC	51887 IV,SC
400 MH	50281 II,FC	52307 II,C	50278 II,C				50276 II,FC	49624 III,C	50279 II,C		

* IES Distribution: FC = Full Cutoff; C = Cutoff; SC = Semi-Cutoff; NC = Non Cutoff
All lamps are clear

Photometric test number, IES distribution type, and cutoff classification

Watts/ Lamp	Forward Throw		Offset - Narrow*		Offset - Wide*		Square	
	Flat Glass	Clear Drop	Clear Drop	Prismatic Refractor	Clear Drop	Prismatic Refractor	Flat Glass	Clear Drop
150 HPS	51431 IV,FC	51444 IV,NC	49739 IV,NC	49738 IV,NC	49922 IV,NC	49923 IV,NC		51151 IV,SC
175 MH	51449 IV,FC	51443 IV,NC	49747 III,NC	49745 IV,NC	49983 IV,NC	49984 IV,NC	51048 III,FC	51039 IV,NC
250 HPS	51437 IV,FC	51440 IV,SC	49736 III,NC	49734 III,NC	49986 IV,NC	49985 III,NC		51135 IV,SC
250 MH	51452 IV,FC	51442 IV,NC	49757 II,C	49758 IV,NC	50000 IV,NC	49999 IV,NC	51046 III,FC	51041 III,SC
400 MH COMPACT	51448 IV,FC	51441 IV,NC					51055 III,FC	51037 III,NC
400 HPS	51419 IV,FC	51417 IV,SC	49730 III,C	49732 III,NC	49899 IV,NC	49900 IV,NC		51132 IV,SC
400 MH	51034 IV,FC	51028 IV,C	49291 II,NC	49530 II,NC	49982 III,NC	49981 III,NC		51031 IV,NC

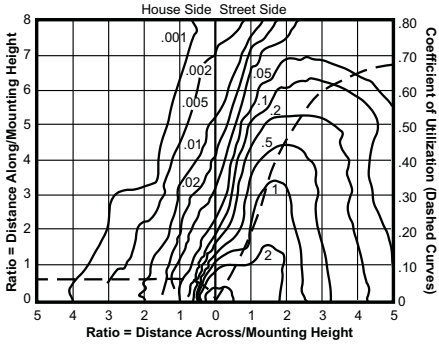
IES Distribution: FC = Full Cutoff; C = Cutoff; SC = Semi-Cutoff; NC = Non Cutoff
* All units tested at 0° tilt except offset types
All lamps are clear

Example: IV, FC = IES Type IV, Full Cutoff

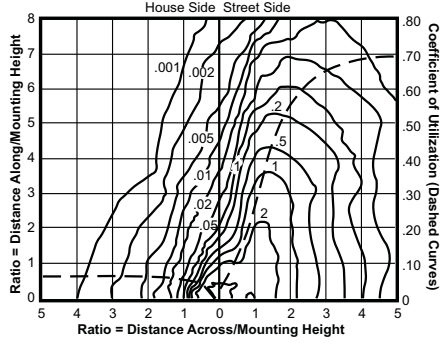
Photometrics— 30' Mounting Height

Isofootcandle curves

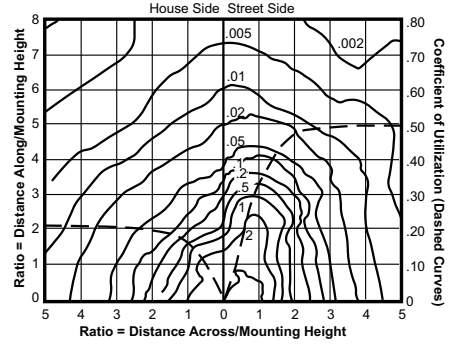
Cat. No. G400HP00HWC
400W Clear HPS/Test No. 49899



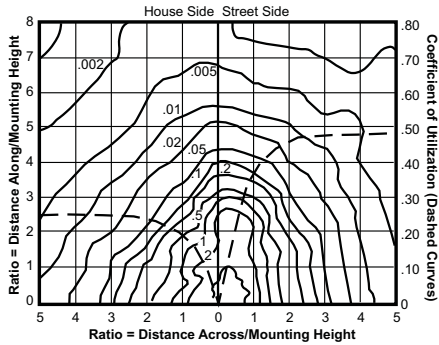
Cat. No. G400HP00HNC
400W Clear HPS/Test No. 49730



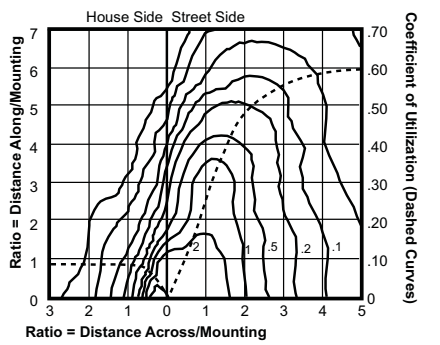
Cat. No. G400HP00LWR
400W Clear HPS/Test No. 49484



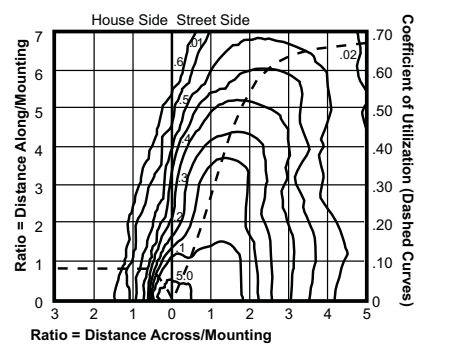
Cat. No. G400HP00LNR
400W Clear HPS/Test No. 49482



