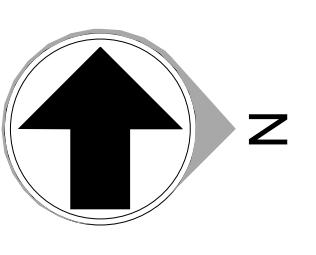
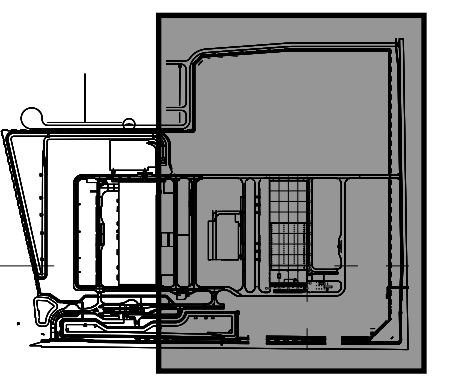
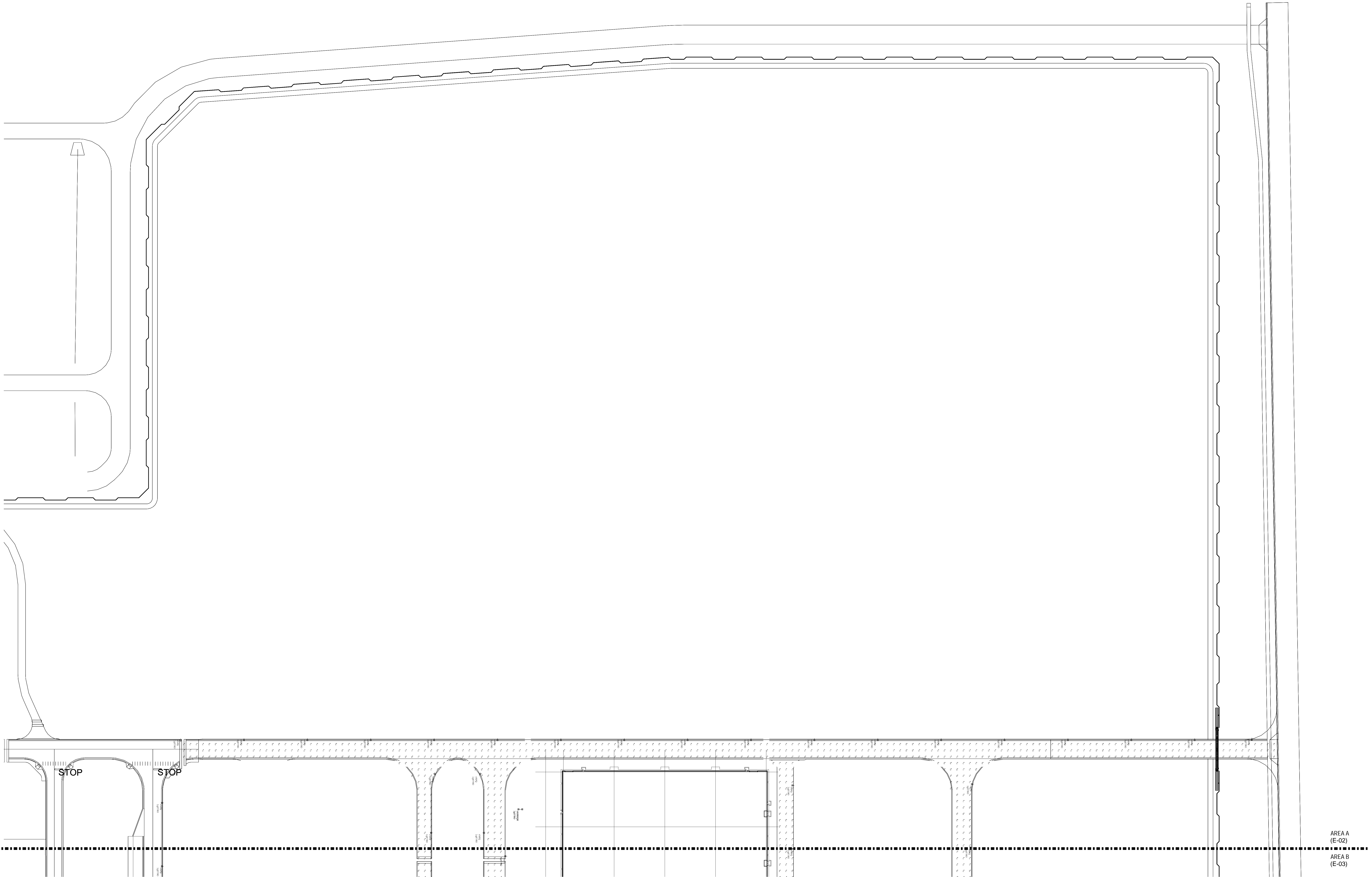


KEY PLAN:



REVISIONS		
NO.	DATE	DESCRIPTION

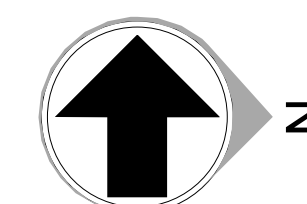
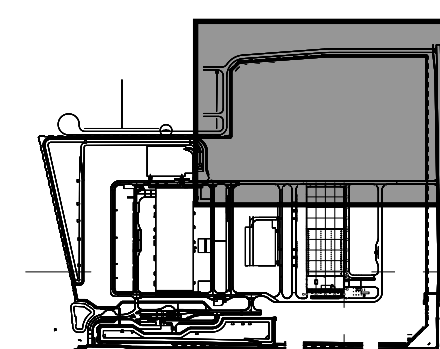
DRAWN:
ARS
APPRVD:
PAC



HDR, INC.
1917 SOUTH 67th STREET
OMAHA, NE 68106
(402) 399-1000

CONFIDENTIAL
PROJECT RED HAWK
DESIGN REVIEW SUBMITTAL

KEY PLAN:



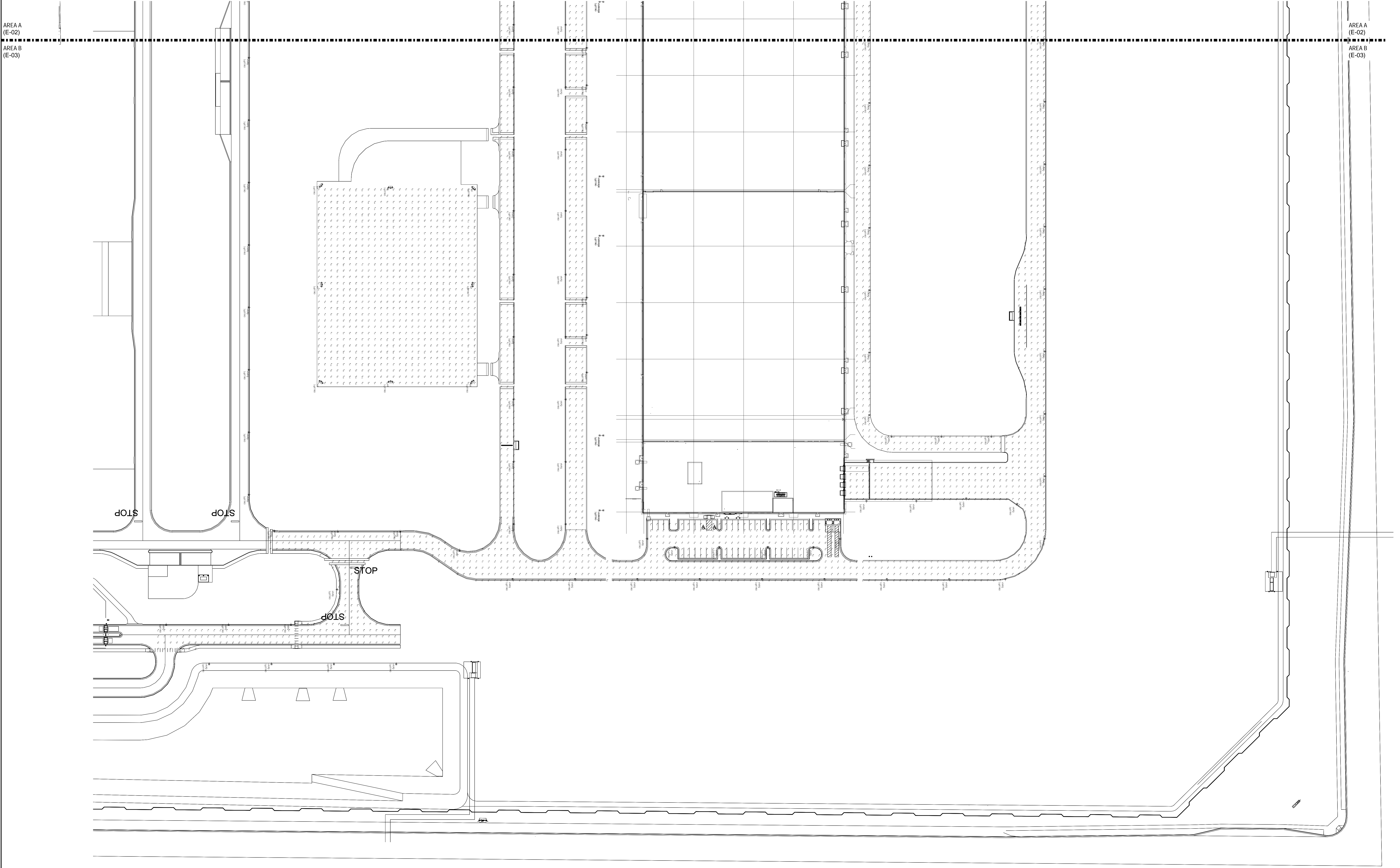
REVISIONS		
NO.	DATE	DESCRIPTION

DRAWN:
ARS
APPRVD:
PAC

SITE LIGHTING PLAN
PHOTOMETRIC CALCULATIONS -
AREA A

SCALE: 1" = 50'

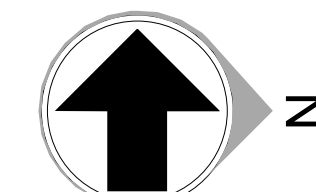
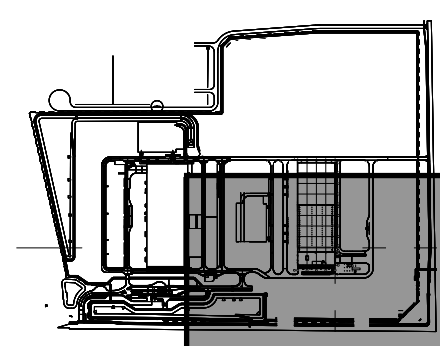
SHEET NUMBER:
E-02



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1917 SOUTH 67th STREET
OMAHA, NE 68106
(402) 399-1000

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PROJECT RED HAWK
DESIGN REVIEW SUBMITTAL

KEY PLAN:



REVISIONS		
NO.	DATE	DESCRIPTION

DRAWN:
ARS
APPRVD:
PAC

SITE LIGHTING PLAN
PHOTOMETRIC CALCULATIONS -
AREA B

SCALE: 1" = 50'

SHEET NUMBER:

E-03



Project:	
Location:	
Cat.No:	
Type:	
Lamps:	Qty:
Notes:	

example: ECF-S-64I-900-NW-G2-AR-5-120-HIS-MGY

Prefix		Number of LEDs		Drive Current		LED Color - Generation		Mounting		Distribution				Voltage				
ECF-S																		
ECF-S	EcoForm site and area, small	32L	32 LEDs (2 modules)	365	365 mA	WW-G2	Warm White 3000K, 70CRI Generation 2	AR ²	Arm Mount (standard)	Type 2				120	120V			
				530	530 mA					2	Type 2	AFR	Auto Front Row	208	208V			
				700	700 mA									240	240V			
		1A	1050 mA	NW-G2	Neutral White 4000K, 70CRI Generation 2	The following mounting kits must be ordered separately (See accessories)	2-90	Rotated left 90°	AFR-90	Auto Front Row, Rotated left 90°	277	277V						
		1.2A	1200 mA								347	347V						
		48L	48 LEDs (3 modules)	900	900 mA						CW-G2	Cool White 5000K, 70CRI Generation 2	SF ³	Slip Fitter Mount (fits to 2 ³ / ₈ " O.D. tenon)	Type 3	BLC	Back Light Control	480
				1A	1050 mA	3-90	Rotated left 90°	BLC-90	Back Light Control rotated at 90°	UNV								120-277V (50/60Hz)
				1.2A ¹⁸	1200 mA					347-480V (50/60Hz)								
		64L	64 LEDs (4 modules)	900	900 mA			WS	Wall mount with surface conduit rear entry permitted	3-270	Rotated right 270°	BLC-270	Back Light Control rotated at 270°	HVV				
1A ¹⁸	1050 mA			4	Type 4											LCL ¹⁹	LEED Corner Optic Left	
																		4-90
		RAM ²	Retrofit arm mount kit	Type 5	5W	Type 5W												

