Moore+Bruggink
Consulting Engineers

March 30, 2021

Re: Luxury Fabrics
    Project No. 210152.01

Gregory L. Ransford
Fresh Coast Planning
950 Taylor Avenue, Ste 200
Grand Haven, MI 49417

Dear Mr. Ransford:

We have reviewed comments provided in your March 27, 2021 email as well as comments provided by Vriesman & Korhorn in their letter dated March 23, 2021. Following are your comments and our responses to the comments provided:

March 27, 2021 Email

1. A specification sheet for the proposed light fixtures is attached.
2. The dumpster detail shown on sheet 2 includes a note regarding dumpster enclosure doors as being required.
3. We have verified that there are 36 white pines that are 6-7 feet tall. A representative photo is attached.
4. The site architect will follow up with this information.
5. It is a 6" raised curb that will be located in front of the new parking spaces. ADA access will be through the existing building door.
6. We have included the existing building floor plan. There are 10 office seats shown. The remainder of the building will be retail showroom. Updated parking calculations are shown on the updated site plans.
7. We have added the adjacent structure outlines to the updated plans.

March 23, 2021 Letter

1. Plans have been revised to show removal of the existing berm and the creation of one large stormwater basin. The volume of the existing basin is 14,687 cubic feet to elevation 710.00. The volume for the proposed expanded basin will be 55,903 cubic feet to elevation 710.00, which will provide more than 3 times the original capacity.
2. In order to get minimum 1% fall from the truck dock, the grade at the edge of the pavement cannot be raised. We understand that the edge of the parking lot could be under water for a short while during large rain events.
3. No revisions to the existing pond overflow or outlet structure are proposed.
4. We have added spot grades as well as an underdrain to help alleviate surface water behind the building.
5. Spot grades have been added.
6. Pending site plan approval.

7. Pending site plan approval.
8. Pending site plan approval.
9. Pending site plan approval.
10. Acknowledged.

Thank you for your comments and the opportunity to respond.

Sincerely,

Zachary S. Voogt, P.E.
Project Engineer

Enclosures

cc: Fritz Wahlfield Jr.

Project		Catalog #		Type	
Prepared by		Notes		Date	

Lumark

Axcent

Wall Mount Luminaire

Typical Applications

Wall • Surface • Inverted • Floodlighting • Pathway

Product Certifications

Product Features

Quick Facts

- Available in 14W - 123W (1,800 - 17,000 lumens) models
- Full cutoff and refractive lens models available
- Energy and maintenance savings up to 95% compared to HID
- Energy efficient illumination results in up to 144 LPW
- Replaces 70W up to 450W HID equivalents

Dimensional Details

Full Cutoff

Refractive Lens

Deep Back Housing
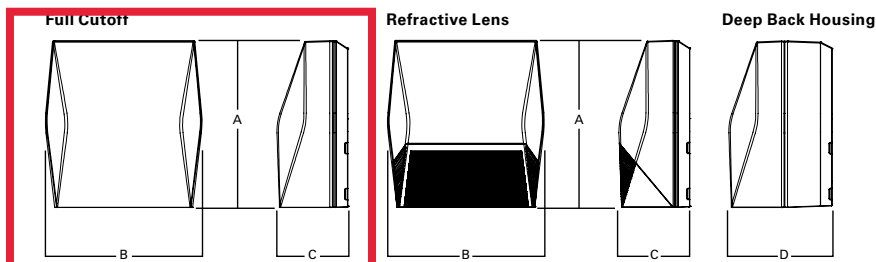
Dimensional Data

	AXCS Small	AXCL Large
A	8" [202mm]	11-1/2" [292mm]
B	7-1/2" [190mm]	10-3/4" [273mm]
C	3-5/8" [94mm]	4-7/8" [124mm]
D	6-1/8" [155mm]	7-1/8" [181mm]

Ordering Information

SAMPLE NUMBER: **AXCS1A-AP-347V**

Model Series [1]	LED Color Temperature	Color	Options (Add as Suffix)
Full Cutoff **AXCS1A**=14W **AXCS2A**=21W **AXCS3A**=27W **AXCS4A**=44W **AXCS5A**=52W **AXCL6A**=56W **AXCL8A**=72W **AXCL10A**=102W **AXCL12A**=123W **Refractive Lens** **AXCS1ARL**=14W **AXCS2ARL**=21W **AXCS3ARL**=27W **AXCS4ARL**=44W **AXCS5ARL**=52W **AXCL6ARL**=56W **AXCL8ARL**=72W **AXCL10ARL**=102W **AXCL12ARL**=123W	**[Blank]**=4000K, Neutral **C**=5000K, Cool **W**=3000K, Warm	**[Blank]**=Carbon Bronze (Standard) **WT**=Summit White **BK**=Black **AP**=Grey **GM**=Graphite Metallic **DP**=Dark Platinum	**347V**=347V [2] **480V**=480V [2] **PC1**=Photocontrol 120V [3, 4, 5] **PC2**=Photocontrol 208-277V, 347V, 480V [4, 5, 6] **PC**=Photocontrol 120-277V, 347V, 480V [4, 7, 8] **KKIT**=Knuckle Floodlight Mount [7] **TRNKIT**=Trunnion Floodlight Mount **SFKIT**=Slipfitter Floodlight Mount **PMAKIT**=Pole Mount Arm **ZW**=WaveLinx-enabled 4-PIN Twistlock Receptacle [4, 9] **ZW-SWPD4XX**=WaveLinx Wireless Sensor, 7' – 15' Mounting Height [4, 9, 10, 11] **ZW-SWPD5XX**=WaveLinx Wireless Sensor, 15' – 40' Mounting Height [4, 9, 10, 11] **LWR-LW**=Enlighted Wireless Sensor, Wide Lens for 8' - 16' Mounting Height [4, 9, 12] **LWR-LN**=Enlighted Wireless Sensor, Narrow Lens for 16' - 40' Mounting Height [4, 9, 12] **MSP/DIM-L12**=Integrated Sensor for Dimming Operation, 8' - 12' Mounting Height [4, 9, 13] **MSP/DIM-L30**=Integrated Sensor for Dimming Operation, 12' - 30' Mounting Height [4, 9, 13] **MSP-L12**=Integrated Sensor for ON/OFF Operation, 8' - 12' Mounting Height [4, 9, 13] **MSP-L30**=Integrated Sensor for ON/OFF Operation, 12' - 30' Mounting Height [4, 9, 13] **CBP**=Cold Weather Battery Pack [3, 14, 15, 16, 17, 18] **CBP-CEC**=Cold Weather Battery Pack, CEC compliant [3, 14, 15, 16, 17, 18] **10K**=10kV/10kA Surge Protection **HA**=50°C High Ambient [15, 19] **GRF**=Glare Reducing Lens [20] **AHD145**=After Hours Dim, 5 Hours [5, 21] **AHD245**=After Hours Dim, 6 Hours [5, 21] **AHD255**=After Hours Dim, 7 Hours [5, 21] **AHD355**=After Hours Dim, 8 Hours [5, 21]

Accessories (Order Separately) [22]	
VS/AXCS-XX=Vandal Shield Axcent Small [7, 23] **VS/AXCS-MS**=Vandal Shield Axcent Small (With Motion Sensor) [7, 23] **WG/AXCS**=Wire Guard Axcent Small [7] **WG/AXCS-MS**=Wire Guard Axcent Small (With Motion Sensor) [7] **VS/AXCL-XX**=Vandal Shield Axcent Large [5, 23] **VS/AXCL-MS**=Vandal Shield Axcent (With Motion Sensor) [5, 23] **WG/AXCL**=Wire Guard Axcent Large [5] **WG/AXCL-MS**=Wire Guard Axcent (With Motion Sensor) [5] **BB/AXC**=Axcent Lumen Select Back Box [24] **BB/AXC-PC**=Axcent Lumen Select Back Box with PC [24] **BB/AXC-WT**=Axcent Lumen Select Back Box, White [24] **BB/AXC-WT-PC**=Axcent Lumen Select Back Box with PC, White [24]	**KKIT/AXCS-XX**=Knuckle and Visor Floodlight Kit (For Axcent Small) [7] **SFKIT/AXCS-XX**=Slipfitter Floodlight Kit (For Axcent Small) [7] **TRNKIT/AXCS-XX**=Trunnion and Visor Floodlight Kit (For Axcent Small) [7] **TRNKIT-XX**=Trunnion Floodlight Kit (For Axcent Large) [5] **SFKIT-XX**=Slipfitter Floodlight Kit (For Axcent Large) [5] **PMAKIT-XX**=Pole Mount Kit **ISHH-01**=Integrated Sensor Programming Remote [25] **MA1010-XX**=Single Tenon Adapter for 3-1/2" O.D. Tenon **MA1011-XX**=2@180° Tenon Adapter for 3-1/2" O.D. Tenon **MA1017-XX**=Single Tenon Adapter for 2-3/8" O.D. Tenon **MA1018-XX**=2@180° Tenon Adapter for 2-3/8" O.D. Tenon **SWPD4-XX**=WaveLinx Wireless Sensor, 7' – 15' Mounting Height [10, 11, 26] **SWPD5-XX**=WaveLinx Wireless Sensor, 15' – 40' Mounting Height [10, 11, 26]

