

COGCC Lighting Mitigation Plan

This document contains the COGCC required Lighting Mitigation Plan for the Crestone Peak Resources Shelton Pad per the Rule 424 requirements.

By COR Engineering LLC




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Project and Submittal Information

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Project Name:	Shelton CPR-25
COR Engineering Project #:	2022-0175 - CIVI - Shelton CPR-25 Pad LMP
Submittal Date	March 14, 2022
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DISCLAIMER: This analysis is completed using IES standards, good practice, published manufacturer's data and well-established lighting design software. The engineer has made every attempt to provide good analysis to show Rule 424 compliance. The Owner/Operator is responsible for compliance with this approved lighting plan and Rule 424 including commissioning, testing and maintenance.

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Introduction

This document will be informational and serve to explain a method that is similar to approved international standards. Most of Rule 424 is straight forward and is simple enough to adjust the standard modeling methods.

However, the concept of modeling the impact of the lighting of multiple rigs (which no one entity controls) or even of a single rig and the total illuminance present on a residence or facility that is 1 mile from the source is a bit difficult. Herein we show a method and approach to perform analysis and interpret results so that AHJ can verify plan compliance with Rule 424.

Executive Summary

Overall, the site and the lighting for the Shelton site is in compliance with the Rule 424 requirements.

During the Drilling phase, we analyzed the 2 worst case drilling rig locations, and calculated obtrusive lighting levels at relative elevations between -50' to a +225' at a distance of 500' from the site disturbance boundary. The nearest residence is 2239' away from disturbance area. Maximum illuminance values at the 500' perimeter are found to be less than 0.15fc or (1.61lux). The calculated values at the nearest residences are <0.05fc (0.538lux), and the Rule 424.f requirement is to be less than 0.37fc (4lux) at the residences. Therefore, the lighting is acceptable. The site, as designed, is in compliance within the lumens to square footage of hardscape as limited by Rule 424.d.

During the Completion Phase, the only lighting that will be onsite will be the mobile light plants. These will vary with quantity, up to six (6), and in location depending on work to be completed at the time. The light plants will be adjusted to point into the site and away from the neighbors. Therefore, the lighting will not be obtrusive to any neighbors, particularly with the ongoing walk around checks that will be performed as part of the mitigation plans.

During Production, lighting will be installed onsite. Therefore, we have attached the permanent lighting plan for submittal.

Several mitigation techniques will be employed throughout the site's lifespan to maintain compliance with this approved lighting plan.

This lighting plan is prepared in accordance with IES standards and good practice based upon published manufacturer data using well-established lighting software. The owner/operator is responsible to ensure compliance with this plan and maintaining their lighting. Attached is the compliance report from the software as well.

Approach

The way the code is drafted, the calculation would have to show the lighting levels at each residence (single or multifamily) within 1 mile of the facility as calculated at 5.5' from the finished grade. This approach will not address multi-story residences with balconies, etc. As some facilities reside within 1 mile of large neighborhoods with hundreds and even thousands of houses, this will be overly cumbersome. We propose we simplify the consideration a little to prevent having to model every

house. Additionally, variations in topography over the expanse of a 1-mile radius from the edge of the site, (over 2-mile diameter and more than 3.14159 square miles) further complicate the matter.

Now, for the moment we will ignore topographical changes that occur across that distance between the drilling rig and the residence, and assume that they are on level ground. We will address the topographic impact later.

If we do the overall site illumination calculations to the edge of the exterior disturbance area and extend it 100' beyond as mentioned by Rule 424 when a residence is within 2000' of the facility, then we can show compliance with the majority of the Rule 424 requirements. As mentioned, this is a fairly straight forward adjustment to the existing operations. Then to show compliance with Rule 424.f, we can draw a boundary at the site boundary and provide what is called an obtrusive lighting calculation up from ground level to higher than the tallest fixture on the rig. This will give us an idea of the amount of light spillage will come out of the site. Then we can again do the same at the line that is just closer than the closest residence providing a wraparound calculation showing the lighting levels present on a vertical plane caused by the drilling site.

If, under the analysis method put forward, we are in compliance, then the need for further analysis is moot, as this will present worst case. However, compliance would not be limited to the 5.5' from the finished grade. To take into account the residences further out than the nearest, the calculation must take into account all elevations that are just higher than the highest fixture and down to the ground. Compliance on this boundary should justify compliance for the overall lighting, period.

Now, going back to the changes in elevation which is simple enough with this method. With the lighting software, we can simply extend the vertical calculation plane to extend beyond the largest changes in elevation. This will represent a residential unit located above/below the actual site. We assume the site is at elevation 0, and extend the calculation line up to the height of the sum of the highest fixture onsite plus the positive change in elevation within one mile. Similarly, we extend the vertical calculation plane downward to an elevation as low as the lowest depression within one mile. In the software there is no "ground" unless it is created as an object. In this submittal, we have assumed the lowest depression is less than 50' below and that the highest elevation is 40' above the top of the rig, giving the calculation elevations mentioned in the executive summary. Illuminance values drops inversely proportional to square of the radius from the source to the calculation area. Therefore, the further away, the lower the illuminance values, and our proposed method will be more conservative.

Temporary portable lighting is variable based upon R424 and not considered herein. Idealized locations are shown on the drawings attached to this report. These locations are subject to change and per R424 guidance shall not require additional modeling.

Environmental and Special Considerations

The environmental considerations are based upon the Wildlife Protection Plan for Shelton CPR-25 Pad prepared by RPG Resources. The site is a multi-well pad located in Section 25 of Township4 North, Range 65 West, in an unincorporated area of Weld County, CO. The Site is in the Western Great Plains Range and Irrigated Region Land Resource Region (LRR) of the Central High Plains, Southern Part Major Land Resource Region (MLRA; NRCS 2006), and the field-verified surrounding land types are oil and gas, rangeland, and agriculture.

Per this study, the site is not located within any mapped High Priority Habitats. Therefore, standard Lighting Mitigation Approaches will be employed.

The environmental site assessment did not reveal the presence of any known NWI/NHD-mapped wetlands or water bodies within or adjacent to the Site, nor were there any new potential aquatic features identified during the Site visit. Thus, no impacts to any potential wetlands or waters of the U.S. are expected as a result of project activities associated with the Site.

The site lighting is designed to minimize impacts to habitats or other areas of concern outside the disturbance area. Site plans show the lighting calculations well below the 4 lux (0.371 fc) at 500' from the site boundary in the vertical plane. In addition to intensity, the color of light matters to habitats. Therefore, whenever the Operator can, they will replace fixtures with Kelvin ratings above 3500K they will use new fixtures with 3500K color or less. The rig mounted fixtures are per the rig owner as it is leased by the Operator, and therefore the fixtures cannot be changed.

Drilling Phase Narrative

The Drilling Phase will have no sound wall. The site lighting is shown on the plans attached. Lighting will be provided on the drilling rig and the work trailers. There will be up to three (3) mobile light plants onsite with varying locations and aiming depending on the work being completed. Per the analysis and the compliance report the areas pass with regard to the 4lux limitation.

Roadways – There are some roadways nearby, namely County Road 49. We have analyzed the roadways for glare and obtrusive lighting. Both showed no glare issues.

See attached for Calculation Summary.

Completion Phase Narrative

The Completion Phase will have no sound wall. The site lighting will consist of up to six (6) mobile light plants onsite with varying locations and aiming depending on the work being completed. There is not planned to be any other illumination onsite during Completion.

Production Phase Narrative

There will be no site lighting onsite during the Production Phase operations. Therefore, there is no analysis or plans showing any fixtures.

Lumens per Square Foot – All Phases

Limitations on the site are <12lumens per square foot per code. Per the attached analysis the site is <12 lumens per square foot in both the Drilling and Completion phases. As mentioned, the Production Phase will have no lighting.

See attached drawings for Lumens per Square Foot calculations.

Mitigation Techniques and Best Management Practices to be Employed

1. At rig setup and regularly during Drilling and Completion phases, operator will walk around the outside of the disturbance area to confirm fixture adjustment is preventing obtrusive lighting from leaving the site.
2. As there are comments from neighbors, the operator is committed to adjust fixtures or install shielding on offending fixtures, working with the neighbor up to what is reasonably possible, to minimize the particular offending fixture to reduce the issue.
3. When fixture selections are within the operator's control, they will install 3000K fixtures which have been proven to reduce impact to habitats, human circadian rhythms. In addition, most people find 3000K fixtures less offensive than the 5000K fixtures. The operator cannot control the fixtures installed on the drilling rig as it is leased for the drilling portion.
4. During Completion Phase, light plants will be present as needed for safe light levels. Per the discussion above the Operator will continue the perimeter walks to reduce obtrusive lighting levels as possible.
5. The moveable lights will be relocated as needed to support safe operations. As Rule 424 wording indicates, these devices are considered exempt from the analysis due to their nature.

Attachments

1. Lighting Mitigation Plan Drawings
2. Lighting Level Heat Map
3. Fixture Cutsheets

Attachment 1

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CRESTONE PEAK RESOURCES SHELTON CPR-25 PAD LIGHTING MITIGATION PLAN ISSUE FOR PERMIT



1 OVERALL AREA MAP
SCALE: NTS

GENERAL NOTES

- COORDINATE EXACT EQUIPMENT LOCATIONS WITH OWNER PRIOR TO ROUGH-INS. REVIEW ENTIRE PROJECT PACKAGE INCLUDING OTHER TRADE DRAWING FOR COMPLETE UNDERSTANDING OF DESIGN.
- THE OWNER AND ENGINEER ARE NOT RESPONSIBLE FOR THE CONTRACTOR'S SAFETY PRECAUTIONS OR TO MEANS, METHODS TECHNIQUES CONSTRUCTION SEQUENCES OR PROCEDURES REQUIRED TO PERFORM THE WORK.
- THE INTENT OF THE DRAWINGS IS TO PROVIDE CLARIFICATION OF THE PLAN OF INSTALLATION OF LIGHTING RELATIVE TO SITE LAYOUT FOR RULE 424 PLAN SUBMISSION REVIEW AND COMPLIANCE. OWNER & OPERATOR ARE RESPONSIBLE TO ENSURE COMPLIANCE WITH THE CODE REQUIREMENTS AND OPERATIONS AS DESCRIBED HEREIN.
- DIMENSIONS - CONTRACTOR/CUSTOMER TO VERIFY ALL DIMENSIONS AND REPORT ANY DISCREPANCIES TO ENGINEER IMMEDIATELY.
- ALL ELECTRICAL INSTALLATIONS ARE TO BE PER ELECTRICAL ENGINEERING DRAWINGS AND SPECIFICATIONS AS PROVIDED BY OTHERS. THESE DRAWINGS ARE NOT ELECTRICAL ENGINEERING DESIGN AND ARE INTENDED FOR PLAN REVIEW AND OPERATIONAL PRESCRIPTION PURPOSES ONLY.
- VERIFY ALL FIXTURE MODEL, HEIGHT, TILT, AIMING, SHIELDING AND LOCATION AS SHOWN HEREIN PRIOR TO ROUGH-IN OR INSTALLATION.
- SITE FIXTURES TO BE FULL CUTOFF AS DEFINED BY MUNICIPAL CODE, NOT

- EMITTING LIGHTING ABOVE 90° FROM NADIR. SEE EXAMPLES OF FULL CUTOFF.
- REFER TO ELECTRICAL DRAWINGS FOR CONDUIT SIZING, WIRING, AND OTHER ELECTRICAL. REFER TO OWNER/OPERATOR FOR FIXTURE POLE COLOR AND FINISH.
 - ALL EXTERIOR LIGHTING TO BE SWITCHED WITH DUSK TO DAWN PHOTOCCELL AND FIXTURE MOUNTED OCCUPANCY SENSORS WITH 15 MINUTE TO 1 HOUR TIMED OFF SINCE LAST OCCUPANCY SENSED BY ANY SENSOR OR AS OTHERWISE DESCRIBED ON THE ELECTRICAL DRAWINGS. SENSORS TO BE TIED TOGETHER SO THAT ANY SENSING ON ONE SENSORS TURN ON ALL LIGHTS IN THAT AREA.
 - INSTALLATION MUST BE COMPLIANT WITH APPLICABLE CURRENT LOCAL, STATE, AND FEDERAL BUILDING AND ENERGY CONSERVATION CODES: INTERNATIONAL BUILDING CODE 2018, INTERNATIONAL ENERGY CONSERVATION CODE 2018, NATIONAL ELECTRICAL CODE (NEC) NFPA 70 2020.
 - CONTRACTOR PROVIDE TO OWNER DOCUMENTATION REGARDING OPERATIONS AND MAINTENANCE OF THE LIGHTING SYSTEM AND COMPONENTS INCLUDING MANUFACTURERS' INFORMATION, SPECIFICATIONS, PROGRAMMING PROCEDURES AND MEANS OF ILLUSTRATING TO OWNER HOW BUILDING, EQUIPMENT AND SYSTEMS ARE INTENDED TO BE INSTALLED, MAINTAINED AND OPERATED.
 - PER OGEB DIRECTOR THE SITE IS LIMITED TO THE FOLLOWING:

- LZ-1 1.25 LUMENS / SQUARE FOOT OF HARDSCAPE PER WELD COUNTY, ALL LZs ARE ALLOWED UP TO 12 LUMENS PER SQUARE FOOT OF HARD SCAPE DURING CONSTRUCTION (DRILLING AND COMPLETION).
 - DURING PRODUCTION THERE WILL BE NO PERMANENT LIGHTING ONSITE DURING PRODUCTION.
- BEST MANAGEMENT PRACTICES TO BE EMPLOYED DURING THE PHASES OF THE FACILITY OPERATION WILL BE DISCUSSED ON THE RELATIVE PHOTOMETRIC ANALYSIS SHEETS.
- PORTABLE LIGHT PLANTS WILL BE USED DURING THE CONSTRUCTION PHASES TO PROVIDE SUFFICIENT LIGHTING FOR SAFE WORK PRACTICES. LIGHTING STANDARDS. OPERATORS SHALL ADHERE TO THE FOLLOWING LIGHTING STANDARDS AT ALL OIL AND GAS LOCATIONS DURING ALL PHASES OF OIL AND GAS OPERATIONS:
 - OPERATORS SHALL DIRECT SITE LIGHTING DOWNWARD AND INWARD, SUCH THAT NO LIGHT SHINES ABOVE A HORIZONTAL PLANE PASSING THROUGH THE CENTER POINT OF THE LIGHT SOURCE, WITH LIGHTS HIDDEN BY THE SOUND WALL IF ONE IS PRESENT.
 - OPERATORS WILL PLACE BULBS WITHIN FIXTURES THAT OBSCURE, BLOCK, OR DIFFUSE THE LIGHT TO REDUCE LIGHT INTENSITY OUTSIDE THE BOUNDARIES OF THE OIL AND GAS LOCATION.
 - OPERATORS WILL USE BMPS INCLUDING, BUT NOT LIMITED TO:
 - MINIMIZING LIGHTING WHEN NOT NEEDED USING TIMERS OR MOTION

- SENSORS ("USE ONLY THE LIGHTS YOU NEED")
- USING FULL CUT-OFF LIGHTING
 - USING LIGHTING COLORS THAT REDUCE LIGHT INTENSITY
 - USING LOW-GLARE AND NO-GLARE LIGHTING.
- 19. DISCLAIMER:** THESE CALCULATIONS HEREIN HAVE BEEN PERFORMED WITH EVERY INTENT TO MEET CODE REQUIREMENTS ACCORDING TO IES STANDARDS AND GOOD PRACTICE USING MANUFACTURER PUBLISHED IES FILES AND CUTSHEETS. THERE MAY BE DISCREPANCIES BETWEEN THE RESULTS PRESENTED HEREIN AND ACTUAL FIELD MEASUREMENTS BASED ON THE EXTENT FIELD CONDITIONS VARY FROM INPUT DATA. EXAMPLE CONDITIONS INCLUDE SURFACE REFLECTANCES, SURFACE COLORS, FIXTURE AIMING, MOUNTING HEIGHTS, VOLTAGE, TEMPERATURE, ATMOSPHERIC CONDITIONS, LUMINARY POSITIONS, STRUCTURES OR OTHER EQUIPMENT LOCATIONS, EQUIPMENT TOLERANCES, MEASUREMENT METHODS, PRESENCE OF DIRT OR OTHER FOREIGN MATTER, DIRTY OR OBSCURED OPTICS. ENGINEER NOT RESPONSIBLE FOR ANY ERRORS IN MANUFACTURER PUBLISHED INFORMATION. ALL DIMENSIONS, CUTSHEETS, SITE LAYOUTS, DRAWINGS AND IMAGES ARE PROVIDED FOR PHOTOMETRIC REFERENCE AND NOT FOR CONSTRUCTION. OPERATOR IS RESPONSIBLE FOR ONGOING MAINTENANCE AND COMPLIANCE WITH THE APPROVED LIGHTING ANALYSIS PROVIDED HEREIN AND APPLICABLE MUNICIPAL, COUNTY, STATE AND FEDERAL CODES.



UTILITIES SHOWN ARE BASED ON THE INFORMATION AVAILABLE TO THE ENGINEER. THERE IS NO GUARANTEE ALL FACILITIES ARE SHOWN OR THAT THE LOCATION, DEPTH, AND SIZE OF EACH FACILITY IS CORRECT. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UTILITIES AND SERVICE LINES PRIOR TO CONSTRUCTION.

DRAWINGS

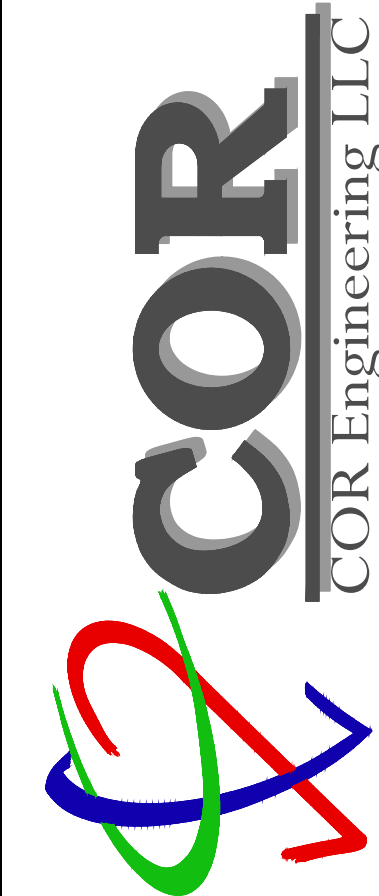
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L-1.01	L - SITE LAYOUT
L-1.02	L - SCHEDULES
L-2.01	L - DRILLING FIXTURES
L-2.02	L - DRILLING PHOTOMETRICS
L-3.01	L - COMPLETION FIXTURES

REV	DATE	DESCRIPTION
0	2022.02.24	WELD COUNTY IFP
1	2022.03.14	COGCC LMP

WARNING



IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.
DRAWING INTENDED FOR 22x34

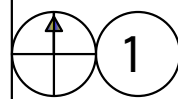


CRESTONE SHELTON CPR-25 PAD
LIGHTING MITIGATION PLAN
L - COVERSHEET
ISSUE FOR PERMIT

2022-0175

L-0.00

COR ENGINEERING PROJECT NUMBER: 2022-0175



SITE MAP
SCALE: NTS

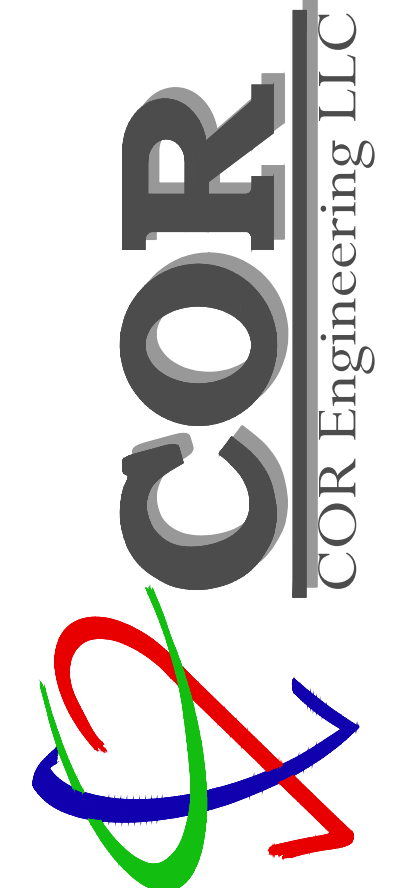


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UTILITIES SHOWN ARE BASED ON THE INFORMATION AVAILABLE TO THE ENGINEER. THERE IS NO GUARANTEE ALL FACILITIES ARE SHOWN OR THAT THE LOCATION, DEPTH, AND SIZE OF EACH FACILITY IS CORRECT. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UTILITIES AND SERVICE LINES PRIOR TO CONSTRUCTION.

