EXHIBIT "A"

Comparing Kelvin: 3000K, 4000K, 5000K

3000K balances warmth with functionality. In contrast, 5000K's bright white is designed for high-energy spaces where visibility is critical. Key Difference: 3000K offers a warmer, more inviting light, while 5000K provides a brighter, more energizing illumination.

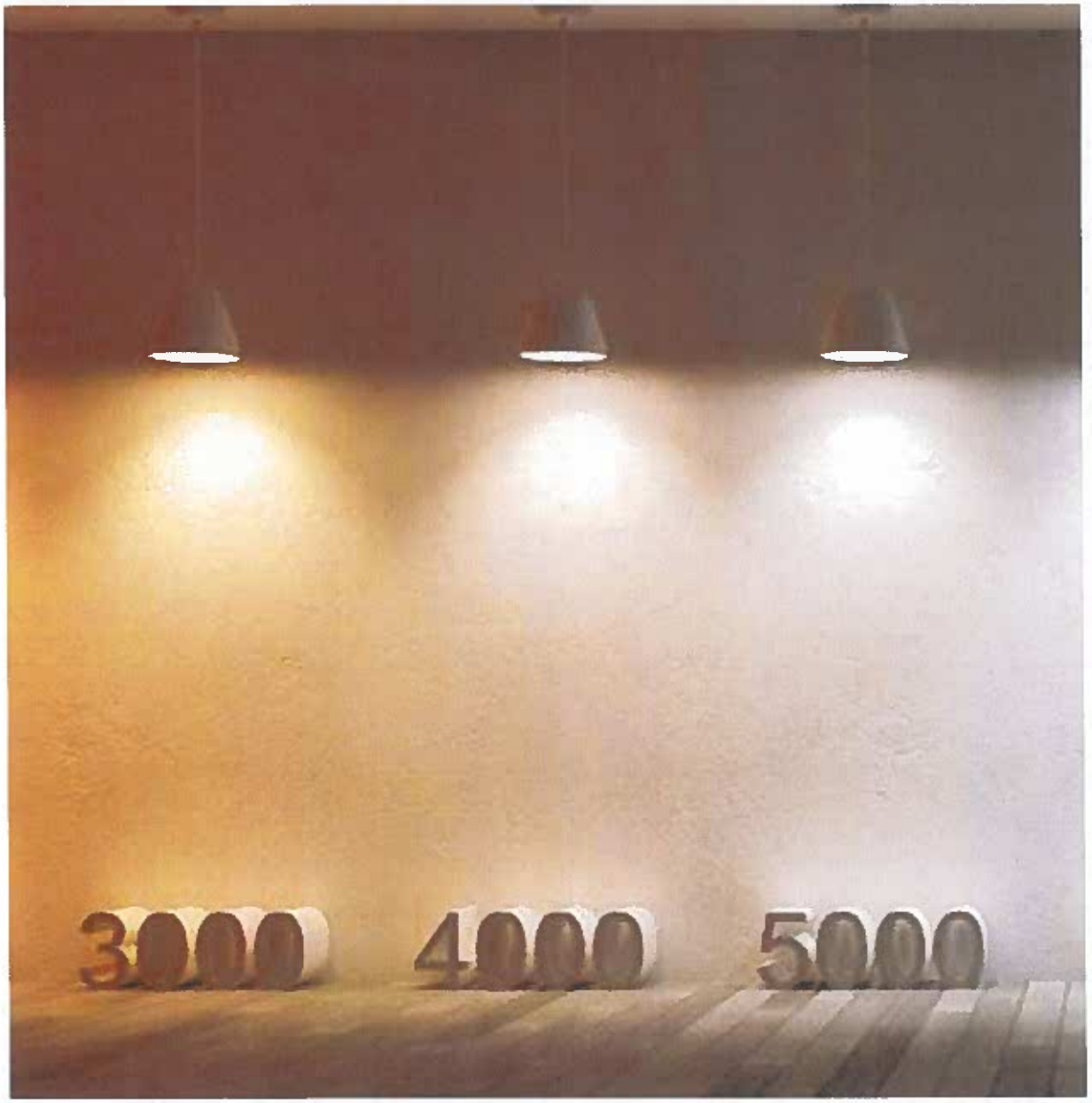


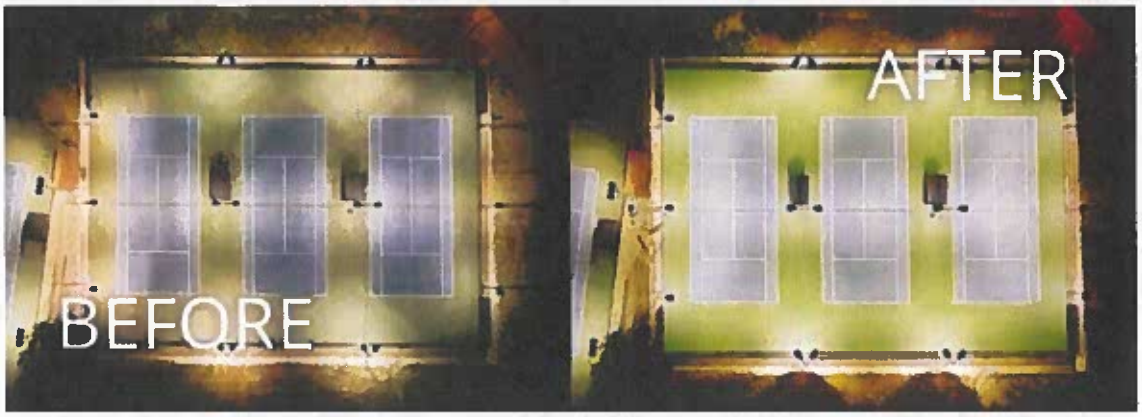
EXHIBIT "B"

Comparing Foot-candle Measurements

Some typical foot-candle measurements for given light conditions:

- Unobstructed sunlight: 10,000 fc
- Visually intensive workspace: 200 fc
- Overcast sunlight: 100 fc
- Residential space (working): 70-90 fc
- Residential space (living): 5-40 fc
- Store environment: 5 fc

If there are shadows or dark areas in your space this can often be improved by adding new led lighting or upgrading the fixtures to better distribute the light from each lamp. For example, in **sports lighting such as Tennis Court lighting**, *shadows*, or areas where lighting levels are much lower can cause problems for players during sporting events.