NOTES:
1. DesignLights Consortium® Qualified. Refer to www.designlights.org Qualified Products List under Family Models for details.
2. Transformer used only when ordered with motion sensor or AXCS1 through AXCS5 or AXCL6 fixture wattages.
3. Not available in 347 or 480 VAC.
4. Button photocontrol and any motion sensor (MSP, ZW, or LWR) not offered together.
5. Only available on AXCL6-AXCL12 models.
6. Used with 277, 347, and 480 VAC options.
7. Only available on AXCS1-AXCS5 models.
8. This configuration may contain materials that are not RoHS compliant. Contact your lighting representative for more information.
9. Uses deep back housing.
10. Sensor passive infrared (PIR) may be overly sensitive when operating below -20°C (-4°F). For the device to be field-configurable, requires WAC Gateway components WAC-PoE and WPOE-120 in appropriate quantities. Only compatible with WaveLinx system and software and requires system components to be installed for operation. See website for more Wavelinx application information.
11. Replace XX with sensor color (WH, BZ, or BK).
12. Enlighted wireless sensors are factory installed and require network components LWP-EM-1, LWP-GW-1, and LWP-PoE8 in appropriate quantities. See website for application information.
13. The ISHH-01 accessory is required to adjust parameters.
14. Ambient operating temperature -20°C to 25°C for AXCL6 through AXCL10. Ambient operating temperature -20°C to 30°C on AXCS4 models. Ambient operating temperature -20°C to 40°C on AXCS1 through AXCS3 models.
15. Not available with AXCS5 or AXCL12 models.
16. Uses deep back housing for AXCS1, AXCLS2, AXCS3, and AXCS4 models.
17. Not to be mounted in upwards / inverted orientation. Downlight wall mount only for AXCS1 through AXCS4.
18. In AXCS1, AXCS2, AXCS3, and AXCS4 models, CBP cannot be used with any sensor option (PC, MSP, ZW, or LWR).
19. Can not be ordered with CBP or PC options.
20. Use dedicated IES files on product website for lumen values and distributions.
21. Requires the use of PC1 or PC2 button photocontrol. See After Hours Dim supplemental guide for additional information.
22. Replace XX with color designation.
23. For use with full cutoff lens configurations only.
24. Lumen Select functionality not available in conjunction with any motion sensor option (MSP, ZW, or LWR). Photocontrol back box not available with any photocontrol or motion sensor options (PC, MSP, ZW, or LWR).
25. This tool enables adjustment to parameters including high and low modes, sensitivity, time delay, cutoff and more. Consult you lighting representative for more information.
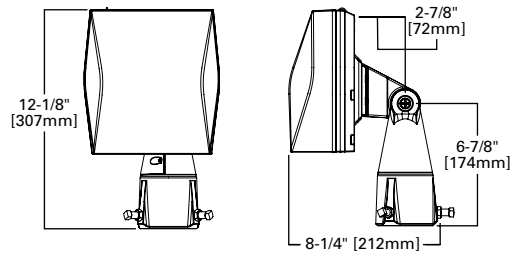26. Requires 4-PIN twistlock receptacle (ZW) option.

Stock Ordering Information

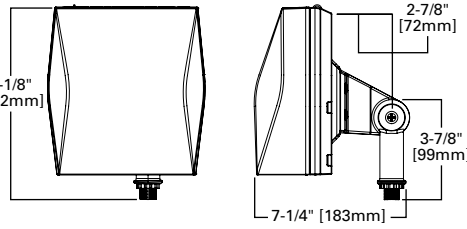| Model Series [1]			
Full Cutoff		**Refractive Lens**	
AXCS1A=14W	**AXCL10A**=102W	**AXCS1ARL**=14W	**AXCL10ARL**=102W
AXCS2A=21W	**AXCL12A**=123W	**AXCS2ARL**=21W	**AXCL12ARL**=123W
AXCS3A=27W	**AXCL6A-347V**=56W	**AXCS3ARL**=27W	**AXCL6ARL-347V**=56W
AXCS4A=44W	**AXCL8A-347V**=72W	**AXCS4ARL**=44W	**AXCL8ARL-347V**=72W
AXCS5A=52W	**AXCL10A-347V**=102W	**AXCS5ARL**=52W	**AXCL10ARL-347V**=102W
AXCL6A=56W	**AXCL12A-347V**=123W	**AXCS6ARL**=56W	**AXCL12ARL-347V**=123W
AXCL8A=72W		**AXCL8ARL**=72W	

Note: All stock configurations are 4000K color temperatures, standard Carbon Bronze finish, and wall mount configuration.
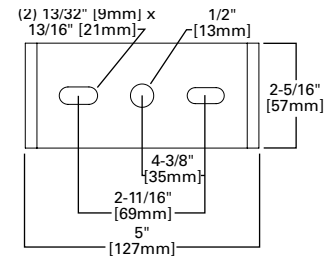
Mounting Details
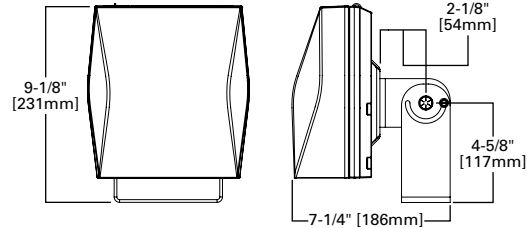
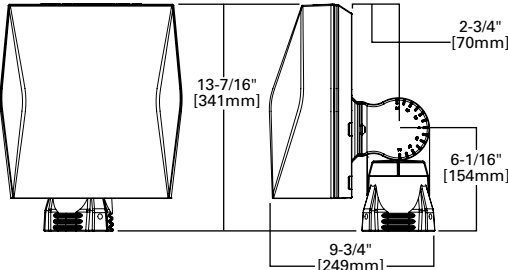**Slipfitter Mount** (Small)
Tenon OD: 2-3/8" | **EPA:** 0.60

12-1/8" [307mm]

2-7/8" [72mm]

6-7/8" [174mm]

8-1/4" [212mm]

Knuckle Mount (Small)

9-1/8" [232mm]

2-7/8" [72mm]

3-7/8" [99mm]

7-1/4" [183mm]

Trunnion Mount Detail

(2) 13/32" [9mm] x 13/16" [21mm]

1/2" [13mm]

2-5/16" [57mm]

4-3/8" [35mm]

2-11/16" [69mm]

5" [127mm]

Trunnion Mount (Small)

9-1/8" [231mm]

2-1/8" [54mm]

4-5/8" [117mm]

7-1/4" [186mm]

Slipfitter Mount (Large)
Tenon OD: 2-3/8" to 2-7/8" | **EPA:** 1.10

13-7/16" [341mm]

2-3/4" [70mm]

6-1/16" [154mm]

9-3/4" [249mm]

Pole Mount Arm Drill Pattern

1-1/4" [32mm]

4-7/8" [124mm]

4" [102mm]

6-15/16" [177mm]

Ø9/16" [15mm]

3-3/4" [96mm]

Trunnion Mount (Large)

12" [305mm]

2-1/8" [54mm]