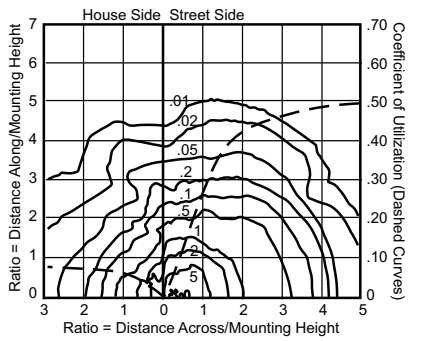
Cat. No. G400HP00HDR
400W Clear HPS/Test No. 50346



Cat. No. G400HP00HDC
400W Clear HPS/Test No. 50347



Cat. No. G400HP00LFF
400W Clear HPS/Test No. 51419

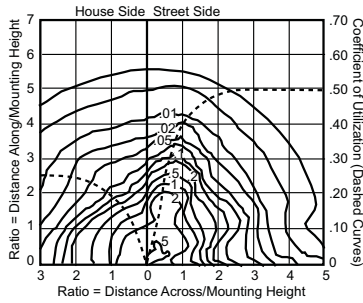


High Pressure Sodium

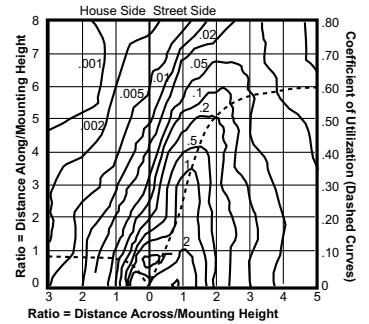
MONGOOSE®

Isofootcandle curves

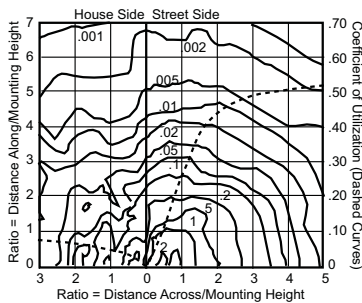
Cat. No. G400MH00LNF
400W Clear MH/Test No. 50281



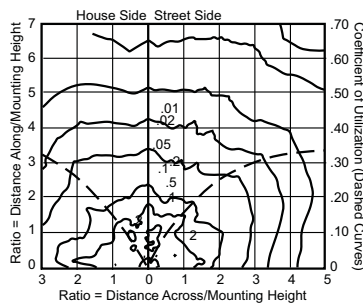
Cat. No. G400MH00HWR
400W Clear MH/Test No. 49981



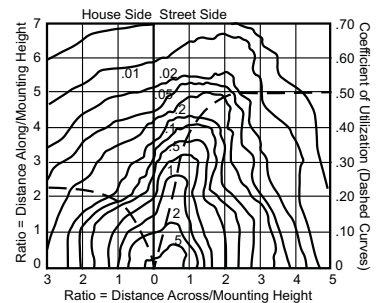
Cat. No. G400MH00LFC
400W Clear MH/Test No. 51028



Cat. No. G400MH00LSC
400W Clear MH/Test No. 51031



Cat. No. G400MH00LWF
400W Clear MH/Test No. 50276



Metal Halide



HOLOPHANE[®]
LEADER IN LIGHTING SOLUTIONS

An **AcuityBrands** Company

Acuity Lighting Group, Inc.

214 Oakwood Ave., Newark, OH 43055 /
Holophane Canada, Inc. 9040 Leslie Street, Suite
208, Richmond Hill, ON L4B 3M4 / Holophane
Europe Limited, Bond Ave., Milton Keynes MK1
1JG, England / Holophane, S.A. de C.V.,
Apartado Postal No. 986, Naucalpan de Juarez,
53000 Edo. de Mexico

Contact your local Holophane factory sales representative for application assistance, and computer-aided design and cost studies. For information on other Holophane products and systems, call the Inside Sales Service Department at 740-345-9631. In Canada call 905-707-5830 or fax 905-707-5695.

Limited Warranty and Limitation of Liability
Refer to the Holophane limited material warranty and limitation of liability on this product, which are published in the "Terms and Conditions" section of the current product digest, and is available from our local Holophane sales representative.

Visit our web site at www.holophane.com

**ATTACHEMENT-B
FIXTURE "G2"**



**FILTR•GARD® H2 AND H2U LUMINAIRE
UL844, UL 1598 Outdoor Salt Water,
UL1598 Suitable for Wet Locations**

APPLICATIONS

- For adverse, severe duty and hazardous classifications (HID lamps)

SPECIFICATION FEATURES

- 1598 Listed General Non-Hazardous **Suitable For Wet Locations**. For metal halide lamps in polymeric lamp containment barriers
- 1598 Outdoor Salt Water Listed (formerly UL595)
 - Meets NEMA 4X Standards
- 844 Listed
 - Class I, Division 2, Groups A, B, C and D
- Class II, Division 1, Groups E, F and G
- Class II, Division 2, Group G
- Class III, Divisions 1 and 2
- Maxi-Lux® guard
- Charcoal filters
- Multiple optical assemblies
- NEMA decal
- Wiring compartment
- Polyester powder gray paint finish
- **H2** shipped as components: Ballast, Mounting, Optical, and Accessories
- **H2U** shipped all in one carton with lamp and optical installed
- Low copper aluminum alloys
- Quick disconnect
- Mogul base socket
- Multiple mounting arrangements
- Safety chain provisions