Source: FSG

Table A-2. Recommended Illuminance Criteria for *Outdoor* Sports and Recreation Areas

Recommended Maintained Illuminance Targets [a,b]														
		TS = Task Surface: Recommended illuminances are at height of task surface above finished grade or floor												
		Horizontal (E_h)							Vertical (E_v)					
		Target E_h @ Height AFF			CV	Uniformity Ratio			Target E_v @ Height AFF				CV	Uniformity Ratio	
APPLICATION TASK/AREA	Class of Play	CAT	Lux @ m	(Fc @ Ft)	Max Avg Min	Max CV	Ratio	Ratio Basis	CAT	Lux @ m	(Fc @ Ft)	Max Avg Min	Max CV	Ratio	Ratio Basis
Motor Racing															
Track	I	R	500 @ 0.91	(50 @ 3.0)	Avg	0.21	2.5:1	Max:Min							
Track	II	P	300 @ 0.91	(30 @ 3.0)	Avg	0.25	3:1	Max:Min							
Track	III	O	200 @ 0.91	(20 @ 3.0)	Avg	0.30	4:1	Max:Min							
Pickleball															
Area of play	I	S	1,000 @ 0.91	(100 @ 3.0)	Avg	0.13	1.5:1	Max:Min							
Area of play	II	S	750 @ 0.91	(75 @ 3.0)	Avg	0.13	1.7:1	Max:Min							
Area of play	III	R	500 @ 0.91	(50 @ 3.0)	Avg	0.17	2:1	Max:Min							
Area of play	IV	P	300 @ 0.91	(30 @ 3.0)	Avg	0.21	2.5:1	Max:Min							
Platform Tennis															
Area of play	II	R	500 @ 0.91	(50 @ 3.0)	Avg	0.17	2:1	Max:Min							
Area of play	III	P	300 @ 0.91	(30 @ 3.0)	Avg										
Area of play	IV	O	200 @ 0.91	(20 @ 3.0)	Avg										
Polo															
Area of play	III	S	750 @ 0.91	(75 @ 3.0)	Avg	0.21	2.5:1	Max:Min							
Area of play	IV	R	500 @ 0.91	(50 @ 3.0)	Avg	0.25	3:1	Max:Min							
Rifle, Pistol															
Shooting line	IV	M	100 @ 0.91	(10 @ 3.0)	Avg	0.17	2:1	Max:Min							
Target	IV								R	500 @ 0.91	(50 @ 3.0)	Avg			
Rodeo															
Rodeo area	I	T	1,000 @ 0.91	(100 @ 3.0)	Avg	0.17	1.7:1	Max:Min							
Rodeo area	II	S	750 @ 0.91	(75 @ 3.0)	Avg	0.17	2:1	Max:Min							
Rodeo area	III	R	500 @ 0.91	(50 @ 3.0)	Avg	0.21	2.5:1	Max:Min							
Rodeo area	IV	P	300 @ 0.91	(30 @ 3.0)	Avg	0.25	3:1	Max:Min							
Skate Parks															
Area of play	III	R	200 @ 0.91	(20 @ 3.0)	Avg	0.25	3:1	Max:Min							
Area of play	IV	O	50 @ 0.91	(5 @ 3.0)	Min	0.25	3:1	Max:Min							
Speed Skating (ice, inline)															
Skating area	II	P	300 @ 0.91	(30 @ 3.0)	Avg	0.21	2:1	Max:Min							
Skating area	III	O	200 @ 0.91	(20 @ 3.0)	Avg	0.25	3:1	Max:Min							
Skating area	IV	M	100 @ 0.91	(10 @ 3.0)	Avg	0.30	4:1	Max:Min							

DarkSky

LSI is Proudly DarkSky Compliant

At LSI, sustainability is built into every solution we design. As part of our mission to create environmentally responsible lighting, we proudly support and align with the principles of DarkSky International. By engineering products that meet these high standards, we help reduce light pollution and protect the natural nighttime environment without sacrificing performance or safety. Our approach reflects a long-term commitment to sustainable lighting.

DarkSky APPROVED

DarkSky Certification

At LSI, sustainability is built into every solution we design. As part of our mission to create environmentally responsible lighting, we proudly support and align with the principles of DarkSky International.

By engineering products that meet these high standards, we help reduce light pollution and protect the natural nighttime environment. We do so without sacrificing performance or safety. Our approach reflects a long-term commitment to sustainable lighting.

Compliancy Requirements

DarkSky compliance is all about responsible outdoor lighting through solutions that are useful, targeted, controlled, and warm-colored. DarkSky International's specific compliance requirements are:

- **No Uplight:** Fixtures must emit no light above 90 degrees from the horizontal plane, preventing unnecessary skyglow.
- **Directional Control:** Light should be directed only where it is needed, avoiding unnecessary illumination of surrounding areas. For sports lighting applications, at least 85% of total lumens must be directed downward toward

the intended target area.