4-5/8" [118mm]

8-7/16" [215mm]
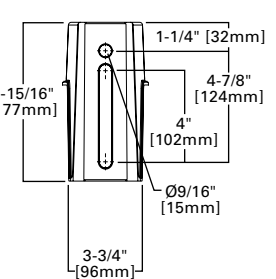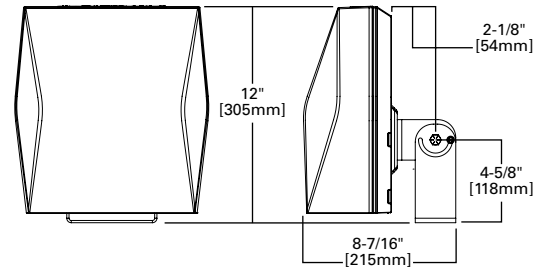
Pole Mount Arm (Large)
EPA: 1.10
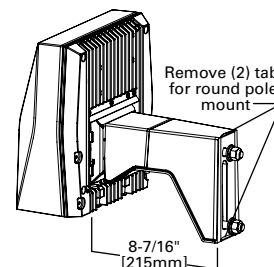
Remove (2) tabs for round pole mount

8-7/16" [215mm]

Lumen Select Back Box

3" [76mm]

Ø0.27" [7mm]

5-3/32" [129mm]

5-21/32" [143mm]

4-11/32" [110mm]

2-3/32" [53mm]

Wall Mount Plate Detail (Large)

4-3/4" [120mm]

6-1/4" [159mm]

1/2" [13mm]

Wall Mount Plate Detail (Small)

4-3/4" [120mm]

4-3/4" [120mm]

7/16" [11mm]
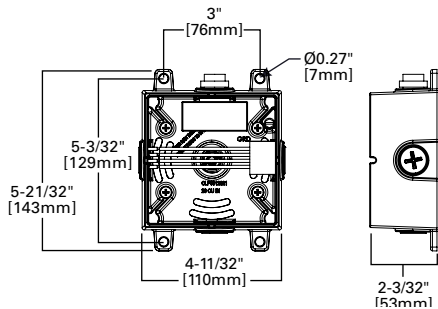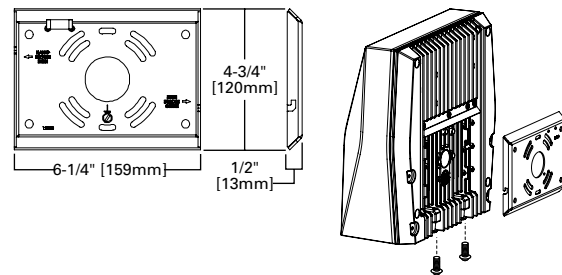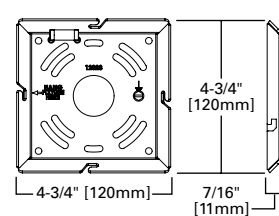
Enlighted Sensor
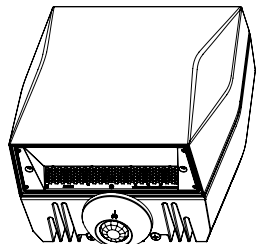
Occupancy Sensor
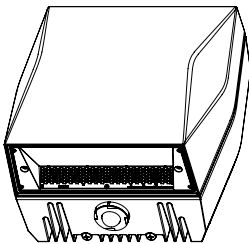
Button Photocontrol

Vandal Shield

Wire Guard

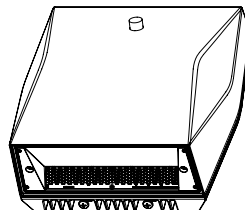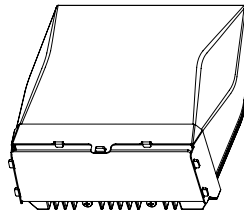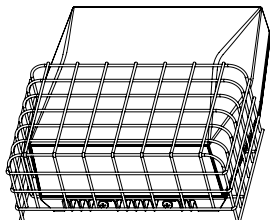## Product Specifications

Construction
- Die-cast aluminum housing
- External back fin design extracts heat from the surface to thermally optimize design for longer luminaire life

Optics
- Dark Sky Approved (Fixed mount, Full cutoff, and 3000K CCT only)
- Silicone-sealed optical LED chamber
- Acrylic refractive or full cutoff lens options for Type IV distributions

Electrical
- Driver incorporates 6kV surge protection
- -40°C minimum operating temperature
- 40°C maximum operating temperature

- <20% total harmonic distortion
- 0-10V dimming driver is standard with leads external to the fixture

Mounting
- Steel wedge mounting plate fits directly to 4" standard j-box or directly to wall with the "Hook-N-Lock" mechanism
- Stainless steel set screws
- Lumen Select Back Box accessory offers four 1/2" NPT conduit entry wire ways. Resistor Pack combinations allow field-dimming of 75% or 50% when connected to luminaire dimming leads

Emergency Egress
- Optional integral cold weather battery emergency egress includes emergency operation test

switch, an AC-ON indicator light and a premium, maintenance-free battery pack
- The separate emergency lighting LEDs are wired to provide redundant emergency lighting. Listed to UL Standard 924, Emergency Lighting

Finish
- Five-stage super TGIC polyester powder coat paint, 2.5 mil nominal thickness

Shipping Data
- Small fixture=5 lbs. [2.36 kgs.]
- Small with sensor or CBP=10 lbs. [4.40 kgs.]
- Large fixture=12 lbs. [5.45 kgs.]
- Large with sensor or CBP=17 lbs. [7.73 kgs.]
- Large with sensor & CBP=21 lbs. [9.54 kgs.]

Energy and Performance Data

Power and Lumens (Axcent Small)

Light Engine		AXCS1A	AXCS2A	AXCS3A	AXCS4A	AXCS5A
Power (Watts)		14	21	27	44	52
Input Current @ 120V (A)		0.12	0.18	0.23	0.37	0.43
Input Current @ 240V (A)		0.06	0.09	0.11	0.18	0.22
Input Current @ 277V (A)		0.05	0.08	0.10	0.16	0.19
Input Current @ 347V (A)		0.04	0.06	0.08	0.13	0.15
Input Current @ 480V (A)		0.03	0.04	0.06	0.09	0.11
Configuration						
Full Cutoff	4000K/5000K Lumens	1,806	2,561	3,537	5,520	6,300
	3000K Lumens	1,526	2,164	2,989	4,665	5,324
	BUG Rating	B1-U0-G0	B1-U0-G0	B1-U0-G0	B2-U0-G1	B2-U0-G1
Refractive Lens	4000K/5000K Lumens	1,915	2,716	3,704	5,858	6,699
	3000K Lumens	1,618	2,295	3,130	4,950	5,661
	BUG Rating	B1-U3-G2	B1-U3-G2	B1-U3-G2	B1-U4-G3	B1-U4-G3

Power and Lumens (Axcent Large)

Light Engine		AXCL6A	AXCL8A	AXCL10A	AXCL12A
Power (Watts)		56	72	102	123
Input Current @ 120V (A)		0.44	0.60	0.83	1.01
Input Current @ 240V (A)		0.22	0.31	0.41	0.51
Input Current @ 277V (A)		0.20	0.27	0.36	0.45
Input Current @ 347V (A)		0.17	0.22	0.30	0.37
Input Current @ 480V (A)		0.13	0.16	0.22	0.27
Configuration					
Full Cutoff	4000K Lumens	7,594	9,696	13,283	16,823
	5000K Rating	7,465	9,531	13,058	16,538
	3000K Lumens	6,619	8,450	11,577	14,662
	BUG Rating	B1-U0-G1	B1-U0-G1	B3-U0-G2	B3-U0-G2
Refractive Lens	4000K Lumens	7,809	9,970	13,641	17,346
	5000K Rating	7,689	9,817	13,450	17,034
	3000K Lumens	6,817	8,704	11,924	15,102
	BUG Rating	B1-U4-G4	B2-U5-G5	B2-U5-G5	B2-U5-G5

Energy and Performance Data

Power and Lumens (Small + CBP)

Light Engine		AXCS1A	AXCS2A	AXCS3A	AXCS4A
Power (Watts)		18	25	31	48
Input Current @ 120V (A)		0.15	0.21	0.26	0.40
Input Current @ 240V (A)		0.08	0.11	0.13	0.20
Input Current @ 277V (A)		0.07	0.09	0.11	0.18
Configuration					
Full Cutoff	4000K/5000K Lumens	629	587	647	570
	3000K Lumens	531	496	547	482
Refractive Lens	4000K/5000K Lumens	667	623	686	605
	3000K Lumens	563	526	580	511

Note: Power and current based on full power consumption while CBP is charging. Lumen outputs are while operating in emergency mode only.