ORDERING NUMBER LOGIC

H2	0	05L	3C	GG	F
PRODUCT IDENT	VOLTAGE	WATTAGE/LIGHT SOURCE/BALLAST TYPE	MOUNTING	OPTICAL***	OPTIONS
XX(X)	X	XXX	XX	XX(X)	XXX
H2 = Filtr•Gard H2 Luminaire CAUTION: see pages H-8-9 for Temperature Profile Data and Limitations. Standard: No lamp included. H2U = Filtr•Gard H2 Luminaire shipped all in one carton with lamp and optical installed	60 Hz* 0=120/208/240/277 Multivolt 1=120 2=208 3=240 4=277 5=480 * For 50 Hz, contact factory	See Ballast Selection Table UL844, UL1598 05L = 50W/HPS/HPF/Reactor or Lag 07L = 70W/HPS/HPF Reactor or Lag 10L = 100W HPS/HPF Reactor or Lag 15L = 150W(55V)/HPS/HPF Reactor or Lag 05K = 50W/HPS/Hot Restart HPF Reactor 07K = 70W/HPS/Hot Restart HPF Reactor 10K = 100W/HPS/Hot Restart HPF Reactor 15K = 150W(55V)/HPS/Hot Restart HPF Reactor 07S = 70W/HPS/Mag-Reg 10S = 100W/HPS/Mag-Reg 15S = 150W/HPS/Mag-Reg 25S = 250W/HPS/Autoreg 40S = 400W/HPS/Autoreg 10M = 100W/MH/HPF Lag (Med Base) Standard: Lamp not included except with H2U 17E = 175W/EPMH/Autoreg 25E = 250W/EPMH/Autoreg 40E = 400W/EPMH/Autoreg	3C = 3/4-in. Ceiling 4C = 1-in. Ceiling 3F = 3/4-in. Flexible pendant* 4F = 1-in. Flexible Pendant* 5J = 1-1/4-in. Angle Stanchion** 6J = 1-1/2-in. Angle Stanchion** 3P = 3/4-in. Rigid Pendant 4P = 1-in. Rigid Pendant 5S = 1-1/4-in. Straight Stanchion 6S = 1-1/2-in. Straight Stanchion 3W = 3/4-in. Wall 4W = 1-in. Wall 6P = 1-1/2-in. Pendant * Use when support is non-rigid. ** For limits see Temperature Profile. Caution: For metal halide, a universal burning type lamp must be used. *** Cannot be used for 250 and 400 watt units, switched quartz units or hot restart units. **** Contact Factory NOTE: Flexible pendant mounting cover must be used if unit is not rigidly mounted or fixture will not hang straight.	UL844, UL1598, UL1598 Outdoor Salt Water GG = Small Globe with Guard FG = Large Globe with Guard EG = Enclosed Reflector ALGLAS® finish with Guard (not UL1598 Outdoor Salt Water) NOTE: Not available with H2U V5G = 8-in. (203mm) Glass Refractor Type V with Guard V2G = 8-in. (203mm) Glass Refractor Type II with Guard R5G = 12-in. (305mm) Glass Refractor Type V with Guard R2G = 12-in. (305mm) Glass Refractor Type II with Guard UL844, UL1598 ONLY* A5G = 12-in. (305mm) Acrylic Refractor Type V with Guard A2G = 12-in. (305mm) Acrylic Refractor Type II with Guard L5G = 12-in. (305MM) Polycarbonate Refractor Type V with Guard L2G = 12-in. (305mm) Polycarbonate Refractor Type II with Guard NOTE: Remove G as last digit to eliminate Guard For additional information, see Photometric Selection Table	F =Fusing—(Not available with multivolt or UL1598 Outdoor Salt Water units) Q =Time Delay Automatically Switched Quartz is available in certain ratings for Class II only. (Not available for Low Profile mounting.) For availability and Temperature Profile and Limitations with quartz lamp, see pages H-8 and H-9 U =UL1598 Outdoor Salt Water/UL844

BALLAST SELECTION TABLE+

Temperature is 40°C unless otherwise indicated.

Wattage	Light Source	Ballast Type/Voltage					
		Multivolt	120	208	240	277	480
50	HPS	L	K,L	N/A	N/A	N/A	L
70, 100	HPS	L,K,A	L,K,S	L,K,S	L,K,S	L,K,S	K,S
150 (55V)	HPS	L,K,A	L,K,S	L,K,S	L,K,S	L,K,S	K,S
250, 400	HPS	S	S	S	S	S	S
100	MH	M*	M*	M*	M*	M*	M*
175, 250, 400	EPMH	E	E	E	E	E	E

- * NOTE: When using one of these opticals for a classified area, a special ballast assembly is required. Order, for example, similar to H201L3PA5G except for use with specified optical.
- **Standard max Ambient Temp is 40°C — for 55°C, 65°C, 90°C, contact factory.
- ***Before using, see pages H-8 and H-9 for Temperature Profile information.

- +Ballast Type—
- N/A = Not Available
- K = Hot Restart (HPF Reactor Type)
- L = High Pressure Sodium HPF Reactor or Lag
- E = Energy Act Compliant Pulse MH (EPMH)

- A = HPS Autoreg
- M*=Metal Halide, HPF Lag
- S = High Pressure Sodium Mag-Reg or Autoreg



FILTR•GARD® H2 AND H2U LUMINAIRE

UL844, UL 1598 Outdoor Salt Water,
UL1598 Suitable for Wet Locations

DIMENSIONS

See Pages H-22 thru H-25.

NOTES

You must use temperature profile data to properly select luminaire.
See Pages H-8 and H-9.

REFERENCES

See Pages H-8 and H-9 for Temperature Profiles and Limitations.
See Page H-36 for start of Accessories.
See Page H-41 for Component Ordering Logic.
See Pages H-42 for Explanation of Options and Other Terms Used.

DATA

See Dimensions Pages for approximate Net Weight.
Add weight for each component to get total luminaire weight.