- **Glare & Spill Control:** Ensure that light sources are not directly visible and cause discomfort or temporary blindness. Prevent light from shinning upwards into the night sky or spilling onto neighboring properties.
- **Uniformity:** The average illuminance on the targeted area must not exceed 10% above the average target illuminance level.
- **Spectrum Requirements:** Fixtures must have a maximum correlated color temperature (CCT) of 3000K, minimizing blue light and reducing skyglow.
- **Smart Controls:** Lighting systems should include appropriate controls, such as motion sensors, timers, and dimmers to help ensure that lights are only used when needed and at the appropriate intensity.
- **Certification:** Areas like sport courts & fields, parks, and communities can be certified by DarkSky for their commitment to dark skies and responsible lighting practices.

LSI's Solution

LSI works to support this initiative by designing lighting solutions that align with these guidelines, all while maintaining safety and visibility. Our commitment to DarkSky principles helps reduce light pollution, protect ecosystems, and improve human well-being, ensuring outdoor spaces support long-term environmental and community well-being. LSI does this by:

- **Mitigate Uplight and Glare:** Our fixtures feature a wide variety of specially engineered optics that can eliminate uplight or the need to tilt luminaires. The result is significantly reduced glare and environmental impact, preserving visibility of the night sky while maintaining high-quality lighting.
- **Targeted Light Distribution:** LSI's high precision optics direct light where it is needed for maximum efficiency and minimum waste. Less waste results in less spill light and lower luminaire outputs for maximum energy savings and return on investment. Multiple shielding options allow light to be further contained to exactly where it's needed, avoiding light trespass and enhancing visual comfort.
- **Compliant Color Temperatures:** We provide a variety of CCT options that are at or below the 3000K maximum required for DarkSky certification on most of our outdoor luminaires. We even offer true turtle amber solutions that eliminate blue light emissions and support ecological preservation.



Calculation Summary					
Project: BLACK DESERT PICKLEBALL					
Label	CalcType	Avg	Max	Min	Avg/Min
COURT 1	Illuminance	93.65	112	60	1.57
COURT 2	Illuminance	91.82	113	63	1.46
COURT 3	Illuminance	91.72	113	63	1.46
COURT 4	Illuminance	93.07	113	60	1.55
COURT 5	Illuminance	90.16	113	60	1.50
COURT 6	Illuminance	91.80	113	63	1.79
COURT 7	Illuminance	91.57	113	63	1.79
COURT 8	Illuminance	93.62	113	63	1.51
COURT 9	Illuminance	90.16	113	60	1.50
COURT10	Illuminance	91.54	113	63	1.79
COURT11	Illuminance	91.57	113	63	1.79
COURT12	Illuminance	92.62	113	63	1.52
COURT13	Illuminance	93.04	113	60	1.57
COURT14	Illuminance	91.21	113	62	1.52
COURT15	Illuminance	91.73	113	63	1.52
COURT16	Illuminance	90.14	113	60	1.50
COURT17	Illuminance	84.71	105	56	1.51
COURT18	Illuminance	102.07	120	63	1.62
COURT19	Illuminance	94.94	109	66	1.44
STADIUM 1	Illuminance	82.68	119	70	1.41
STADIUM 2	Illuminance	78.43	99	63	1.49

The light levels shown are maintained using a .86 light loss factor (LLF) Light loss factors are used to adjust the light output of a luminaire operating in a controlled laboratory environment to the output obtained under actual field conditions. The LLF used in these calculations includes both recoverable and non-recoverable factors. Recoverable factors include lamp/arc dirt depreciation (LDD). Non-recoverable factors include optical system variations, and depreciation in initial luminaire lumen output. The use of the light loss factor shown requires making certain assumptions about the lighting system, the specific application, and the maintenance of the system over time. Therefore, actual light levels measured in the field may vary from the calculated values, especially in regards to individual location measurements.

Calculations are a LED Maintained Lamp Lumen factor based upon 50,000 hours of life, derived from IES TM21-11, and based upon an in-situ case temperature of 25°C

Based on the information provided, all dimensions and luminaire Locations shown represent recommended positions. The engineer and / or architect must determine applicability of the layout to existing or future field conditions

Filename: BLACK DESERTS.AGI
Date: 9/8/2025

Luminaire Schedule								
Project: BLACK DESERT PICKLEBALL								
Symbol	Qty	Label	Arrangement	Description	LLF	Luminaire Lumens	Luminaire Watts	Total Watts
	40	A	SINGLE	ZAL-7SL-CT-40 (ZONE LARGE) @ 22' AFG HT.	0.900	77598	646	25800
	20	B	TWIN 180	ZAL-7SL-CT-40 (ZONE LARGE) @ 22' AFG HT.	0.900	77598	646	25920
	14	C	SINGLE	ADS-I-LS-30L-640-SIAAC (ADVANTAGE) @ 25' AFG HT.	0.900	29066	239.4	3630.4



ZONE Large - Sport/Court Light (ZNL)