Options							
Dimming controls		Motion sensing lens	Photo-sensing		Electrical	Luminaire	Finish
DD ^{4,18}	0-10V External dimming (for controls by others)	IMR13 ¹⁵ Integral with #3 lens	PCB ^{8,9}	Photocontrol Button	Fusing	Square Pole Adapter included in standard product	Textured
DCC ^{4,5,6,18}	Dual Circuit Control	IMR17 ¹⁶ Integral with #7 lens	TLRD5 ^{10,17}	Twist Lock Receptacle 5 Pin	F1 ⁹ Single (120, 277, 347VAC)		BK Black
FAWS ^{4,5,18}	Field Adjustable Wattage Selector				F2 ⁹ Double (208, 240, 480VAC)		WH White
LLC ^{4,6,7,8,18}	Integral wireless module		TLRD7 ^{10,17}	Twist Lock Receptacle 7 Pin	Pole Mount Fusing	TB ¹² Terminal Block	BZ Bronze
BL ^{1,4,7,18}	Bi-level functionality				FP1 ⁹ Single (120, 277, 347VAC)	RPA ¹³ Round Pole Adapter (fits to 3"- 3.9" O.D. pole)	DGY Dark Gray
SRDR ^{4,5,6,8,17}	SR driver connected to Zhaga socket		TLRPC ^{9,10,11,17}	Twist Lock Receptacle w/ Photocell	FP2 ⁹ Double (208, 240, 480VAC)		MGY Medium Gray
DynaDimmer: Automatic Profile Dimming					FP3 ⁹ Canadian Double Pull (208, 240, 480VAC)	HIS ¹⁴ Internal House Side Shield	Customer specified
CS50 ^{4,8}	Safety 50% Dimming, 7 hours				Surge Protection (10kA standard)		RAL Specify optional color or RAL (ex: RAL7024)
CM50 ^{4,8}	Median 50% Dimming, 8 hours				SP2 Increased 20kA		CC Custom color (Must supply color chip for required factory quote)
CS30 ^{4,8}	Safety 30% Dimming, 7 hours						
CM30 ^{4,8}	Median 30% Dimming, 8 hours						

- | | | |
|--|---|--|
| <ol style="list-style-type: none"> 1. BL-IMRI3/7 equipped with out-boarded sensor housing when voltage is HVU (347-480V) 2. Mounts to a 4" round pole with adapter included for square poles. 3. Limited to a maximum of 45 degrees aiming above horizontal. 4. Not available with other dimming control options. 5. Not available with motion sensor. 6. Not available with photocontrol. 7. Must specify a motion sensor lens. 8. Not available in 347 or 480V 9. Must specify input voltage. | <ol style="list-style-type: none"> 10. TLRD5, TLRD7 and TLRPC receptacle pins 4 & 5 are capped off when ordered with any of the Dimming controls DD or FAWS or LLC. 11. Not available in 480V. Order photocell separately with TLRD5/7. 12. Not available with DCC. 13. Not available with SF and WS. RPAs provided with black finish standard. 14. HIS not available with Type 5, 5W, BLC, BLC-90, BLC-270, LCL or RCL optics. 15. Not available with DD, DCC, and FAWS dimming control options. | <ol style="list-style-type: none"> 16. Not available with DD, DCC, FAWS and LLC dimming control options. 17. When ordering SRDR, controller (by others) to be used on socket must be SR compatible (See specifications for more details). Consult factory for lead time. All 7 pins in NEMA receptacle are connected to SR driver. SRDR not available with TLRD5 or TLRPC. 18. 0-10V dimming driver standard. 19. LCL and RCL not available with 48L-1.2A or 64L-1A. |
|--|---|--|

ECF-S EcoForm small

Area luminaire

EcoForm Accessories²¹ (ordered separately, field installed)

Shielding Accessories

House Side shield

Standard optic orientation:

HIS-32-H²⁰ Internal House Side Shield for 32 LEDs (2 modules)

HIS-48-H²⁰ Internal House Side Shield for 48 LEDs (3 modules)

HIS-64-H²⁰ Internal House Side Shield for 64 LEDs (4 modules)

Optic at 90 or 270 orientation:

HIS-32-V²⁰ Internal House Side Shield for 32 LEDs (2 modules)

HIS-48-V²⁰ Internal House Side Shield for 48 LEDs (3 modules)

HIS-64-V²⁰ Internal House Side Shield for 64 LEDs (4 modules)

Luminaire Accessories

ECF-BD-G2 Bird deterrent

ECF-RAM-G2-(F) Retrofit Arm mount kit

ECF-SF-G2-(F) Slip Fitter Mount (fits to 2 3/8" O.D. tenon)

ECF-WS-G2-(F) Wall mount with surface conduit rear entry permitted

EcoForm PTF2 (pole top fitter fits 23/8-21/2" OD x 4" depth tenon)

PTF2-ECF-S/L-1-90-(F) 1 luminaire at 90°

PTF2-ECF-S/L-2-90-(F) 2 luminaires at 90°

PTF2-ECF-S/L-2-180-(F) 2 luminaires at 180°

PTF2-ECF-S/L-3-90-(F) 3 luminaires at 90°

PTF2-ECF-S/L-4-90-(F) 4 luminaires at 90°

PTF2-ECF-S/L-3-120-(F) 3 luminaires at 120°

EcoForm PTF3 (pole top fitter fits 3-31/2" OD x 6" depth tenon)

PTF3-ECF-S/L-1-90-(F) 1 luminaire at 90°

PTF3-ECF-S/L-2-90-(F) 2 luminaires at 90°

PTF3-ECF-S/L-2-180-(F) 2 luminaires at 180°

PTF3-ECF-S/L-3-90-(F) 3 luminaires at 90°

PTF3-ECF-S/L-4-90-(F) 4 luminaires at 90°

PTF3-ECF-S/L-3-120-(F) 3 luminaires at 120°

EcoForm PTF4 (pole top fitter fits 31/2-4" OD x 6" depth tenon)

PTF4-ECF-S/L-1-90-(F) 1 luminaire at 90°

PTF4-ECF-S/L-2-90-(F) 2 luminaires at 90°

PTF4-ECF-S/L-2-180-(F) 2 luminaires at 180°

PTF4-ECF-S/L-3-90-(F) 3 luminaires at 90°

PTF4-ECF-S/L-4-90-(F) 4 luminaires at 90°

PTF4-ECF-S/L-3-120-(F) 3 luminaires at 120°

(F) = Specify finish

Footnotes

20. Not available with Type 5 or 5W optics

21. Consult Signify to confirm whether specific accessories are BAA-compliant.

Ready to Go configurations (when ordered with the "RS-" catalog code, the following configurations will ship in 2 weeks):

Catalog Number	12NC	Catalog Number	12NC
RS-ECF-S-32L-1A-NW-G2-AR-3-UNV-BZ	912401466002	RS-ECF-S-64L-1A-NW-G2-AR-3-UNV-BK	912401534560
RS-ECF-S-32L-1A-NW-G2-AR-3-UNV-MGY	912401466003	RS-ECF-S-64L-1A-NW-G2-AR-4-UNV-BZ	912401466016
RS-ECF-S-32L-1A-NW-G2-AR-3-UNV-BK	912401534554	RS-ECF-S-64L-1A-NW-G2-AR-4-UNV-MGY	912401466017
RS-ECF-S-32L-1A-NW-G2-AR-4-UNV-BZ	912401466004	RS-ECF-S-64L-1A-NW-G2-AR-4-UNV-BK	912401534561
RS-ECF-S-32L-1A-NW-G2-AR-4-UNV-MGY	912401466005	RS-ECF-S-64L-1A-NW-G2-AR-5-UNV-BZ	912401466018
RS-ECF-S-32L-1A-NW-G2-AR-4-UNV-BK	912401534555	RS-ECF-S-64L-1A-NW-G2-AR-5-UNV-MGY	912401466019
RS-ECF-S-32L-1A-NW-G2-AR-5-UNV-BZ	912401466006	RS-ECF-S-64L-1A-NW-G2-AR-5-UNV-BK	912401534562
RS-ECF-S-32L-1A-NW-G2-AR-5-UNV-MGY	912401466007	RS-ECF-RAM-G2-DGY	912401466487
RS-ECF-S-32L-1A-NW-G2-AR-5-UNV-BK	912401534556	RS-ECF-RAM-G2-MGY	912401466488
RS-ECF-S-48L-1A-NW-G2-AR-3-UNV-BZ	912401466008	RS-ECF-RAM-G2-WH	912401466485
RS-ECF-S-48L-1A-NW-G2-AR-3-UNV-MGY	912401466009	RS-ECF-RAM-G2-BZ	912401466486
RS-ECF-S-48L-1A-NW-G2-AR-3-UNV-BK	912401534557	RS-ECF-RAM-G2-BK	912401466484
RS-ECF-S-48L-1A-NW-G2-AR-4-UNV-BZ	912401466010	RS-HIS-32-H	912401466489
RS-ECF-S-48L-1A-NW-G2-AR-4-UNV-MGY	912401466011	RS-HIS-48-H	912401466491
RS-ECF-S-48L-1A-NW-G2-AR-4-UNV-BK	912401534558	RS-HIS-64-H	912401466493
RS-ECF-S-48L-1A-NW-G2-AR-5-UNV-BZ	912401466012		
RS-ECF-S-48L-1A-NW-G2-AR-5-UNV-MGY	912401466013		
RS-ECF-S-48L-1A-NW-G2-AR-5-UNV-BK	912401534559		
RS-ECF-S-64L-1A-NW-G2-AR-3-UNV-BZ	912401466014		
RS-ECF-S-64L-1A-NW-G2-AR-3-UNV-MGY	912401466015		

ECF-S EcoForm small

Area lumineaire

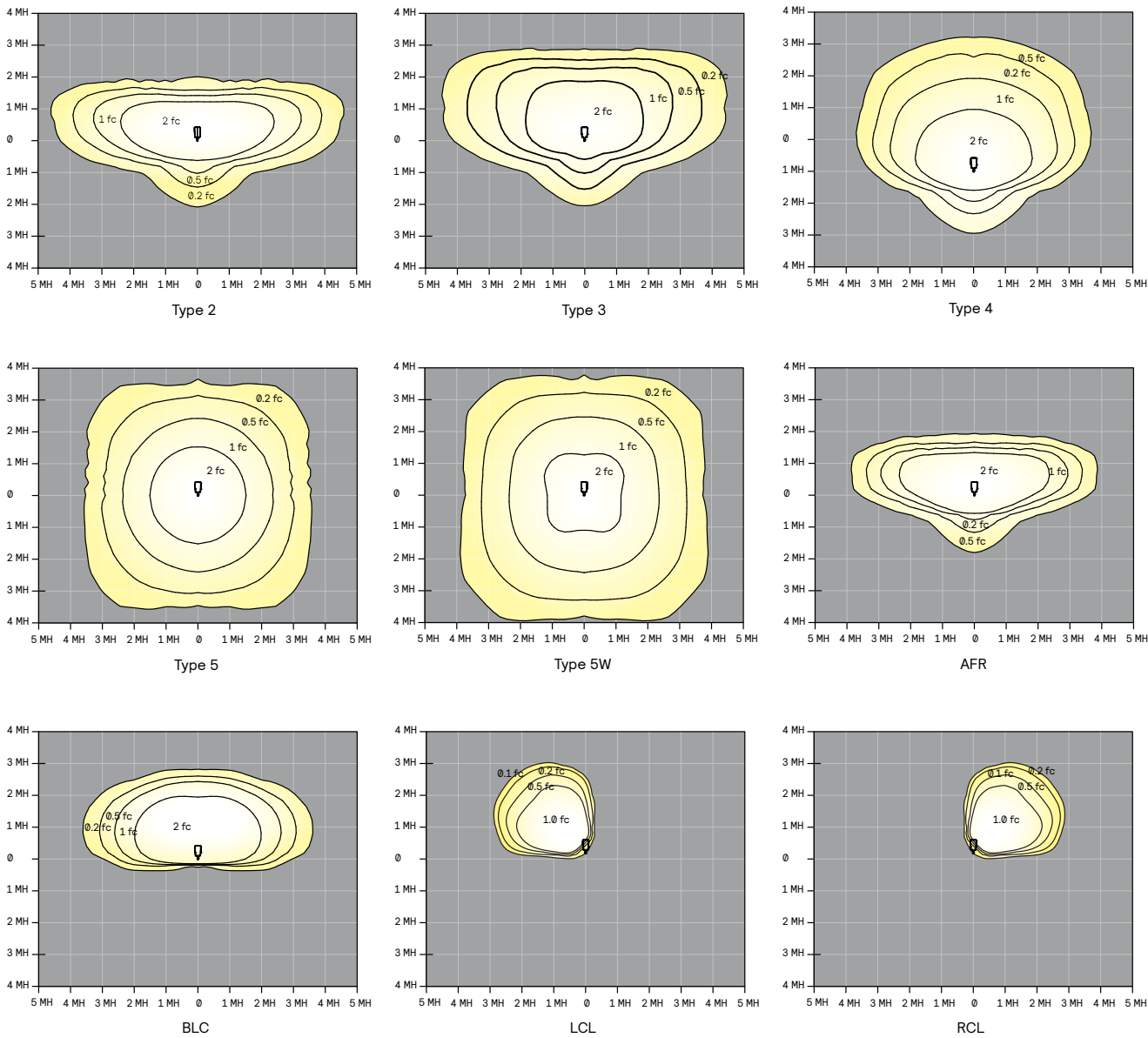
Predicted Lumen Depreciation Data

Predicted performance derived from LED manufacturer's data and engineering design estimates, based on IESNA LM-80 methodology. Actual experience may vary due to field application conditions. L70 is the predicted time when LED performance depreciates to 70% of initial lumen output. Calculated per IESNA TM21-11. Published L70 hours limited to 6 times actual LED test hours

Ambient Temperature °C	Driver mA	Calculated L70 Hours	L70 per TM-21	Lumen Maintenance % at 60,000 hrs
25°C	up to 1200 mA	>100,000 hours	>120,000 hours	>99%

Optical Distributions

Based on configuration ECF-S-48L-1A-NW-G2 (159W) mounted at 20ft.