OPTICAL ELIGIBILITY AND PHOTOMETRIC SELECTION TABLE

Photometric curve number 35-17 - - - - All light sources are clear unless otherwise indicated. Before using, imperative to check Temperature Profile information to properly match Optical to Classification - see pages H-8 and H-9.

Filtr•Gard Luminaire	70, 100, 150W(55V) HPS	250W HPS	100W MH	175W EPMH	250W EPMH	400W EPMH
Globe and guard (FG, 250W max) (GG, 175W max) coated (6693)	6618	(FG) 6633	8323	(FG) 6835	(FG) 6835	N/A
Globe and guard (FG, 250W max) (GG, 175W max) and dome reflector (H2000-001)	6619	(FG) 6634	8324	(FG) 6836	(FG) 6836	N/A
Globe and guard (FG, 250W max) (GG, 175W max*) and deep dome reflector (H2000-006)	7024	(FG) 7445	8325	(GG) 7446	(FG) 9155	N/A
Globe and guard (FG, 250W max) (GG, 175W max) and angle dome reflector (H2000-002)	6609	(FG) 6645	8326	6838	(FG) 9150	N/A
Angle Stanchion (5J or 6J) with globe and guard (FG, 250W max) (GG, 175W max)	7037	9136	8329	(GG) 9130	(FG) 9137	N/A
Angle Stanchion (5J or 6J) with globe and guard (FG, 250W max) (GG, 175W max) and dome reflector (H2000-001)	6814	9139	8330	(GG) 9133	(FG) 9140	N/A
Glass refractor Type V with guard (V5G, 175W max) (R5G, 400W max)	(R5G) (V5G) 6807 9442	(R5G) 6639**	(V5G) 8331	(V5G) 452876	(R5G) 9156	(R5G) 6778
Glass refractor Type II with guard (V2G, 175W max) (R2G, 400W max)	(R2G) 6810	(R2G) 6646**	(V2G) 9151	(V2G) 452875	(R2G) 9149	(R2G) 9153
Acrylic refractor Type V with guard (A5G, 150W max)	6867	N/A	8332	N/A	N/A	N/A
Acrylic refractor Type II with guard (A2G, 150W max)	6874	N/A	8333	N/A	N/A	N/A
Polycarbonate refractor Type V with guard (L5G, 150W max)	6864	N/A	N/A	N/A	N/A	N/A
Polycarbonate refractor Type II with guard (L2G, 150W max)	9152	N/A	*** 8335	N/A	N/A	N/A
Enclosed reflector with ALGLAS® (400W max) finish (without guard H2000-EN) (with guard H2000-EG)	6709	6725**	N/A	6731	6731	7838 (Coated)

NOTE: C/F=Contact Factory

NOTE: *For some ratings shown in Temperature Profile Information, GG can be used up to 250 watt maximum.

NOTE: **These curves are for 400 watt HPS also.

NOTE: ***Hazardous Location UL Listing not available. UL1598 or non UL Listed only..

N/A=Not Available





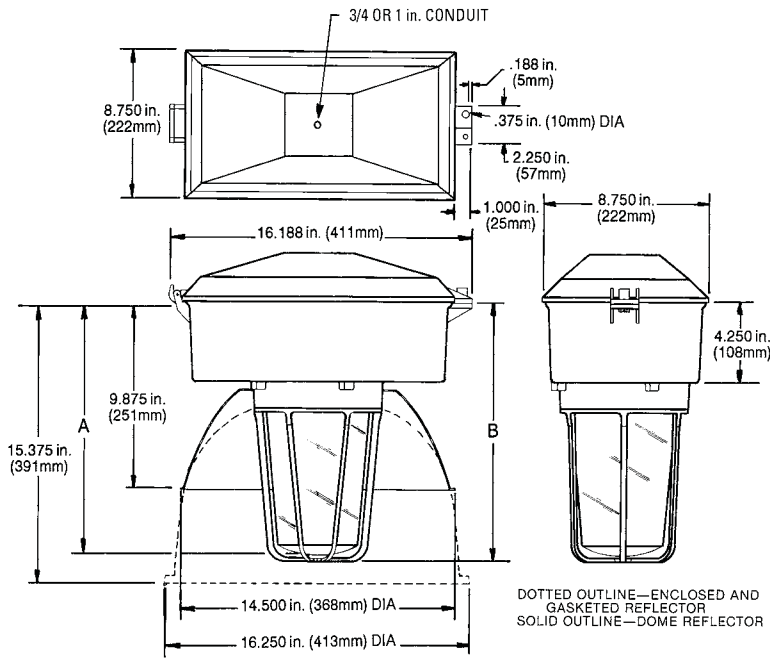
FILTR•GARD® H2 AND H2U LUMINAIRE

UL844, UL 1598 Outdoor Salt Water,
UL1598 Suitable for Wet Locations

YOU MUST USE TEMPERATURE PROFILE DATA
TO PROPERLY SELECT LUMINAIRE

FIXTURE DIMENSIONS

LUMINAIRE



BALLAST

Wattage	Approx Net Weight (lbs)	Approx Net Weight (kgs)
50	14.0	6
70	13.0-19.2	6-9
100	13.5-20.5	6-9
150 (55V)	14.5-21.1	7-10
175	14.4-15.5	7-7
250	16.7-22.5	8-10
400	19.3-22.7	9-10

NOTE: Does not include mountings or optics.