CRESTONE SHELTON CPR-25 PAD	
LIGHTING MITIGATION PLAN	
L - SITE LAYOUT	
ISSUE FOR PERMIT	
2022-0175	
L-1.01	









WARNING
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IF THIS BAR DOES NOT MEASURE
1" THEN DRAWING IS NOT TO
SCALE.
DRAWING INTENDED FOR 22x34

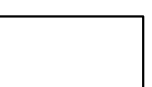
REV	DATE	DESCRIPTION
0	2022.02.24	WELD COUNTY IFP
1	2022.03.14	COGCC LMP

Luminaire Location Summary					
Scene: Drilling					
LumNo	Label	Orient	Tilt	Mtg. Ht.	Tag (Qty)
4	LF100BZ-110-277	0	30	8	WX (1)
5	LF100BZ-110-277	0	30	8	WX (1)
7	LF100BZ-110-277	0	30	8	WX (1)
8	LF100BZ-110-277	0	30	8	WX (1)
9	LF100BZ-110-277	180	30	8	WX (1)
10	LF100BZ-110-277	180	30	8	WX (1)
11	LF100BZ-110-277	180	30	8	WX (1)
13	LF100BZ-110-277	180	30	8	WX (1)
14	LF100BZ-110-277	180	30	8	WX (1)
15	LF100BZ-110-277	270	15	8	WX (1)
16	LF100BZ-110-277	270	15	8	WX (1)
18	LF100BZ-110-277	270	15	8	WX (1)
19	LF100BZ-110-277	270	15	8	WX (1)
33	pfm1llwyunv176_1	270	30	42.153	D (1)
34	dlU2-unv1-s903_1	360	0	174.325	A (1)
35	VMV9L2A-UNVI-S903_1	270	0	159.424	B (1)
36	VMV9L2A-UNVI-S903_1	270	0	143.09	B (1)
37	VMV9L2A-UNVI-S903_1	270	0	133.757	B (1)
38	ZPLA4-UNVI_1	180	45	34.632	C (1)
39	ZPLA4-UNVI_1	360	45	34.632	C (1)
40	ZPLA4-UNVI_1	360	45	34.732	C (1)
41	ZPLA4-UNVI_1	90	45	34.632	C (1)
42	ZPLA4-UNVI_1	90	45	34.632	C (1)
43	ZPLA4-UNVI_1	90	45	34.632	C (1)
44	ZPLA4-UNVI_1	90	45	34.632	C (1)
45	ZPLA4-UNVI_1	90	45	125.601	C (1)
46	VMV9L2A-UNVI-S903_1	270	0	109.257	B (1)
47	VMV9L2A-UNVI-S903_1	270	0	92.924	B (1)
48	VMV9L2A-UNVI-S903_1	270	0	81.872	B (1)
49	VMV9L2A-UNVI-S903_1	270	0	54.596	B (1)
50	ZPLA4-UNVI_1	270	45	34.632	C (1)
51	ZPLA4-UNVI_1	270	45	34.632	C (1)
52	ZPLA4-UNVI_1	270	45	34.632	C (1)
53	ZPLA4-UNVI_1	270	45	34.632	C (1)
54	dlU2-unv1-s903_1	360	45	182.32	A (1)
55	dlU2-unv1-s903_1	360	0	174.325	A (1)
56	VMV9L2A-UNVI-S903_1	90	0	159.424	B (1)
57	VMV9L2A-UNVI-S903_1	90	0	143.09	B (1)
58	VMV9L2A-UNVI-S903_1	90	0	133.757	B (1)
59	pfm1llwyunv176_1	270	30	15.632	D (1)
60	pfm1llwyunv176_1	270	30	15.632	D (1)
61	pfm1llwyunv176_1	90	30	15.632	D (1)
62	pfm1llwyunv176_1	90	30	15.632	D (1)
63	pfm1llwyunv176_1	90	30	42.153	D (1)
64	pfm1llwyunv176_1	360	30	55.814	D (1)
65	pfm1llwyunv176_1	360	30	15.632	D (1)
66	pfm1llwyunv176_1	360	30	15.632	D (1)
67	pfm1llwyunv176_1	180	30	15.632	D (1)
68	pfm1llwyunv176_1	180	30	15.632	D (1)
69	ZPLA4-UNVI_1	180	45	32.632	C (1)
70	ZPLA4-UNVI_1	270	45	125.601	C (1)
71	VMV9L2A-UNVI-S903_1	90	0	109.257	B (1)
72	VMV9L2A-UNVI-S903_1	90	0	92.924	B (1)
73	VMV9L2A-UNVI-S903_1	90	0	81.872	B (1)
74	VMV9L2A-UNVI-S903_1	90	0	54.596	B (1)
75	LF100BZ-110-277	270	30	8	WX (1)
76	LF100BZ-110-277	270	30	8	WX (1)
77-80	MOBILE LIGHT PLANT	VARIES	VARIES	VARIES	LP(6)
All fixtures other than the LF100BZ fixtures and the portable light plants will move with the rig. LF100BZ are connected to portable buildings.					

Luminaire Location Summary					
Completion					
LumNo	Label	Z	Orient	Tilt	Tag (Qty)
1-6	MOBILE LIGHT PLANT	VARIES	VARIES	VARIES	LP(6)
THE ONLY FIXTURES ON SITE DURING COMPLETION WILL BE THE PORTABLE LIGHT PLANTS WHICH WILL BE MOVED AROUND TO PROVIDE SAFE LIGHTING LEVELS.					


Obtrusive Light - Compliance Report		
Custom		
Filename: 175 - Photometric Base		
3/13/2022 21:56:30		
Illuminance		
Maximum Allowable Value: 0.37 Fc		
Calculations Tested (43):		
Calculation Label	Test Results	Max. Illum.
Obt-500_III_Seg1	PASS	0.0
Obt-500_III_Seg2	PASS	0.0
Obt-500_III_Seg3	PASS	0.0
Obt-500_III_Seg4	PASS	0.0
Obt-500_III_Seg5	PASS	0.0
Obt-500_III_Seg6	PASS	0.0
Obt-500_III_Seg7	PASS	0.0
Obt-500_III_Seg8	PASS	0.0
Obt-500_III_Seg9	PASS	0.0
Obt-500_III_Seg10	PASS	0.0
Obt-500_III_Seg11	PASS	0.0
Obt-500_III_Seg12	PASS	0.0
Obt-500_III_Seg13	PASS	0.0
Obt-500_III_Seg14	PASS	0.0
Obt-500_III_Seg15	PASS	0.0
Obt-500_III_Seg16	PASS	0.0
Obt-500_III_Seg17	PASS	0.0
Obt-500_III_Seg18	PASS	0.0
Obt-500_III_Seg19	PASS	0.0
Obt-500_III_Seg20	PASS	0.0
Obt-500_III_Seg21	PASS	0.0
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Obt-500_III_Seg24	PASS	0.0
Obt-500_III_Seg25	PASS	0.0
Obt-500_III_Seg26	PASS	0.0
Obt-500_III_Seg27	PASS	0.0
Obt-500_III_Seg28	PASS	0.0
Obt-500_III_Seg29	PASS	0.1
Obt-500_III_Seg30	PASS	0.1
Obt-500_III_Seg31	PASS	0.0
Obt-500_III_Seg32	PASS	0.0
Obt-500_III_Seg33	PASS	0.1
Obt-500_III_Seg34	PASS	0.1
Obt-500_III_Seg35	PASS	0.1
Obt-500_III_Seg36	PASS	0.1
Obt-500_III_Seg37	PASS	0.1
Obt-500_III_Seg38	PASS	0.0
Obt-500_III_Seg39	PASS	0.0
Obt-Nearest_III_Seg1	PASS	0.0
Obt-Nearest_III_Seg2	PASS	0.0
Obt-2ndNear_III_Seg1	PASS	0.0
Obt-2ndNear_III_Seg2	PASS	0.0
Threshold Increment (TI)		
Maximum Allowable Value: 15 %		
Calculations Tested (2):		
Calculation Label	Adaptation Luminance	Test Results
CoRd49-NB	10	PASS
CoRd49-SB	10	PASS

Drilling Phase Luminaire Schedule											
Scene: Drilling B											
Tag	Symbol	Qty	Label	Arrangement	LLF	Description	Luminaire Watts	Total Watts	[MANUFAC]	Luminair e Lumens	BUG Rating
WX		15	LF100BZ-110-277	Single	1	LF100BZ-110-277 - 13200 LM, LED, CRI 72, Bronze	105.37	1580.55	LUMATEQ LIGHTING	13801	B4-U0-G1
C		14	ZPLA4-UNVI_1	SINGLE	1	ZPLA4_UNVI	62	868	EATON CROUSE-HINDS	7621	B3-U0-G0
B		14	VMV9L2A-UNVI-S903	SINGLE	1	VMV9L2A_UNVI-S903 - Type 5 Optics	73.1	1023.4	COOPER CROUSE-HINDS	8328	B3-U1-G0
A		3	dlU2-unv1-s903_1	SINGLE	1	DLL2_UNVI S903	32.2	96.6	COOPER CROUSE-HINDS	3639	B2-U2-G1
D		11	pfm1llwyunv176_1	SINGLE	1	PFM1LLWYUNV176	99	1089	COOPER CROUSE-HINDS	9045	B3-U1-G1
LP		6	WCDE-7.5K-4X1000W 4 HEAD		1	METAL HALIDE FLOODLIGHT TOWER	4000	24000	LARSON ELECTRONICS	440,000	NA
NOTE: LUMINAIRE LP IS A PORTABLE TRAILER STYLE LIGHT PLANT THAT IS EXEMPT FROM MODELING AS THEIR LOCATION AND ARRANGEMENT IS TASK SPECIFIC AND VARIES DAY TO DAY.											

Completion Phase Luminaire Schedule											
Scene: Completion											
LP		6	WCDE-7.5K-4X1000W 4 HEAD		1	METAL HALIDE FLOODLIGHT TOWER	4000	24000	LARSON ELECTRONICS	440,000	NA
NOTE: LUMINAIRE LP IS A PORTABLE TRAILER STYLE LIGHT PLANT THAT IS EXEMPT FROM MODELING AS THEIR LOCATION AND ARRANGEMENT IS TASK SPECIFIC AND VARIES DAY TO DAY. DURING COMPLETION,											

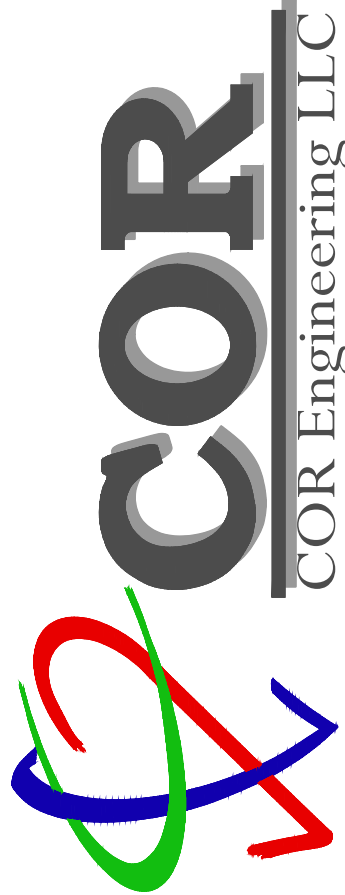
REV	DATE	DESCRIPTION
0	2022.02.24	WELD COUNTY I/P
1	2022.03.14	COGCC LMP

WARNING



IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.
DRAWING INTENDED FOR 22x34






COR Engineering LLC

CRESTONE SHELTON CPR-25 PAD
LIGHTING MITIGATION PLAN
L - SCHEDULES
ISSUE FOR PERMIT

2022-0175
L-1.02

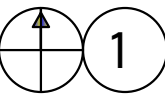
Lumens per Square Foot		Scene: Drilling		Overall lm/sqft:	PASS
Configuration	Lumens	Square Footage	Lumens/sqft	Limit	Pass/Fail
Drilling B	760,713	295285	2.576	12,000	PASS
Completion	440,000	295285	1.490	12,000	PASS
Production	0	295285	0.000	1,250	PASS
Per Table 405.C.1, for LZ-1 Production is allowed 1.25 lm/sqft of hardscape.					
Per Table 405.B.1, for Construction (Drilling and Completion) all LZs are allowed 12.0 lm/sqft of hardscape.					



Know what's below.
Call before you dig.

UTILITIES SHOWN ARE BASED ON THE INFORMATION AVAILABLE TO THE ENGINEER. THERE IS NO GUARANTEE ALL FACILITIES ARE SHOWN OR THAT THE LOCATION, DEPTH, AND SIZE OF EACH FACILITY IS CORRECT. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UTILITIES AND SERVICE LINES PRIOR TO CONSTRUCTION.

COR ENGINEERING PROJECT NUMBER: 2022-0175



DRILLING FIXTURE LAYOUT

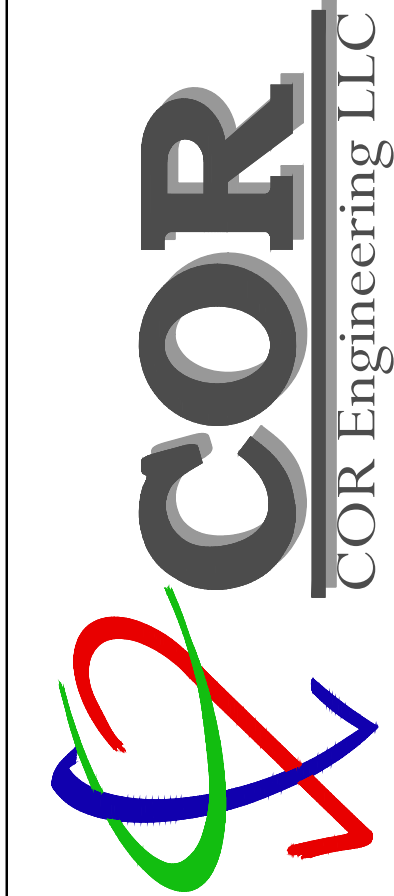
SCALE: NTS



UTILITIES SHOWN ARE BASED ON THE INFORMATION AVAILABLE TO THE ENGINEER. THERE IS NO GUARANTEE ALL FACILITIES ARE SHOWN OR THAT THE LOCATION, DEPTH, AND SIZE OF EACH FACILITY IS CORRECT. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UTILITIES AND SERVICE LINES PRIOR TO CONSTRUCTION.

CRESTONE SHELTON CPR-25 PAD
LIGHTING MITIGATION PLAN
L - DRILLING FIXTURES
ISSUE FOR PERMIT

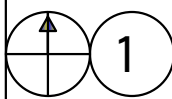
2022-0175
L-2.01



WARNING
0 1/2 1
IF THIS BAR DOES NOT MEASURE
1" THEN DRAWING IS NOT TO
SCALE.
DRAWING INTENDED FOR 22x34

REV	DATE	DESCRIPTION
0	2022.02.24	WELD COUNTY IFP
1	2022.03.14	COGCC LMP

COR ENGINEERING PROJECT NUMBER: 2022-0175



DRILLING PHTOOMETRIC LAYOUT

SCALE: NTS

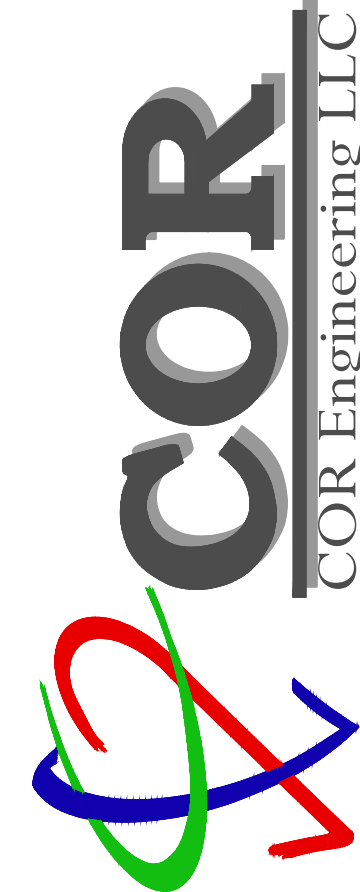
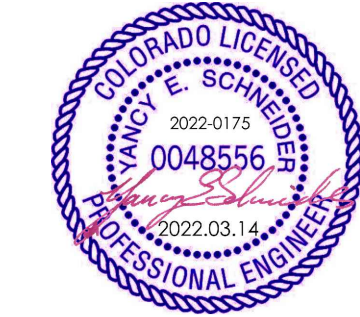


UTILITIES SHOWN ARE BASED ON THE INFORMATION AVAILABLE TO THE ENGINEER. THERE IS NO GUARANTEE ALL FACILITIES ARE SHOWN OR THAT THE LOCATION, DEPTH, AND SIZE OF EACH FACILITY IS CORRECT. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UTILITIES AND SERVICE LINES PRIOR TO CONSTRUCTION.

CRESTONE SHELTON CPR-25 PAD
LIGHTING MITIGATION PLAN
L - DRILLING PHOTOMETRICS
ISSUE FOR PERMIT

2022-0175

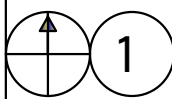
L-2.02



WARNING
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.
DRAWING INTENDED FOR 22x34

REV	DATE	DESCRIPTION
0	2022.02.24	WELD COUNTY IFP
1	2022.03.14	COGCC LMP

COR ENGINEERING PROJECT NUMBER: 2022-0175



COMPLETION FIXTURE LAYOUT

SCALE: NTS



LIGHT PLANT, TYPICAL OF SIX ON THIS PLAN. NOT INCLUDED IN PHOTOMETRIC CALCULATIONS.



UTILITIES SHOWN ARE BASED ON THE INFORMATION AVAILABLE TO THE ENGINEER. THERE IS NO GUARANTEE ALL FACILITIES ARE SHOWN OR THAT THE LOCATION, DEPTH, AND SIZE OF EACH FACILITY IS CORRECT. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UTILITIES AND SERVICE LINES PRIOR TO CONSTRUCTION.