ECF-S EcoForm small

Area luminaire

3000K LED Wattage and Lumen Values

Ordering Code	Total LEDs	LED Current (mA)	Color Temp.	Average System Watts	Type 2			Type 3			Type 4			Type 5			Type 5W		
					Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
ECF-S-32L-365-WW-G2-x	32	365	3000	40	5,508	B1-U0-G1	138	5,428	B1-U0-G2	136	5,637	B1-U0-G2	141	5,790	B3-U0-G1	145	5,604	B3-U0-G1	140
ECF-S-32L-530-WW-G2-x	32	530	3000	56	7,159	B2-U0-G2	129	7,055	B1-U0-G2	127	7,327	B1-U0-G2	132	7,526	B3-U0-G2	135	7,284	B3-U0-G2	131
ECF-S-32L-700-WW-G2-x	32	700	3000	73	9,234	B2-U0-G2	127	9,034	B2-U0-G2	124	9,452	B2-U0-G2	130	9,707	B4-U0-G2	133	9,395	B4-U0-G2	129
ECF-S-32L-1A-WW-G2-x	32	1050	3000	106	13,001	B3-U0-G2	123	12,719	B2-U0-G2	120	13,306	B2-U0-G3	126	13,665	B4-U0-G2	129	13,227	B4-U0-G2	125
ECF-S-32L-1.2A-WW-G2-x	32	1200	3000	122	14,421	B3-U0-G3	119	14,108	B2-U0-G3	116	14,760	B2-U0-G3	121	15,158	B4-U0-G2	125	14,671	B4-U0-G2	121
ECF-S-48L-900-WW-G2-x	48	900	3000	135	17,115	B3-U0-G3	127	16,744	B3-U0-G3	124	17,518	B2-U0-G3	130	17,990	B4-U0-G2	133	17,413	B5-U0-G3	129
ECF-S-48L-1A-WW-G2-x	48	1050	3000	159	19,381	B3-U0-G3	122	18,960	B3-U0-G3	119	19,836	B3-U0-G4	125	20,372	B5-U0-G3	128	19,717	B5-U0-G3	124
ECF-S-48L-1.2A-WW-G2-x	48	1200	3000	183	21,515	B3-U0-G3	118	21,048	B3-U0-G4	115	22,020	B3-U0-G4	121	22,616	B5-U0-G3	124	21,888	B5-U0-G3	120
ECF-S-64L-900-WW-G2-x	64	900	3000	178	22,652	B3-U0-G3	127	22,161	B3-U0-G4	125	23,185	B3-U0-G4	130	23,810	B5-U0-G3	134	23,045	B5-U0-G3	130
ECF-S-64L-1A-WW-G2-x	64	1050	3000	206	25,520	B3-U0-G3	124	24,966	B3-U0-G4	121	26,120	B3-U0-G4	127	26,150	B5-U0-G3	127	25,964	B5-U0-G4	126

Ordering Code	Total LEDs	LED Current (mA)	Color Temp.	Average System Watts	Type AFR			BLC			LCL or RCL		
					Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
ECF-S-32L-365-WW-G2-x	32	365	3000	40	5,706	B2-U0-G1	143	3,691	B0-U0-G1	94	2,449	B0-U0-G1	62
ECF-S-32L-530-WW-G2-x	32	530	3000	56	7,417	B2-U0-G1	133	5,005	B0-U0-G2	91	3,183	B0-U0-G1	58
ECF-S-32L-700-WW-G2-x	32	700	3000	73	9,567	B2-U0-G2	131	6,409	B0-U0-G2	89	4,106	B0-U0-G1	57
ECF-S-32L-1A-WW-G2-x	32	1050	3000	106	13,467	B3-U0-G2	128	9,024	B1-U0-G2	87	5,793	B0-U0-G2	56
ECF-S-32L-1.2A-WW-G2-x	32	1200	3000	122	14,939	B3-U0-G2	123	10,010	B1-U0-G2	84	6,426	B0-U0-G2	54
ECF-S-48L-900-WW-G2-x	48	900	3000	135	17,731	B3-U0-G2	131	11,880	B1-U0-G2	89	7,626	B0-U0-G2	57
ECF-S-48L-1A-WW-G2-x	48	1050	3000	159	20,076	B3-U0-G2	127	13,453	B1-U0-G2	86	8,636	B0-U0-G2	55
ECF-S-48L-1.2A-WW-G2-x	48	1200	3000	183	22,288	B3-U0-G2	122	14,934	B1-U0-G3	83			
ECF-S-64L-900-WW-G2-x	64	900	3000	178	23,465	B3-U0-G2	132	15,723	B1-U0-G3	90	10,093	B0-U0-G2	58
ECF-S-64L-1A-WW-G2-x	64	1050	3000	206	26,437	B4-U0-G3	128	17,714	B1-U0-G3	87			

4000K LED Wattage and Lumen Values

Ordering Code	Total LEDs	LED Current (mA)	Color Temp.	Average System Watts	Type 2			Type 3			Type 4			Type 5			Type 5W		
					Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
ECF-S-32L-365-NW-G2-x	32	365	4000	40	5,798	B1-U0-G1	145	5,713	B1-U0-G2	143	5,934	B1-U0-G2	148	6,094	B3-U0-G1	152	5,898	B3-U0-G2	147
ECF-S-32L-530-NW-G2-x	32	530	4000	56	7,536	B2-U0-G2	135	7,426	B1-U0-G2	133	7,713	B1-U0-G2	138	7,922	B3-U0-G2	142	7,667	B3-U0-G2	138
ECF-S-32L-700-NW-G2-x	32	700	4000	73	9,720	B2-U0-G2	133	9,509	B2-U0-G2	130	9,949	B2-U0-G2	136	10,218	B4-U0-G2	140	9,889	B4-U0-G2	136
ECF-S-32L-1A-NW-G2-x	32	1050	4000	106	13,685	B3-U0-G2	130	13,388	B2-U0-G3	127	14,006	B2-U0-G3	133	14,384	B4-U0-G2	136	13,923	B4-U0-G2	132
ECF-S-32L-1.2A-NW-G2-x	32	1200	4000	122	15,180	B3-U0-G3	125	14,851	B2-U0-G3	122	15,537	B2-U0-G3	128	15,956	B4-U0-G2	131	15,443	B4-U0-G2	127
ECF-S-48L-900-NW-G2-x	48	900	4000	135	18,016	B3-U0-G3	133	17,625	B3-U0-G3	130	18,440	B3-U0-G3	136	18,937	B4-U0-G3	140	18,329	B5-U0-G3	136
ECF-S-48L-1A-NW-G2-x	48	1050	4000	159	20,401	B3-U0-G3	129	19,958	B3-U0-G4	126	20,880	B3-U0-G4	132	21,444	B5-U0-G3	135	20,755	B5-U0-G3	131
ECF-S-48L-1.2A-NW-G2-x	48	1200	4000	183	22,647	B3-U0-G3	124	22,156	B3-U0-G4	121	23,179	B3-U0-G4	127	23,806	B5-U0-G3	130	23,040	B5-U0-G3	126
ECF-S-64L-900-NW-G2-x	64	900	4000	178	23,844	B3-U0-G3	134	23,327	B3-U0-G4	131	24,405	B3-U0-G4	137	25,063	B5-U0-G3	141	24,258	B5-U0-G4	136
ECF-S-64L-1A-NW-G2-x	64	1050	4000	206	26,863	B3-U0-G3	130	26,280	B3-U0-G4	128	27,495	B3-U0-G4	134	27,526	B5-U0-G3	134	27,330	B5-U0-G4	133

Ordering Code	Total LEDs	LED Current (mA)	Color Temp.	Average System Watts	Type AFR			BLC			LCL or RCL		
					Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
ECF-S-32L-365-NW-G2-x	32	365	4000	40	6,006	B2-U0-G1	150	3,991	B0-U0-G1	101	2,633	B0-U0-G1	67
ECF-S-32L-530-NW-G2-x	32	530	4000	56	7,807	B2-U0-G1	140	5,412	B0-U0-G2	99	3,423	B0-U0-G1	62
ECF-S-32L-700-NW-G2-x	32	700	4000	73	10,070	B2-U0-G2	138	6,930	B0-U0-G2	96	4,415	B0-U0-G1	61
ECF-S-32L-1A-NW-G2-x	32	1050	4000	106	14,176	B3-U0-G2	134	9,756	B1-U0-G2	94	6,229	B0-U0-G2	60
ECF-S-32L-1.2A-NW-G2-x	32	1200	4000	122	15,725	B3-U0-G2	129	10,822	B1-U0-G2	90	6,910	B0-U0-G2	58
ECF-S-48L-900-NW-G2-x	48	900	4000	135	18,664	B3-U0-G2	138	12,843	B1-U0-G2	96	8,200	B0-U0-G2	62
ECF-S-48L-1A-NW-G2-x	48	1050	4000	159	21,133	B3-U0-G2	133	14,544	B1-U0-G3	93	9,286	B0-U0-G2	59
ECF-S-48L-1.2A-NW-G2-x	48	1200	4000	183	23,461	B3-U0-G2	128	16,145	B1-U0-G3	90			
ECF-S-64L-900-NW-G2-x	64	900	4000	178	24,700	B3-U0-G2	139	16,998	B1-U0-G3	97	10,853	B0-U0-G2	62
ECF-S-64L-1A-NW-G2-x	64	1050	4000	206	27,828	B4-U0-G3	135	19,150	B1-U0-G3	94			