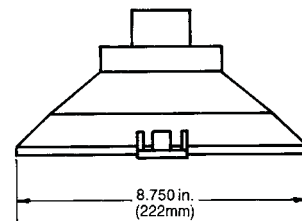
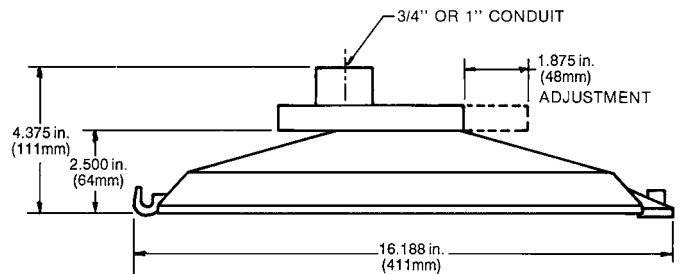
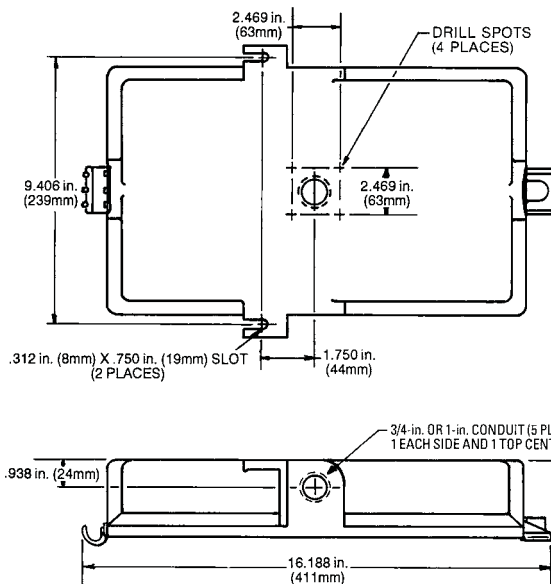
GLOBE

Dim	9 in. (229mm)	7 in. (178mm)
A	13.250 in. (337mm)	11.750 in. (298mm)
B	13.625 in. (346mm)	12.125 in. (308mm)

MOUNTINGS

CEILING	Approximate Net Weight
3/4-inch=3C	3.5 lbs 2 kgs
1-inch=4C	

FLEXIBLE PENDANT	Approximate Net Weight
3/4-inch=3F	3.5 lbs 2 kgs
1-inch=4F	



GE Lighting Systems, Inc.
www.gelightingssystem.com



FILTR•GARD® H2 AND H2U LUMINAIRE

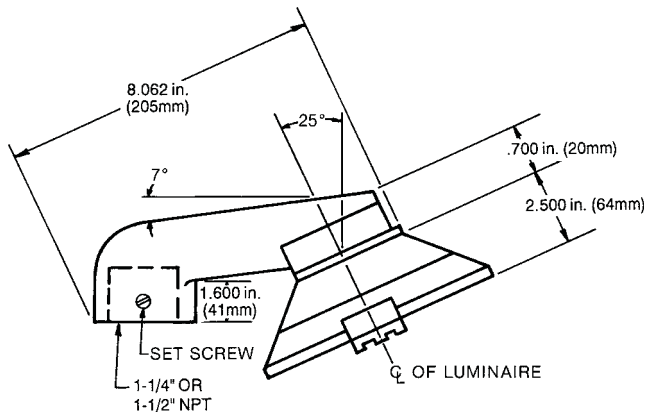
UL844, UL 1598 Outdoor Salt Water,
UL1598 Suitable for Wet Locations

**YOU MUST USE TEMPERATURE PROFILE DATA
TO PROPERLY SELECT LUMINAIRE**

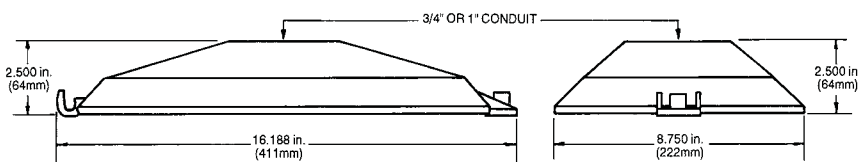
FIXTURE DIMENSIONS

MOUNTINGS

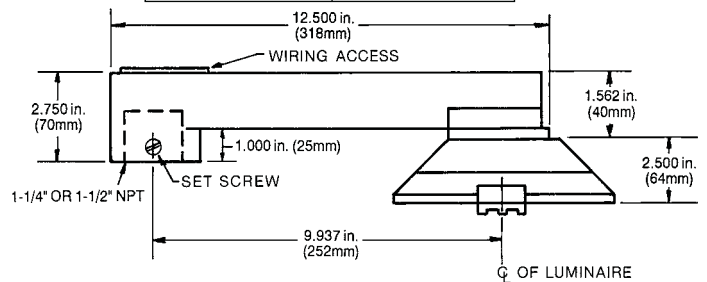
ANGLE STANCHION	Approximate Net Weight
1-1/4-inch=5J	5.0 lbs 2 kgs
1-1/2-inch=6J	



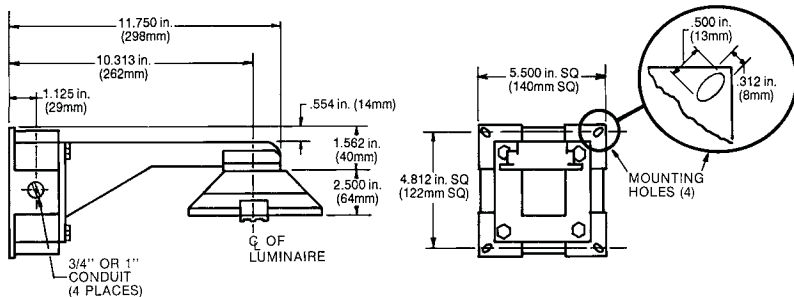
PENDANT	Approximate Net Weight
3/4-inch=3P	3.5 lbs 2 kgs
1-inch=4P	