CRESTONE SHELTON CPR-25 PAD
LIGHTING MITIGATION PLAN
L - COMPLETION FIXTURES
ISSUE FOR PERMIT



COR
COR Engineering LLC



WARNING
0 1/2 1
IF THIS BAR DOES NOT MEASURE
1" THEN DRAWING IS NOT TO
SCALE.
DRAWING INTENDED FOR 22x34

REV	DATE	DESCRIPTION
0	2022.02.24	WELD COUNTY IFP
1	2022.03.14	COGCC LMP

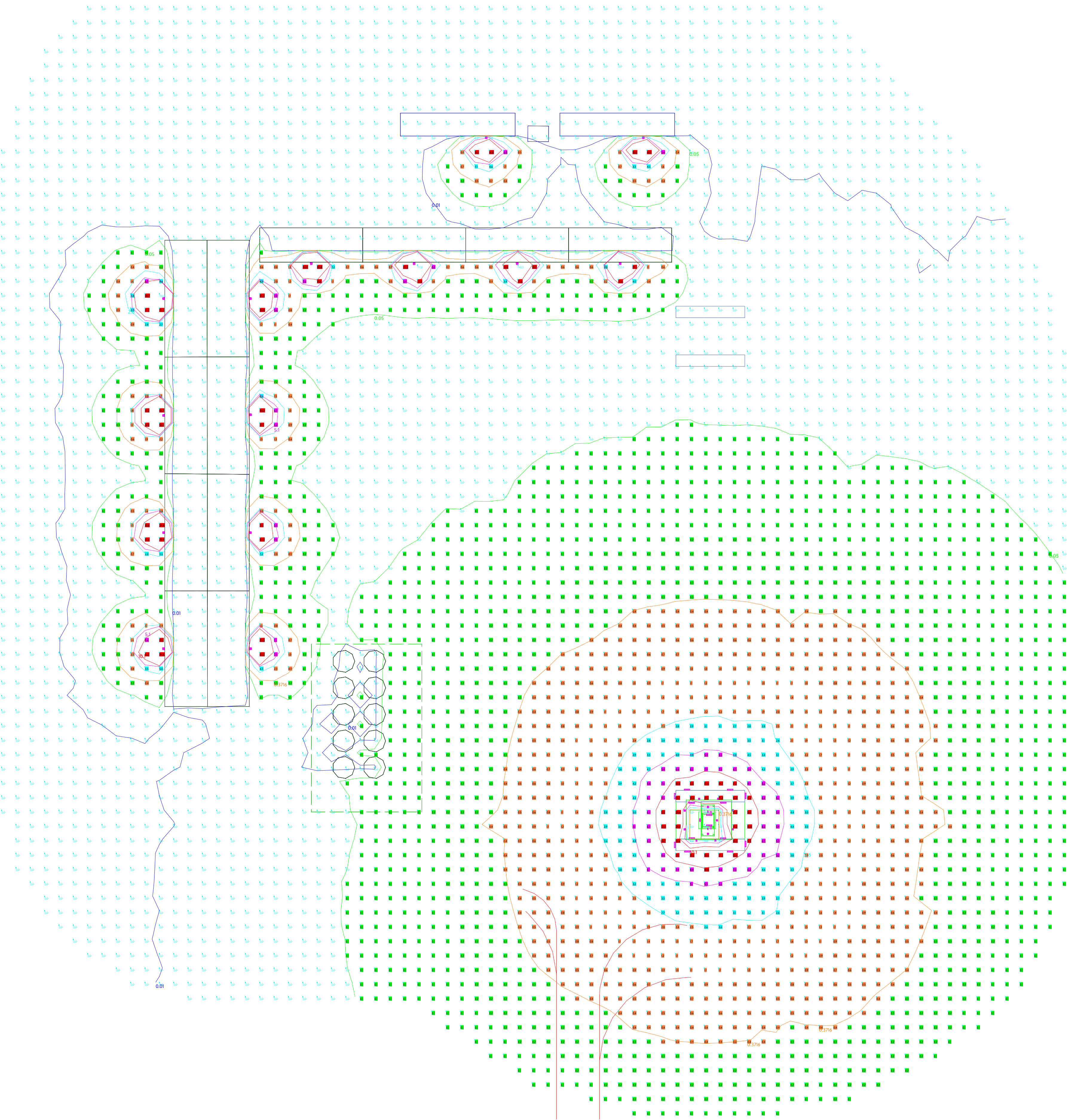
2022-0175

L-3.01

Attachment 2

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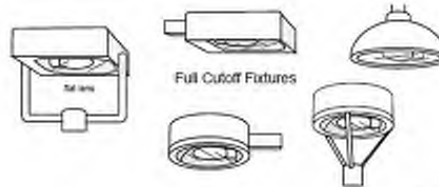
ILLUMINANCE COLOR CODES		
0.05	<=VALUE< 0.3715 fc	
0.3716	<=VALUE< 2.5 fc	
2.6	<=VALUE< 5 fc	
5.1	<=VALUE< 10 fc	
10.1	<=VALUE< 99 fc	

Attachment 3

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Examples of Fully Shielded Luminaires



Illuminating
ENGINEERING SOCIETY



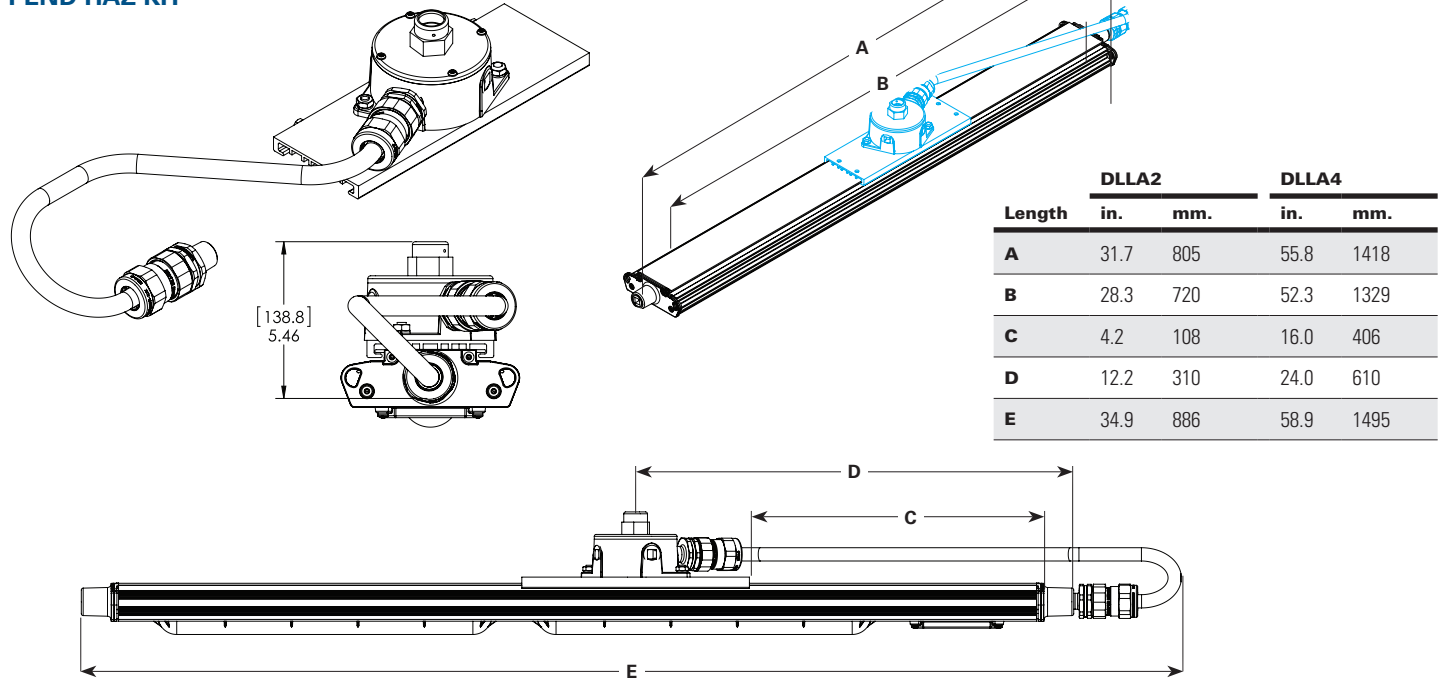
JOINT IDA - IES
MODEL
LIGHTING
ORDINANCE
(MLO)

with USER'S GUIDE

June 15, 2011

Mounting options

Pendant mount - Class I, Div. 2 only PEND HAZ KIT



Ordering information – 347-480 VAC model

See page 7 for 120-277 VAC; 127-300 VDC models

Part number example

DLL4N/UNV34 S903 TF P

Pauluhn DLL linear LED, cool white, 4 foot, ½" hubs, 80° narrow light pattern, 347-480 VAC driver, polycarbonate lens, through feed hubs, painted

Series	Optics	Lens	Finish
DLL Pauluhn DLL series linear LED luminaire	BLANK Wide (120°) N Narrow (80°)	S903 Clear polycarbonate S903D Diffused polycarbonate	BLANK Natural aluminum P Painted (gray, epoxy) WH Painted (white, epoxy)
Length/lumens	Voltage	Options	Emergency backup
4 4 foot length, 7,900 lumens 2 2 foot length, 3,900 lumens	/UNV34 347-480 VAC /UNV1 EM11 emergency battery back-up only	TF Pull wire included in fixture	BLANK Standard model (no battery back-up) EM1* Integrated emergency battery back-up
See page 7 for 120-277 VAC/127-300 VDC models.			

* One year warranty. Remote EM Kit also available, 120-277 VAC only. Contact factory for more information. All EM1 models are painted, gray epoxy is standard.

Accessories (ordered separately)

DP1057MTK	Flush/back mount back plate (compatible with DuraPro)
DP1050MTK	Ceiling/swivel mount (compatible with DuraPro)
DP1053MTK	Ceiling/wall mount offset (compatible with DuraPro)
MP1054MTK KIT	Ceiling mount bracket and adapter kit (compatible with MagnaPro)
DP1052MTK	Offset wall mount (compatible with DuraPro)
PM KIT 1.25	Pole mount kit, 1.25" conduit
PM KIT 1.5	Pole mount kit, 1.50" conduit
PM KIT 2.0	Pole mount kit, 2.00" conduit

Accessories (ordered separately)

PEND HAZ KIT	Pendant mount kit
SS KIT	Safety chain kit
VMVL/UNV1 80W 1A KIT	1 amp driver replacement kit 100-277 VAC for 4 ft. linear
VMVL/UNV34 80W 1A KIT	1 amp driver replacement kit 347-480 VAC for 4 ft. linear
VMVL/UNV1 80W 0.5A KIT	0.5 amp driver replacement kit 100-277 VAC for 2 ft. linear
VMVL/UNV34 80W 0.5A KIT	0.5 amp driver replacement kit 347-480 VAC for 2 ft. linear

IES ROAD REPORT
PHOTOMETRIC FILENAME : DLL4N-UNV1-S903.IES

DESCRIPTIVE INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST]LinLED_4ft_Poly_80Deg_nonmtl_140709
[TESTLAB]Eaton Crouse-Hinds Syracuse
[ISSUE DATE]07/09/14
[TEST DATE]07/09/14
MANUFAC]COOPER CROUSE-HINDS
[LUMCAT]DLL4N/UNV1-S903 - 4 Ft Linear Narrow Beam Polycarb Lens
[LUMINAIRE]4 ft LED linear, 80 degree non metalized reflector
[OTHER]V=119.9, F=60.0, I=0.45, W=54.0, PF=0.989, CF=1.24
[ABSOLUTE]NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED.
[NUMPASSES]1
[ABSOLUTE LUMENS]7189

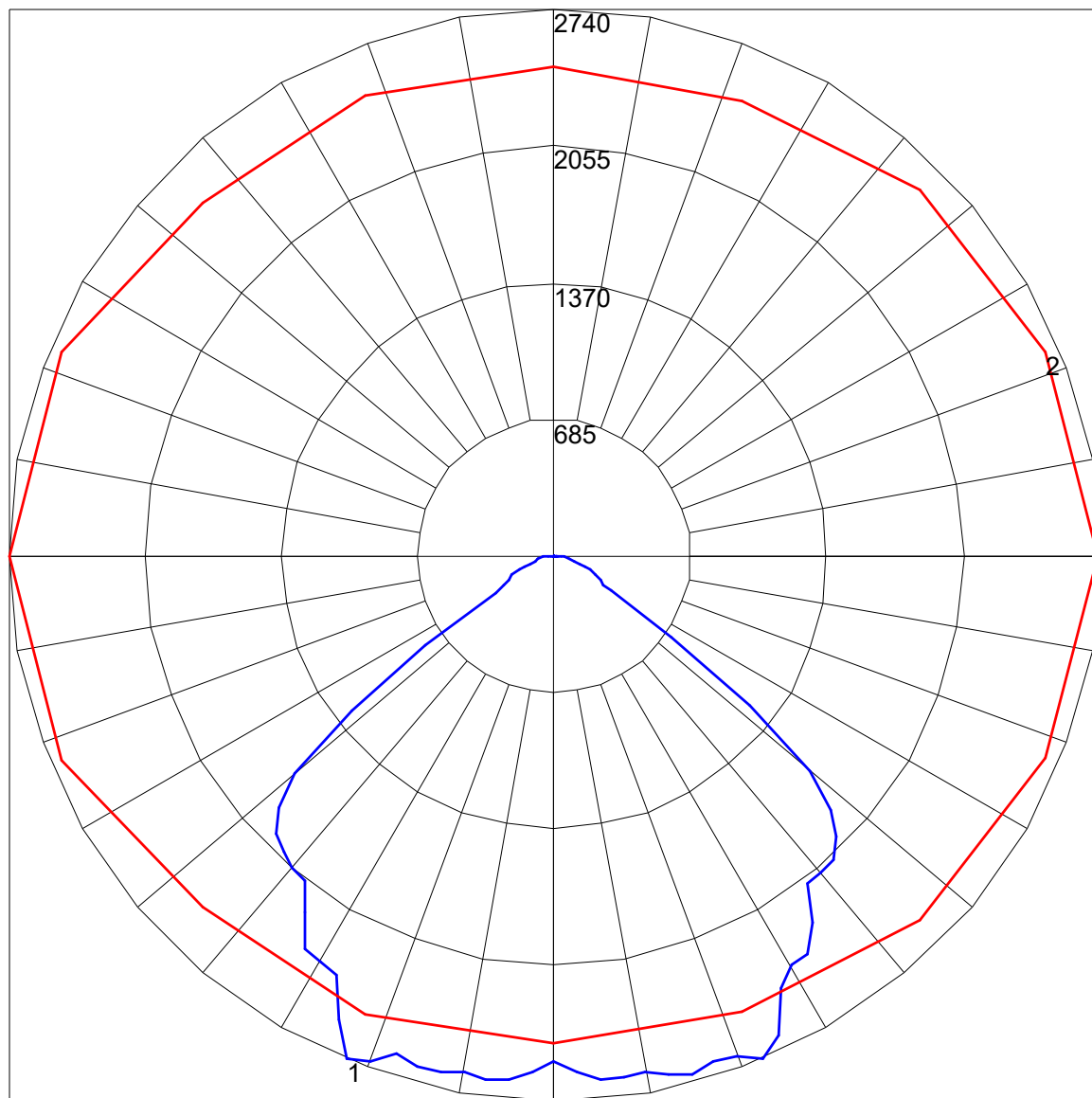
CHARACTERISTICS

IES Classification	Type VS
Longitudinal Classification	Very Short
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	7189
Downward Total Efficiency	N.A. (absolute)
Total Luminaire Efficiency	N.A. (absolute)
Luminaire Efficacy Rating (LER)	133
Total Luminaire Watts	54
Ballast Factor	1.00
Upward Waste Light Ratio	0.00
Maximum Candela	2740
Maximum Candela Angle	180H 22.5V
Maximum Candela (<90 Degrees Vertical)	2740
Maximum Candela Angle (<90 Degrees Vertical)	180H 22.5V
Maximum Candela At 90 Degrees Vertical	8.48 (0.1% Luminaire Lumens)
Maximum Candela from 80 to <90 Degrees Vertical	258.41 (3.6% Luminaire Lumens)
Cutoff Classification (deprecated)	N.A. (absolute)

LUMINAIRE CLASSIFICATION SYSTEM (LCS)

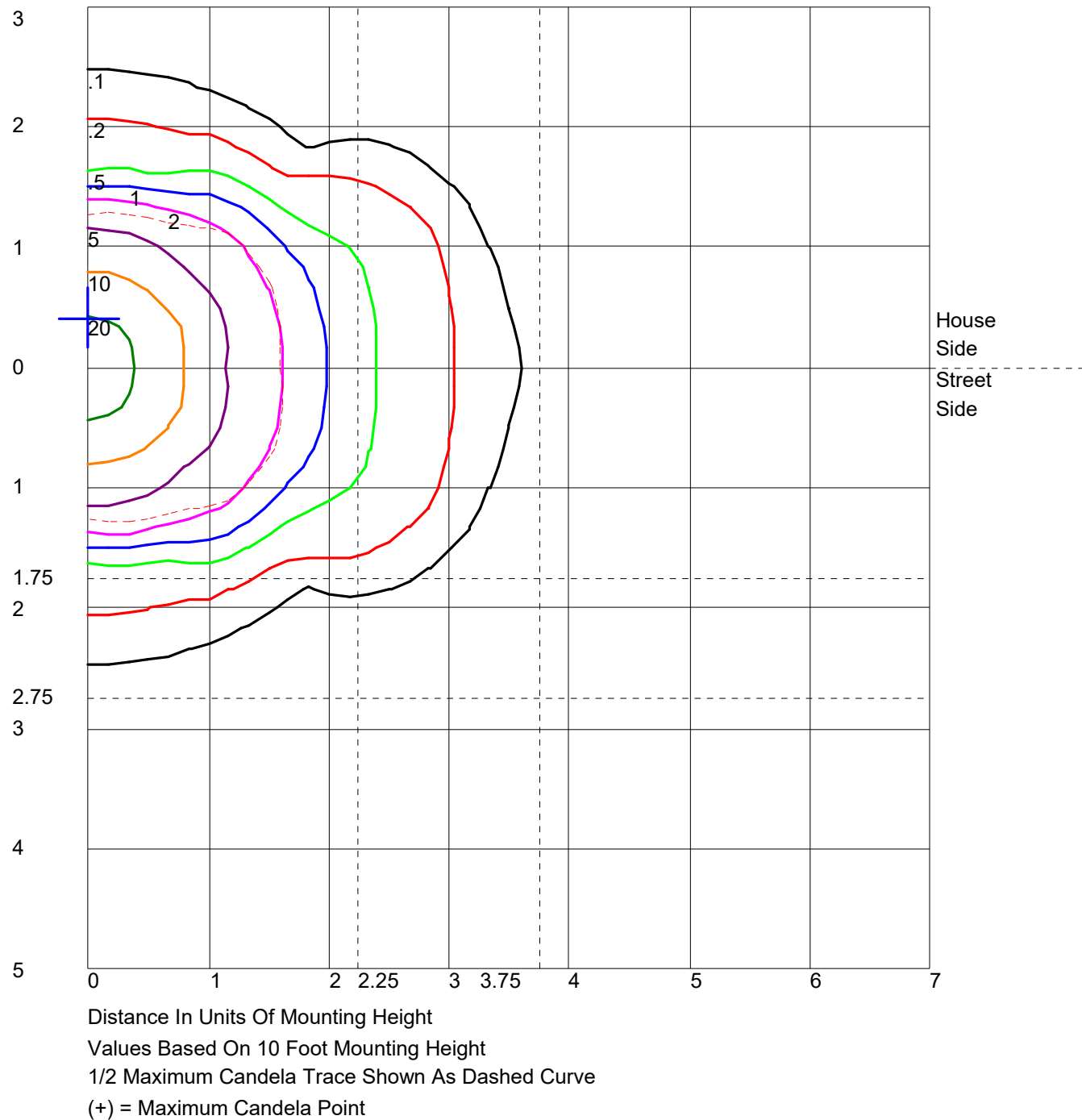
	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	1076.1	N.A.	15.0
FM - Front-Medium (30-60)	2098.8	N.A.	29.2
FH - Front-High (60-80)	418.7	N.A.	5.8
FVH - Front-Very High (80-90)	19.1	N.A.	0.3
BL - Back-Low (0-30)	1067.7	N.A.	14.9
BM - Back-Medium (30-60)	2068.9	N.A.	28.8
BH - Back-High (60-80)	418.2	N.A.	5.8
BVH - Back-Very High (80-90)	18.7	N.A.	0.3
UL - Uplight-Low (90-100)	2.6	N.A.	0.0
UH - Uplight-High (100-180)	0.2	N.A.	0.0
Total	7189.0	N.A.	100.0
BUG Rating	B3-U1-G1		

