



Extraction Oil & Gas, Inc

LIGHT MITIGATION PLAN

FOR

T-Bone 28 XOG Pad

Prepared For:



1101 Broad Street
Milliken, CO 80543

Prepared By:



1720 Bellaire Street Suite 400
Denver, CO 80222
www.rpgres.com

Date Prepared: March 2024

Date Revised: July 2024

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APPENDIX A – Photometric Plans

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1. PLAN PURPOSE

This Light Mitigation Plan was prepared by RPG Resources (RPG), on behalf of Extraction Oil & Gas, Inc (Civitas Resources, Inc.; hereafter Extraction) for the proposed T-Bone 28 XOG Pad. This plan was prepared to comply with State and local Light Mitigation Plan requirement for new oil and gas locations, and it addresses Extraction’s plans to adhere to maximum permissible light levels and recommended mitigation measures. Implementation of this plan will serve to avoid or minimize adverse effects to local communities and wildlife populations during the development of the Site.

2. SITE DESCRIPTION

Extraction’s T-Bone 28 XOG Pad (Site) is located in Township 5N, Range 66W, Section 28 within the town of Milliken, in Weld County, CO. The Site is situated within 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).

The area in which the Site is located was observed to be cropland at the time of the field survey. Elevation at the Site ranges from 4727-4802 feet.

The Site is not located within any Colorado Parks and Wildlife High Priority Habitats (HPHs). There are 7 Residential Building Units within 2,000 feet of the Site.

3. OPERATIONAL STAGES & LIGHTING LEVELS

The current estimated operation stage’s light levels are as follows:

Table 3.1 – T-Bone 28 XOG Operational Phase Light Levels	
PHASE	ESTIMATED LIGHT LEVEL
Drilling	5.09 Lumens/SQFT
Completions	3.08 Lumens/SQFT
Flowback	3.08 Lumens/SQFT
Production	N/A

The information above is subject to change based on project adjustments and/or other unforeseen factors. The estimated lighting levels listed above meet all state and local threshold requirements. Permanent lighting will not be installed during any phase of the proposed development. Please refer to Appendix A for Photometric Plans.

4. LIGHTING FIXTURE SPECIFICATIONS

The following lighting fixtures outlined in the table below will be used during at least one of the operational phases at the T-Bone 28 XOG Well pad:

Table 4.1 – T-Bone 28 XOG Light Fixture Schedule					
IDENTIFIER	DESCRIPTOIN	MANUFACTURER	DRILLING	COMPLETIONS	FLOWBACK
L1	COMPACT LED HIGH PERFORMANCE SPORT LIGHT	C-MOR ENERGY SERVICES	X		
L2	MOBILE LIGHT TOWER	GENERAC MAGNUM	X	X	X
L3	CHAMP FMVA LED FLOODLIGHT	EATON		X	X

Additional specifications for each light figure can be found in Appendix B.

5. BEST MANAGEMENT PRACTICES

The following lighting BMPs will be used to minimize and control light pollution at the T-Bone 28 XOG Well pad:

Construction: During pad construction, operations will occur only during daytime thus eliminating and light mitigation considerations.

Drilling and Completions: Extraction will direct site lighting downward at a 20-degree angle and will not shine light above a horizontal plane passing through the center point light source.

Drilling and Completions: Extraction will use low-glare and no-glare lighting where feasible to minimize safety hazards.

Drilling and Completions: A Sound/nuisance barrier will be installed around the working pad during drilling and completion operations which will additionally limit light migration.

Production: Extraction will not have permanent lighting on location.

LITERATURE CITED

Colorado Energy and Carbon Management Commission. 2024. 400 Series: Operations and Reporting

Town of Milliken, Weld County, Colorado. 2024. Town of Milliken Code: CHAPTER 16 - Land Use Code, ARTICLE III - General Standards Applicable to all Districts, Division 5 - Site Infrastructure Standards, Sec. 16-3-510. - Lighting. Available through Municode.com.