STRAIGHT STANCHION	Approximate Net Weight
1-1/4-inch=5S	6.7 lbs 3 kgs
1-1/2-inch=6S	



WALL	Approximate Net Weight
3/4-inch=3W	5 lbs 2 kgs
1-inch=4W	





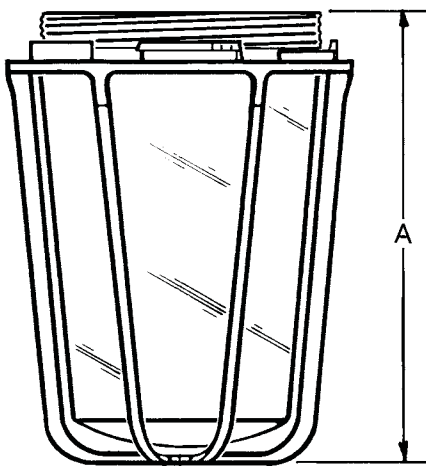
FILTR•GARD® H2 AND H2U LUMINAIRE

UL844, UL 1598 Outdoor Salt Water,
UL1598 Suitable for Wet Locations

YOU MUST USE TEMPERATURE PROFILE DATA
TO PROPERLY SELECT LUMINAIRE

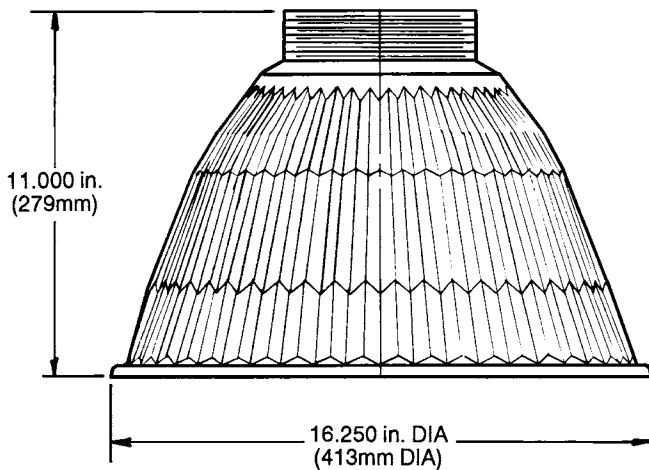
FIXTURE DIMENSIONS

OPTICALS CHECK TEMPERATURE PROFILES AND LISTINGS			
GLOBE AND GUARD	Approximate Net Weight		DIM A
FG 9-in. (229mm)	3.7 lbs	2 kgs	9.250 in. (235mm)
GG 7-in. (178mm)	3.0 lbs	1 kgs	8.125 in. (206mm)



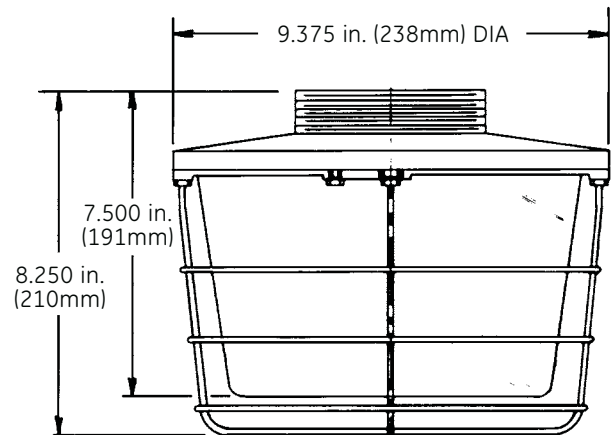
ENCLOSED INDUSTRIAL REFLECTOR (EG or E)

Approximate Net Weight	5 lbs	2 kgs
------------------------	-------	-------



8-INCH GLASS REFRACTOR (V2G or V5G)

Approximate Net Weight	3.9 lbs	1.5 kgs
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FILTR•GARD® H2 AND H2U LUMINAIRE

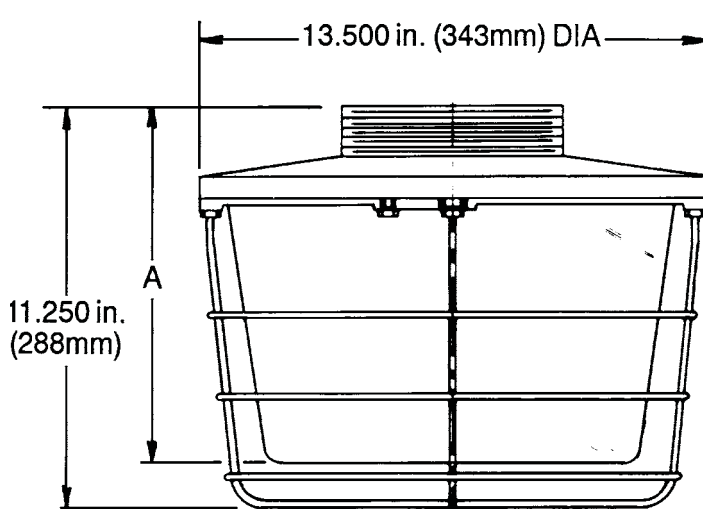
UL844, UL 1598 Outdoor Salt Water,
UL1598 Suitable for Wet Locations

YOU MUST USE TEMPERATURE PROFILE DATA
TO PROPERLY SELECT LUMINAIRE

FIXTURE DIMENSIONS

OPTICALS CHECK TEMPERATURE PROFILES AND LISTINGS

GLOBE AND GUARD	Approximate Net Weight		DIM A
R2G, R5G (Glass)	14.7 lbs	7 kgs	10.125 in. (257mm)
L2G, L5G, (Polycarbonate)	6.0 lbs	6 kgs	9.500 in. (241mm)
A2G, A5G (Acrylic)			