POLAR GRAPH

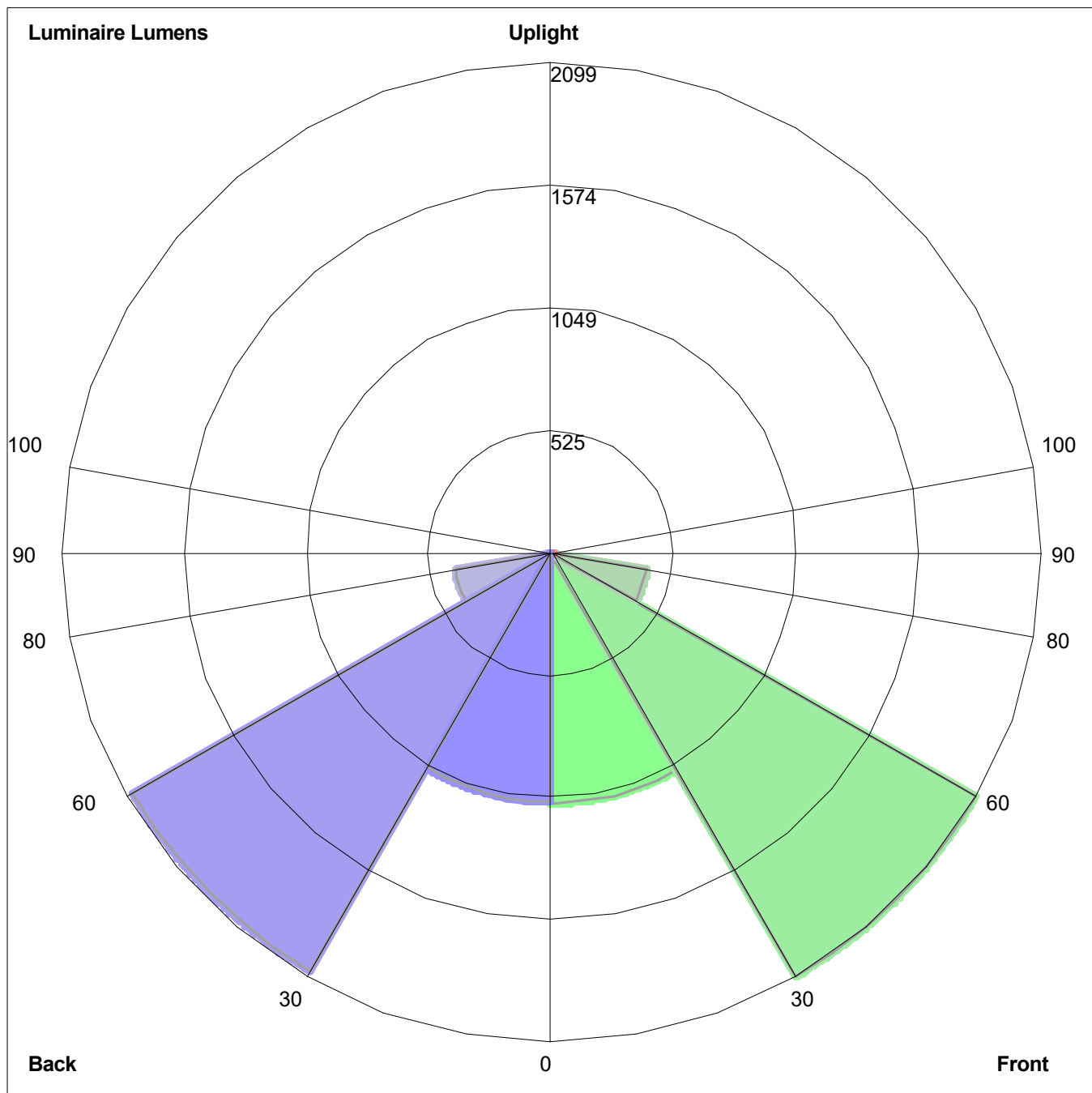


Maximum Candela = 2740 Located At Horizontal Angle = 180, Vertical Angle = 22.5
1 - Vertical Plane Through Horizontal Angles (180 - 0) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (22.5) (Through Max. Cd.)

ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINANCE



LUMINAIRE CLASSIFICATION SYSTEM (LCS) GRAPH



Luminaire Lumens:
Front: Low=1076.1, Medium=2098.8, High=418.7, Very High=19.1
Back: Low=1067.7, Medium=2068.9, High=418.2, Very High=18.7
Uplight: Low=2.6, High=0.2

BUG Rating : B3-U1-G1

Why PFM LED?

Reliable floodlights. PFM LED luminaires are engineered to deliver high lumen output and maintenance-free long life in the toughest conditions.

Versatile design

- Can be used for outdoor or indoor applications, and for a wide range of mounting heights depending on model and light level requirement

Smaller and lighter

- 25% smaller footprint than previous model
- 10 lbs. (4.5 kg) less weight than previous model

Full frame yoke

- Designed to utilize the SFA6 slipfitter and SWB6 wall mount bracket, making it ideal for retrofit or new installations



High lumen output:

- Up to 117 lumens per watt
- Up to 72% energy savings over traditional HID fixtures (compared to 400W MH)



Multiple lens options:

- Tempered clear glass lens standard
- Polycarbonate and diffused glass lens options available

Rugged heat sink

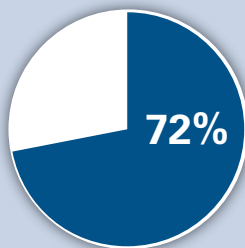
- Heat sink designed to perform and provide maximum light levels in high ambient temperatures up to +65°C and as low as -40°C
- Thick walled castings make for a tough, rugged housing that keeps the internal driver and LED temperature down

LED vs. HID savings at a glance

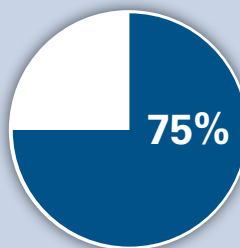
Why are so many facilities making the switch from HID to LED?

The numbers say it all.

PFM13L/UNV1 vs. 400 watt HID



72% REDUCTION IN ENERGY COSTS



75% LOWER TOTAL COST OF OWNERSHIP



100% MAINTENANCE REDUCTION

Assumptions: Calculations based on overall life of the LED system. Energy cost of \$.09 per kilowatt; 24 hour per day operation; labor rate of \$75 each for 2 workers; average time for fixture maintenance of 1 hour.

Features & specifications

Champ Pro PFM series LED floodlights

Champ PFM LED floodlights are designed to provide full-spectrum, crisp, white light. Seven versions of the Champ PFM are available, from 3,000 to 13,000 lumens, providing ideal solutions for a wide range of harsh and heavy industrial applications.

Up to 75% reduction in energy costs and 150,000 hours of continuous operation.

Model number	Nominal lumens*	Wattage	Lumens per watt	Equivalent HID luminaire
PFM3L	3,189	28	114	70W-100W
PFM5L	5,183	45	115	100W-150W
PFM7L	7,095	62	114	150W-175W
PFM9L	9,132	79	116	175W-250W
PFM11L	11,107	99	112	250W-400W
PFM13L	13,100	112	117	400W
PFM15L	15,181	131	116	450W+

*Tolerance +/- 10%; @120 VAC, 25°C ambient, 7x6 optics.

Applications:

- Locations requiring continuous and consistent light levels in extreme ambient temperatures
- Areas requiring frequent on-and-off of lights
- Where extremely corrosive, wet, dusty, hot and/or cold conditions exist
- Manufacturing plants; heavy industrial, chemical, food and beverage facilities; mining; platforms; loading docks; tunnels; outdoor wall and pole mounted areas

LED system:

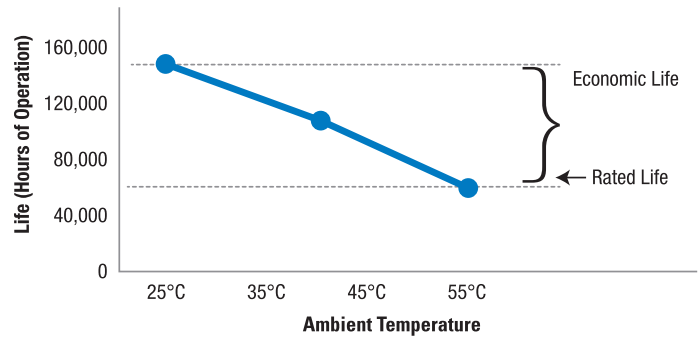
- Cool white (5000K, 70 CRI) and warm white (3000K, 80 CRI)
- Custom designed optics – 7x6 standard, 3x3 optional (3L-11L)

Champ PFM LED benefits:

- Instant illumination and restrike
- Better visibility with crisp, white light
- Cold temperature operation / no warm-up required
- Serviceable drivers
- Easy installation – yoke design to mount to SFA6
- Energy-efficient technology – up to 72% energy savings over HID fixtures
- 60,000 hours of rated life at 55°C – eliminates need for frequent lamp replacement
- Contains no mercury or other hazardous substances
- Shock- and vibration-resistant solid-state luminaires have no filaments or glass components that could break – greatly reduces the risk of premature failure
- Operating ambient -40°C to 65°C
- 5 year fixture warranty‡

‡Extension of standard terms and conditions to five years. Refer to page 2 of the D-0914 authorized distributor price book for Crouse-Hinds standard Terms and Conditions.

LED system lifetime rated versus economic life:



Economic life can range anywhere between 50,000 to 150,000 hours, or 5 to 20 years of maintenance-free operation.

Fixture life and years of maintenance-free operation

Ambient temperature	Fixture life (hours)	No. of years at 24 hours usage	No. of years at 12 hours usage
25°C	150,000	17	34
40°C	90,000	10	20
55°C	60,000	7	14

*50,000 hours of life at 65°C ambient.

Fixture life:

- Rated life of 60,000 hours @ 55°C operating ambient and 24/7 continuous operation for 365 days
- Economic life of 150,000 hours @ 25°C ambient
- L70 LED life >300,000 hours @ 55°C

Electrical ratings:

Model number	Input power (watts)	Input amps at 120-277 VAC	
PFM3L	28.0 - 29.1	0.24 - 0.11	PFM3L - PFM15L UNV1 driver 100-277 VAC @ 50/60 Hz; 108-250 VDC @ 50/60 Hz UNV34 driver 347-480 VAC @ 50/60 Hz, Power factor >0.9
PFM5L	45.4 - 45.8	0.38 - 0.18	
PFM7L	61.8 - 62.5	0.52 - 0.24	
PFM9L	78.8 - 80.3	0.66 - 0.31	
PFM11L	98.8 - 99.9	0.83 - 0.37	
PFM13L	111.8 - 112.4	0.94 - 0.42	
PFM15L	131.4 - 131.5	1.10 - 0.48	

Standard materials:

- Lamp housing and adapter – die cast aluminum with Corro-free™ epoxy powder coat
- Lens – heat- and impact-resistant glass (standard)
- Gaskets – silicone and neoprene
- External hardware – stainless steel

Qualifications and compliances:

- DesignLights Consortium® Qualified (some models are not DLC qualified)*



* Approved models include: PFM3L/UNV1; PFM5L/UNV1; PFM7L/UNV1; PFM9L/UNV1; PFM11L/UNV1; PFM13L/UNV1; PFM3L/UNV34; PFM5L/UNV34; PFM7L/UNV34; PFM9L/UNV34; PFM11L/UNV34; PFM13L/UNV34

7x6 optics on all approved models; 3x3 optics not DLC approved.

Refer to www.designlights.org Qualified Products List under family models for full listing details. Not all models are approved for all application categories.



Certifications and compliances:

NEC and CEC

- Wet Locations, Type 4X, IP66

UL Standards

- UL1598 Luminaires, UL1598A Marine, UL8750

CSA Standard

- cUL Listed to CSA Standard CSA C22.2 No. 250

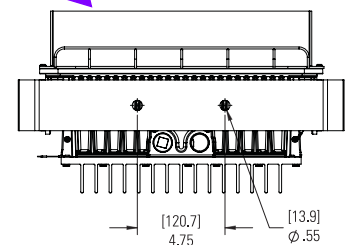
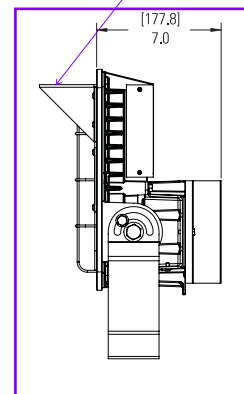
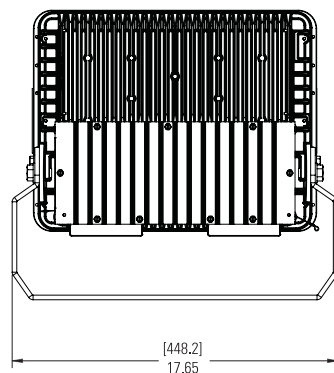
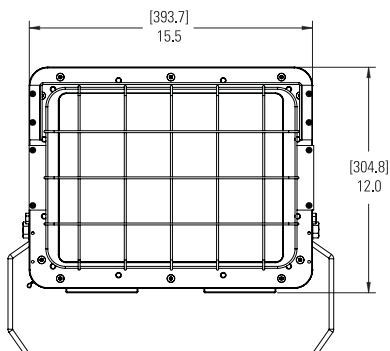
IEC Standard

- IEC 60598
- CE

Weights and dimensions:

Model number	Lbs.	Kg.	Width		Height		Depth	
			in.	mm.	in.	mm.	in.	mm.
PFM3L-PFM7L	30.7	13.9	15.5	393.7	12.0	304.8	7.0	177.8
PFM9L-PFM15L	31.8	14.4	15.5	393.7	12.0	304.8	7.0	177.8

WITH DVL VISOR



Ordering information

Part number example

PFM5LCY/UNV1D 76 S903

PFM 5L C Y /UNV1 D 76

S903

Model

PFM NEC model

Mount

Y Yoke

Light source/intensity

3L 3,189 nominal lumens*

5L 5,183 nominal lumens*

7L 7,095 nominal lumens*

9L 9,132 nominal lumens*

11L 11,107 nominal lumens*

13L 13,100 nominal lumens*

15L 15,181 nominal lumens*

*7x6 model.

Color temperature

C 5000K, 70 CRI (cool white)

W 3000K, 80 CRI (warm white)

Voltage

/UNV1 100-277 VAC, 50/60 Hz; 108-250 VDC

/UNV34 347-480 VAC 50/60 Hz

Options

S891 Diffused glass lens

S903 Polycarbonate lens

Entries

BLANK ¾" NPT

M20 20mm entry

M25 25mm entry

Optical distribution

76 7x6 floodlight pattern optics

33* 3x3 floodlight pattern optics

*3L - 11L only.

Dimming

D Dimmable driver

BLANK Non-dimmable

Accessories (ordered separately)

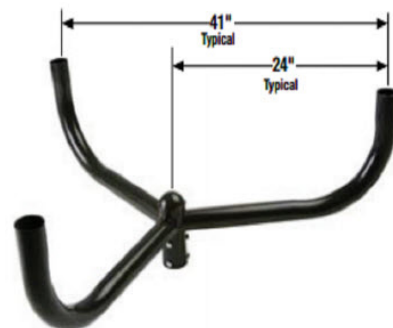
DSV2 Bolt-on visor

P62 Bolt-on wire guard

SC831 Safety cable

SFA6 Floodlight slipfitter

SWB6 Slipfitter wall mount adapter



Bull horns – provided with 2 3/8" pole tenon

IES ROAD REPORT
PHOTOMETRIC FILENAME : COPY_PFM11LWYUNV176.IES

DESCRIPTIVE INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] R253_05_PFM11LWY_76_UNV1_150522
[TESTLAB] Eaton Crouse-Hinds Syracuse
[ISSUE DATE] 05/22/15
[MANUFAC] COOPER CROUSE-HINDS
[LUMCAT] PFM11LWYUNV176
[LUMINAIRE] 20150410-253: Low-Voltage 11L Sample with Clear Glass Lens.
[AGI32] File was generated from AGI32
[CONVERT] Photometric type and web converted from original test data