Power and Lumens (Large + CBP)

Light Engine		AXCL6A	AXCL8A	AXCL10A
Power (Watts)		60	76	106
Input Current @ 120V (A)		0.50	0.63	0.88
Input Current @ 240V (A)		0.25	0.32	0.44
Input Current @ 277V (A)		0.22	0.27	0.38
Configuration				
Full Cutoff	4000K/5000K Lumens	1,070		
	3000K Lumens	945		
Refractive Lens	4000K/5000K Lumens	1,098		
	3000K Lumens	973		

Note: Power and current based on full power consumption while CBP is charging. Lumen outputs are while operating in emergency mode only.

Power and Lumens Multipliers
(Lumen Select Back Box + Axcent Small)

Configuration		~75% Nominal Output	~50% Nominal Output
Catalog Number	**Material Number**	**Connect per Installation Instructions**	
AXCS1A*	13109741 or 13109939 or Other	74%	50%
AXCS2A*	13109698 or 13109938 or Other	74%	50%
AXCS3A*	13109697 or 13109937 or Other	74%	50%
AXCS4A*	13109695 or 13109936	75%	40%
AXCS4A*	13495299 or 13495470 or Other	72%	50%
AXCS5A*	13109652 or 13109935	75%	40%
AXCS5A*	13495471 or 13495472 or Other	72%	50%

Power and Lumens Multipliers
(Lumen Select Back Box + Axcent Large)

Configuration		~75% Nominal Output	~50% Nominal Output
Catalog Number	**Material Number**	**Connect per Installation Instructions**	
AXCL6A*	12963843 or 12964235	75%	40%
AXCL6A*	13495473 or 13495474 or Other	69%	47%
AXCL8A*	12963842 or 12964234	84%	48%
AXCL8A*	13495475 or 13495476 or Other	69%	47%
AXCL10A*	12963840 or 12964233	84%	48%
AXCL10A*	13495477 or 13495478 or Other	69%	47%
AXCL12A*	12902056 or 12902057	85%	50%
AXCL12A*	13495479 or 13495480 or Other	72%	49%

Lumen Maintenance (Axcent Small)

Ambient Temperature	TM-21 Lumen Maintenance (72,000 Hours)	Theoretical L70 (72,000 Hours)
Up to 3A		
25°C	90%	246,000
40°C	90%	225,000
50°C	89%	195,000
Up to 5A		
25°C	89%	240,000
40°C	88%	223,000
50°C	87%	186,000

Lumen Maintenance (Axcent Large)

Ambient Temperature	TM-21 Lumen Maintenance (72,000 Hours)	Theoretical L70 (72,000 Hours)
Up to 8A		
25°C	94%	556,000
40°C	94%	556,000
50°C	92%	340,000
Up to 10A		
25°C	94%	556,000
40°C	94%	478,000
50°C	87%	207,000
Up to 12A		
25°C	94%	151,000
40°C	81%	125,000

Lumen Multiplier

Ambient Temperature	Lumen Multiplier
10°C	1.02
15°C	1.01
25°C	1.00
40°C	0.97

COOPER
Lighting Solutions

Control Options

0-10V This fixture is offered standard with 0-10V dimming driver(s) for use with a lighting control panel or other control method.

Photocontrol (PC1, PC2 and PC) Optional button-type photocontrol provides a flexible solution to enable "dusk-to-dawn" lighting by sensing light levels.

After Hours Dim (AHD) This feature allows photocontrol-enabled luminaires to achieve additional energy savings by dimming during scheduled portions of the night. The dimming profile will automatically take effect after a "dusk-to-dawn" period has been calculated from the photocontrol input. Specify the desired dimming profile for a simple, factory-shipped dimming solution requiring no external control wiring. Reference the After Hours Dim supplemental guide for additional information.

Dimming Occupancy Sensor (MSP/DIM-LXX and MSP-LXX) These sensors are factory installed in the luminaire housing. When the MSP/DIM-LXX sensor option is selected, the occupancy sensor is connected to a dimming driver and the entire luminaire dims when there is no activity detected. When activity is detected, the luminaire returns to full light output. The MSP/DIM sensor is factory preset to dim down to approximately 50 percent power with a time delay of ten minutes. The MSP-LXX sensor is factory preset to turn the luminaire off after five minutes of no activity.
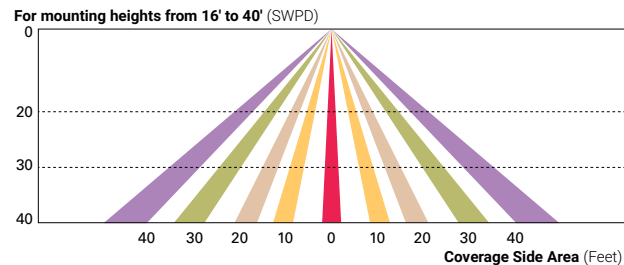
These occupancy sensors includes an integrated photocell that can be activated with the ISHH-01 accessory for "dusk-to-dawn" control or daylight harvesting - the factory preset is ON. The ISHH-01 is a wireless tool utilized for changing the dimming level, time delay, sensitivity and other parameters.

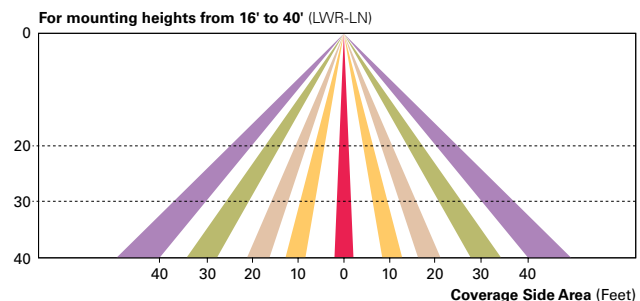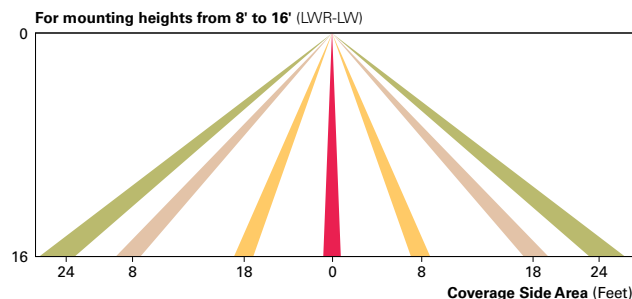A variety of sensor lens are available to optimize the coverage pattern for mounting heights from 8'-30'.

For mounting heights from 12' to 30' (-L30)

For mounting heights from 8' to 12' (-L12)
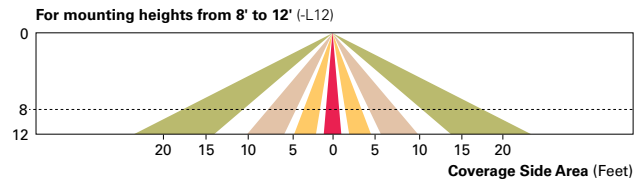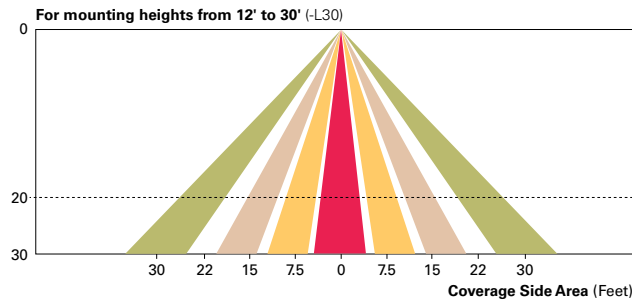
WaveLinx Wireless Control and Monitoring System The WaveLinx Outdoor control platform operates on a wireless mesh network based on IEEE 802.15.4 standards enabling wireless control of outdoor lighting. Use the WaveLinx Mobile application for set-up and configuration. At least one Wireless Area Controller (WAC) is required for full functionality and remote communication (including adjustment of any factory pre-sets).