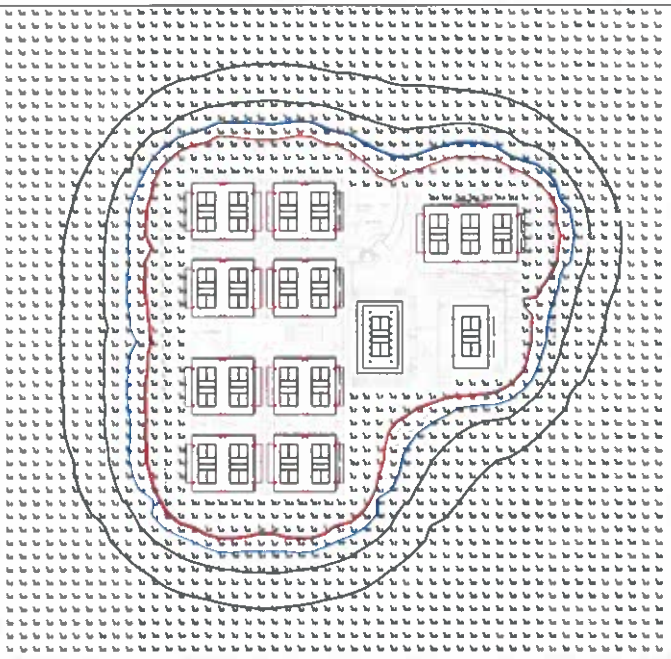


Advantage Series

Project: Black Desert Pickleball Complex Location: UT	Frasure Reps 3343 Lookout Drive Cincinnati, OH 45208 Phone: 513-666-4242 Email: patrick@frasurereps.com

FRASUREREPS
SPORTS LIGHTING

Date:9/8/2025





ZONE Large - Sport/Court Light
(ZNL)



Advantage Series

Luminaire Schedule

Project: BLACK DESERT PICKLEBALL

Symbol	Qty	Label	Arrangement	Description	LLF	Luminaire Lumens	Luminaire Watts	Total Watts
	40	A	SINGLE_1_1	ZNL-7BL-CT-40 (ZONE LARGE) @ 22' MTG. HT.	0.960	77500	648	25920
	20	B	TWIN 90	ZNL-7BL-CT-40 (ZONE LARGE) @ 22' MTG. HT.	0.960	77500	648	25920
	16	C	SINGLE_3	ADS-14.5-30L-840-R3M-IL (ADVANTAGE) @ 35' MTG. HT.	0.960	29086	239.4	3830.4

Project: Black Desert Pickleball Complex
Location: UT

Frasure Reps
3343 Lookout Drive
Cincinnati, OH 45208
Phone: 513-666-4242
Email: patrick@frasurereps.com

FRASUREREPS
SPORTS LIGHTING

Date:10/10/2025

Catalog # : _____ Project : _____ Type : _____

Prepared By : _____ Date : _____

External Shields (EHS)

Shielding



OVERVIEW	
Standard length	2 - 8 Inch
EPA	.8 - 6.8

QUICK LINKS

Ordering Guide | EPA | Dimensions

FEATURES & SPECIFICATIONS

- A formed aluminum product
- Black Duragrip finish is standard with custom colors as an option
- Customizable lengths are available. Consult with Factory
- Field installable only.

COMPATIBLE FIXTURES



MRS



MRM ZNM



MRL ZNL



SLM ZNX

EHS PART NUMBERS

MRM/ZNM F/L/R/B 3 Inch	783607BLK
MRM/ZNM F/L/R/B 6 Inch	776538BLK
MRM/ZNM/SLM LB/RB 3 Inch	790806BLK
MRM/ZNM/SLM LB/RB 6 Inch	790805BLK
MRM/ZNM/SLM LRB 3 Inch	789807BLK
MRM/ZNM/SLM LRB 6 Inch	789788BLK
MRL/ZNL F/L/R/B 3 Inch	785970BLK
MRL/ZNL F/L/R/B 6 Inch	785962BLK

MRL/ZNL LRB 3 Inch	789813BLK
MRL/ZNL LRB 6 Inch	789812BLK
MRL/ZNL LB/RB 3 Inch	790955BLK
MRL/ZNL LB/RB 6 Inch	790954BLK
MRS L/R/B 3 Inch	783607BLK
MRS L/R/B 6 Inch	776538BLK
SLM F/L/R 3 Inch	783607BLK
SLM F/L/R 6 Inch	776538BLK

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External House Side Shield

Type : _____

Have questions? Call us at (800) 436-7800

ORDERING GUIDE

Back to Quick Links

TYPICAL ORDER EXAMPLE: EHS MRM FB BLK 30

Prefix	Product	Sides	Finish	Height
EHS - External House Side Shield	MRS - Mirada Small[2,4] MRM - Mirada Medium[2] ZNM - Zone Medium[2] SLM - Slice Medium[3] MRL - Mirada Large[2] ZNL - Zone Large[2] ZNX - Zone Slice[3]	F/L/B/R - Single Shield LRB - C Shape Shield[4] LB/RB - Corner Shield[4]	BLK - Black *Consult Factory for Custom Colors	30 - 3 Inch 60 - 6 Inch Other Lengths Available

Need more information?
Click here for our glossary

Have additional questions?
Call us at (800) 436-7800

1 - Consult factory for special lengths
2 - EHS cannot be mounted with IL or IH
3 - EHS cannot be mounted at the back
4 - EHS cannot be mounted front

EPA

Back to Quick Links

MRM EHS 6 INCHES

Tilt Degree	0	30	45
Single	1.1	2.1	2.5
D180	1.6	2.1	2.5
D90	1.5	2.5	2.9
T90	1.6	3.1	3.4
TN120	1.6	3.9	4.5
Q90	1.6	3.1	3.4

MRM EHS 3 INCHES

Tilt Degree	0	30	45
Single	0.8	1.8	2.2
D180	1.3	1.8	2.2
D90	1.1	2.2	2.6
T90	1.3	2.8	3.1
TN120	1.3	3.6	4.2
Q90	1.3	2.8	3.1