CHARACTERISTICS

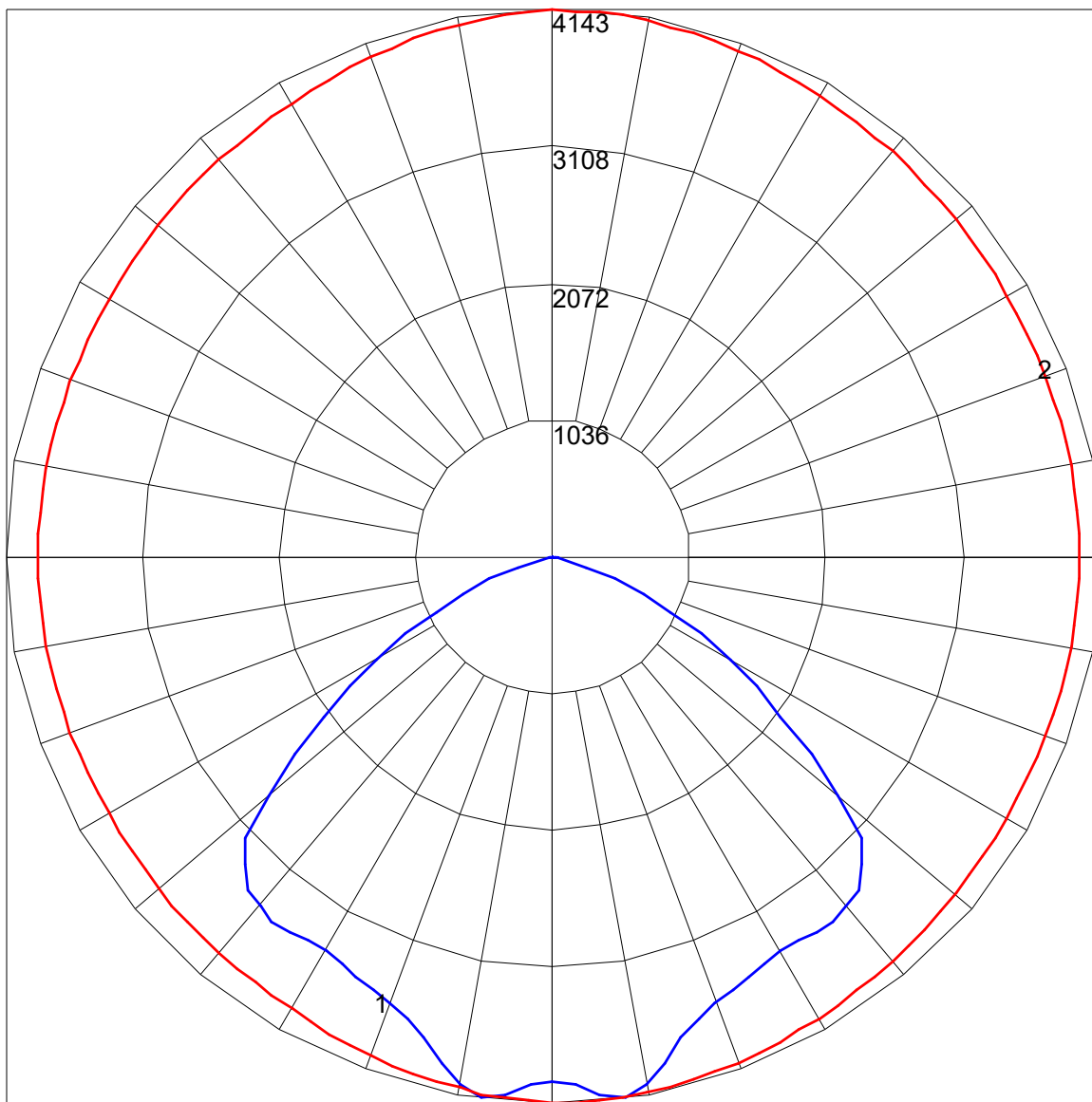
IES Classification	Type II
Longitudinal Classification	Very Short
Lumens Per Lamp	9045 (1 lamp)
Total Lamp Lumens	9045
Luminaire Lumens	9068
Downward Total Efficiency	100 %
Total Luminaire Efficiency	100 %
Luminaire Efficacy Rating (LER)	92
Total Luminaire Watts	99
Ballast Factor	1.00
Upward Waste Light Ratio	0.00
Maximum Candela	4143.412
Maximum Candela Angle	270H 7.5V
Maximum Candela (<90 Degrees Vertical)	4143.412
Maximum Candela Angle (<90 Degrees Vertical)	270H 7.5V
Maximum Candela At 90 Degrees Vertical	2.838 (0.0% Lamp Lumens)
Maximum Candela from 80 to <90 Degrees Vertical	23.293 (0.3% Lamp Lumens)
Cutoff Classification (deprecated)	Cutoff

LUMINAIRE CLASSIFICATION SYSTEM (LCS)

	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	1575.1	17.4	17.4
FM - Front-Medium (30-60)	2718.7	30.1	30.0
FH - Front-High (60-80)	353.7	3.9	3.9
FVH - Front-Very High (80-90)	3.2	0.0	0.0
BL - Back-Low (0-30)	1551.9	17.2	17.1
BM - Back-Medium (30-60)	2560.8	28.3	28.2
BH - Back-High (60-80)	301.3	3.3	3.3
BVH - Back-Very High (80-90)	3.4	0.0	0.0
UL - Uplight-Low (90-100)	< 0.05	0.0	0.0
UH - Uplight-High (100-180)	0.0	0.0	0.0
Total	9068.1	100.2	100.0

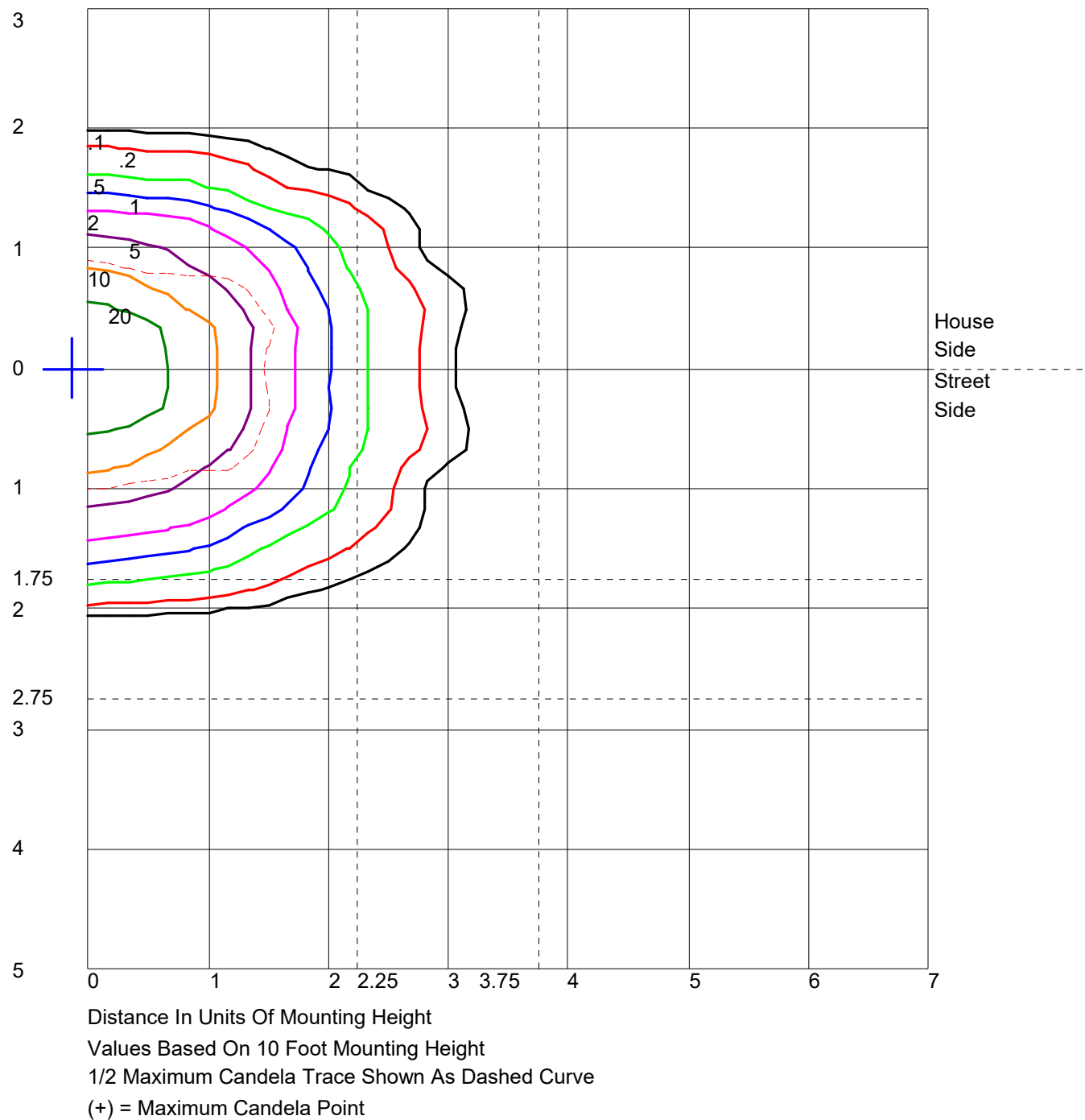
BUG Rating B3-U1-G1

POLAR GRAPH

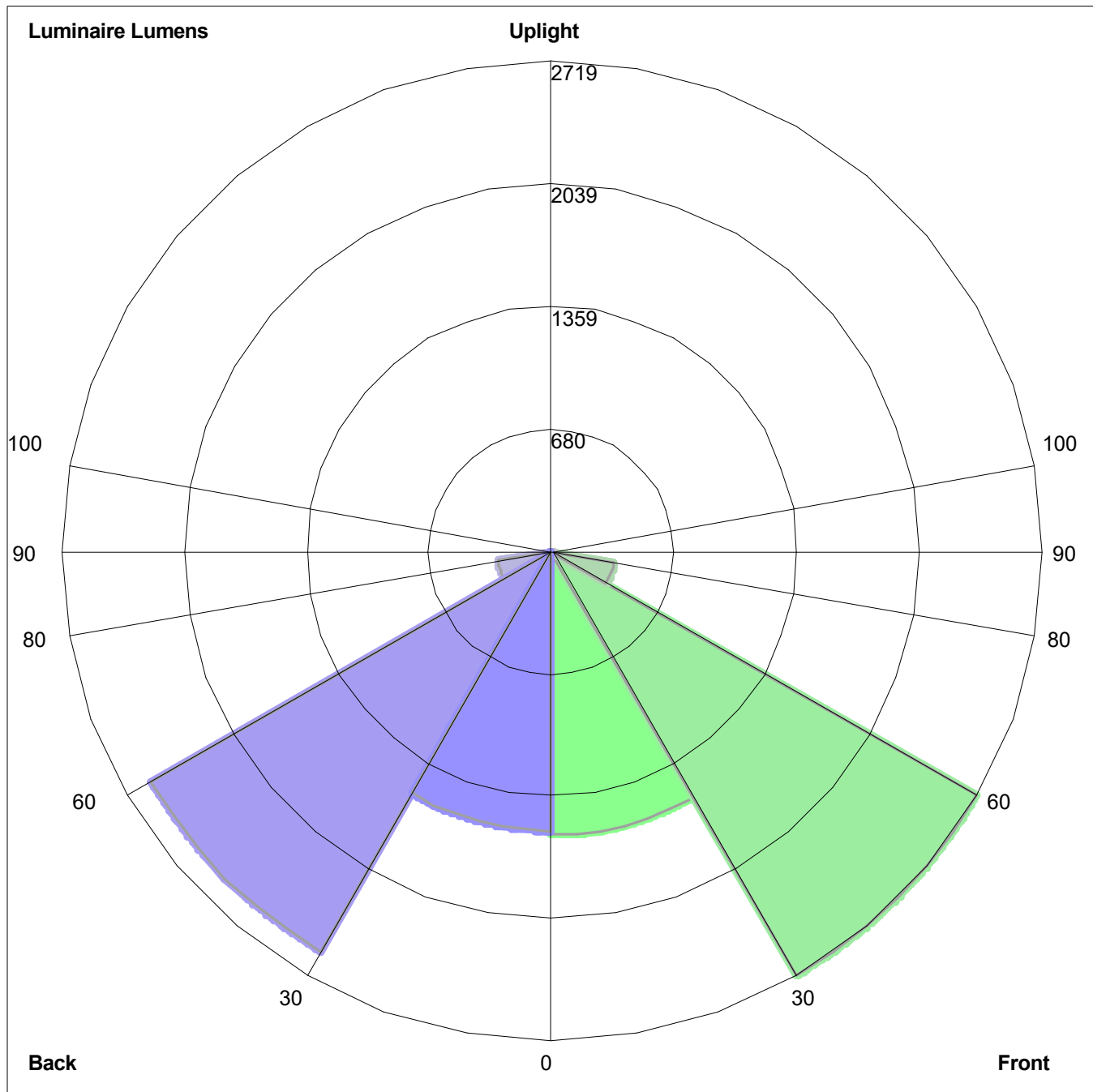


Maximum Candela = 4143.412 Located At Horizontal Angle = 270, Vertical Angle = 7.5
1 - Vertical Plane Through Horizontal Angles (270 - 90) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (7.5) (Through Max. Cd.)

ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINANCE



LUMINAIRE CLASSIFICATION SYSTEM (LCS) GRAPH



Luminaire Lumens:
Front: Low=1575.1, Medium=2718.7, High=353.7, Very High=3.2
Back: Low=1551.9, Medium=2560.8, High=301.3, Very High=3.4
Uplight: Low=0.0, High=0.0

BUG Rating : B3-U1-G1

Champ VMV LED connected luminaires

An Eaton Intelligent Power™ solution

cULus Cl. I, Div. 2, Groups A, B, C, D
cULus Cl. I, Zone 2, nA nR
cULus Cl. II, Groups E, F, G
cULus Cl. III

UL/CSA
IEC/EN
Wet Locations
Type 4X; IP66

2L

Remote monitoring and control for use in hazardous and hard-to-access areas

Eaton's Crouse-Hinds Division now has an innovative and reliable solution that optimizes your industrial lighting applications based on space and specific usage requirements.

Combining our advanced LED lighting fixtures with communications and sensing technology, we put full lighting control at your fingertips, allowing you to maximize energy savings and minimize maintenance costs.

Model	Typical lumens (Type V)Ⓐ	Watts	Lumens per watt	Equivalent HID luminaire	Typical energy savings / lifetime
VMV3L	3,531	29	122	70W-100W	Up to 77%
VMV5L	5,256	41	129	100W-150W	Up to 67%
VMV7L	7,120	54	131	150W-175W	Up to 67%
VMV9L	9,134	74	124	250W-320W	Up to 74%
VMV11L	11,034	89	123	320W-400W	Up to 74%

Applications:

- Suited for customer specifically seeking to optimize benefits from control features such as scheduling, occupancy sensing, dimming, etc.
- Convenient centralized controls through software (scheduling, dimming, etc.) instead of circuit level control
- Where opportunities exist for optimizing light levels and minimizing energy usage and run time
- Where extremely corrosive, wet, dusty, hot and/or cold conditions exist
- Manufacturing plants; heavy industrial, chemical, food and beverage facilities; mining; platforms; loading docks; tunnels; outdoor wall and pole mounted areas

Connected lighting benefits:

Eliminate over-usage of lights

- Optimize facility illumination by using light where and when you need it
- Up to 80% more efficient than standard LED luminairesⒶ
- Up to two times more fixture life due to reduced run timeⒷ
- Reduced maintenance
- Reduced light pollution

Flexible and intuitive software controls

- Tune light output to meet safety and task needs – light where you need it
- Permission-based user control for added security
- Software alarms that notify on fixture, sensor and radio issues
- Ability to group fixtures by area for zone based control

Certifications and compliances:

- DesignLights Consortium® (pending)

NEC/CEC/ROW:

- cULus Class I, Division 2, Groups A, B, C, D
- cULus Class I, Zone 2, nA nR
- cULus Class II, Groups E, F, G
- cULus Class III
- cULus Zone 21 tb
- Simultaneous Presence
- Wet locations, Type 4X, IP66
- Marine listed
- R/C for sensor and controller
- ATEX/IECEx nA, nR, ia (pending)
- CE (pending)

National Fire Protection Association (NFPA):

- NEC NFPA 70

UL standards:

- UL1598; UL1598A; UL8750; UL844; UL60079-0; UL60079-11; UL60079-15; UL60730; UL913; UL50; UL50E

ISA12.12.01:

- Non-incendive equipments

CSA standards:

- cUL Listed to CSA standard C22.2 No. 250 (for Luminaires)
- cUL Listed to CSA standard C22.2 No. 137 (Electric Luminaires for Hazardous Locations)
- CSA 60079-11
- CSA 60079-0

IEC/EN standards (pending):

- IEC/EN 60079-0, IEC/EN 60079-15, IEC/EN 60079-11, IEC/EN 60079-31
- IEC 60529
- IEC 60598

National Electrical Manufacturers Association (NEMA):

- NEMA 250



Standard materials:

- Lamp housing and adapter – die cast aluminum with Corro-free epoxy powder coat
- Lens – heat- and impact-resistant glass
- Gaskets – silicone (non-silicone gasket available – consult factory)
- External hardware – stainless steel
- Factory sealed, no external seals required

Accessories (ordered separately):

Description	Cat. #
• Trunnion mount kit with pin.....	VMVL S812 K1
<i>Available with ceiling mount only</i>	

LED system:

- High intensity discrete power emitters
- Cool white (5000K, 70 CRI) (standard); warm white (3000K, 80 CRI) (optional)
- Custom Type I, III and V optics available

Fixture lifeⒶ:

- Rated life of 60,000 hours at 55°C and 50,000 hours at 65°C operating ambient and 24/7 continuous operation for 365 days
- Up to twice the economic life than conventional LED at 25°C ambient
- L70 >100,000 hours at 55°C

Drivers:

Option	Voltage
/UNV1	120-277 VAC, 50/60 Hz; 108-250 VDC, 50/60 Hz

Photometrics:

- Complete photometrics can be found at www.crouse-hinds.com/photometrics

Ⓐ Tolerance +/- 10%.

Ⓑ Assuming 24/7 operation base case for LED.

Champ VMV LED connected luminaires

An Eaton Intelligent Power solution

cULus Cl. I, Div. 2, Groups A, B, C, D
cULus Cl. I, Zone 2, nA nR
cULus Cl. II, Groups E, F, G
cULus Cl. III

UL/CSA
IEC/EN
Wet Locations
Type 4X; IP66

2L

Ordering information:

Part number example

VMV11LW2AR1G/UNV1 S890 CNTRL-X

VMV 11L W 2A R1 G /UNV1 S890 CNTRL-X

Lamp / function

3L	3,351 lumens
5L	5,256 lumens
7L	7,120 lumens
9L	9,134 lumens
11L	11,034 lumens

Color temperature

BLANK	Cool white (5000K), colored
W	Warm white (3000K)

Guard

BLANK	No guard
G	P3001 wire guard

Voltage[Ⓔ]

/UNV1	120-277 VAC, 50/60 Hz; 108-250 VDC, 50/60 Hz
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Control options

CNTRL-X	Controller unit only
HZS-X12	Sensor unit with controller (up to 30 ft. mounting option)
HZS-X40	Sensor unit with controller (30-40 ft. mounting option)

Options

S812 [Ⓕ]	Trunnion mount kit with pin
S831	Safety cable
S890	Quick clip
S891	Diffused lens
S892 [Ⓖ]	Redundant driver
S896	Teflon coated lens
S903	Polycarbonate lens
TB6	Six-pole terminal block

Mounting style

BLANK	No cover	2C	¾" ceiling
J	1½" stanchion, 25° angled	3C	1" ceiling
P	1½" stanchion, straight	20C	20mm ceiling
2A	¾" pendant	25C	25mm ceiling
3A	1" pendant	2HA	¾" flexible pendant
20A	20mm pendant	2TW	¾" wall
25A	25mm pendant	3TW	1" wall
2B	¾" cone pendant	20TW	20mm wall
3B	1" cone pendant	25TW	25mm wall

Optics

BLANK	Type V optic standard (all mounts)
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[Ⓔ] UNV34 not available.

[Ⓕ] Available with ceiling mount only.

[Ⓖ] Available with 5L, 7L and 9L models. Redundant driver standard on 11L model. 7L = 6,616 lumens with S892 suffix.