WaveLinx Wireless Sensor (SWPD4 and SWPD5) These outdoor sensors offer passive infrared (PIR) occupancy and a photocell for closed loop daylight sensing. These sensors can be factory installed or field-installed via simple, tool-less integration into luminaires equipped with the Zhaga Book 18 compliant 4-PIN receptacle (ZW). These sensors are factory preset to dim down to approximately 50 percent power after 15 minutes of no activity detected. These occupancy sensors include an integral photocell for "dusk-to-dawn" control or daylight harvesting that is factory-enabled. A variety of sensor lenses are available to optimize the coverage pattern for mounting heights from 7'-40'.

For mounting heights from 16' to 40' (SWPD)

Enlighted Wireless Control and Monitoring System (LWR-LW and LWR-LN) The Enlighted System is a connected lighting solution that combines LED luminaires with an integrated wireless sensor system. The sensor controls the lighting system in compliance with the latest energy codes and collects valuable data about building performance and use. Software applications turn the granular data into information through energy dashboards and specialized apps that make it simple and help optimize the use of other resources beyond lighting.

For mounting heights from 8' to 16' (LWR-LW)

For mounting heights from 16' to 40' (LWR-LN)

Cooper Lighting Solutions
1121 Highway 74 South
Peachtree City, GA 30269
P: 770-486-4800
www.cooperlighting.com

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Specifications and dimensions
subject to change without notice.

PS514102EN **page 6**
December 3, 2020 3:27 PM

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Project		Catalog #		Type	
Prepared by		Notes		Date	

Lumark
PRV / PRV-XL Prevail LED

Area / Site Luminaire

Typical Applications

Outdoor • Parking Lots • Walkways • Roadways • Building Areas

Prevail XL

Prevail

Interactive Menu

Product Certifications

ISO SYSTEMS CERTIFIED | UL LISTED | DLC QPL LISTED | DLC QPL PREMIUM | FC CLASS A CAN ICES-005 | RoHS COMPLIANT | IP66

5 YEAR LIMITED WARRANTY | ida DARK SKY APPROVED

Product Features

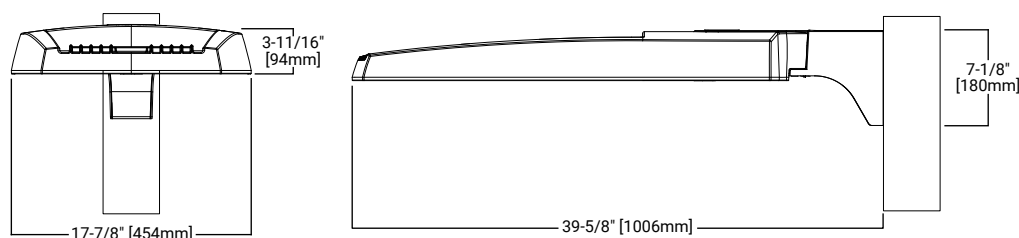LumenSafe Technology | Enlighted | WaveLinx

Quick Facts

- Lumen packages range from 7,100 - 48,600 lumens (50W - 350W)
- Replaces 70W up to 1,000W HID equivalents
- Efficacies up to 148 lumens per watt
- Energy and maintenance savings up to 85% versus HID solutions
- Standard universal quick mount arm with universal drill pattern

Dimensional Details

Prevail

2-3/4" [70mm]

6-15/16" [177mm]

13-15/16" [354mm]

26-13/16" [681mm]

Prevail XL

3-11/16" [94mm]

7-1/8" [180mm]

17-7/8" [454mm]

39-5/8" [1006mm]

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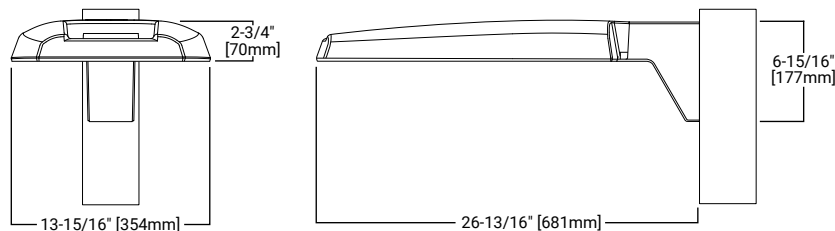
Ordering Information

SAMPLE NUMBER: **PRV-XL-C75-D-UNV-T4-SA-BZ**

Product Family [1, 2]	Light Engine [3]	Driver	Voltage	Distribution	Mounting (Included)	Color
PRV=Prevail	**C15**=(1 LED) 7,100 Nominal Lumens **C25**=(2 LEDs) 13,100 Nominal Lumens **C40**=(2 LEDs) 17,100 Nominal Lumens **C60**=(2 LEDs) 20,000 Nominal Lumens	**D**=Dimming (0-10V)	**UNV**=Universal (120-277V) **347**=347V **480**=480V [4]	**T2**=Type II **T3**=Type III **T4**=Type IV **T5**=Type V	**SA**=Standard Versatile Arm **MA**=Mast Arm **WM**=Wall Mount Arm	**AP**=Grey **BZ**=Bronze **BK**=Black **DP**=Dark Platinum **GM**=Graphite Metallic **WH**=White **CC**=Coastal Construction
PRV-XL=Prevail XL	**C75**=(4 LED) 26,100 Nominal Lumens **C100**=(4 LED) 31,000 Nominal Lumens **C125**=(4 LED) 36,000 Nominal Lumens **C150**=(6 LED) 41,100 Nominal Lumens **C175**=(6 LED) 48,600 Nominal Lumens					

Options (Add as Suffix)	Accessories (Order Separately) [18]
7030=70 CRI / 3000K CCT [5] **7050**=70 CRI / 5000K CCT [5] **HSS**=House Side Shield [6] **L90**=Optics Rotated 90° Left **R90**=Optics Rotated 90° Right **10K**=10kv UL 1449 Fused Surge Protective Device **20MSP**=20kV MOV Surge Protective Device **20K**=20kv UL 1449 Fused Surge Protective Device **HA**=50°C High Ambient Temperature [7] **PER**=NEMA 3-PIN Twistlock Photocontrol Receptacle **PER7**=NEMA 7-PIN Twistlock Photocontrol Receptacle **MSP/DIM-L12**=Integrated Sensor for Dimming Operation, 8' – 12' Mounting Height [8, 9] **MSP/DIM-L30**=Integrated Sensor for Dimming Operation, 12' – 30' Mounting Height [8, 9] **MSP-L12**=Integrated Sensor ON/OFF Operation, 8' – 12' Mounting Height [8, 9] **MSP-L30**=Integrated Sensor ON/OFF Dimming Operation, 12' – 30' Mounting Height [8, 9] **MS/DIM-L20**=Motion Sensor for Dimming Operation, 9' – 20' Mounting Height [9, 10] **MS/DIM-L40W**=Motion Sensor for Dimming Operation, 21' – 40' Mounting Height [9, 10] **MS-L20**=Motion Sensor for ON/OFF Operation, 9' – 20' Mounting Height [9, 10] **MS-L40W**=Motion Sensor for ON/OFF Operation, 21' – 40' Mounting Height [9, 10] **ZD**=DALI-enabled 4-PIN Twistlock Receptacle [9, 11, 12] **ZW**=Wavelinx-enabled 4-PIN Twistlock Receptacle [9, 11, 12] **SWPD4XX**=Wavelinx Wireless Sensor, 7' – 15' Mounting Height [9, 11, 12, 13, 14] **SWPD5XX**=Wavelinx Wireless Sensor, 15' – 40' Mounting Height [9, 11, 12, 13, 14] **LWR-LW**=Enlighted Wireless Sensor, Wide Lens for 8' – 16' Mounting Height [9, 15] **LWR-LN**=Enlighted Wireless Sensor, Narrow Lens for 16' – 40' Mounting Height [9, 15] **(See Table Below)**=LumenSafe Integrated Network Security Camera [16, 17]	**PRVWM-XX**=Wall Mount Kit [8] **PRVMA-XX**=Mast Arm Mounting Kit [8] **PRVSA-XX**=Standard Arm Mounting Kit [8] **PRVXLSA-XX**=Standard Arm Mounting Kit (for Prevail XL) [16] **PRVXLWM-XX**=Wall Mount Kit (for Prevail XL) [16] **PRVXLMA-XL**=Mast Arm Mounting Kit (for Prevail XL) [16] **MA1010-XX**=Single Tenon Adapter for 3-1/2" O.D. Tenon **MA1011-XX**=2@180° Tenon Adapter for 3-1/2" O.D. Tenon **MA1017-XX**=Single Tenon Adapter for 2-3/8" O.D. Tenon **MA1018-XX**=2@180° Tenon Adapter for 2-3/8" O.D. Tenon **HS/VERD**=House Side Shield [6, 19] **VGS-F/B**=Vertical Glare Shield, Front/Back [19] **VGS-SIDE**=Vertical Glare Shield, Side [19] **OA/RA1013**=Photocontrol Shorting Cap **OA/RA1014**=NEMA Photocontrol - 120V **OA/RA1016**=NEMA Photocontrol - Multi-Tap 105-285V **OA/RA1201**=NEMA Photocontrol - 347V **OA/RA1027**=NEMA Photocontrol - 480V **ISHH-01**=Integrated Sensor Programming Remote [20] **FSIR-100**=Wireless Configuration Tool for Occupancy Sensor [21] **SWPD4-XX**=WaveLinx Wireless Sensor, 7' – 15' Mounting Height [12, 13, 14] **SWPD5-XX**=WaveLinx Wireless Sensor, 15' – 40' Mounting Height [12, 13, 14] **WOLC-7P-10A**=WaveLinx Outdoor Control Module (7-PIN) [22]