MRS EHS 6 INCHES

Tilt Degree	0	30	45
Single	1.1	1.9	2.4
D180	1.5	1.9	2.4
D90	1.5	2.4	2.7
T90	2	2.9	3.2
TN120	2	2.5	2.9
Q90	2	2.9	3.2

MRS EHS 3 INCHES

Tilt Degree	0	30	45
Single	0.8	1.6	2.1
D180	1.2	1.6	2.1
D90	1.2	2.1	2.5
T90	1.7	2.6	2.9
TN120	1.7	2.2	2.6
Q90	1.7	2.6	2.9

MRL EHS 6 INCHES

Tilt Degree	0	30	45
Single	1.6	3	3.7
D180	2.4	3	3.7
D90	2	3.8	4.5
T90	2.8	4.6	5.3
TN120	2.8	5.8	6.8
Q90	2.8	4.6	5.3

MRL EHS 3 INCHES

Tilt Degree	0	30	45
Single	1.3	2.7	3.4
D180	2.1	2.7	3.4
D90	1.7	3.5	4.2
T90	2.5	4.2	5
TN120	2.5	5.5	6.5
Q90	2.5	4.3	5

SLM EHS 6 INCHES

Tilt Degree	0	30	45
Single	1.1	2.7	3.2
D180	1.7	2.7	3.2
D90	1.6	3.1	3.7
T90	1.8	3.5	4.2
TN120	1.9	5	6
Q90	1.8	3.5	4.2

SLM EHS 3 INCHES

Tilt Degree	0	30	45
Single	0.8	2.4	2.9
D180	1.4	2.4	2.9
D90	1.2	2.8	3.4
T90	1.5	3.2	3.9
TN120	1.6	4.7	5.7
Q90	1.5	3.2	3.9

ZNM EHS 6 INCHES

Tilt Degree	0	30	45
Single	1.1	2.1	2.5
D180	1.6	2.1	2.5
D90	1.5	2.5	2.9
T90	1.6	3.1	3.4
TN120	1.6	3.9	4.5
Q90	1.6	3.1	3.4

ZNM EHS 3 INCHES

Tilt Degree	0	30	45
Single	0.8	1.8	2.2
D180	1.3	1.8	2.2
D90	1.1	2.2	2.6
T90	1.3	2.8	3.1
TN120	1.3	3.6	4.2
Q90	1.3	2.8	3.1

ZNL EHS 6 INCHES

Tilt Degree	0	30	45
Single	1.6	3	3.7
D180	2.4	3	3.7
D90	2	3.8	4.5
T90	2.8	4.6	5.3
TN120	2.8	5.8	6.8
Q90	2.8	4.6	5.3

ZNL EHS 3 INCHES

Tilt Degree	0	30	45
Single	1.3	2.7	3.5
D180	2.1	2.7	3.5
D90	1.8	3.5	4.2
T90	2.5	4.3	5
TN120	2.5	5.5	6.5
Q90	2.5	4.3	5

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External House Side Shield

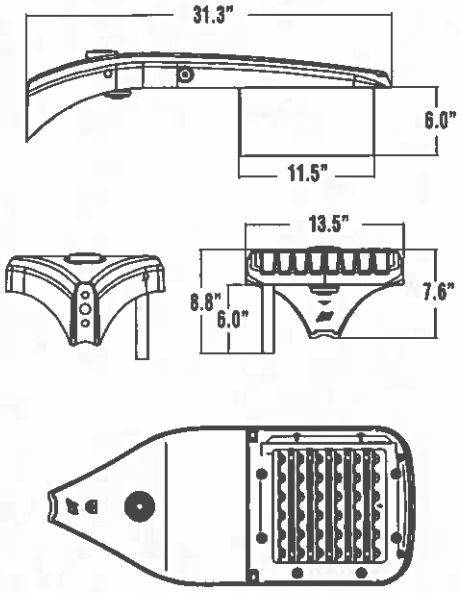
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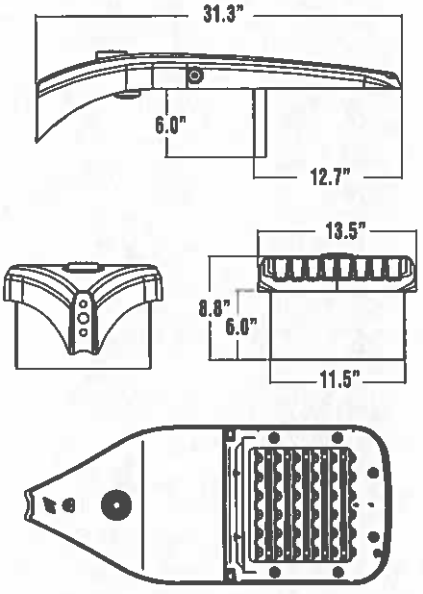
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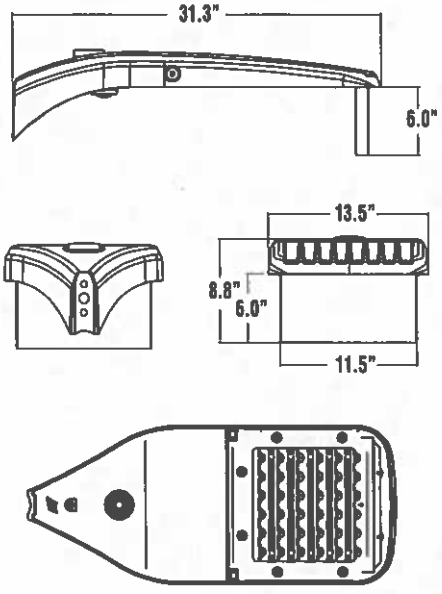
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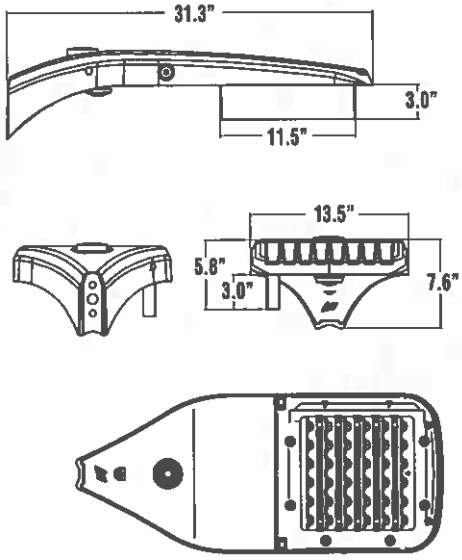
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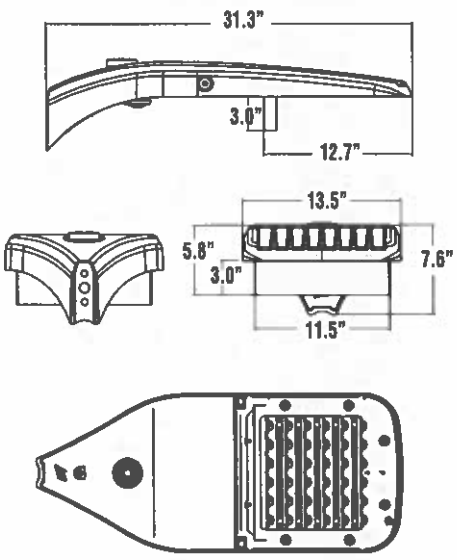
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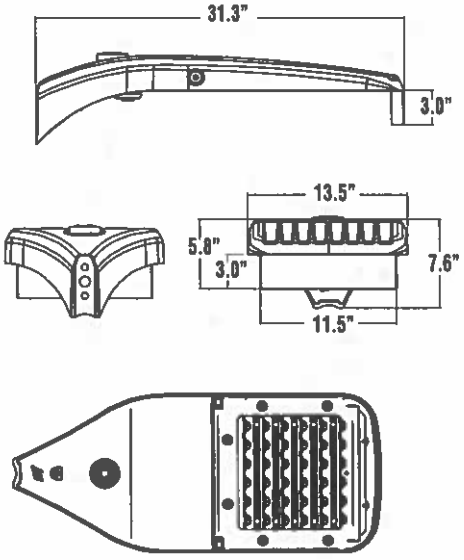
MRM/ZNM EHS 30 SIDE