ECF-S EcoForm small

Area luminaire

5000K LED Wattage and Lumen Values

Ordering Code	Total LEDs	LED Current (mA)	Color Temp.	Average System Watts	Type 2			Type 3			Type 4			Type 5			Type 5W		
					Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
ECF-S-32L-365-CW-G2-x	32	365	5000	40	5,798	B1-U0-G1	145	5,713	B1-U0-G2	143	5,934	B1-U0-G2	148	6,094	B3-U0-G1	152	5,898	B3-U0-G2	147
ECF-S-32L-530-CW-G2-x	32	530	5000	56	7,536	B2-U0-G2	135	7,426	B1-U0-G2	133	7,713	B1-U0-G2	138	7,922	B3-U0-G2	142	7,667	B3-U0-G2	138
ECF-S-32L-700-CW-G2-x	32	700	5000	73	9,720	B2-U0-G2	133	9,509	B2-U0-G2	130	9,949	B2-U0-G2	136	10,218	B4-U0-G2	140	9,889	B4-U0-G2	136
ECF-S-32L-1A-CW-G2-x	32	1050	5000	106	13,685	B3-U0-G2	130	13,388	B2-U0-G3	127	14,006	B2-U0-G3	133	14,384	B4-U0-G2	136	13,923	B4-U0-G2	132
ECF-S-32L-1.2A-CW-G2-x	32	1200	5000	122	15,180	B3-U0-G3	125	14,851	B2-U0-G3	122	15,537	B2-U0-G3	128	15,956	B4-U0-G2	131	15,443	B4-U0-G2	127
ECF-S-48L-900-CW-G2-x	48	900	5000	135	18,016	B3-U0-G3	133	17,625	B3-U0-G3	130	18,440	B3-U0-G3	136	18,937	B4-U0-G3	140	18,329	B5-U0-G3	136
ECF-S-48L-1A-CW-G2-x	48	1050	5000	159	20,401	B3-U0-G3	129	19,958	B3-U0-G4	126	20,880	B3-U0-G4	132	21,444	B5-U0-G3	135	20,755	B5-U0-G3	131
ECF-S-48L-1.2A-CW-G2-x	48	1200	5000	183	22,647	B3-U0-G3	124	22,156	B3-U0-G4	121	23,179	B3-U0-G4	127	23,806	B5-U0-G3	130	23,040	B5-U0-G3	126
ECF-S-64L-900-CW-G2-x	64	900	5000	178	23,844	B3-U0-G3	134	23,327	B3-U0-G4	131	24,405	B3-U0-G4	137	25063	B5-U0-G3	141	24258	B5-U0-G4	136
ECF-S-64L-1A-CW-G2-x	64	1050	5000	206	26,863	B3-U0-G3	130	26,280	B3-U0-G4	128	27,495	B3-U0-G4	134	27526	B5-U0-G3	134	27330	B5-U0-G4	133

Ordering Code	Total LEDs	LED Current (mA)	Color Temp.	Average System Watts	Type AFR			BLC			LCL or RCL		
					Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
ECF-S-32L-365-CW-G2-x	32	365	5000	40	6,006	B2-U0-G1	150	3,991	B0-U0-G1	101	2,633	B0-U0-G1	67
ECF-S-32L-530-CW-G2-x	32	530	5000	56	7,807	B2-U0-G1	140	5,412	B0-U0-G2	99	3,423	B0-U0-G1	62
ECF-S-32L-700-CW-G2-x	32	700	5000	73	10,070	B2-U0-G2	138	6,930	B0-U0-G2	96	4,415	B0-U0-G1	61
ECF-S-32L-1A-CW-G2-x	32	1050	5000	106	14,176	B3-U0-G2	134	9,756	B1-U0-G2	94	6,229	B0-U0-G2	60
ECF-S-32L-1.2A-CW-G2-x	32	1200	5000	122	15,725	B3-U0-G2	129	10,822	B1-U0-G2	90	6,910	B0-U0-G2	58
ECF-S-48L-900-CW-G2-x	48	900	5000	135	18,664	B3-U0-G2	138	12,843	B1-U0-G2	96	8,200	B0-U0-G2	62
ECF-S-48L-1A-CW-G2-x	48	1050	5000	159	21,133	B3-U0-G2	133	14,544	B1-U0-G3	93	9,286	B0-U0-G2	59
ECF-S-48L-1.2A-CW-G2-x	48	1200	5000	183	23,461	B3-U0-G2	128	16,145	B1-U0-G3	90			
ECF-S-64L-900-CW-G2-x	64	900	5000	178	24,700	B3-U0-G2	139	16,998	B1-U0-G3	97	10,853	B0-U0-G2	62
ECF-S-64L-1A-CW-G2-x	64	1050	5000	206	27,828	B4-U0-G3	135	19,150	B1-U0-G3	94			

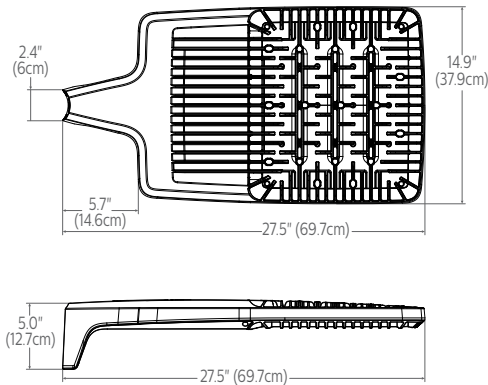
ECF-S EcoForm small

Area luminaire

Dimensions

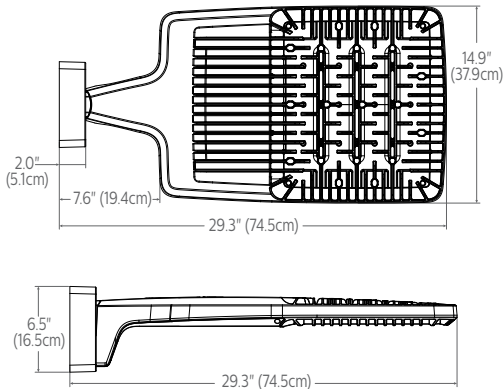
Standard Arm (AR)

Weight: 22 Lbs (9.9 Kg) EPA: 0.21ft² (.019m²)



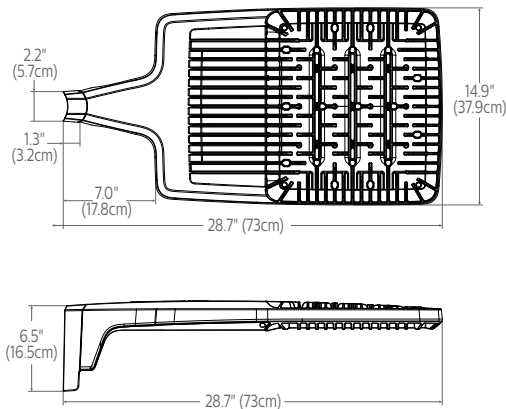
Wall (WS)

Weight: 27 Lbs. (12. 2Kg) EPA: 0.27ft² (.025m²)



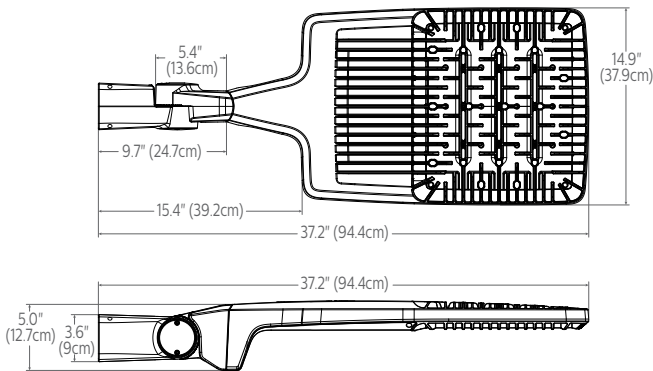
Retrofit Arm (RAM)

Weight: 24 Lbs (10.9 Kg) EPA: 0.24ft² (.022m²)

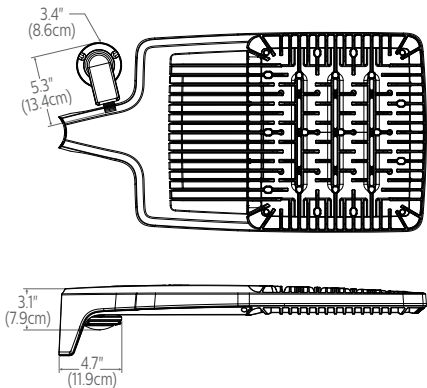


Slip fitter (SF)

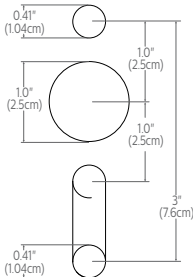
Weight: 27 Lbs (12.2 Kg) EPA: 0.33ft² (.031m²)



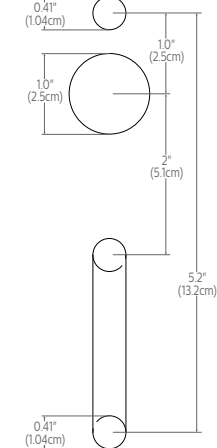
Outboard IMR-HVU sensor



Standard Arm (AR) drill pattern



Retrofit Arm (RAM) drill pattern



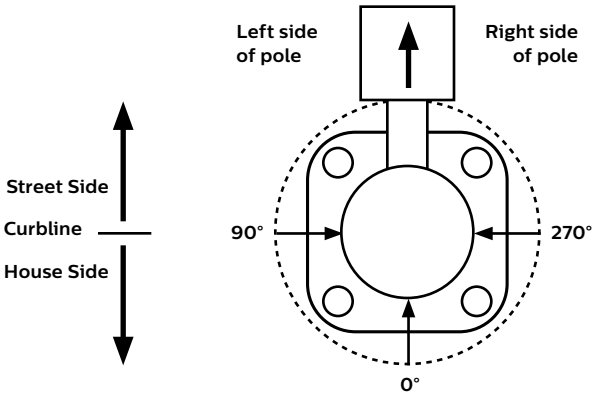
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Area luminaire

Optical Orientation Information

Standard Optic Position

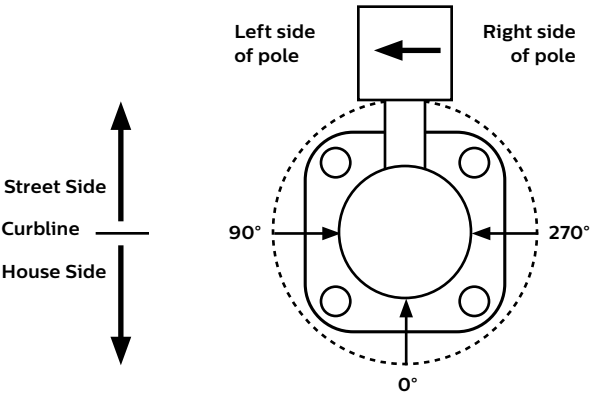
Luminaires ordered with asymmetric optical systems in the standard optic position will have the optical system oriented as shown below:



Note: The hand hole will normally be located on the pole at the 0° point.

Optic Rotated Left (90°) Optic Position

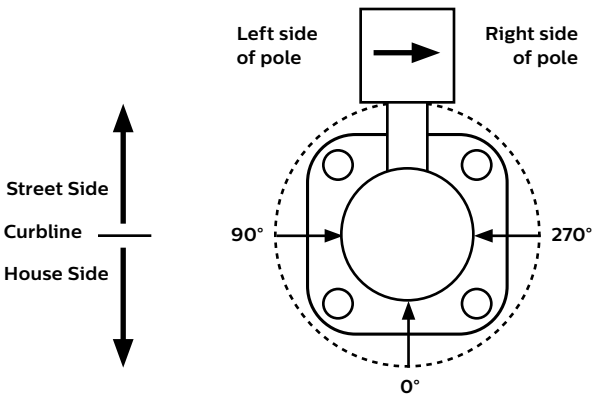
Luminaires ordered with optical systems in the Optic Rotated Left (90°) optic position will have the optical system oriented as shown below (Type 5 and 5W optics are not available with factory set rotatable optics):



Note: The hand hole will normally be located on the pole at the 0° point.

Optic Rotated Right (270°) Optic Position

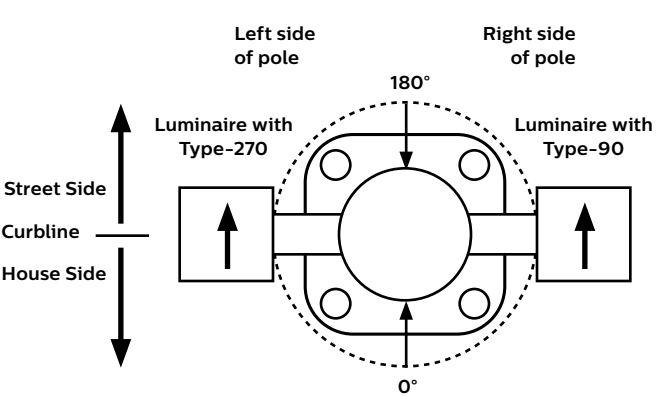
Luminaires ordered with optical systems in the Optic Rotated Right (270°) optic position will have the optical system oriented as shown below (Type 5 and 5W optics are not available with factory set rotatable optics):



Note: The hand hole will normally be located on the pole at the 0° point.

Twin Luminaire Assemblies with Type-90/Type-270 Rotated Optical Systems

Twin luminaire assemblies installed with rotated optical systems are an excellent way to direct light toward the interior of the site (Street Side) without additional equipment. It is important, however, that care be exercised to insure that luminaires are installed in the proper location.



Luminaires with Optic Rotated Right (270°) are installed on the LEFT Side of Pole

Luminaires with Optic Rotated Left (90°) are installed on the RIGHT Side of Pole

Note: The hand hole location will depend on the drilling configuration ordered for the pole.