NOTES:
1. DesignLights Consortium® Qualified. Refer to www.designlights.org Qualified Products List under Family Models for details.
2. Customer is responsible for engineering analysis to confirm pole and fixture compatibility for applications. Refer to installation instructions and pole white paper WP513001EN for additional support information.
3. Standard 4000K CCT and 70CRI.
4. Only for use with 480V Wye systems. Per NEC, not for use with ungrounded systems, impedance grounded systems or corner grounded systems (commonly known as Three Phase Three Wire Delta, Three Phase High Leg Delta and Three Phase Corner Grounded Delta systems).
5. Use dedicated IES files on product website for non-standard CCTs.
6. Option will come factory-installed. House Side Shield not suitable with T5 distribution or C60 lumen package.
7. Not available with C60 lumen package.
8. Only available in PRV configurations C15, C25, C40 or C60.
9. Controls system is not available with photocontrol receptacle (PER or PER7) or other controls systems (MS, MSP, ZW, ZD or LWR).
10. Utilizes the Wattstopper sensor FSP-211.
11. Sensor passive infrared (PIR) may be overly sensitive when operating below -20°C (-4°F).
12. For the device to be field-configurable, requires WAC Gateway components WAC-PoE and WPOE-120 in appropriate quantities. Only compatible with WaveLinx system and software and requires system components to be installed for operation. See website for more Wavelinx application information.
13. Replace XX with sensor color (WH, BZ, or BK).
14. Requires 4-PIN twistlock receptacle (ZD or ZW) option.
15. Enlighted wireless sensors are factory installed and require network components LWP-EM-1, LWP-GW-1, and LWP-PoE8 in appropriate quantities. See website for application information.
16. Only available in PRV-XL configurations C75, C100, C125, C150, or C175.
17. Not available with 347V, 480V, or HA options. Consult LumenSafe system product pages for additional details and compatibility information.
18. Replace XX with paint color.
19. Must order one per optic/LED when ordering as a field-installable accessory (1, 2, 4, or 6).
20. This tool enables adjustment to Integrated Sensor (MSP) parameters including high and low modes, sensitivity, time delay, cutoff and more. Consult your lighting representative at Eaton for more information.
21. This tool enables adjustment to Motion Sensor (MS) parameters including high and low modes, sensitivity, time delay, cutoff and more. Consult your lighting representative at Eaton for more information.
22. Requires 7-PIN NEMA twistlock photocontrol receptacle (PER7) option. The WOLC-7 cannot be used in conjunction with other controls systems (MS, MSP, ZW, ZD or LWR). Operates on 120-347V input voltages.

LumenSafe Integrated Network Security Camera Technology Options (Add as Suffix)

| Product Family	Camera Type	Data Backhaul	
L=LumenSafe Technology LumenSafe Technology	**D**=Dome Camera	**C**=Cellular, Customer Installed SIM Card **A**=Cellular, Factory Installed AT&T SIM Card **V**=Cellular, Factory Installed Verizon SIM Card **S**=Cellular, Factory Installed Sprint SIM Card	**E**=Ethernet Networking

Stock Ordering Information

Product Family [1]	Light Engine	Voltage	Distribution	Options (Add as Suffix)
PRVS=Prevail	**C15**=(1 LED) 7,100 Nominal Lumens **C25**=(2 LEDs) 13,100 Nominal Lumens **C40**=(2 LEDs) 17,100 Nominal Lumens **C60**=(2 LEDs) 20,000 Nominal Lumens	**UNV**=Universal (120-277V) **347**=347V [2]	**T3**=Type III **T4**=Type IV	**MSP/DIM-L30**=Integrated Sensor for Dimming Operation, Maximum 30' Mounting Height [2]
PRVS-XL=Prevail XL	**C75**=(4 LED) 26,100 Nominal Lumens **C100**=(4 LED) 31,000 Nominal Lumens **C125**=(4 LED) 36,000 Nominal Lumens **C150**=(6 LED) 41,100 Nominal Lumens **C175**=(6 LED) 48,600 Nominal Lumens			

NOTES:
1. All stock configurations are standard 4000K/70CRI, bronze finish, and include the standard versatile mounting arm.
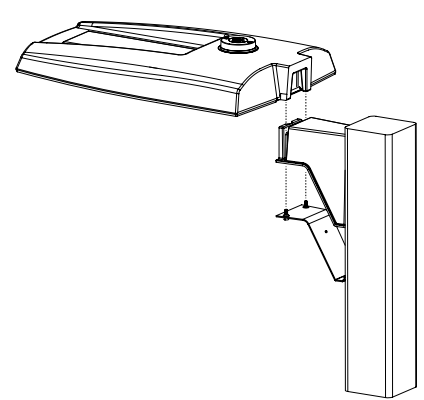2. Only available in PRVS configurations C15, C25, C40 or C60.
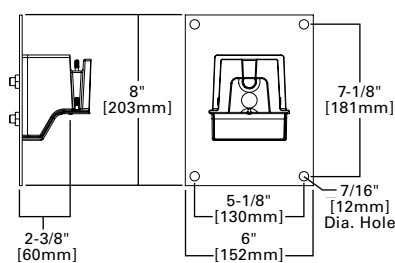
Mounting Details

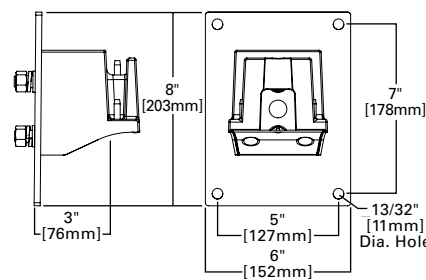**Pole Mount Arm** (PRV)
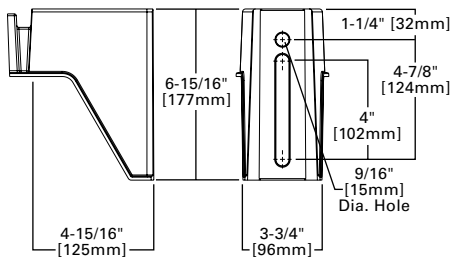
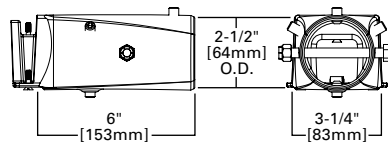**Pole Mount Arm** (PRV-XL)
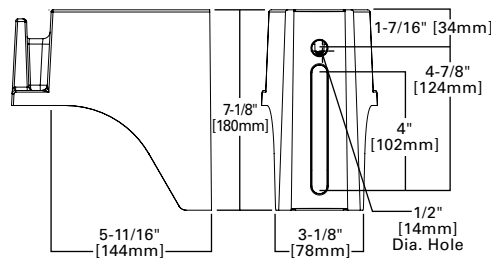
Versatile Mount System