**ATTACHMENT - C
FIXTURE "W1" & "W2"**

WALLLIGHTER 250 CUTOFF LUMINAIRE

APPLICATIONS

- Building perimeters, entrances, walkways and residential yards
- Loading docks and many other wall mounted area lighting applications

SPECIFICATION FEATURES

- /  1598 Listed
Suitable For Wet Locations
- Three-piece die-cast aluminum housing protected inside and out with dark bronze polyester powder finish
- Enclosed, gasketed, with anodized aluminum reflector and tempered glass bottom closure
- Standard and tamper resistant hardware included
- Thru-feed conduit entrance on side with built-in conduit clamps
- Front access to ballast components when installed
- Mogul (E39 standard) or medium base (E26 standard) sockets



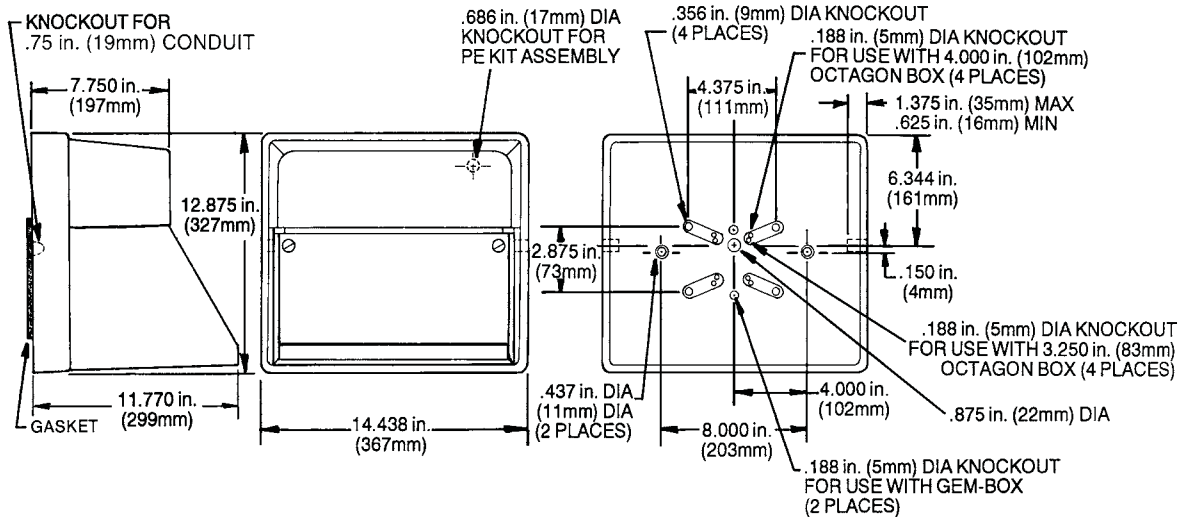
The Energy Independence and Security Act of 2007 (EISA) affects Metal Halide (MH) and Pulse Metal Halide (PMH) wattages from 175W to 450W and for domestic usage, the new digit is "E = EISA-compliant PMH" which has a minimum efficiency of 88%. In many cases, the lumen value and lamp life of a lesser wattage meets or exceeds the former MH ballast/lamp system. For 175W applications, where 175W E-PMH is not available, 150W PMH may be an acceptable substitute. 150W PMH is medium base socket unless otherwise listed or requested.

ORDERING NUMBER LOGIC

W25C	25	S	0	A	1	G	MGL	DB	Q
PRODUCT IDENT	WATTAGE	LIGHT SOURCE	VOLTAGE	BALLAST TYPE	PE FUNCTION	LENS TYPE	LAMP BASE	COLOR	OPTIONS
XXXX	XX	X	X	X	X	X	XXX	XX	XXX
W25C = Wallighter 250 (250 watt max.) luminaire with cutoff optics	See Ballast and Photometric Selection Table 05 = 50 07 = 70 10 = 100 15 = 150 17 = 175 20 = 200 25 = 250 77 = 70/75	See Ballast and Photometric Selection Table E = Energy Act Compliant Pulse MH (EPMH) S = HPS M = MH P = PMH	See Ballast and Photometric Selection Table 60Hz 0 = 120/208/240/277 Multivolt 1 = 120 2 = 208 3 = 240 4 = 277 5 = 480 C = 120X240X277V D = 347 F = 120X347	See Ballast and Photometric Selection Table A = Autoreg G = Mag-Reg with Grounded Socket Shell H = HPF Reactor or Lag K = Hot Restart M = Mag-Reg N = NPF Reactor or Lag P = CWI with Grounded Socket Shell	1 = None 3 = Internal *PE Control For PE Kit, see Accessories * Not available with multivolt or 480V	G = Glass	For IES Optical Configuration See Ballast and Photometric Selection Table MGL = Mogul base E39 (Standard without lamp) MED = Medium base E26 (Standard with lamp)	DB=Dark Bronze	B = Time Delay Automatically Switched Quartz F = Fusing (Not available with multivolt) Q = Non-Time Delay Automatically Switched Quartz

WALLIGHTER 250 CUTOFF LUMINAIRE

FIXTURE DIMENSIONS



DATA

Approximate Net Weight	15-30 lbs	8-14 kgs
Suggested Mounting Height	8-20 ft	2-6 M

BALLAST AND PHOTOMETRIC SELECTION TABLE

All light sources are clear unless otherwise indicated.