ECF-S EcoForm small

Area luminaire

Specifications

Housing

One-piece die cast aluminum housing with integral arm and separate, self-retained hinged, one-piece die cast door frame. Luminaire housing rated to IP65, tested in accordance to Section 9 of IEC 60598-1.

Vibration resistance

Luminaire is tested and rated 3G over 100,000 cycles conforming to standards set forth by ANSI C136.31-2018. Testing includes vibration in three axes, all performed on the same luminaire.

Light engine

Light engine comprises of a module of 16-LED aluminum metal clad board fully sealed with optics offered in multiples of 2, 3, and 4 modules or 32, 48, and 64 LEDs. Module is RoHS compliant. Color temperatures: 3000K +/-125K, 4000K, 5000K +/- 200K. Minimum CRI of 70. LED light engine is rated IP66 in accordance to Section 9 of IEC 60598-1.

Energy saving benefits

System efficacy up to 152 lms/W with significant energy savings over Pulse Start Metal Halide luminaires. Optional control options provide added energy savings during unoccupied periods.

Optical systems

Type 2, 3, 4, 5, 5W, and AFR distributions available. Internal Shield option mounts to LED optics and is available with Type 2, 3, 4, and AFR distributions, including a dedicated BLC, LCL, and RCL optics to provide the best backlight control possible for those stringent requirements around property lines. Types 2, 3, 4, AFR, and BLC when specified and used as rotated, are factory set only. Performance tested per LM-79 and TM-15 (IESNA) certifying its photometric performance. Luminaire designed with 0% uplight (U0 per IESNA TM-15).

Mounting

Standard luminaire arm mounts to 4" O.D. round poles. Can also be used with 5" O.D. poles. Square pole adapter included with every luminaire. Round Pole Adapter (RPA) required for 3-3.9" poles. EcoForm features a retrofit arm kit. When specified with the retrofit arm (RAM) option, EcoForm seamlessly simplifies site conversions to LED by eliminating the need for additional pole drilling on most existing poles. RAM will be boxed separately. Also optional are slipfitter and wall mounting accessories. Note that only fixed mounts (AR, RAM, WS) are required to meet IDA compliance. SF mounting will not meet IDA.

Control options

0-10V dimming (DD): Access to 0-10V dimming leads supplied through back of luminaire (for secondary dimming controls by others). Cannot be used with other control options.

Dual Circuit Control (DCC): Luminaire equipped with the ability to have two separate circuits controlling drivers and light engines independently. Permits separate switching of separate modules controlled by use of two sets of leads, one for each circuit. Not recommended to be used with other control options, motion response, or photocells.

Sensor Ready Zhaga Socket Connector (SRDR): Product equipped with Sensor Ready drivers connected to 4-pin Zhaga Book 18 compliant receptacle designed for sensor and other control system applications. Receptacle is rated IP66 assembly in a compact design that provides a sealed electrical interface and rated UV resistance, mounted on underside of the luminaire, protective dust cap included. When a controller not provided by Signify is used with Sensor Ready Zhaga socket connector, the controller must be certified to work with the Xitanium SR LED drivers as part of the SR certified program. SRDR can be used with NEMA 7-pin twist lock receptacle, which is mounted on top of the luminaire.

Automatic Profile Dimming (CS/CM/CE/CA): Standard dimming profiles provide flexibility towards energy savings goals while optimizing light levels during specific dark hours. Dimming profiles include two dimming settings including dim to 30% or 50% of the total lumen output. When used in combination with not programmed motion response it overrides the controller's schedule when motion is detected. After 5 minutes with no motion, it will return to the automatic dimming profile schedule. Automatic dimming profile scheduled with the following settings:

- **CS50/CS30:** Security for 7 hours night duration (Ex., 11 PM – 6 AM)
- **CM50/CM30:** Median for 8 hours night duration (Ex., 10 PM – 6 AM)

All above profiles are calculated from mid point of the night. Dimming is set for 6 hours after the mid point and 1 or 2 hours before depending of the duration of dimming. Cannot be used with other dimming control options.

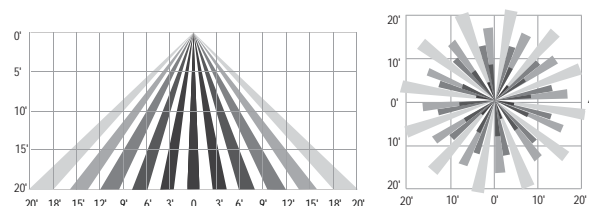
Field Adjustable Wattage Selector (FAWS): Luminaire equipped with the ability to manually adjust the wattage in the field to reduce total luminaire lumen output and light levels. Comes pre-set to the highest position at the lumen output selected. Use chart below to estimate reduction in lumen output desired. Cannot be used with other control options or motion response.

FAWS Position	Percent of Typical Lumen Output
1	25%
2	50%
3	55%
4	65%
5	75%
6	80%
7	85%
8	90%
9	95%
10	100%

Note: Typical value accuracy +/- 5%

Wireless system (LLC): Optional wireless controller integral to luminaire ready to be connected to a Limelight system (sold by others). The system allows you to wirelessly manage the entire site, independent lighting groups or individual luminaires while on-site or remotely. Based on a high-density mesh network with an easy to use web-based portal, you can conveniently access, monitor and manage your lighting network remotely. Wireless controls can be combined with site and area, pedestrian, and parking garage luminaires as well, for a completely connected outdoor solution. Equipped with motion response with #3 lens for 8-25' mounting heights. Also available with remote pod accessory where pod is mounted separate from luminaire to pole or wall.

LLC wireless controller with #3 lens



Motion response options

Bi-Level Infrared Motion Response (BL-IMRI): Motion Response module is mounted integral to luminaire factory pre-programmed to 50% dimming when not ordered with other control options. BL-IMRI is set/operates in the following fashion: The motion sensor is set to a constant 50%. When motion is detected by the PIR sensor, the luminaire returns to full power/light output. Dimming on low is factory set to 50% with 5 minutes default in "full power" prior to dimming back to low. When no motion is detected for 5 minutes, the motion response system reduces the wattage by 50%, to 50% of the normal constant wattage reducing the light level. Other dimming settings can be provided if different dimming levels are required. This can also be done with FSIR-100 Wireless Remote Programming Tool (contact Technical Support for details).

Infrared Motion Response with Other Controls: When used in combination with other controls (Automatic Dimming Profile), motion response device will simply override controller's schedule with the added benefits of a combined dimming profile and sensor detection. In this configuration, the motion response device cannot be re-programmed with FSIR-100 Wireless Remote Programming Tool. The profile can only be re-programmed via the controller.

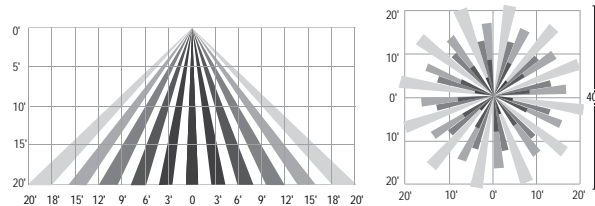
ECF-S EcoForm small

Area luminaire

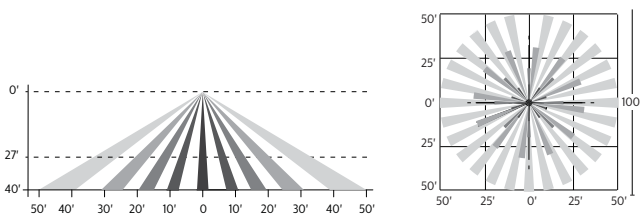
Specifications

Infrared Motion Response Lenses (IMRI3/IMRI7): Infrared Motion Response Integral module is available with two different sensor lens types to accommodate various mounting heights and occupancy detection ranges. Lens #3 (IMRI3) is designed for mounting heights up to 20' with a 40' diameter coverage area. Lens #7 is designed for higher mounting heights up to 40' with larger coverage areas up to 100' diameter coverage area. See charts for approximate detection patterns:

IMRI3 Luminaire or remote mount controller with #3 lens



IMRI7 Luminaire or remote mount controller with #7 lens



Electrical

Twist-Lock Receptacle (TLRD5/TLRD7/ TLRPC): Twist Lock Receptacle with 5 pins enabling dimming or with 7 pins with additional functionality (by others) can be used with a twistlock photoelectric cell or a shorting cap. Dimming Receptacle Type B (5-pin) and Type D-24 (7-pin) in accordance to ANSI C136.41. Can be used with third-party control system. Receptacle located on top of luminaire housing. When specifying receptacle with twistlock photoelectric cell, voltage must be specified. When ordering 7-pin Twist-lock receptacle (TLRD7), all 7 pins are wired to respective pins with the Sensor Ready (SR) driver, and photocell or shorting cap is not included. When ordering a twist-lock receptacle with a photocell (TLRPC), the receptacle used is a 5-pin receptacle, so pins 6 and 7 are not available (no SR driver). 0-10V dimming leads (pins 4 and 5) are connected if not ordered with any other dimming option.

Buy American Act of 1933 (BAA):

This product is manufactured in one of our US factories and, as of the date of this document, this product was considered a commercially available off-the-shelf (COTS) item meeting the requirements of the BAA. This BAA designation hereunder does not address (i) the applicability of, or availability of a waiver under, the Trade Agreements Act, or (ii) the "Buy America" domestic content requirements imposed on states, localities, and other non-federal entities as a condition of receiving funds administered by the Department of Transportation or other federal agencies. Prior to ordering, please visit www.signify.com/baa to view a current list of BAA-compliant products to confirm this product's current compliance.

Driver: Driver efficiency (>90% standard). 120-480V available (restrictions apply). Open/short circuit protection. All drivers are 0-10V dimming to 10% power standard, except when using Sensor Ready (SR) drivers, which uses DALI protocol (options CS50/CM50/CS30/CM30, SRDR, and TR7). Drivers are RoHS and FCC Title 47 CFR Part 15 compliant.

Button Photocontrol (PCB): Button style design for internal luminaires mounting applications. The photocontrol is constructed of a high impact UV stabilized polycarbonate housing. Rated voltage of 120V or 208-277V with a load rating of 1000 VA. The photocell will turn on with 1-4Fc of ambient light.

Surge protection (SP1/SP2): Surge protection device tested in accordance with ANSI/IEEE C62.45 per ANSI/IEEE C62.41.2 Scenario I Category C High Exposure 10kV/10kA waveforms for Line-Ground, Line-Neutral and Neutral-Ground, and in accordance with DOE MSSLC Model Specification for LED Roadway Luminaires Appendix D Electrical Immunity High test level 10kV/10kA. 20kV / 10kA surge protection device that provides extra protection beyond the SP1 10kV/10kA level.

Listings

UL/cUL wet location listed to the UL 1598 standard, suitable for use in ambient temperatures from -40° to 40°C (-40° to 104°F). Most EcoForm configurations are qualified under Premium and Standard DesignLights Consortium® categories. Consult DLC Qualified Products list to confirm your specific luminaire selection is approved. CCTs 3000K and warmer are Dark Sky Approved.

Finish

Each standard color luminaire receives a fade and abrasion resistant, electrostatically applied, thermally cured, triglycidal isocyanurate (TGIC) textured polyester powdercoat finish. Standard colors include bronze (BZ), black (BK), white (WH), dark gray (DGY), and medium gray (MGY). Consult factory for specs on optional or custom colors.

Service Tag

Each individual luminaire is uniquely identifiable, thanks to the Service tag application. With a simple scan of a QR code, placed on the inside of the mast door, you gain instant access to the luminaire configuration, making installation and maintenance operations faster and easier, no matter what stage of the luminaire's lifetime. Just download the APP and register your product right away. For more details visit: signify.com

Warranty

EcoForm luminaires feature a 5-year limited warranty. See signify.com/warranties for complete details and exclusions.





Gardco PowerForm LED floodlights provide over 1,500W HID replacement while significantly reducing energy and maintenance costs. PowerForm features a modular housing design available in four different sizes for a range of commercial, retail, industrial, airport, and other outdoor floodlighting applications. PowerForm is available with multiple lumen packages delivering approximately 42,300 to 138,600 lumens.