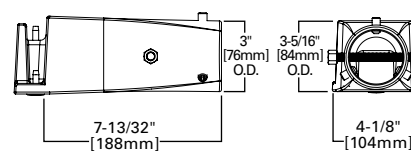**Wall Mount** (PRV)

Wall Mount (PRV-XL)

Mast Arm Mount (PRV)

Mast Arm Mount (PRV-XL)

Mounting Configurations and EPAs

NOTE: For 2 PRV's mounted at 90°, requires minimum 3″ square or 4″ round pole for fixture clearance. For 2 PRV-XL's mounted at 90°, requires minimum 4″ square or round pole for fixture clearance. Customer is responsible for engineering analysis to confirm pole and fixture compatibility for applications.
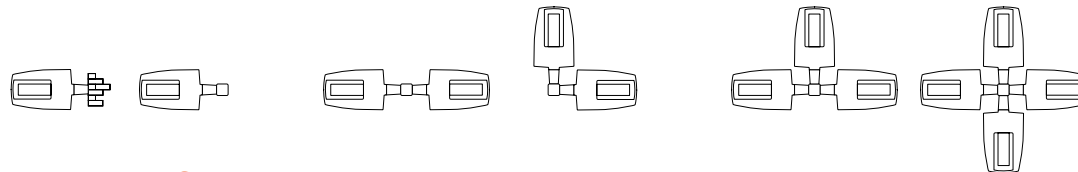
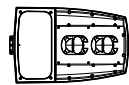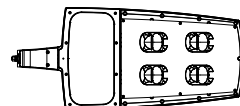| Wall Mount	Arm Mount Single	Arm Mount 2 @ 180°	Arm Mount 2 @ 90°	Arm Mount 3 @ 90°	Arm Mount 4 @ 90°
	EPA 0.92 (PRV)	EPA 1.35 (PRV)	EPA 1.42 (PRV)	EPA 1.63 (PRV)	EPA 1.63 (PRV)
	EPA 1.12 (PRV-XL)	EPA 2.25 (PRV-XL)	EPA 2.13 (PRV-XL)	EPA 2.52 (PRV-XL)	EPA 2.52 (PRV-XL)

Optical Configurations
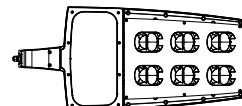
PRV-C15
(7,100 Nominal Lumens)
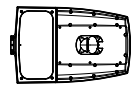
PRV-C25/C40/C60
(13,100/17,100/20,000 Nominal Lumens)

PRV-XL-C75/C100/C125
(26,100/31,000/36,300 Nominal Lumens)

PRV-XL-C150/C175
(41,100/48,600 Nominal Lumens)

Product Specifications

Construction
- Single-piece die-cast aluminum housing
- Tethered die-cast aluminum door

Optics
- Dark Sky Approved (3000K CCT and warmer only)
- Precision molded polycarbonate optics

Electrical
- -40°C minimum operating temperature
- 40°C maximum operating temperature
- >.9 power factor
- <20% total harmonic distortion

- Class 1 electronic drivers have expected life of 100,000 hours with <1% failure rate
- 0-10V dimming driver is standard with leads external to the fixture

Mounting
- Versatile, patented, standard mount arm accommodates multiple drill patterns ranging from 1-1/2" to 4-7/8"
- A knock-out on the standard mounting arm enables round pole mounting
- Prevail: 3G vibration rated
- Prevail XL Mast Arm: 3G vibration rated
- Prevail XL Standard Arm: 1.5G vibration rated

Finish
- Five-stage super TGIC polyester powder coat paint, 2.5 mil nominal thickness

Shipping Data
- Prevail: 20 lbs. (9.09 kgs.)
- Prevail XL: 45 lbs. (20.41 kgs.)

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Lighting Solutions

Energy and Performance Data

Power and Lumens (PRV)

View PRV IES files

Light Engine		C15	C25	C40	C60
Power (Watts)		52	96	131	153
Input Current @ 120V (A)		0.43	0.80	1.09	1.32
Input Current @ 277V (A)		0.19	0.35	0.48	0.57
Input Current @ 347V (A)		0.17	0.30	0.41	0.48
Input Current @ 480V (A)		0.12	0.22	0.30	0.35
Distribution					
Type II	4000K Lumens	7,123	13,205	17,172	20,083
	BUG Rating	B2-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G3
	3000K Lumens	6,994	12,965	16,860	19,718
Type III	4000K Lumens	7,111	13,183	17,144	20,050
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4
	3000K Lumens	6,982	12,944	16,832	19,686
Type IV	4000K Lumens	7,088	13,140	17,087	19,984
	BUG Rating	B1-U0-G3	B2-U0-G4	B2-U0-G4	B3-U0-G5
	3000K Lumens	6,959	12,901	16,777	19,621
Type V	4000K Lumens	7,576	14,045	18,264	21,360
	BUG Rating	B3-U0-G3	B4-U0-G3	B4-U0-G4	B5-U0-G4
	3000K Lumens	7,438	13,790	17,932	20,972

Lumen Maintenance

Configuration	TM-21 Lumen Maintenance (50,000 Hours)	Theoretical L70 (Hours)
Up to PRV-C60 at 25ºC	91.30%	194,000
Up to PRV-C60 at 40ºC	87.59%	134,000
Up to PRV-XL-C175 at 25ºC	91.40%	204,000
Up to PRV-XL-C175 at 40ºC	89.41%	158,000

Lumen Multiplier

Ambient Temperature	Lumen Multiplier
10ºC	1.02
15ºC	1.01
25ºC	1.00
40ºC	0.99

Power and Lumens (PRV-XL)

View PRV-XL IES files

Light Engine		C75	C100	C125	C150	C175
Power (Watts)		176	217	264	285	346
Input Current @ 120V (A)		1.50	1.84	2.21	2.38	2.92
Input Current @ 277V (A)		0.66	0.82	0.97	1.04	1.25
Input Current @ 347V (A)		0.54	0.66	0.79	0.84	1.02
Input Current @ 480V (A)		0.40	0.48	0.57	0.62	0.74
Distribution						
Type II	4000K Lumens	26,263	31,231	36,503	41,349	48,876
	BUG Rating	B3-U0-G3	B3-U0-G4	B4-U0-G4	B4-U0-G4	B4-U0-G5
	3000K Lumens	25,786	30,664	35,840	40,598	47,989
Type III	4000K Lumens	26,120	31,061	36,304	41,124	48,610
	BUG Rating	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5
	3000K Lumens	25,646	30,497	35,645	40,377	47,727
Type IV	4000K Lumens	26,098	31,035	36,274	41,089	48,569
	BUG Rating	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5
	3000K Lumens	25,624	30,471	35,615	40,343	47,687
Type V	4000K Lumens	28,129	33,450	39,097	44,287	52,349
	BUG Rating	B5-U0-G5	B5-U0-G5	B5-U0-G5	B5-U0-G5	B5-U0-G5
	3000K Lumens	27,618	32,843	38,387	43,483	51,398

**COOPER** Lighting Solutions

Control Options

0-10V (D) The dimming option provides 0-10V dimming wire leads for use with a lighting control panel or other control method.

Photocontrol (PER and PER7) Photocontrol receptacles provide a flexible solution to enable "dusk-to-dawn" lighting by sensing light levels. Advanced control systems compatible with NEMA 7-pin standards can be utilized with the PER7 receptacle.