IES ROAD REPORT
PHOTOMETRIC FILENAME : VMV9L2A-UNV1-S903.IES

DESCRIPTIVE INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST]103810421CRT-013
[TESTLAB]Interek
[ISSUE DATE]1/31/2019
[MANUFACTURER]COOPER CROUSE-HINDS
[LUMINANCE]VMV9L2A/UNV1-S903 - Type 5 Optics
[LUMINAIRE]N/A
[LAMP]N/A
[LAMP CATEGORY]N/A. LUMINAIRE OUTPUT = 8328 LMS
[OTHER] M4 Model 120.09 VAC, 609.87 mA, 73.04 W, 0.9973 PF

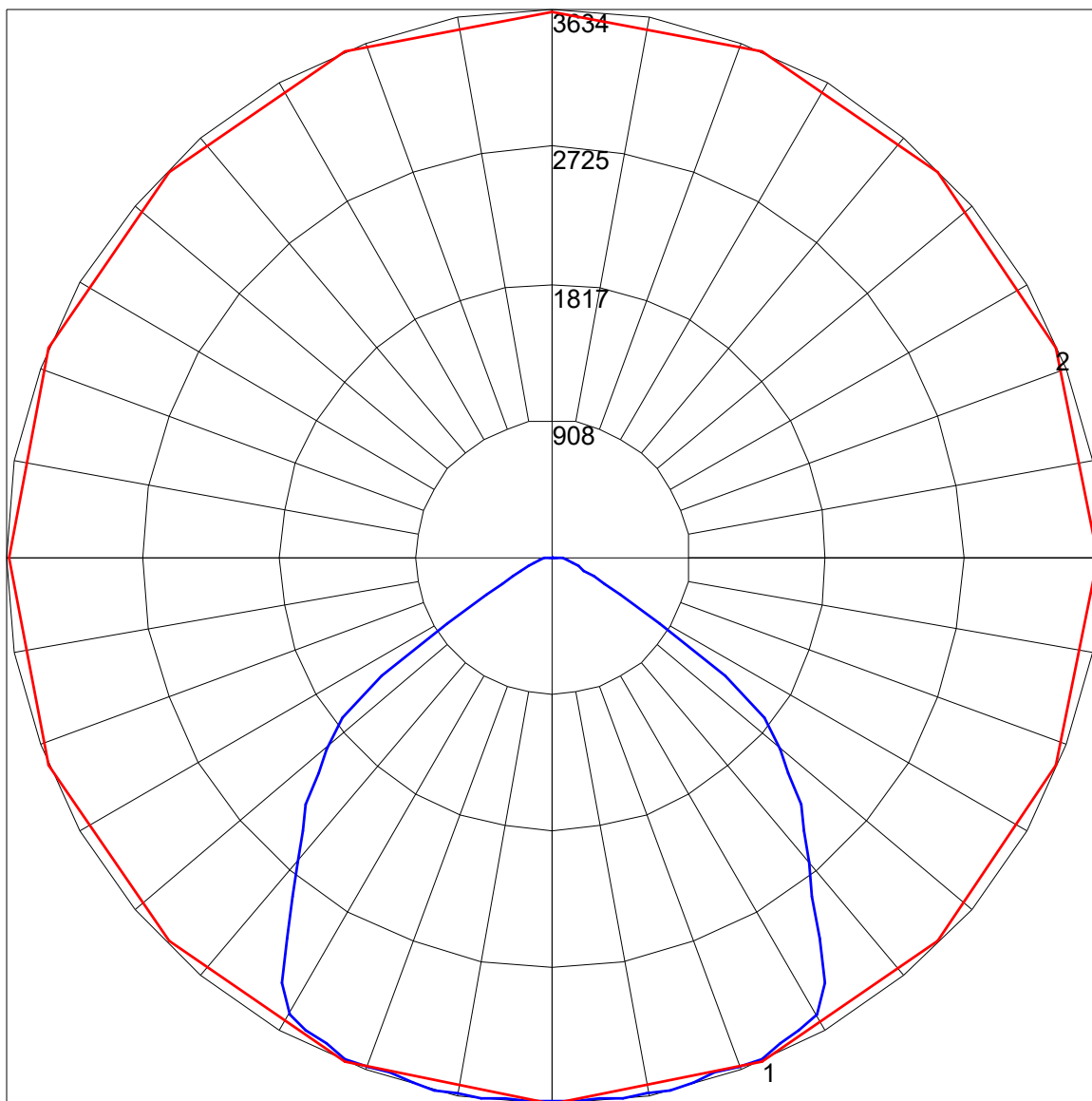
CHARACTERISTICS

IES Classification	Type VS
Longitudinal Classification	Very Short
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	8328
Downward Total Efficiency	N.A. (absolute)
Total Luminaire Efficiency	N.A. (absolute)
Luminaire Efficacy Rating (LER)	114
Total Luminaire Watts	73.1
Ballast Factor	1.00
Upward Waste Light Ratio	0.00
Maximum Candela	3633.504
Maximum Candela Angle	292.5H 12.5V
Maximum Candela (<90 Degrees Vertical)	3633.504
Maximum Candela Angle (<90 Degrees Vertical)	292.5H 12.5V
Maximum Candela At 90 Degrees Vertical	1.87 (0.0% Luminaire Lumens)
Maximum Candela from 80 to <90 Degrees Vertical	31.603 (0.4% Luminaire Lumens)
Cutoff Classification (deprecated)	N.A. (absolute)

LUMINAIRE CLASSIFICATION SYSTEM (LCS)

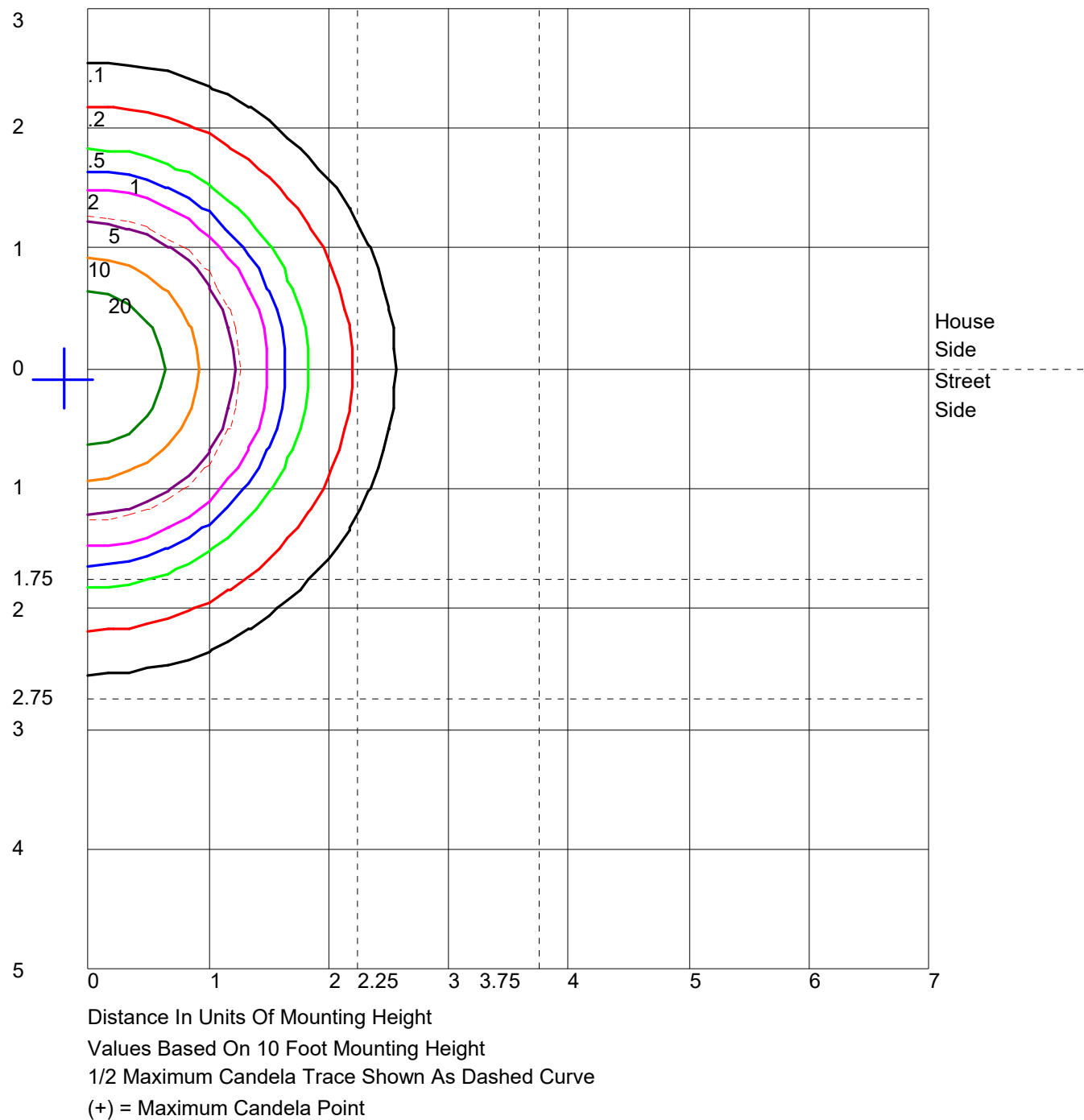
	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	1508.3	N.A.	18.1
FM - Front-Medium (30-60)	2447.0	N.A.	29.4
FH - Front-High (60-80)	203.7	N.A.	2.4
FVH - Front-Very High (80-90)	4.9	N.A.	0.1
BL - Back-Low (0-30)	1508.3	N.A.	18.1
BM - Back-Medium (30-60)	2447.0	N.A.	29.4
BH - Back-High (60-80)	203.7	N.A.	2.4
BVH - Back-Very High (80-90)	4.9	N.A.	0.1
UL - Uplight-Low (90-100)	0.2	N.A.	0.0
UH - Uplight-High (100-180)	0.0	N.A.	0.0
Total	8328.0	N.A.	100.0
BUG Rating	B3-U1-G0		

POLAR GRAPH

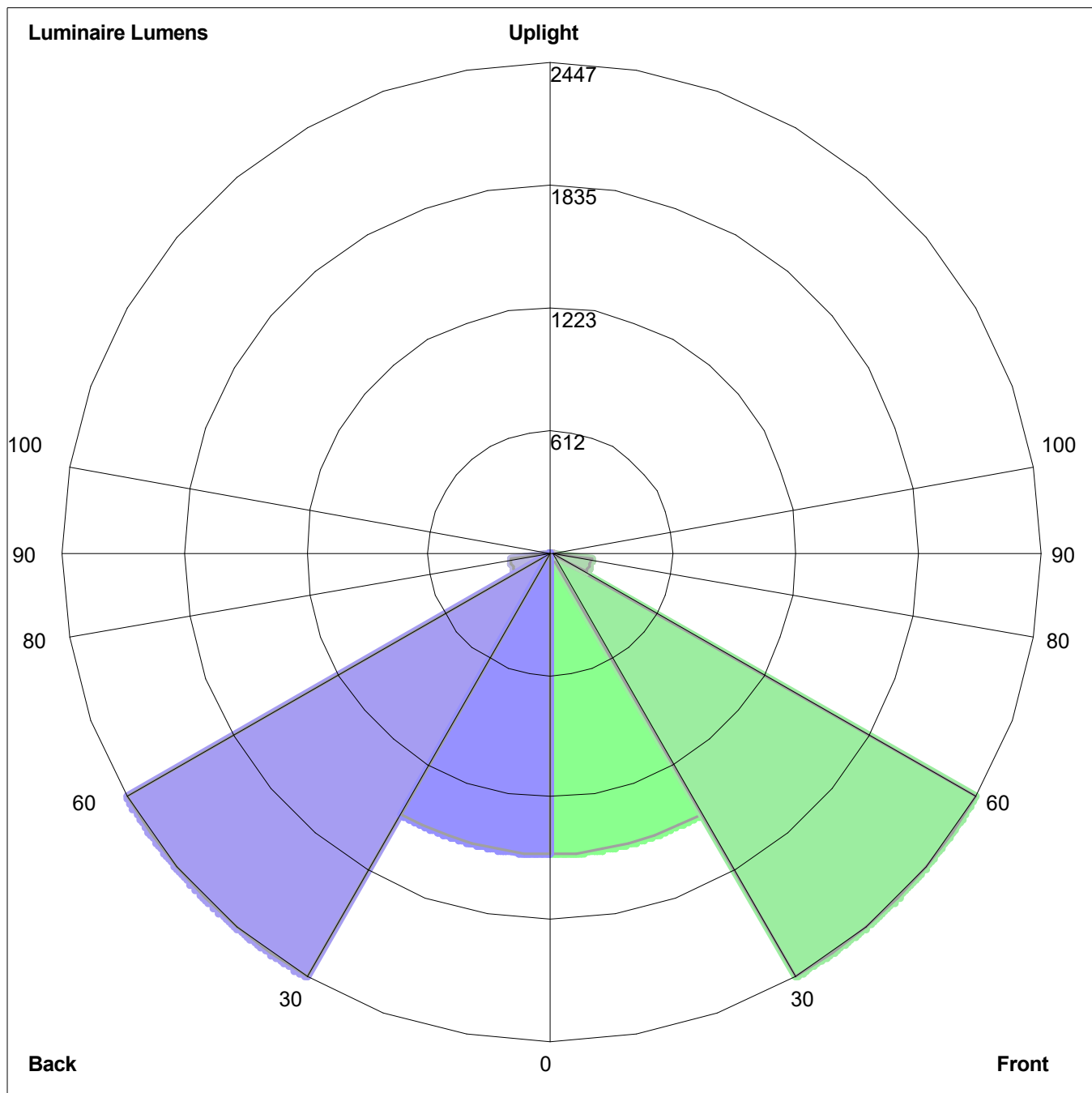


Maximum Candela = 3633.504 Located At Horizontal Angle = 292.5, Vertical Angle = 12.5
1 - Vertical Plane Through Horizontal Angles (292.5 - 112.5) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (12.5) (Through Max. Cd.)

ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINANCE



LUMINAIRE CLASSIFICATION SYSTEM (LCS) GRAPH



Luminaire Lumens:
Front: Low=1508.3, Medium= 2447.0, High=203.7, Very High=4.9
Back: Low=1508.3, Medium= 2447.0, High=203.7, Very High=4.9
Uplight: Low=0.2, High=0.0

BUG Rating : B3-U1-G0

Pauluhn ZPL explosionproof LED luminaires

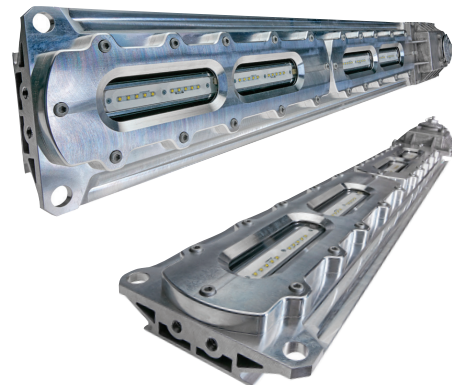
For drilling and marine applications

Cl. I, Div. 1, Groups C, D
Cl. II, Div. 1, Groups E, F, G
Cl. III

UL Listed
CSA Certified
Wet Locations
NEMA 4X; IP66

2L

Pauluhn™ ZPL explosionproof linear LEDs are designed to replace fluorescent T12, T8 and T5HO lighting on marine vessels and land-based and offshore drilling platforms. The rugged and durable design features the industry's most versatile and flexible mounting options. The ZPL is the ideal solution for high vibration, impact and hose down in drilling applications.



Model	Typical lumens	Watts	Lumens per watt	Equivalent HID luminaire	Typical energy savings / lifetime
ZPL2	3,800 +/- 10%	34	111	T12HO	Up to 62%
				T8HO	Up to 57%
				T5HO	Up to 45%
				T12	Up to 34%
				T8	Up to 22%
ZPL4	7,600 +/- 10%	63	120	T5	Up to 6%
				T12HO	Up to 58%
				T8HO	Up to 43%
				T5HO	Up to 53%
				T12	Up to 37%
				T8	Up to 21%
				T5	Up to 10%

Applications:

- Marine vessels, land-based and offshore rigs; areas include: mud room, derrick, mast, SCR house, top drive, operator's house, power and pump stations

Features:

- Industry-leading efficacy: up to 120 LPW
- 5000K CCT, 72 CRI
- -25°C to +55°C ambient operating temperature
- Low profile fixture (<5" height)
- Flush, swivel and pole mount options
- Wide optics for uniform illumination
- Four points of secondary retention and loop feed wiring
- 2,000 PSI high pressure hose rated
- 5G 3-axis vibration
- 2kV surge protection
- 5 year fixture warranty

Standard materials:

- Housing – copper-free aluminum
- Lens – glass; diffused glass (optional)

Mounting (ordered separately):

Versatile mounting options:

- Flush mount
- Swivel/surface mount
- Pole mount

Photometrics:

- Complete photometrics can be found at www.crouse-hinds.com/photometrics

Certifications and compliances:

NEC/CEC:

- Class I, Division 1, Groups C, D
- Class II, Division 1, Groups E, F, G
- Class III
- NEMA 4X, IP66
- Marine and wet locations
- Paint spray rated

UL standards:

- UL844 – Electrical Fixture Hangers for Hazardous Locations
- UL1598 – Luminaire
- UL1598A – Luminaire for Installation on Marine Vessels

CSA standard:

- C22.2 No. 137

Electrical ratings:

	ZPL2	ZPL4
Lumen output	3,800	7,600
Frequency	50/60 Hz	50/60 Hz
Voltage	100-277 VAC, 108-250 VDC; 347-480 VAC	

Model	Voltage	Current (A)	Watts	Power factor	THD
ZPL2/UNV1	100	0.33	33	0.99	<20%
ZPL2/UNV1	277	0.13	34	0.94	<20%
ZPL2/UNV34	347	0.09	32	0.98	<20%
ZPL2/UNV34	480	0.07	33	0.94	<20%
ZPL4/UNV1	100	0.63	63	0.99	<20%
ZPL4/UNV1	277	0.23	63	0.98	<20%
ZPL4/UNV34	347	0.18	62	0.99	<20%
ZPL4/UNV34	480	0.13	62	0.98	<20%

Temperature performance data:

Ambient temp. °C	Supply wire °C	Class I, Division 1	Class II, Division 1	Simultaneous Presence	Paint spray
40	75	T6	T5	T6	T5
55	75	T6	T5	T5	T5

Weights:

Model	Lbs.	Kg.
ZPL2	18.0	8.2
ZPL4	27.0	12.2

Pauluhn ZPL explosionproof LED luminaires

For drilling and marine applications

Cl. I, Div. 1, Groups C, D
Cl. II, Div. 1, Groups E, F, G
Cl. III

UL Listed
CSA Certified
Wet Locations
NEMA 4X; IP66

2L

Ordering information:

Part number example

ZPL4/UNV1 S891

ZPL

4

/UNV1

S891

Series	
ZPL	Pauluhn ZPL linear LED luminaire

Length / lumens	
4	4 ft. length, 7,600 lumens
2	2 ft. length, 3,800 lumens

Voltage	
/UNV1	100-277 VAC; 108-250 VDC
/UNV34	347-480 VAC

Lens	
BLANK	Glass
S891	Diffused glass

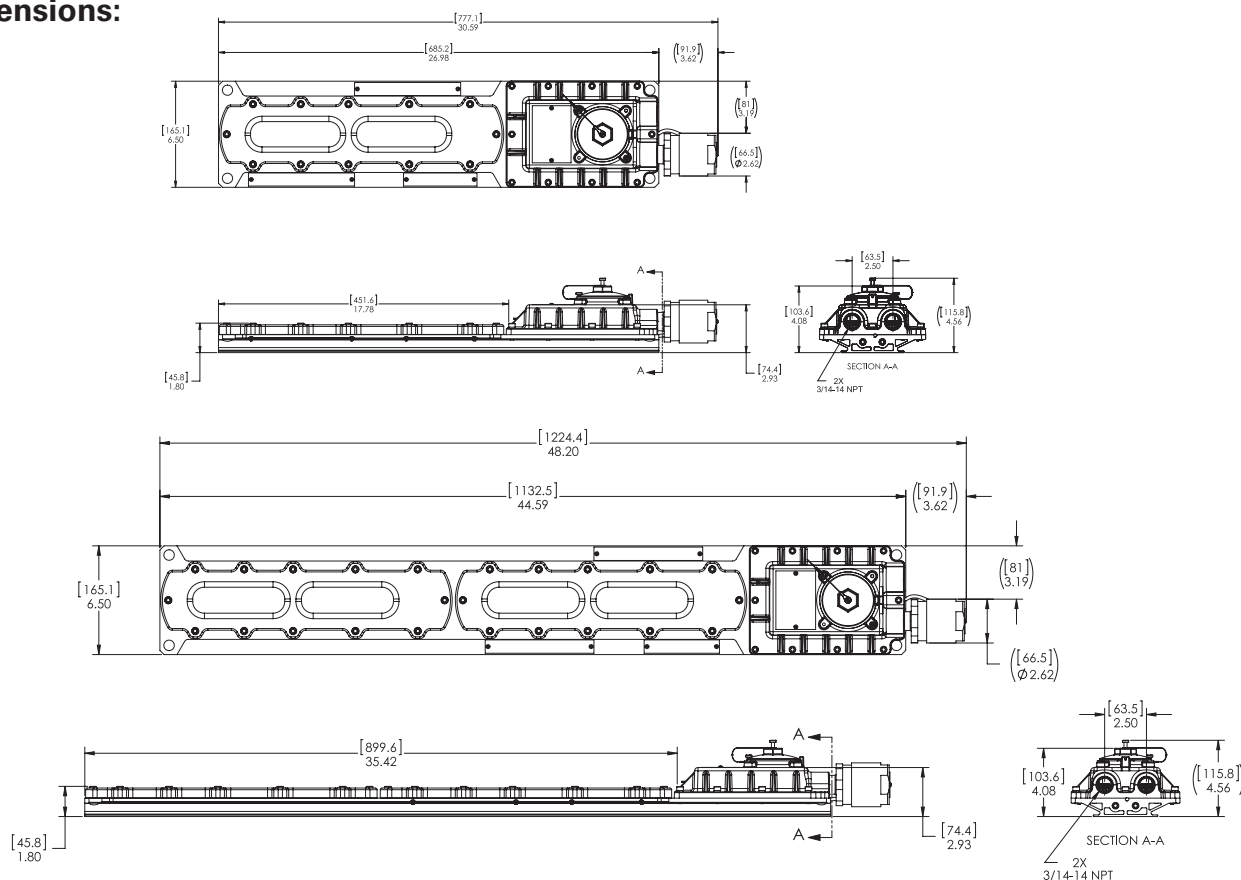
Options:

Description	Suffix
• Diffused glass lens	S891

Accessories (ordered separately):

Description	Cat. #
• Flush/back mount back plate	ZP1057MTK
• Ceiling/swivel mount	ZP1050MTK
• 1¼" pole mount kit	PM KIT 1.25
• 1½" pole mount kit	PM KIT 1.5
• 2" pole mount kit	PM KIT 2.0
• Safety chain kit (two cables)	SS KIT
• Polycarbonate paint spray lens shield kit (2 ft. fixture)	ZPL PS2
• Polycarbonate paint spray lens shield kit (4 ft. fixture)	ZPL PS4

Dimensions:



IES ROAD REPORT

PHOTOMETRIC FILENAME : ZPLA4 UNV1 S891 EMP STANDARD MODE.IES

DESCRIPTIVE INFORMATION (From Photometric File)

IESNA:LM-63-2002

[TEST] SCALED

[TESTLAB] Eaton Crouse Hinds

[ISSUE DATE] 4/6/2020

[MANUFAC] CROUSE-HINDS

[LUMCAT] ZPLA4/UNV1-S891-EMP (Standard Mode)

[LUMINAIRE] Grey aluminum housing, frosted glass enclosure

[LAMP] 40 white LEDs

[BALLAST]

[OTHER] File is scaled from original ZPL 2ft for 4ft EM performance in Standard Mode

[MORE]

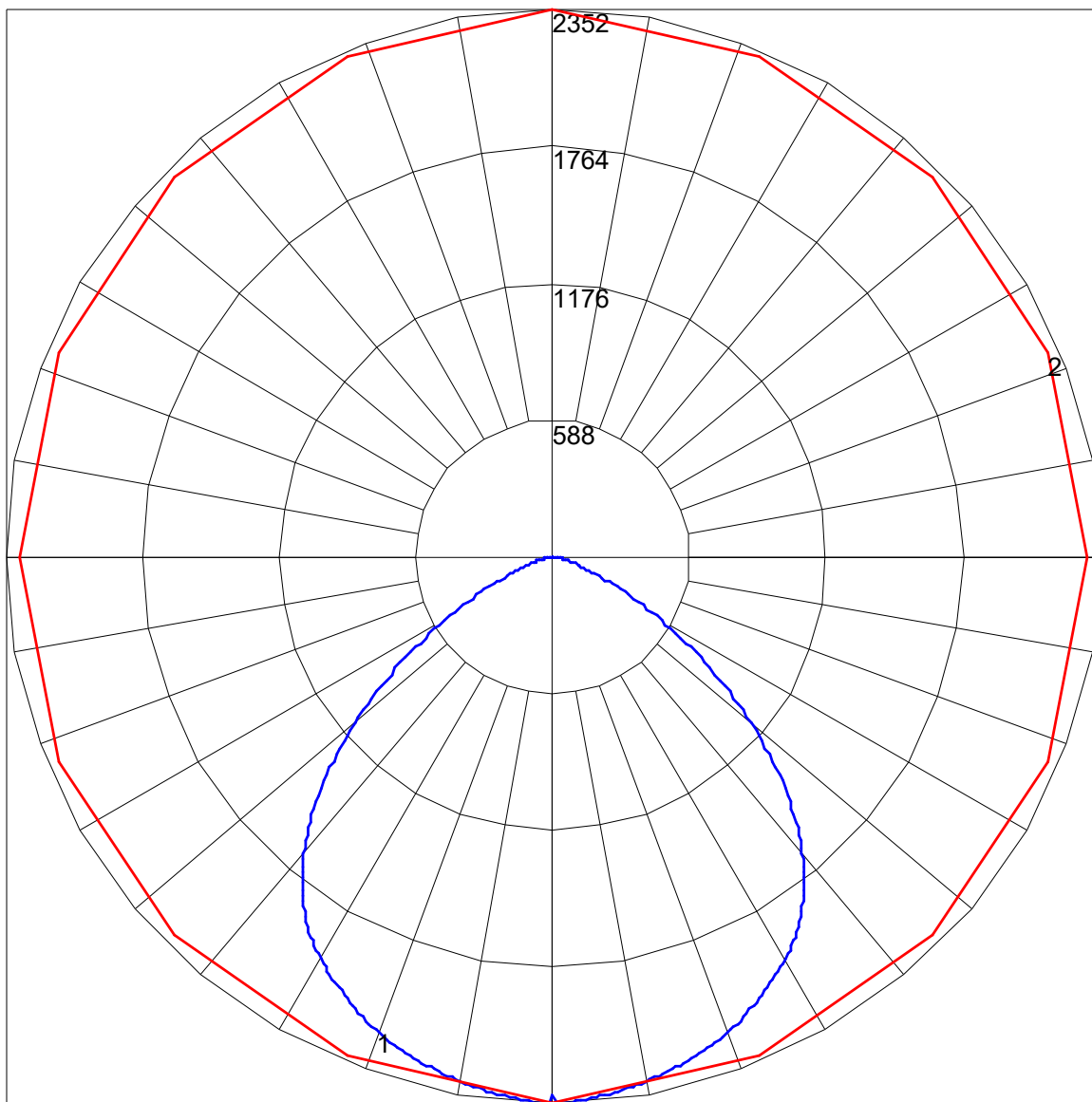
CHARACTERISTICS

IES Classification	Type VS
Longitudinal Classification	Very Short
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	5367
Downward Total Efficiency	N.A. (absolute)
Total Luminaire Efficiency	N.A. (absolute)
Luminaire Efficacy Rating (LER)	87
Total Luminaire Watts	62
Ballast Factor	1.00
Upward Waste Light Ratio	0.00
Maximum Candela	2351.967
Maximum Candela Angle	270H .5V
Maximum Candela (<90 Degrees Vertical)	2351.967
Maximum Candela Angle (<90 Degrees Vertical)	270H .5V
Maximum Candela At 90 Degrees Vertical	.91 (0.0% Luminaire Lumens)
Maximum Candela from 80 to <90 Degrees Vertical	77.126 (1.4% Luminaire Lumens)
Cutoff Classification (deprecated)	N.A. (absolute)

LUMINAIRE CLASSIFICATION SYSTEM (LCS)

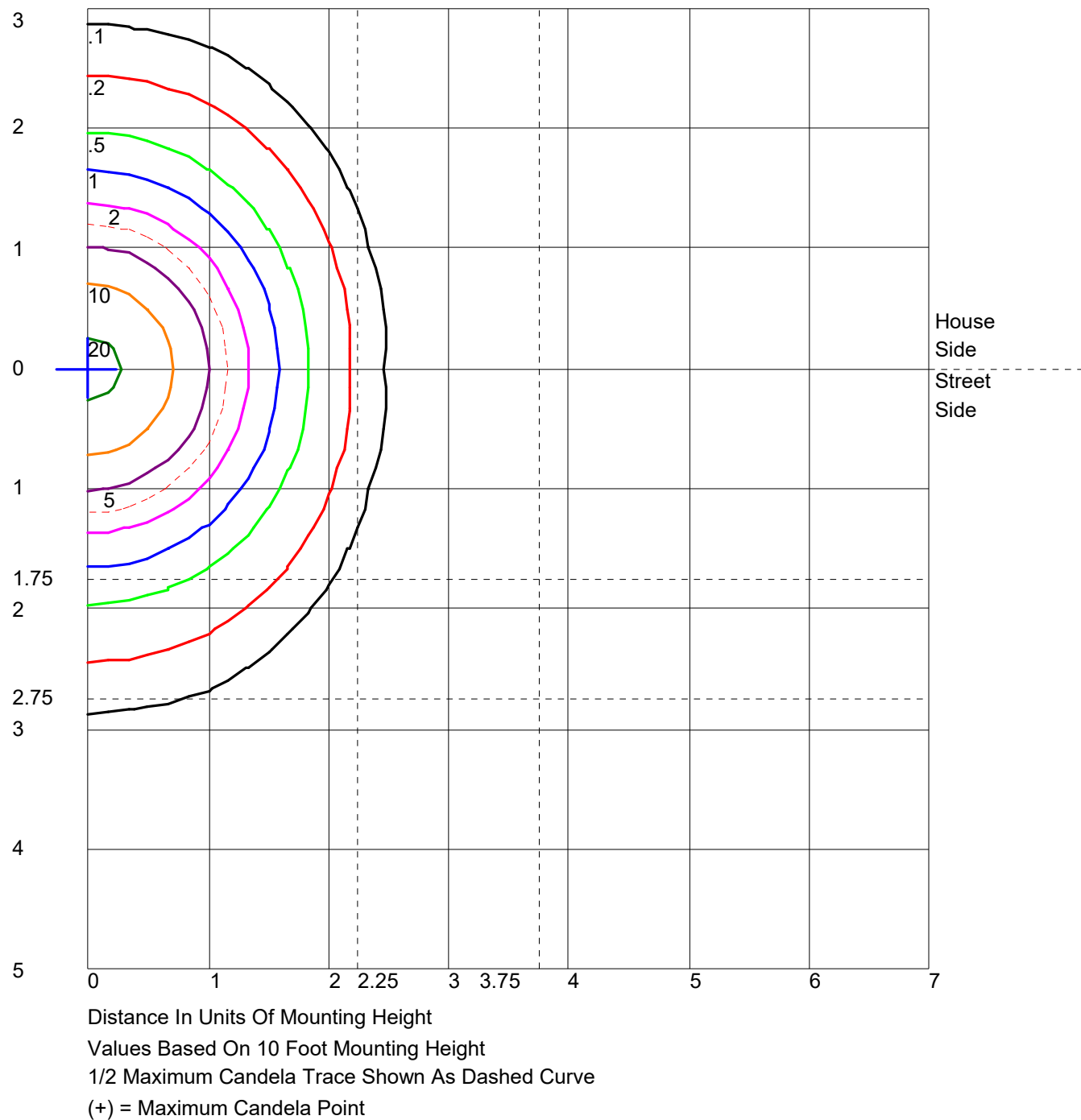
	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	906.3	N.A.	16.9
FM - Front-Medium (30-60)	1513.4	N.A.	28.2
FH - Front-High (60-80)	257.3	N.A.	4.8
FVH - Front-Very High (80-90)	6.4	N.A.	0.1
BL - Back-Low (0-30)	906.3	N.A.	16.9
BM - Back-Medium (30-60)	1513.4	N.A.	28.2
BH - Back-High (60-80)	257.3	N.A.	4.8
BVH - Back-Very High (80-90)	6.4	N.A.	0.1
UL - Uplight-Low (90-100)	< 0.05	N.A.	0.0
UH - Uplight-High (100-180)	0.0	N.A.	0.0
Total	5366.8	N.A.	100.0
BUG Rating	B2-U1-G0		

POLAR GRAPH

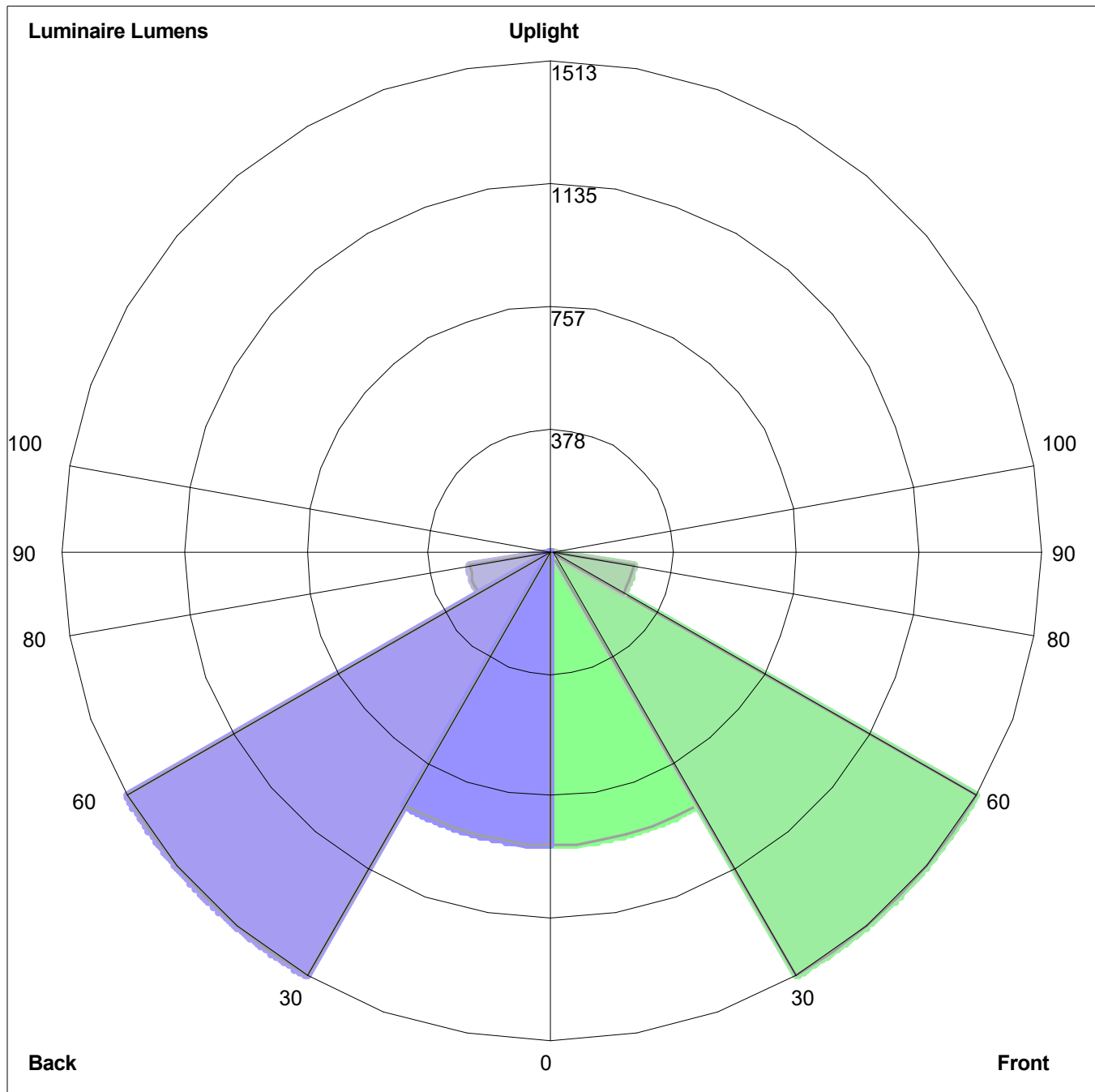


Maximum Candela = 2351.967 Located At Horizontal Angle = 270, Vertical Angle = .5
1 - Vertical Plane Through Horizontal Angles (270 - 90) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (.5) (Through Max. Cd.)

ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINANCE



LUMINAIRE CLASSIFICATION SYSTEM (LCS) GRAPH



Luminaire Lumens:
Front: Low=906.3, Medium=1513.4, High=257.3, Very High=6.4
Back: Low=906.3, Medium=1513.4, High=257.3, Very High=6.4
Uplight: Low=0.0, High=0.0

BUG Rating : B2-U1-G0

BLASTER FLOOD LED LIGHT

LF100BZ-110-277 BLASTER FLOOD LED LIGHT, 100-WATT, BRONZE

SPECIFICATIONS

Maximum Lumens	13,200
Input Voltage (VAC)	110-277V
Input Current Amp (@ 110V)	0.93
Input Power (W)	99.37
Input Power Factor	0.98
Efficacy	132.83
Color Rendering Index (CRI)	72
Correlated Color Temperature (CCT)	5000K

CHARACTERISTICS

Maximum Candela	10,087.88
Maximum Candela Angle	C=240.0 $\gamma=15.0$
Horizontal Beam Angle (50%)	85.5
Vertical Beam Angle (50%)	68.6
Horizontal Field Angle (10%)	127.4
Vertical Field Angle (10%)	102.6
Total Luminaire Watts	98.49

LUMENS=13,200

REPLACES: 320W MH LAMP

**RATED
LIFE = 50k + Hours**

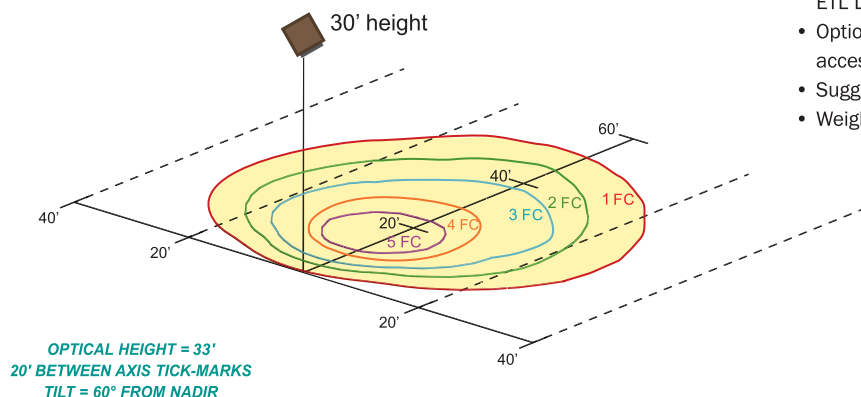


**NICHIA
LED INSIDE**

**MW
MEAN WELL
DRIVER INSIDE**

FEATURES

- Replaces: 320 Watt Metal Halide fixture in Flood and/or Downlight applications
- Dual trunnion mount for traditional Flood applications or as canopy/down light/high bay
- Crisp cool white, low draw, energy efficient light, best for security cameras and visual clarity
- Long life 50,000+ hours LED's to reduce maintenance cost/replacements
- UV-Stable, high impact, vibration and shock resistant tempered glass lens
- Powder coated, heat sink cast aluminum housing with steel 180° swivel universal mounting bracket
- Silicone seals for durability and wide-range LED operating temperature +120F to -20F
- Chromatically stable 5000K, LM 80 Tested, ETL Listed IP-65 wet location (non-submersible)
- Optional: Rock Guard, Slip Fitter and wide range mounting accessories available.
- Suggested Mounting Height: 25' - 35'
- Weight: 15 lbs.