Project:	
Location:	
Cat.No:	
Type:	
Lumens:	Qty:
Notes:	

Ordering guide

example: PFF-184L-900-NW-G2-YK-SP-120-PCB-F1-BZ

Prefix PFF	Number of LEDs	Drive Current	Color Temperature	Mounting	Distribution	Voltage
PFF PowerForm flood	138L 138 LEDs (3 modules) 184L 184LEDs (4 modules) 230L 230 LEDs (5 modules) 276L 276 LEDs (6 modules) Note: 46 LEDs per module	700 700mA 900 900mA 1A 1 Amp 1.2A ^{6,10} 1.2 Amp	WW-G2 Warm White 3000K, 70 CRI Generation 2 NW-G2 Neutral White 4000K, 70 CRI Generation 2	SF Slip Fitter Mount (fits on 2-3/8" O.D. tenon, wires through slip fitter) YK Yoke Mount (9' or 2.74m cord exits luminaire)	A33 Asymmetric 33° Flood (NEMA 6x5) RM Rectangular Medium Flood (NEMA 7x4) SP Spot (12° round) (NEMA 2x2) AIRP Airport Apron Flood (NEMA 7x5)	120 120V 208 208V 240 240V 277 277V 347 347V 480 480V UNV 120-277V HVU 347-480V

Options										Finish	
Dimming Controls ^{1,2}		Fusing		Surge Protection		Other Options ²		Side Rails			
none	leave blank (0-10V dimming driver standard)	none	leave blank	blank	Surge Protector 10kV / 10kA (standard)	none	leave blank	blank	standard anodized, no finish	BK	Black
DD ^{1,2,3,8}	0-10V dimming external wires (controls by others)	Fusing				PCB ^{2,8,9}	Photocontrol Button			WH	White
FAWS ^{1,2,8,10}	Field Adjustable Wattage Selector	F1 ⁷	Single (120, 277, 347VAC)	SP2	Surge Protector 20kV / 10kA (option)	TLRD ^{7,4}	Twist Lock Receptacle 7-pin	PSR	Painted Side Rails, painted same finish to match luminaire finish	BZ	Bronze
		F2 ⁷	Double (208, 240, 480VAC)							DGY	Dark Gray
		F3 ⁷	Canadian Double Pole (208, 240, 480VAC)			TLRPC ^{2,4,7,9}	Twist Lock 5-pin Receptacle w/ 3-pin Photocell			MGY	Medium Gray
		Pole Mount Fusing								RAL ⁵	Optional Color (specify optional color or RAL)
		FP1 ⁷	Single (120, 277, 347VAC)							CC ⁵	Custom Color (must supply color chip, requires factory quote)
		FP2 ⁷	Double (208, 240, 480VAC)								
		FP3 ⁷	Canadian Double Pole (208, 240, 480VAC)								

- | | | |
|---|--|--|
| 1. Choose only 1 of the following Dimming Controls options: either DD or FAWS. | TLRD7 and TLRPC receptacle pins 4 & 5 are capped off when ordered with any of the Dimming Controls DD or FAWS. | 8. PCB can be used with DD and FAWS. |
| 2. 0-10V dimming driver standard. | | 9. PCB and TLRPC available in 120V, 208V, 240V, or 277V only. |
| 3. Luminaire has 0-10V dimming wires exiting the luminaire for dimming controls by others. | 5. Must contact factory prior to ordering - these items are ETO Specials. | 10. FAWS not available with 1.2A (switch has lower current limit). |
| 4. TLRD7 and TLRPC max aiming angle 45°. TLRD7 works with 3, 5 or 7 pin NEMA photocell/dimming, use of photocell (by others) or shorting cap (by others) is required to ensure proper illumination. | 6. 276L with 1.2A only available as ETO Special - must contact factory prior to ordering. | |
| | 7. Must specify specific input voltage, not available with UNV or HVU. | |

Connected lighting

Interact City connector node provides the plug and play wireless communications technology to connect your floodlight to the Interact City lighting management system.

Accessory Ordering Code	Description
LLC	Interact City cellular technology connector node



Contact Signify for additional support when connected lighting or additional services are desired.
 For more details visit: <https://www.interact-lighting.com/en-us/what-is-possible/interact-city>

PFF PowerForm Floodlight

PowerForm Accessories¹ (ordered separately, field installed, specify finish at placeholder F)

Shielding Accessories

Glare shield (black finish)

GS-PFF-138	138 LEDs (3 modules)
GS-PFF-184	184 LEDs (4 modules)
GS-PFF-230	230 LEDs (5 modules)
GS-PFF-276	276 LEDs (6 modules)



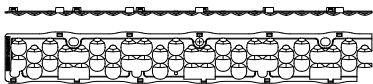
GS louvered glare shields are ordered as an accessory only and can be used with A33, RM, and AIRP optics; can not be used with SP optics due to fit restriction - if required, must contact factory prior to ordering since it is an ETO Special.

Glare shields are aluminum sheet metal louvers painted in a smooth black power coat finish. Each set includes a mounting kit that fastens to the front face of the LED light engine and includes stainless steel hardware.

One glare shield attaches to each 46 LED module. The total number of glare shields is determined by total number of modules per luminaire where required.

Internal house side shield

HIS-PFF-138	138 LEDs (3 modules)
HIS-PFF-184	184 LEDs (4 modules)
HIS-PFF-230	230 LEDs (5 modules)
HIS-PFF-276	276 LEDs (6 modules)



HIS internal house side shields are ordered as an accessory only and can be used with A33 and RM optics; can not be used with SP or AIRP optics due to fit restriction.

Internal shields are injection molded black polymer that snap fit on each 46 LED module. The total number of internal shields is determined by the total number of modules per luminaire where required.

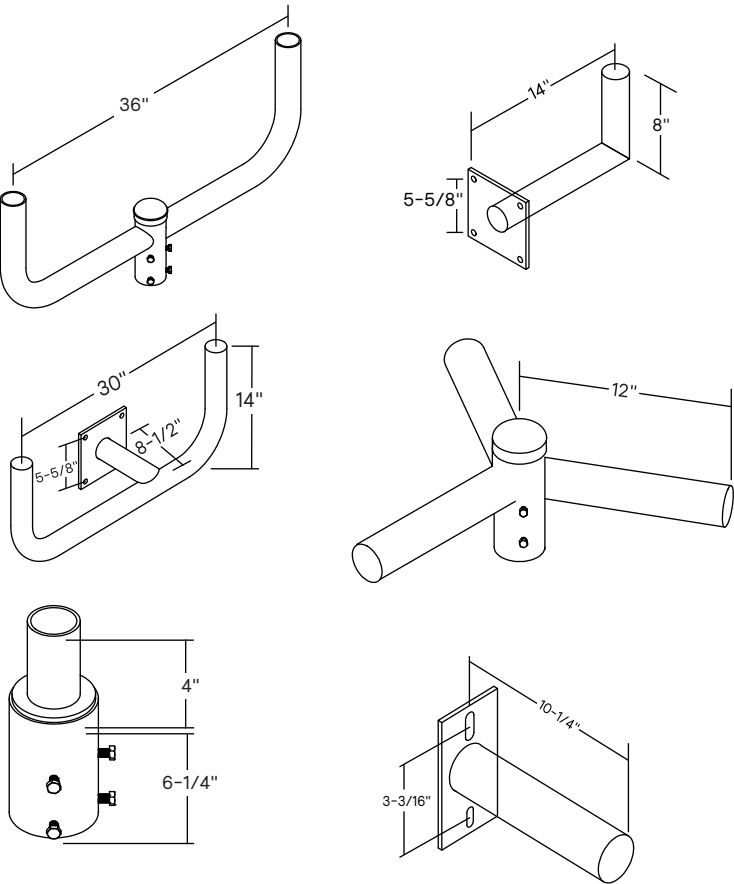
Mounting Accessories

For wall and pole brackets, bullhorns, etc. see <https://www.signify.com/en-us/products/outdoor-luminaires/poles-brackets/site-and-area-brackets/bullhorn-brackets#downloads> for details.

Exception: All UPS Upsweep - contact factory to confirm compatibility.

Exception: SBRKT-SAB-NA-4-WA-(F) Side Angle Flat bracket cannot be used with any PFF versions due to only single mounting hole that is too small for required mounting bolts.

Exception: PFF-276L 6 module version cannot be used with any brackets, etc. due to its weight - too heavy.



1. Consult Signify to confirm whether specific accessories are BAA-compliant.

Examples shown are not to scale - see SBRKT spec sheet for all available brackets

PFF PowerForm

Floodlight

LED Wattage and Lumen Values – 3000K

Ordering Code	Total LEDs	Module Qty	LED Current (mA)	Color Temp.	Average System Watts	A33		RM		SP		AIRP	
						Lumen Output	Efficacy (LPW)	Lumen Output	Efficacy (LPW)	Lumen Output	Efficacy (LPW)	Lumen Output	Efficacy (LPW)
PFF-138L-700-WW-G2	138	3	700	3000	289	43,048	149	42,433	147	43,619	151	42,284	146
PFF-138L-900-WW-G2	138	3	900	3000	397	51,974	131	51,231	129	52,663	133	51,051	128
PFF-138L-1A-WW-G2	138	3	1050	3000	455	58,940	130	58,098	128	59,721	131	57,894	127
PFF-138L-1.2A-WW-G2	138	3	1200	3000	511	65,101	127	64,170	126	65,962	129	62,793	123
PFF-184L-700-WW-G2	184	4	700	3000	386	57,398	149	56,577	147	58,159	151	56,379	146
PFF-184L-900-WW-G2	184	4	900	3000	530	69,299	131	68,308	129	70,217	133	68,068	128
PFF-184L-1A-WW-G2	184	4	1050	3000	606	78,587	130	77,463	128	79,628	131	77,191	127
PFF-184L-1.2A-WW-G2	184	4	1200	3000	681	86,801	127	85,559	126	87,950	129	83,724	123
PFF-230L-700-WW-G2	230	5	700	3000	482	71,747	149	70,722	147	72,698	151	70,474	146
PFF-230L-900-WW-G2	230	5	900	3000	662	86,623	131	85,385	129	87,771	133	85,085	128
PFF-230L-1A-WW-G2	230	5	1050	3000	758	98,234	130	96,829	128	99,534	131	96,489	127
PFF-230L-1.2A-WW-G2	230	5	1200	3000	852	108,500	127	106,949	126	109,937	129	106,574	125
PFF-276L-700-WW-G2	276	6	700	3000	579	86,097	149	84,866	147	87,237	151	84,568	146
PFF-276L-900-WW-G2	276	6	900	3000	795	103,948	131	102,462	129	105,325	133	103,975	131
PFF-276L-1A-WW-G2	276	6	1050	3000	909	117,880	130	116,194	128	119,442	131	117,911	130
PFF-276L-1.2A-WW-G2	276	6	1200	3000	1022	130,200	127	128,338	126	131,924	129	127,888	125

LED Wattage and Lumen Values – 4000K

Ordering Code	Total LEDs	Module Qty	LED Current (mA)	Color Temp.	Average System Watts	A33		RM		SP		AIRP	
						Lumen Output	Efficacy (LPW)	Lumen Output	Efficacy (LPW)	Lumen Output	Efficacy (LPW)	Lumen Output	Efficacy (LPW)
PFF-138L-700-NW-G2	138	3	700	4000	289	45,219	156	44,573	154	45,818	158	44,416	154
PFF-138L-900-NW-G2	138	3	900	4000	397	54,595	137	53,814	135	55,318	139	53,625	135
PFF-138L-1A-NW-G2	138	3	1050	4000	455	61,912	136	61,027	134	62,732	138	60,813	134
PFF-138L-1.2A-NW-G2	138	3	1200	4000	511	68,383	134	67,405	132	69,288	136	65,959	129
PFF-184L-700-NW-G2	184	4	700	4000	386	60,292	156	59,430	154	61,091	158	59,222	154
PFF-184L-900-NW-G2	184	4	900	4000	530	72,793	137	71,752	135	73,757	139	71,500	135
PFF-184L-1A-NW-G2	184	4	1050	4000	606	82,549	136	81,369	134	83,643	138	81,083	134
PFF-184L-1.2A-NW-G2	184	4	1200	4000	681	91,177	134	89,873	132	92,384	136	87,945	129
PFF-230L-700-NW-G2	230	5	700	4000	482	75,365	156	74,288	154	76,363	158	74,027	154
PFF-230L-900-NW-G2	230	5	900	4000	662	90,991	137	89,690	135	92,196	139	89,375	135
PFF-230L-1A-NW-G2	230	5	1050	4000	758	103,187	136	101,711	134	104,553	138	101,354	134
PFF-230L-1.2A-NW-G2	230	5	1200	4000	852	113,971	134	112,341	132	115,480	136	111,947	131
PFF-276L-700-NW-G2	276	6	700	4000	579	90,438	156	89,145	154	91,636	158	88,832	154
PFF-276L-900-NW-G2	276	6	900	4000	795	109,189	137	107,628	135	110,635	139	109,217	137
PFF-276L-1A-NW-G2	276	6	1050	4000	909	123,824	136	122,053	134	125,464	138	123,856	136
PFF-276L-1.2A-NW-G2	276	6	1200	4000	1022	136,765	134	134,809	132	138,576	136	134,336	131

Values from photometric tests performed in accordance with IESNA LM-79 and are representative of the configurations shown. Actual performance may vary due to installation and environmental variables, LED and driver tolerances, and field measurement considerations. It is highly recommended to confirm performance with a photometric layout.