Dimming Occupancy Sensor (MSP and MS) These sensors are factory installed in the luminaire housing. When a sensor for dimming operation (/DIM) option is selected, the luminaire will dim down to approximately 50 percent power after five minutes of no activity detected. When activity is detected, the luminaire returns to full light output. When a sensor for ON/OFF operation is selected, the luminaire will turn off after five minutes of no activity.

These occupancy sensors include an integral photocell that can be activated or inactivated with the programming remote / configuration tool for "dusk-to-dawn" control or "daylight harvesting". **Note:** For MSP sensors, the factory preset is ON (Enabled), and for MS sensors, the factory preset is OFF (Disabled). The programming remote / tool is a wireless tool that can be utilized to change the dimming level, time delay, sensitivity and other parameters. A variety of sensor lenses are available to optimize the coverage pattern for mounting heights from 8'-40'.
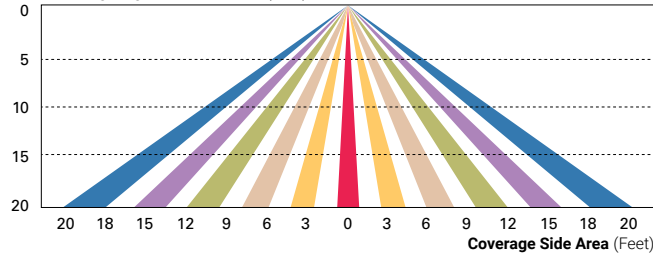
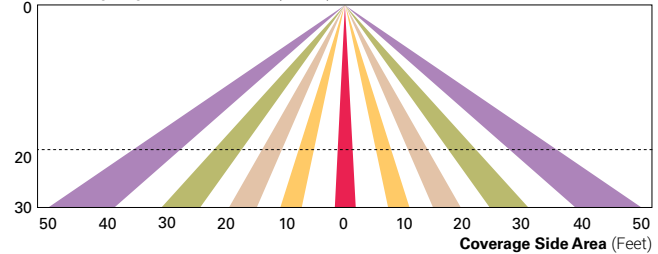**For mounting heights from 8' to 12'** (-L12)
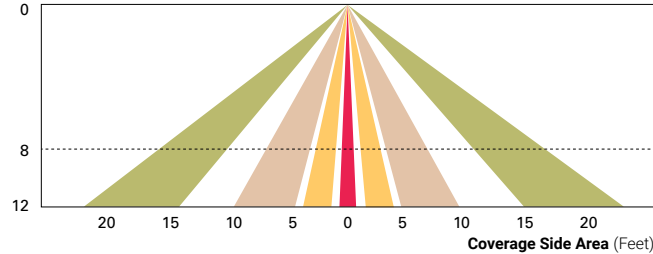
For mounting heights from 12' to 30' (-L30)
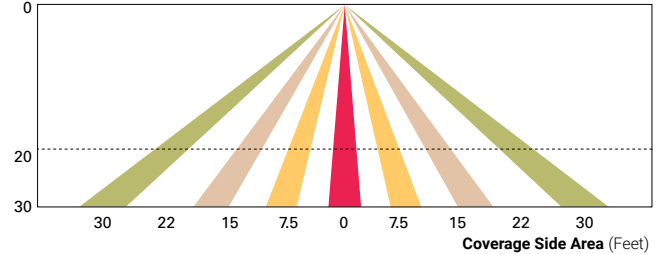
For mounting heights from 9' to 20' (-L20)

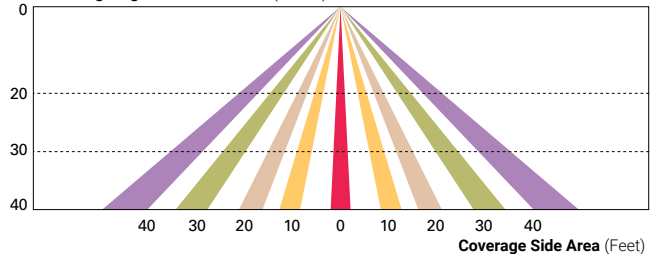**For mounting heights from 21' to 40'** (-L40W)

WaveLinx Wireless Control and Monitoring System Available in 7-PIN or 4-PIN configurations, the WaveLinx Outdoor control platform operates on a wireless mesh network based on IEEE 802.15.4 standards enabling wireless control of outdoor lighting. Use the WaveLinx Mobile application for set-up and configuration. At least one Wireless Area Controller (WAC) is required for full functionality and remote communication (including adjustment of any factory pre-sets).

WaveLinx Outdoor Control Module (WOLC-7P-10A) A photocontrol that enables astronomic or time-based schedules to provide ON, OFF and dimming control of fixtures utilizing a 7-PIN receptacle. The out-of-box functionality is ON at dusk and OFF at dawn.
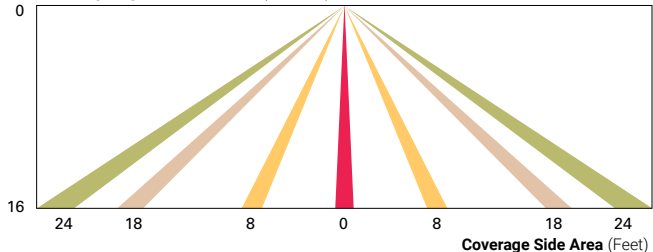
WaveLinx Wireless Sensor (SWPD4 and SWPD5) These outdoor sensors offer passive infrared (PIR) occupancy and a photocell for closed loop daylight sensing. These sensors can be factory installed or field-installed via simple, tool-less integration into luminaires equipped with the Zhaga Book 18 compliant 4-PIN receptacle (ZD or ZW). These sensors are factory preset to dim down to approximately 50 percent power after 15 minutes of no activity detected. These occupancy sensors include an integral photocell for "dusk-to-dawn" control or daylight harvesting that is factory-enabled. A variety of sensor lenses are available to optimize the coverage pattern for mounting heights from 7'-40'.

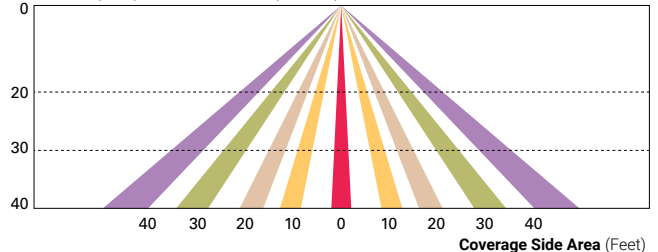**For mounting heights from 16' to 40'** (SWPD)

Enlighted Wireless Control and Monitoring System (LWR-LW and LWR-LN) The Enlighted System is a connected lighting solution that combines LED luminaires with an integrated wireless sensor system. The sensor controls the lighting system in compliance with the latest energy codes and collects valuable data about building performance and use. Software applications turn the granular data into information through energy dashboards and specialized apps that make it simple and help optimize the use of other resources beyond lighting.

For mounting heights from 8' to 16' (LWR-LW)

For mounting heights from 16' to 40' (LWR-LN)

LumenSafe (LD) The LumenSafe integrated network camera is a streamlined, outdoor-ready camera that provides high definition video surveillance. This IP camera solution is optimally designed to integrate into virtually any video management system or security software platform of choice. No additional wiring is needed beyond providing line power to the luminaire. LumenSafe features factory-installed power and networking gear in a variety of networking options allowing security integrators to design the optimal solution for active surveillance.

Date	Issued For
XXXX	

100'-0"

25'-0"   25'-0"   25'-0"   25'-0"

26'-8"

26'-8"

26'-8"

80'-0"

49'-6½"

FEMALE
TOILET

MALE
TOILET

STORAGE

12'-4"

OFFICE

OFFICE

WORK STATIONS

OFFICE

LANDING

HALLWAY

RECEPTION

KITCHEN

OFFICE

OFFICE

VESTIBULE

CONFERENCE ROOM

14'-6½"   8'-9"   12'-2"   12'-2"

25'-1"

8'-9"

FLOOR PLAN
SCALE: 1/8" = 1'-0"

NEW CONSTRUCTION FOR
KAPTEIN BUILDING
13905 IRONWOOD DRIVE NW
GRAND RAPIDS, MICHIGAN 49534

PROJECT NUMBER
18010

SHEET

A1.01

FLOOR PLAN