MRM/ZNM EHS 30 BACK



MRM/ZNM EHS 30 FRONT



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External House Side Shield

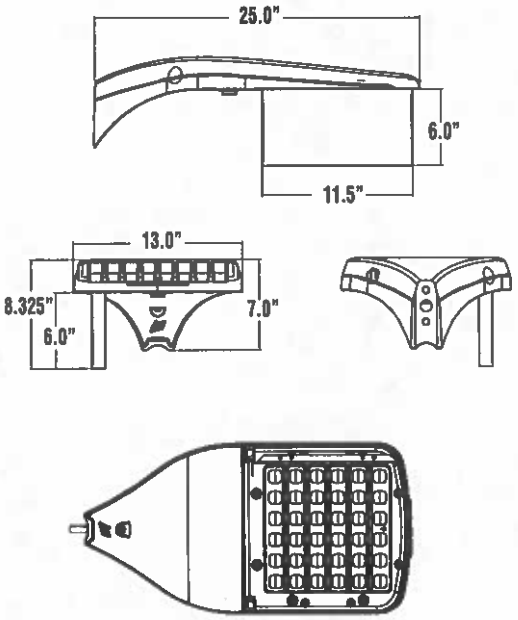
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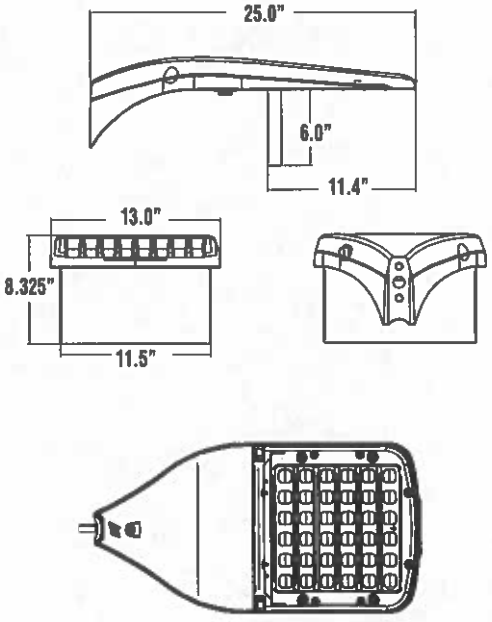
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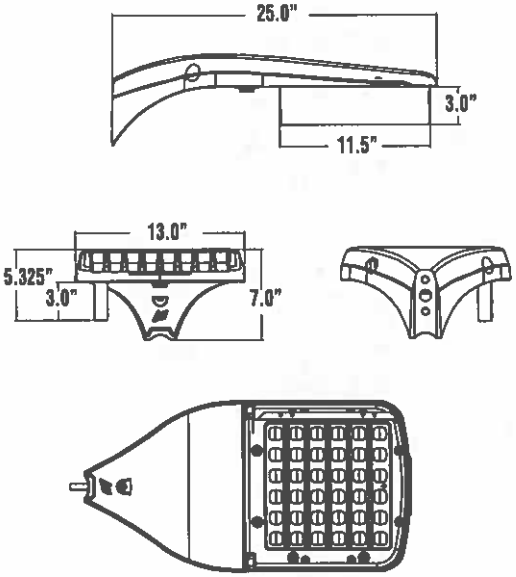
MRS EHS 60 SIDE