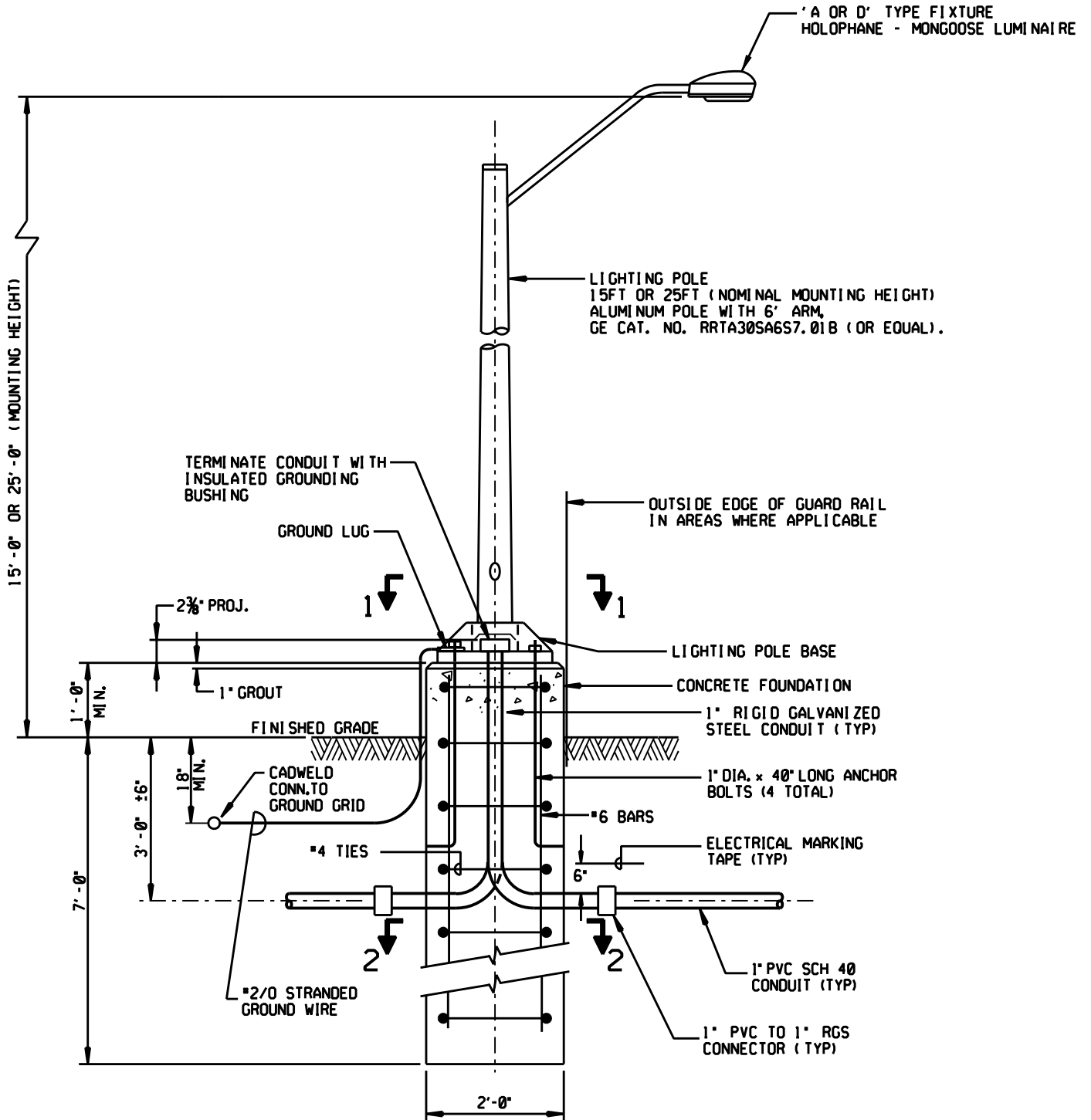
Wattage	Light Source	Ballast Type/Voltage								IES Distribution Type	Photometric Curve Number 35-17----
		60Hz									
		Multivolt	120	208	240	277	480	347, 120X347			
MOGUL BASE LAMP (NOT INCLUDED)											
50	HPS	H	H, K, N	H	H	H	H	N/A	H	SC3	8825
70, 100, 150(55V)	HPS	H	G, H, K, M	G, H, M	G, H, M	G, H, M	G, H, M	G, H, M	G**, M	SC3	8825
200*	HPS	A	A	A	A	A	A	C/F	A	SC3	8830
250*	HPS	A	A	A	A	A	A	A	A	SC3	8830
175	EPMH	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	SC3	8828
250*	EPMH	A	A	A	A	A	A	A	A	SC3	8831
CANADA ONLY											
175	MH	N/A	A	A	A	A	N/A	A	A	SC3	8828
250*	MH	N/A	A, P	A, P	A, P	A, P	P	A, P	A, P	SC3	8831
MEDIUM BASE LAMP (INCLUDED)											
50, 70, 100, 150(55V)	HPS	N	N	N/A	N/A	N/A	N/A	N/A	N/A	SC3	8833
70, 100, 150****	MH	H***	N/A	N/A	N/A	N/A	N/A	N/A	N/A	SC3	8835

NOTE: *Horizontal lamp operation,
 C/F = Contact Factory
 N/A = Not Available
 **347 Volt Only
 ***150W PMH Available in Tri-Volt Multivolt: 120X208X277V or 120X240X277V
 ****150W PMH Only available in HPF-LAG (H) Ballast Type for 120 or 208 or 240 or 277V and Auto-Reg (A) in 120 or 277V

REFERENCES

See Page A-97 for start of Accessories.
 See Page A-101 for Explanation of Options and Other Terms Used.

ATTACHMENT D



DETAIL A

N. T. S.

ROADWAY POLE BASE (TYPE A or D)