NOTE: Some data may be scaled based on tests of similar (but not identical) luminaires. Contact factory for configurations not shown.

Field Adjustable Wattage Selector (FAWS) Multiplier Chart

FAWS Position	Typical Lumens and System Wattage Multiplier	
	138L/184L	230L/276L
1	10%	15%
2	20%	35%
3	30%	45%
4	40%	60%
5	45%	70%
6	55%	85%
7	60%	100%
8	70%	100%
9	80%	100%
10	100%	100%

Note: Actual performance may vary due to LED and driver tolerances

PFF PowerForm

Floodlight

LED Wattage and Lumen Values – 3000K with glare shield

Ordering Code	Total LEDs	Module Qty	LED Current (mA)	Color Temp.	Average System Watts	A33-GS		RM-GS		AIRP-GS	
						Lumen Output	Efficacy (LPW)	Lumen Output	Efficacy (LPW)	Lumen Output	Efficacy (LPW)
PFF-138L-700-WW-G2-GS	138	3	700	3000	289	33,280	115	32,884	114	22,022	76
PFF-138L-900-WW-G2-GS	138	3	900	3000	397	40,180	101	39,701	100	26,587	67
PFF-138L-1A-WW-G2-GS	138	3	1050	3000	455	45,566	100	45,023	99	30,151	66
PFF-138L-1.2A-WW-G2-GS	138	3	1200	3000	511	49,421	97	48,833	96	32,702	64
PFF-184L-700-WW-G2-GS	184	4	700	3000	386	44,374	115	43,844	114	29,363	76
PFF-184L-900-WW-G2-GS	184	4	900	3000	530	53,574	101	52,935	100	35,450	67
PFF-184L-1A-WW-G2-GS	184	4	1050	3000	606	60,754	100	60,030	99	40,201	66
PFF-184L-1.2A-WW-G2-GS	184	4	1200	3000	681	65,895	97	65,110	96	43,604	64
PFF-230L-700-WW-G2-GS	230	5	700	3000	482	55,466	115	54,806	114	36,702	76
PFF-230L-900-WW-G2-GS	230	5	900	3000	662	66,967	101	66,169	100	44,313	67
PFF-230L-1A-WW-G2-GS	230	5	1050	3000	758	75,942	100	75,038	99	50,251	66
PFF-230L-1.2A-WW-G2-GS	230	5	1200	3000	852	83,879	98	82,880	97	55,504	65
PFF-276L-700-WW-G2-GS	276	6	700	3000	579	66,560	115	65,767	114	44,043	76
PFF-276L-900-WW-G2-GS	276	6	900	3000	795	81,834	103	80,859	102	54,150	68
PFF-276L-1A-WW-G2-GS	276	6	1050	3000	909	92,802	102	91,697	101	61,408	68
PFF-276L-1.2A-WW-G2-GS	276	6	1200	3000	1022	100,655	98	99,456	97	66,604	65

LED Wattage and Lumen Values – 4000K with glare shield

Ordering Code	Total LEDs	Module Qty	LED Current (mA)	Color Temp.	Average System Watts	A33-GS		RM-GS		AIRP-GS	
						Lumen Output	Efficacy (LPW)	Lumen Output	Efficacy (LPW)	Lumen Output	Efficacy (LPW)
PFF-138L-700-NW-G2-GS	138	3	700	4000	289	34,958	121	34,542	119	23,132	80
PFF-138L-900-NW-G2-GS	138	3	900	4000	397	42,206	106	41,703	105	27,928	70
PFF-138L-1A-NW-G2-GS	138	3	1050	4000	455	47,863	105	47,293	104	31,671	70
PFF-138L-1.2A-NW-G2-GS	138	3	1200	4000	511	51,913	102	51,295	100	34,351	67
PFF-184L-700-NW-G2-GS	184	4	700	4000	386	46,611	121	46,055	119	30,843	80
PFF-184L-900-NW-G2-GS	184	4	900	4000	530	56,275	106	55,604	105	37,237	70
PFF-184L-1A-NW-G2-GS	184	4	1050	4000	606	63,817	105	63,057	104	42,228	70
PFF-184L-1.2A-NW-G2-GS	184	4	1200	4000	681	69,217	102	68,393	100	45,802	67
PFF-230L-700-NW-G2-GS	230	5	700	4000	482	58,263	121	57,569	119	38,553	80
PFF-230L-900-NW-G2-GS	230	5	900	4000	662	70,343	106	69,505	105	46,547	70
PFF-230L-1A-NW-G2-GS	230	5	1050	4000	758	79,771	105	78,821	104	52,785	70
PFF-230L-1.2A-NW-G2-GS	230	5	1200	4000	852	88,108	103	87,059	102	58,302	68
PFF-276L-700-NW-G2-GS	276	6	700	4000	579	69,916	121	69,083	119	46,264	80
PFF-276L-900-NW-G2-GS	276	6	900	4000	795	85,960	108	84,936	107	56,880	72
PFF-276L-1A-NW-G2-GS	276	6	1050	4000	909	97,481	107	96,320	106	64,504	71
PFF-276L-1.2A-NW-G2-GS	276	6	1200	4000	1022	105,730	103	104,471	102	69,962	68

Values from photometric tests performed in accordance with IESNA LM-79 and are representative of the configurations shown. Actual performance may vary due to installation and environmental variables, LED and driver tolerances, and field measurement considerations. It is highly recommended to confirm performance with a photometric layout.

NOTE: Some data may be scaled based on tests of similar (but not identical) luminaires.

Predicted Lumen Depreciation Data

Ambient Temperature (°C)	Driver Current	Calculated L70 hours	L70 per TM-21	Lumen Maintenance % @ 60,000 hours
25°C	up to 1200 mA	>100,000	>60,000	98%

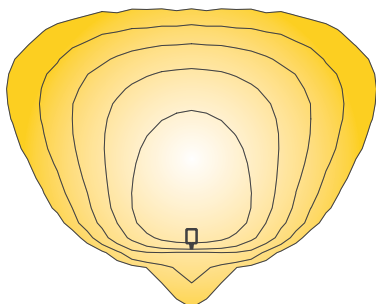
Predicted performance derived from LED manufacturer's data and engineering design estimates, based on IESNA LM-80 methodology. Actual experience may vary due to field application conditions. L70 is the predicted time when LED performance depreciates to 70% of initial lumen output. Calculated per IESNA TM21-11. Published L70 hours limited to 6 times actual LED test hours.

PFF PowerForm

Floodlight

Optical Distribution Diagrams

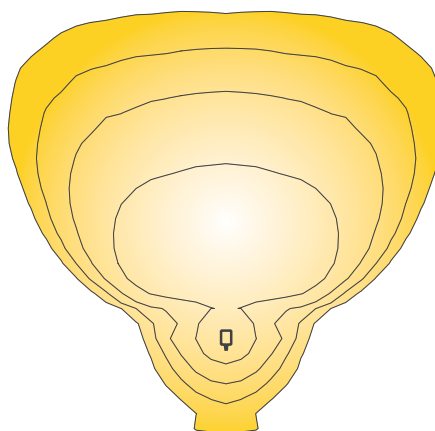
A33 Asymmetric 33° Flood (NEMA 6x5)



30' or 9.14m mounting height, 30° tilt

Applications include: large area lighting, storage yards, transportation terminals, ports, utility sub-stations, security lighting, large facades, large wall washing, tall structures / monuments / statues

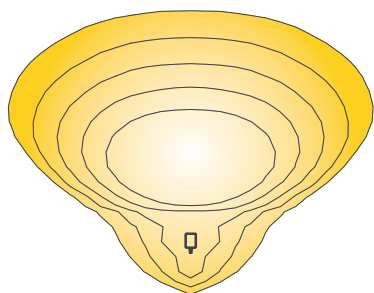
AIRP Airport Apron Flood



30' or 9.14m mounting height, 25° tilt

Applications: airport aprons

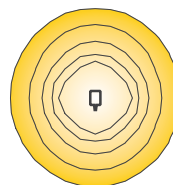
RM Rectangular Medium Flood (NEMA 7x4)



30' or 9.14m setback, 50° tilt

Applications include: building entrances and exits, security lighting, perimeter fences, checkpoints and inspection stations, large and wide wall grazing, large signs

SP Spot 12° Round (NEMA 2x2)

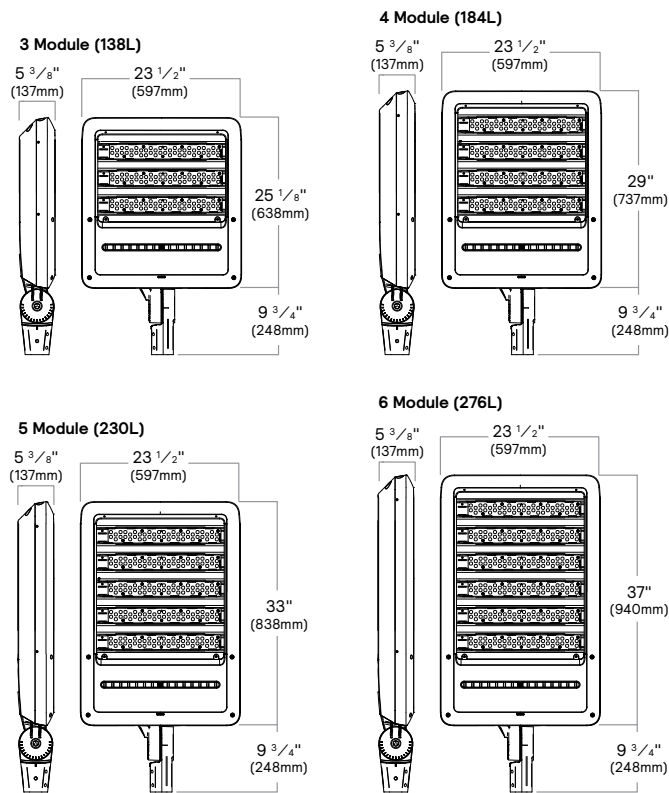


30' or 9.14m setback, 0° tilt

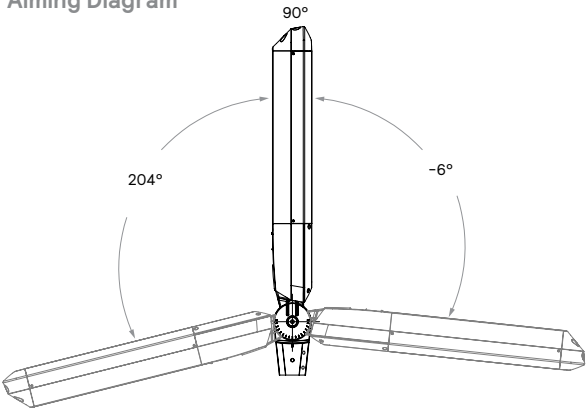
Applications include: spotlighting, accenting, tall columns, tall structures / monuments / statues

PFF PowerForm Floodlight

Dimensions – Slipfitter Mount (SF)



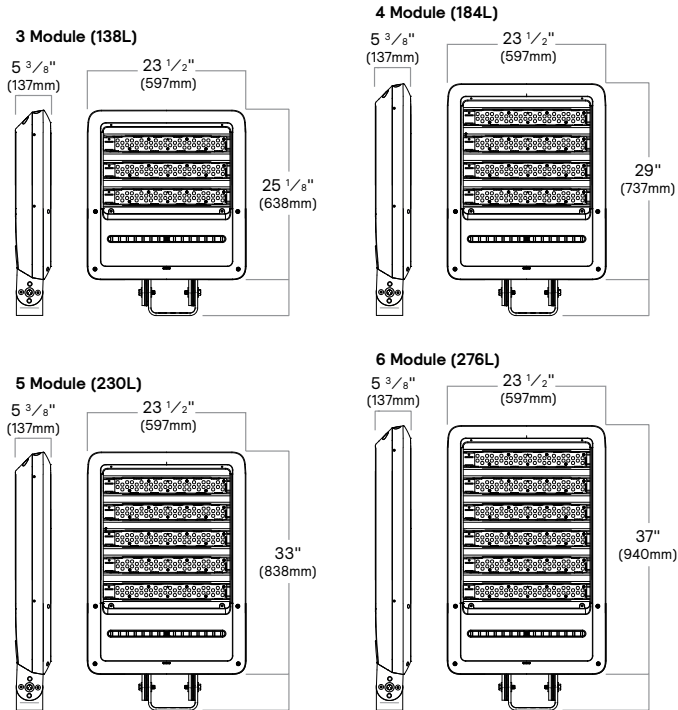
Slipfitter Aiming Diagram



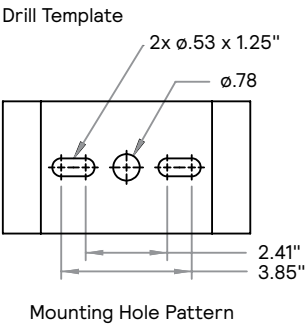
No. of Modules	Effective Projected Area (EPA-ft ²)			Weight of single luminaire PFF SF
	Single: 0° Aim	Single: 45° Aim	Single: 90° Aim	
3	0.647	2.311	3.269	62 lbs (28.1 kg)
4	0.739	2.681	3.792	72 lbs (32.7 kg)
5	0.836	3.021	4.273	81 lbs (36.7 kg)
6	0.938	3.337	4.720	91 lbs (41.3 kg)

Note: Applies to single PFF luminaire with (SF) Slipfitter mount at the following angles: 0° is horizontal to ground, 90° is perpendicular to the ground as shown in drawings.