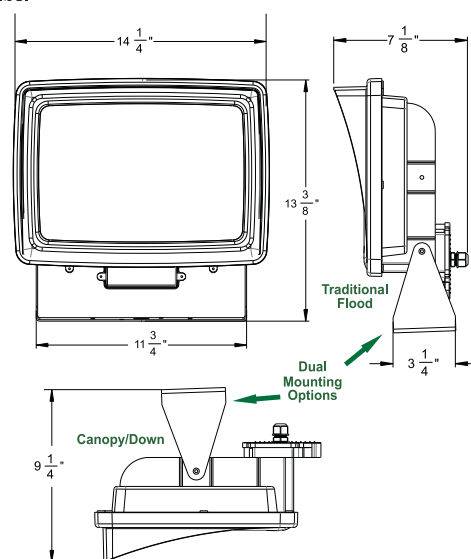
The following shows the cost of illuminating this fixture an average of 12 hours a day for 365 days a year.

100 Watt x 4,380 YKWH x \$.09/KWH
1,000

\$39.42
Yearly Operating Cost
per fixture

Flood Light
Downlight
Pole Light
Up Light
Wall Pack
High Box
Canopy Light

APPLICATION



**ACCESSORIES
AVAILABLE**
on pages 14-15

**IESNA
LM79:
2008**

**DLC
PREMIUM**

**5
YEAR
LIMITED
WARRANTY**

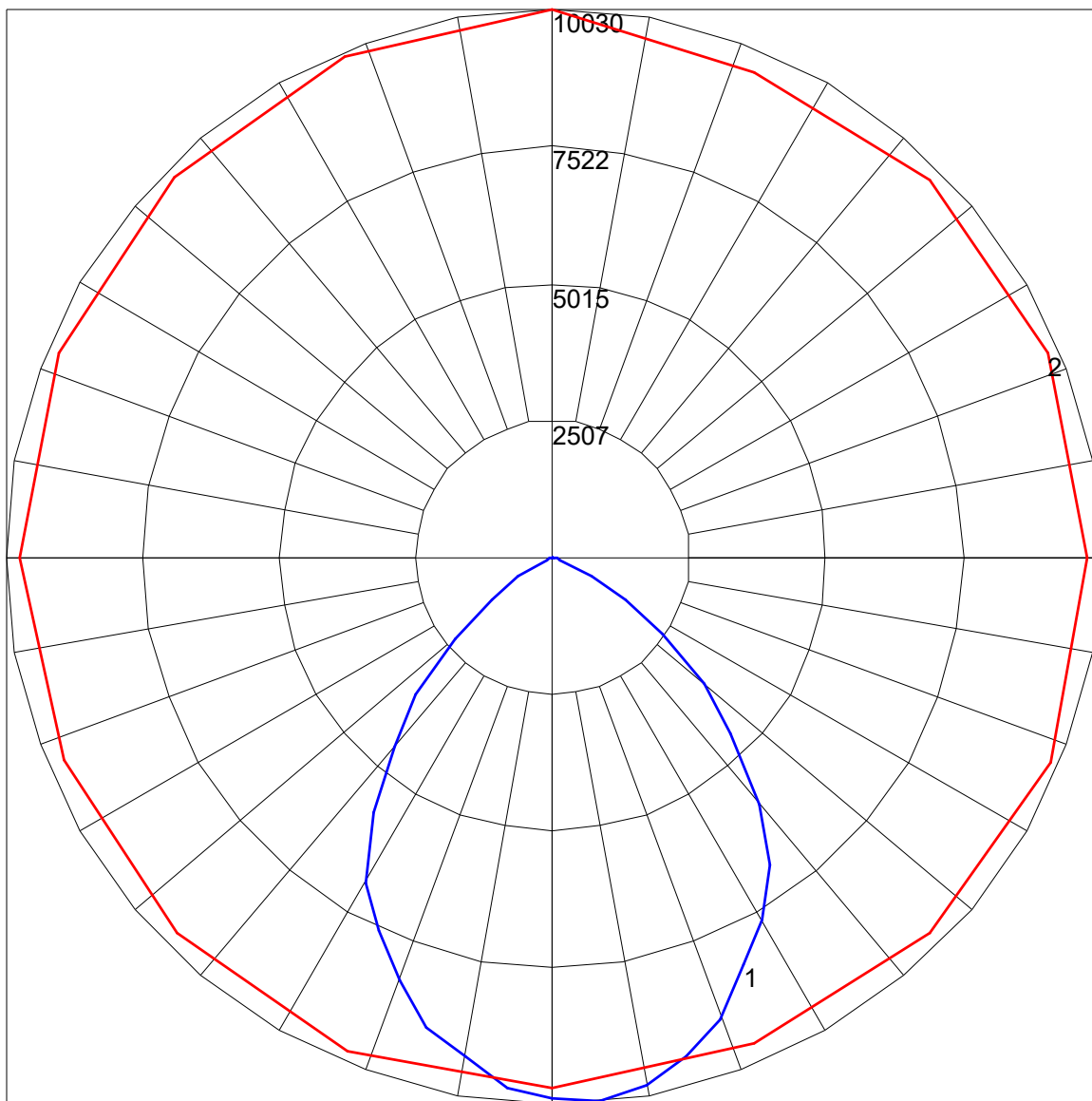
**LOW DRAW
<.84 AMP
@110V**

**LM80-
Tested**

**ETL
IP-65**

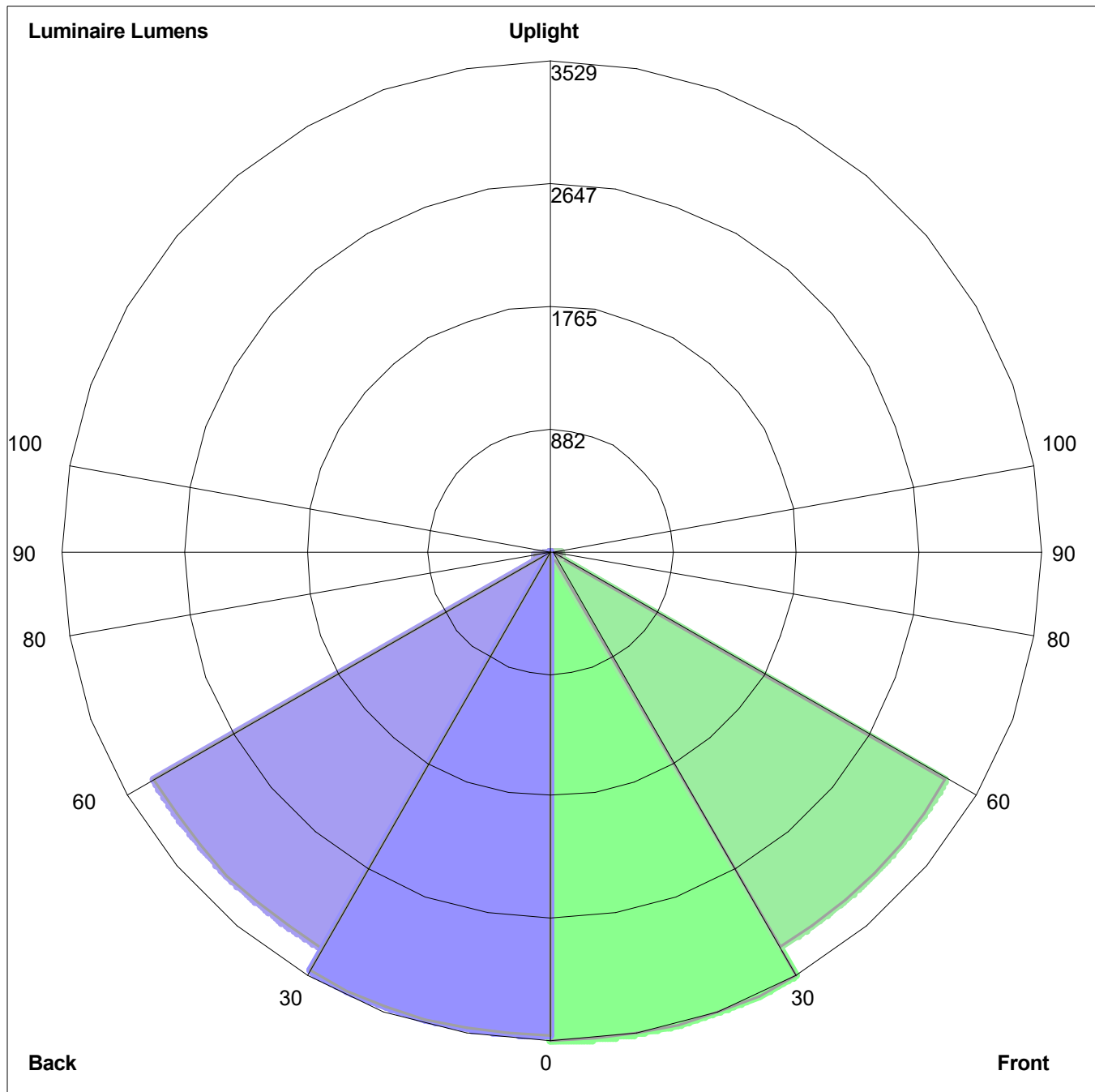
*non-submersible

POLAR GRAPH



Maximum Candela = 10029.73 Located At Horizontal Angle = 90, Vertical Angle = 5
1 - Vertical Plane Through Horizontal Angles (90 - 270) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (5) (Through Max. Cd.)

LUMINAIRE CLASSIFICATION SYSTEM (LCS) GRAPH



Luminaire Lumens:
Front: Low=3529.3, Medium=3284.8, High=74.1, Very High=0.2
Back: Low=3487.7, Medium=3301.7, High=121.4, Very High=1.4
Uplight: Low=0.0, High=0.0

BUG Rating : B4-U0-G1



WCDE-7.5K-4X1000W-MLK Metal Halide Floodlight Tower

Lamp Type: Metal Halide
Light Dimensions: 19"L x 12"OD, 18" Reflector OD
Tower Dimensions: 25' Raised / 8.2' Lowered
Weight: 1527 lbs
Total Watts: 4,000W
Total Lumens: 440,000
Luminous Efficacy: 110 Lm/W
Lamp Life Expectancy: 15,000+
Color Temp: 4100K
Beam Angle: 24° Spot Beam Individual Lights / Floodlight Unit
Ambient Operating Temperature: -10°C to +49°C
Light Materials: Die Cast Aluminum, PMMA Optics
Tower Material: Galvanized Steel
Generator: 7.5kW Sincro Generator
Fuel Capacity: 28 Gallons

Quick Summary

Superior Metal Halide Power
IP67 Waterproof
Dustproof
18" Aluminum Reflectors
360° Rotating Tower
50+ Hour Runtime on Single Tank
20 units fit inside in a 53' Trailer

Special Orders- Requirements

Contact us for special requirements
Toll Free: 1-800-369-6671

Intl: 1-903-270-1187

E-mail: sales@larsonelectronics.com

The WCDE-7.5K-4X1000W-MLK metal halide floodlight tower from Larson Electronics offers tough and durable construction, reliable and efficient performance, and high light output in an easy to operate, self-contained portable unit. This floodlight tower features 4 powerful metal halide lights and PMMA high purity optics to deliver 440,000 lumens of concentrated light. A 28 gallon generator mounted to a steel unibody trailer provides stand alone power for 50 hours on a single tank of fuel, allowing operators to keep working no matter how remote the location. Rugged IP67 rated construction designed to withstand the rigors of harsh outdoor conditions and grueling heavy duty use make this light tower an ideal choice for industrial applications, construction sites, marine use, mining, and emergency services.

Light Features: The WCDE-7.5K-4X1000W-MLK light tower features four 1,000 watt metal halide lamps that produce 110,000 lumens each, for a total of 440,000 lumens of high intensity light while drawing only 4,000 watts of energy. Each light fixture has the individual power to brightly illuminate large areas and when combined, this metal halide floodlight tower provides ample lighting for a wide variety of needs.



[Click Photo to Enlarge](#)



[Click Photo to Enlarge](#)



[Click Photo to Enlarge](#)



These metal halide lamps are paired with high quality reflectors enabling each light head to produce a far reaching yet intense and well focused beam without overcast, glare, or light spillage. Designed especially for high mast mounting, these concentrated spot beams have an even spread with substantial coverage over the work area and provide a night vision that closely resembles natural daylight illumination.



[Click Photo to Enlarge](#)



[Click Photo to Enlarge](#)



[Click Photo to Enlarge](#)

These metal halide lamps have very good color temperature and color rendering which allows them to produce clean, bright white light. The High Intensity Discharge (HID) metal halide lights are highly efficient and offer around 15,000 hours of bulb life expectancy. These metal halide lamps also offer IP67 rated construction that is designed to withstand extremes of environmental and operating conditions. Protected within corrosion resistant die cast aluminum housings, these lights can withstand rapid temperature changes of -10° Celsius to +49° Celsius, and are waterproof and dust tight.



[Click Photo to Enlarge](#)

Tower & Trailer: The telescoping tower on this unit reaches 25' when fully extended and folds to a compact 8.2' for storage and transport. A rear operated manual winch allows operators to easily raise, lower, or rotate the mast through a full 360° of movement as needed. A stepping pad allows operators to make adjustments from the ground with ease. The light heads are trunnion mounted to the mast crosspieces using U brackets and can be individually adjusted while the tower is in the retracted position. The unibody trailer features a formed and welded steel frame, 13" tires and wheels, a

4-point leveling system, and a foldable tongue with a reversible 2-inch ball coupling/pintle hitch. The 4-point base consists of three sliding outriggers each with a drop leg jack (one at the rear and one on each flank) and a 1,000lb stabilizing jack connected to the tongue. Both the main stabilizing jack and the outrigger jacks can be manually adjusted to the desired position using hand cranks. This 4-point design allows the unit to be operational in winds up to 51 mph. The reversible hitch consists of a standard 2" ball coupling on one end and a 3" pintle towing hitch on the other end. To switch ends, the operator simply unbolts the hitch attachment, flips it to the desired end, and reinserts the bolt. This trailer also features forklift pockets for easy lifting and loading/unloading of the unit.

With compact stowing dimensions of 5.48' x 3.6' x 8.2', a 48' truck trailer can hold 18 of these light towers, and a 53' trailer can carry 20 units.



[Click Photo to Enlarge](#)



[Click Photo to Enlarge](#)

Generator: An 7.5kW Sincro generator with a Kubota Z482 EPA Tier 4 engine provides stand alone power to this light tower. Equipped with a fuel level indicator and an easy to reach exterior fill neck, this generator has a 28 gallon tank and provides a minimum of 50 hours of continuous operation.

A Genset Protect system safeguards against the engine starting and stopping with the AC power as well as ensuring the lighting system is turned off at both the startup and shutdown of the unit. This model is equipped with a 12V electric starter and a glow plug cold starting system. All of the operating components are housed with a protective compartment with side lift up doors for easy access to the controls and engine/generator assembly. The gull-wing access doors and canopy is able to withstand dents, scratches, and corrosion and continues to look new for years.

Housing: All of the operating components are housed within a protective compartment constructed of recyclable LMDPE (linear medium density polyethylene) plastic. This material is extremely corrosion resistant and retains its original appearance even after years of use. The enclosure is high impact crack resistant and retains resale value for longer than metal counterparts while also minimizing environmental impact. The highly durable plastic material is fully UV stabilized, contains long term antioxidants and is resistant to both high and low temperatures. The plastic enclosure of the WCDE-4-4X400LTL-LED is significantly lighter than comparable metal enclosures while offering a more attractive appearance. A vertical lift door provides access to the interior while latches provide secure closing while the unit is in use. The entire unit can be loaded and unloaded onto trucks via forklift sleeves mounted to the outer section of the light mast. The entire unit is mounted onto a two wheel trailer with a 2,000 lbs. leaf spring axle. A standard two inch ball coupling, three inch pintle hitch and two standard safety chains allow for easy hookup and towing.



[Click Photo to Enlarge](#)

Applications: Construction, temporary lighting, road side illumination, plant turn arounds, outdoor events, military, road works, and public lighting.



WCDE-7.5K-4X1000W-MLK Illuminating Pit

[Click to Enlarge](#)

At Larson Electronics, we do more than meet your lighting needs. We also provide replacement, retrofit, and upgrade parts as well as industrial grade power accessories. Our craftsmen can custom build any lighting system and/or accessories to fit the unique demands of your operation. A commitment to honesty, quality, and dependability has made Larson Electronics a leader in the lighting and electronics business since 1973. Contact us today at 800-369-6671 or message sales@larsonelectronics.com for more information about our custom options tailored to meet your specific industry needs.

Made in the USA Quality

1. High Efficiency Metal Halide lamp.
2. 110 Lumens per Watt
3. Rugged Die Cast Aluminum Lamp Housing
4. 18" Aluminum Reflectors and Polycarbonate Lenses.
5. Heavy Duty Gasket
6. Adjustable and Portable Steel Tower Construction.
7. Low Maintenance.
8. Corrosion Resistant Marine Approved.
9. UL Listed for Marine Environments.

Metal Halide Benefits

1. Long lamp life.
 2. High efficiency and low amp draw after initial startup.
 3. High durability and reliability
 4. High output and very good color rendering
 5. Vibration and shock resistant
 6. Low maintenance
-

Links (Click on the below items to view):

- [large](#)
- [Manual](#)
- [medium](#)
- [Photo showing the incredible output these units produce.](#)
- [The WCDE-4-MLK can be linked in series and towed safely.](#)
- [This photo shows an internal view of the motor and operating switches.](#)
- [This photo shows the WCDE-4-MLK while collapsed for transportation.](#)
- [HigResPic1](#)
- [HigResPic2](#)
- [HigResPic3](#)
- [HigResPic4](#)
- [HigResPic5](#)
- [HigResPic6](#)
- [HigResPic7](#)
- [HigResPic8](#)
- [HigResPic9](#)
- [HigResPic10](#)
- [Video1](#)
- [Video2](#)