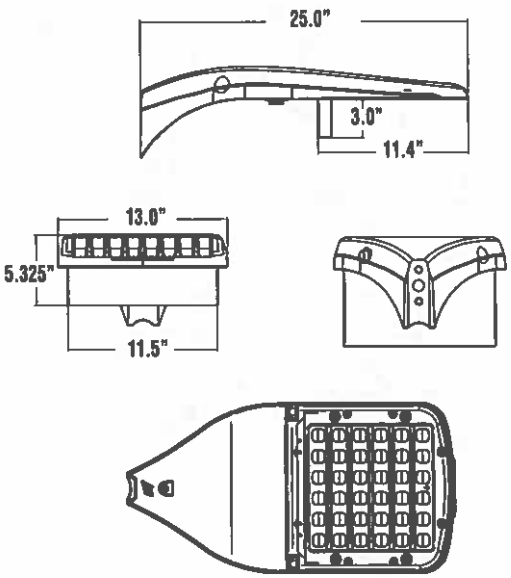
MRS EHS 60 BACK



MRS EHS 30 SIDE



MRS EHS 30 BACK



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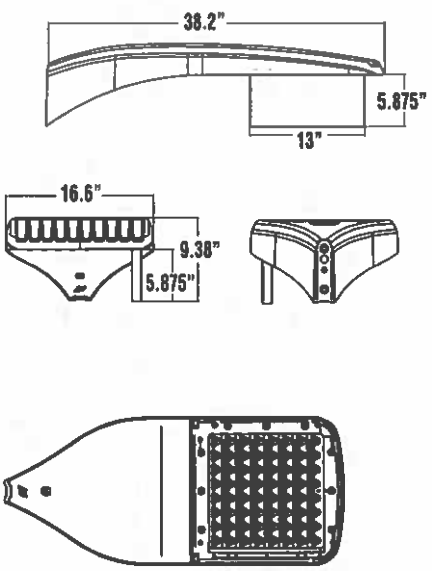
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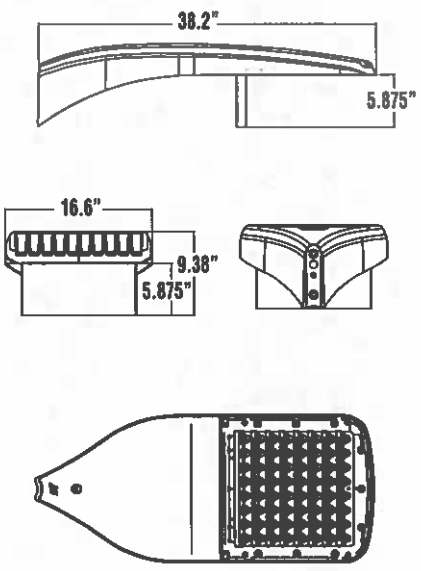
PRODUCT DIMENSIONS

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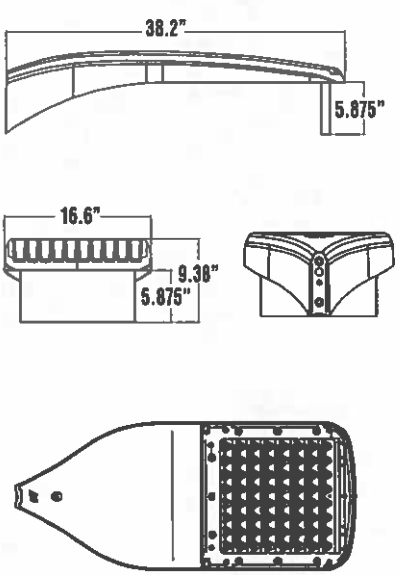
MRL/ZNL EHS 60 SIDE



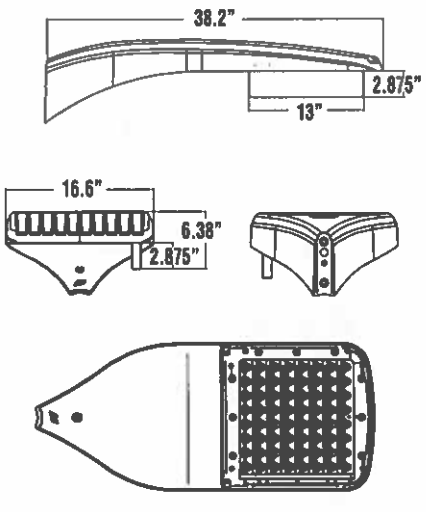
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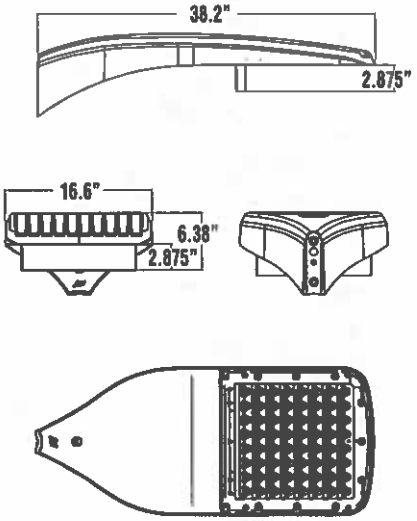
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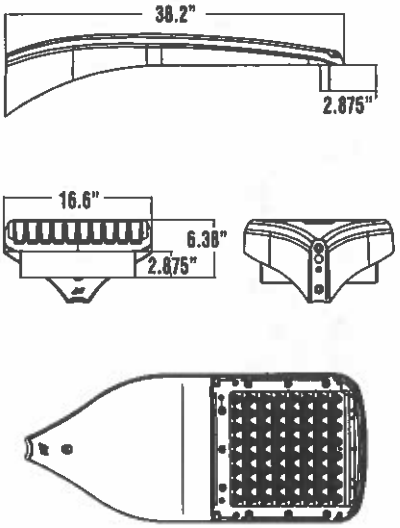
MRL/ZNL EHS 30 SIDE