Dimensions – Yoke Mount (YK)



Yoke Mount Drill Template



No. of Modules	Effective Projected Area (EPA-ft ²)			Weight of single luminaire PFF YK
	Single: 0° Aim	Single: 45° Aim	Single: 90° Aim	
3	0.596	2.232	3.156	66 lbs (29.9 kg)
4	0.688	2.601	3.679	76 lbs (34.5 kg)
5	0.786	2.942	4.161	86 lbs (39 kg)
6	0.887	3.257	4.607	94 lbs (42.6 kg)

Note: Applies to single PFF luminaire with (YK) Yoke mount at the following angles: 0° is horizontal to ground, 90° is perpendicular to the ground as shown in drawings.

PFF PowerForm

Floodlight

Controls options

DD: 0-10V dimming driver with dimming wires externally accessible for connecting dimming controls by others.

PCB: Photocell button (a.k.a. button photoeye).

TLRD7*: Twist Lock Receptacle with 7 pins enabling dimming and additional functionality (by others), can be used with an Interact City node, a twistlock photoelectric cell or a shorting cap. Can also be used with Signify or third party control system. Pins 6 and 7 are capped off (not connected) unless used with SR driver – ETO Specials, contact factory. Receptacle located on top of luminaire housing.

* Use of photoelectric cell or shorting cap is required to ensure proper illumination.
Note: Additional hardware will be required to utilize the additional 2 pins on this receptacle.

TLRPC*: Twist Lock Receptacle with 5 pins and includes 3 pin twistlock photoelectric cell (must specify voltage). Receptacle located on top of luminaire housing.

*Note: Maximum aiming angle is 45° with TLRD7 and TLRPC in order to maintain IP66 rating around the Twist Lock Receptacle; Light Engines and the rest of the luminaire maintain IP66 rating at all aiming angles. UL Wet Location rating is also maintained at all aiming angles. Use of photoelectric cell or shorting cap is required to ensure proper illumination. TLRD7 and TLRPC receptacle pins 4 & 5 are connected to dimming driver's dimming leads whenever no Dimming Controls are selected; if Dimming Controls are selected then receptacle pins 4 & 5 are capped off because driver's dimming leads are used with Dimming Controls.

FAWS: Field Adjustable Wattage Selector, pre-set to the highest position, can be easily switched in the field to the required position. This reduces total luminaire wattage consumption and reduces the light level – see the FAWS multiplier chart for more details.

Note: It is not recommended to use FAWS with other dimming or controls; if you do, set the switch to position 10 (maximum output) to enable the other dimming or controls. Switching FAWS to any position other than 10 will disable the other dimming or controls.

Connected Lighting

Interact City connector node provides the plug and play wireless communications technology to connect your floodlight to the Interact City lighting management system. With Interact you can remotely manage, monitor and control all city lighting, from roads and streets, to parks and plazas, and bridges from one single system. Connected lighting enables capabilities including, accurate on/off switching, dimming control, fault reporting and integration with other systems to enable condition-based lighting. Interact provides you with a robust and scalable infrastructure to further reduce energy consumption, improve operations, and turn lighting into a connected network for your smart city journey.

For more details visit: <https://www.interact-lighting.com/en-us/what-is-possible/interact-city>

Luminaire options

F1: Fusing Single (for 120, 277 or 347VAC)

F2: Fusing Double (for 208, 240 or 480VAC)

F3: Fusing Canadian Double Pole (for 208, 240 or 480VAC)

FP1: Fusing Pole Single (pole mounted near handhole, for 120, 277 or 347VAC)

FP2: Fusing Pole Double (pole mounted near handhole, for 208, 240 or 480VAC).

FP3: Fusing Pole Canadian Double Pole (pole mounted near handhole, for 208, 240 or 480VAC)

SP2: Surge Protection, 20kV/10kA. Surge protection device wired in parallel so that if it fails open the luminaire will remain lit/powerd on.

PFF PowerForm

Floodlight

Specifications

Housing

Main body castings made of a low copper die cast Aluminum alloy (A360) for a high resistance to corrosion, 0.100" (2.5mm) minimum thickness. Side rail extrusions made of corrosion resistant low copper extruded anodized aluminum alloy (Anodized 6063-T5).

Mounting

Up tilt aiming and down tilt aiming possible with all of the mounting options.

cULus Listed as suitable for mounting within 4' or 1.2m of the ground

SF: Adjustable Slip Fitter with AWG 16-3 wires (or AWG 16-5 if DD external control options are selected) exiting through the Slip Fitter. Integral splice compartment for field wiring with cULus Wet Location rated access cover with seal around entire perimeter. Slip Fitter made of low copper die cast Aluminum alloy (A360) for a high resistance to corrosion, adjustable knuckle has 4 degree aiming increments with integral interlocking teeth and bolt to secure aiming in place, integral cast-in aiming marks. Fits on a 2-3/8" O.D. tenon.

YK: Adjustable Yoke with 9' (2.74m) of AWG 16-3 SEOW cord (or AWG 16-5 if DD external control options are selected) exiting the luminaire through IP66 rated cord seal. Customer-specified length or different cord type available - must contact factory prior to ordering, this is an ETO Special. Yoke made of high strength steel, galvanized and painted for high resistance to corrosion, 5 degree aiming increments with bolts to secure aiming in place.

Driver/Electrical Door

Removable die cast aluminum door made of a low copper die cast aluminum alloy (A360) for a high resistance to corrosion. Provides access to electronic components/LED drivers. Door secured with two captive screws outside of gasket perimeter. Includes a lanyard to prevent accidental dropping if access is required.

IP Rating

IP66 rated driver/electrical compartment and light engines in all aiming positions including up tilt aiming per ANSI C136.37 with seals around entire perimeter of the lenses and seal around entire perimeter of the driver/electrical compartment. IP66 rating including when PCB option is installed.

Light Engine

Composed of 4 main components: Heat Sink / LED Module / Optical System / Driver. Electrical components are RoHS compliant. LEDs tested by ISO 17025-2005 accredited lab in accordance with IESNA LM-80 guidelines, extrapolations in accordance with IESNA TM-21. Metal core board ensures greater heat transfer and longer lifespan.

Heat Sinks: Heat sinks that are part of LED Modules are anodized 6063-T5 Aluminum for a high resistance to corrosion. Housing acts as heat sink for drivers, designed to ensure high efficacy and superior cooling by natural vertical convection. Air flow pattern always

close to LEDs and driver optimizing their efficiency and life. Product does not use any cooling device with moving parts (only passive cooling).

LED Module: Composed of high performance white LEDs. Color temperature as per ANSI/NEMA bin 3000K nominal (3045K +/- 175K) or 4000K nominal (3985K +/- 275K), both CRI 70 min.

Optical System: Choice of four distributions including Spot (SP), Asymmetric 33° Flood (A33), Rectangular Medium Flood (RM) distributions and a specialty distribution designed for Airport Apron (AIRP) applications featuring a wide 87° horizontal and narrow 16° vertical beam. Composed of high performance UV stabilized optical grade polymer refractor lenses to achieve desired distribution optimized to get maximum spacing, target lumens and a superior lighting uniformity. Performance shall be tested per LM-63, LM-79 and TM-15 (IESNA) certifying its photometric performance.

IK Rating: IK10 highest impact resistance rating for LED Module lenses.

Driver: High power factor of 90% min. Electronic driver, operating range 50/60 Hz. Auto adjusting universal voltage input from 120 to 277 VAC or 347 to 480 VAC rated for both application line to line or line to neutral, Class I, THD of 20% max. The current supplying the LEDs will be reduced by the driver if the driver experiences internal overheating as a protection to the LEDs and the electrical components. Output is protected from short circuits, voltage overload and current overload. Automatic recovery after correction. Standard built in driver surge protection of 2.5kV (min). Driver enables setting LED drive current to meet your specific total wattage consumption, lumen output and/or efficacy needs - ETO Specials, contact factory.

Integrated Features

Please note that these integrated features always come with this luminaire standard at no additional cost.

0-10V dimming driver included as standard, dimming leads pre-wired to Dimming Controls option except when DD external controls options are selected.

SP1: Surge protection device tested in accordance with ANSI/IEEE C62.45 per ANSI/IEEE C62.41.2 Scenario I Category C High Exposure 10kV/10kA waveforms for Line-Ground, Line-Neutral and Neutral-Ground. Enhanced surge protection device SP2 20kV/10kA available as an option. Surge protection device wired in parallel so that if it fails open the luminaire will remain lit/power on.

Wiring

#2 - #14 AWG wires from the primary circuit, located inside the housing. Due to the inrush current that occurs with electronic drivers, recommend using a time delay or slow blow fuse to avoid unnecessary and unwanted fuse blowing (false tripping) that can occur with fast acting fuses.

Hardware and Seals

All exposed screws shall be stainless and/or corrosion resistant and captive. All seals and sealing devices are made and/or lined with EPDM and/or silicone and/or rubber.

Finish

Five standard textured colors: white, bronze, black, dark gray and medium gray. RAL and custom color matching available - must contact factory prior to ordering, these are ETO Specials. Color in accordance with the AAMA 2604 standard. Application of polyester powder coat paint (2.5 mils/62.5 microns) with ± 1 mils/24 microns of tolerance. The thermosetting resins provides a discoloration resistant finish in accordance with the ASTM D2244 standard, as well as luster retention in keeping with the ASTM D523 standard and humidity proof in accordance with the ASTM D2247 standard.

LED Products Manufacturing Standard

The electronic components sensitive to electrostatic discharge (ESD) such as light emitting diodes (LEDs) are assembled in compliance with EC61340-5-1 and ANSI/ESD S20.20 standards so as to eliminate ESD events that could decrease the useful life of the product.

Luminaire Useful Life

Refer to IES files for energy consumption and delivered lumens for each option. Based on ISTMT in situ thermal testing in accordance with UL1598 and UL8750, exclusive Signify System Reliability Tool, Advance driver data and LED manufacturer LM-80/TM-21 data, expected to reach 100,000 + hours with L70 lumen maintenance @ 25°C. Luminaire Useful Life accounts for LED lumen maintenance AND all of these additional factors including: LED color shift, LED life, driver life, PCB substrate, solder joints, on/off cycles, burning hours and corrosion.

Vibration Resistance

Luminaire meets the ANSI C136.31-2018 specifications, tested by independent lab over 100,000 cycles in all three axes: Bridge/Overpass for 138L 3 modules, 184L 4 modules, 230L 5 modules; Normal for 276L 6 modules.

Certifications and Compliance

cULus Listed for Canada and USA, per UL1598 and UL8750, including suitable for mounting within 4' or 1.2m of the ground. Configurations are DesignLights Consortium qualified, consult DLC QPL Qualified Products List for more details. Luminaire complies with or exceeds the following ANSI C136 standards: .2, .3, .10, .15, .21, .22, .24, .25, .31, .32, .37, .41. Entire luminaire is rated for operation in ambient temperature of -40°C (-40°F) up to +40°C (+104°F).

Limited Warranty

5-year limited warranty. See signify.com/warranties for details and restrictions.

Buy American Act of 1933 (BAA):

This product is manufactured in one of our US factories and, as of the date of this document, this product was considered a commercially available off-the-shelf (COTS) item meeting the requirements of the BAA. This BAA designation hereunder does not address (i) the applicability of, or availability of a waiver under, the Trade Agreements Act, or (ii) the "Buy America" domestic content requirements imposed on states, localities, and other non-federal entities as a condition of receiving funds administered by the Department of Transportation or other federal agencies. Prior to ordering, please visit www.signify.com/baa to view a current list of BAA-compliant products to confirm this product's current compliance.