MRL/ZNL EHS 30 BACK



MRL/ZNL EHS 30 FRONT



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External House Side Shield

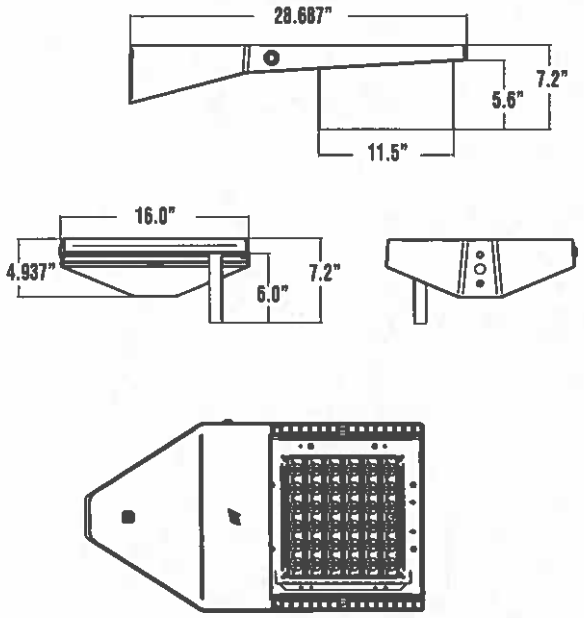
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Have questions? Call us at (800) 436-7800

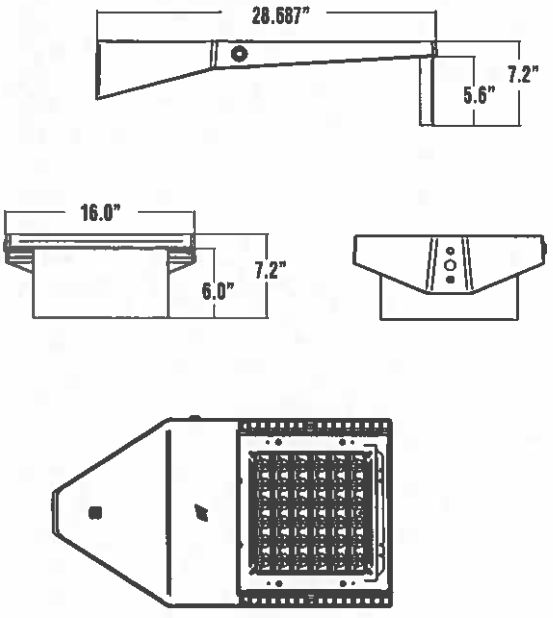
PRODUCT DIMENSIONS

Back to Quick Links

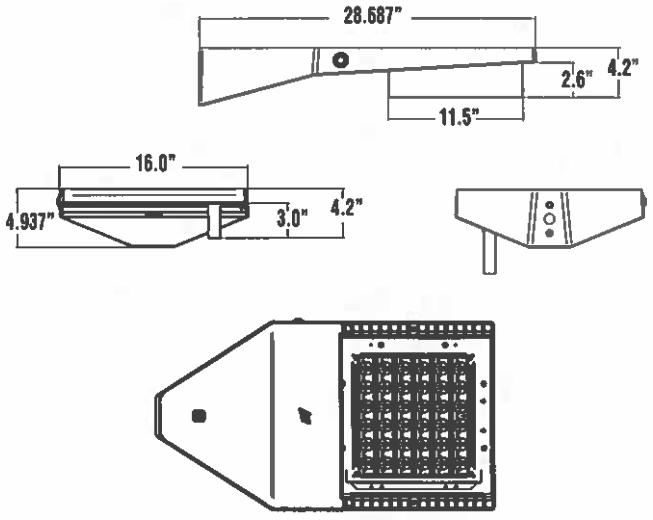
SLM EHS 60 SIDE



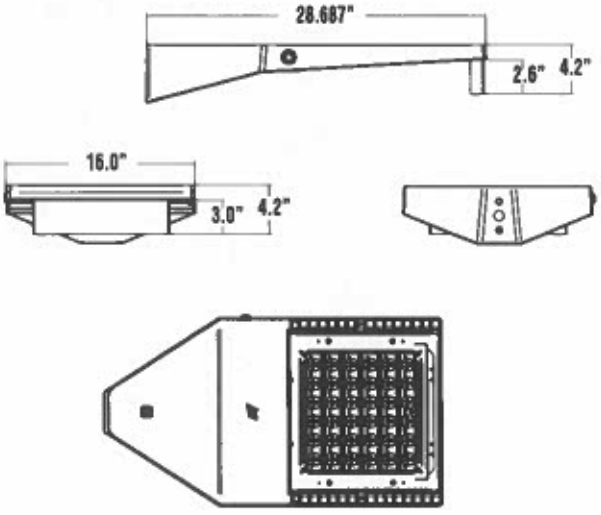
SLM EHS 60 FRONT



SLM EHS 30 SIDE



SLM EHS 30 FRONT



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