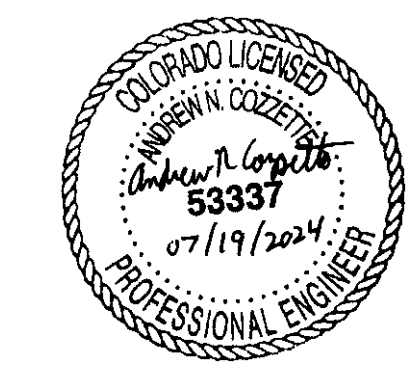
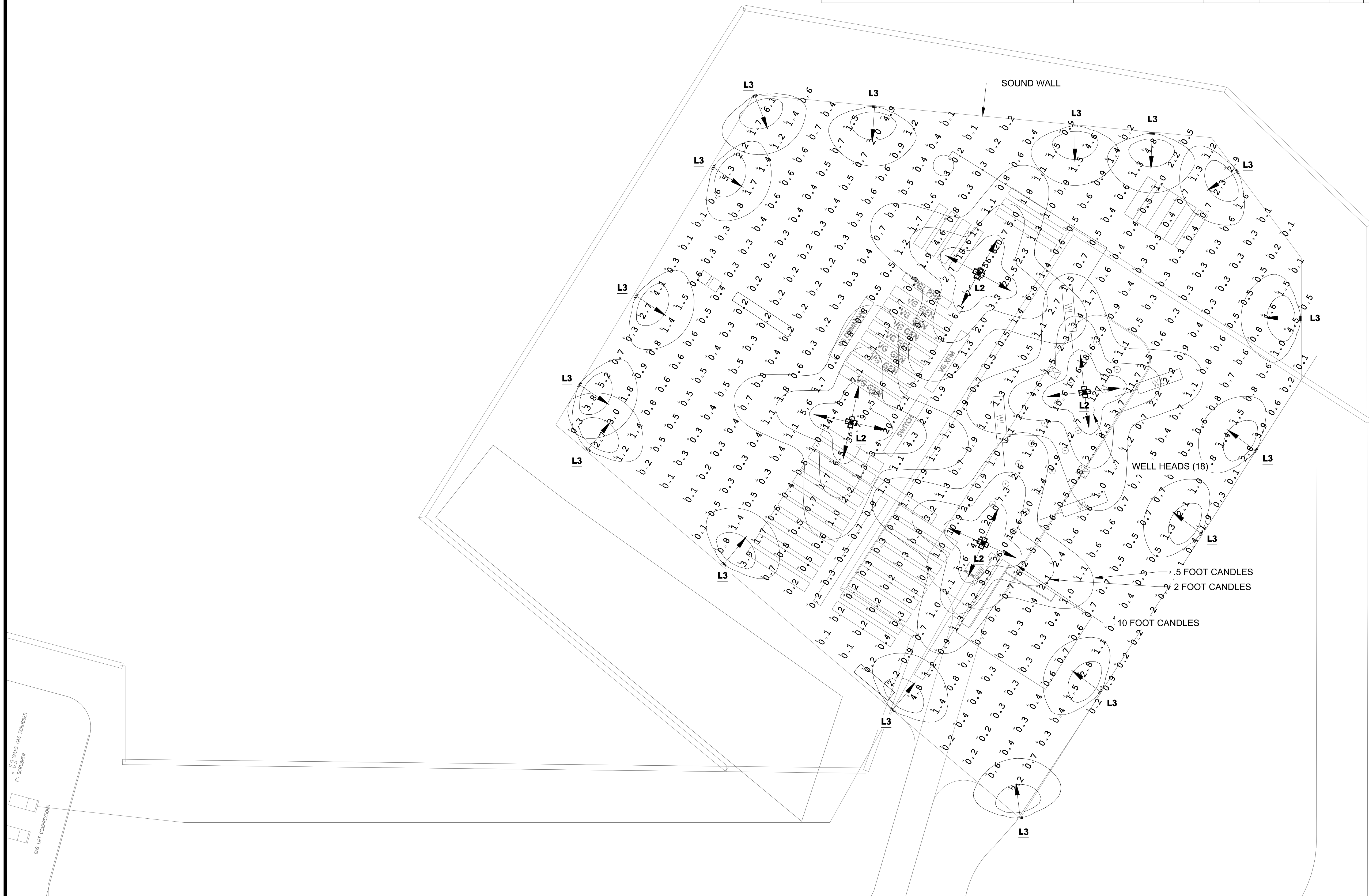
APPENDIX A

Photometric Plans



LIGHTING FIXTURE SCHEDULE								
TYPE	SYMBOL	DESCRIPTION	MOUNTING	MANUFACTURER	PART NUMBER	VOLTAGE	QTY.	LUMENS
L2		MOBILE LIGHT TOWER (4 LED LIGHTS MOUNTED PER TRAILER) (296W LED - EACH LIGHT)	23' MAST HEIGHT	GENERAC MAGNUM	MLT6SMD5 (1000001 9145)	120/240VAC	4	172,200 PER MOBILE LIGHT FIXTURE
L3		CHAMP FMVA LED FLOODLIGHT	20'	EATON	FVMA-13 -76-DG- UNV1-M2	100-277VAC	16	13000 PER LIGHT FIXTURE

SITE TOTALS - WELL COMPLETION	
TOTAL LUMENS	896800 LUMENS
SITE PERMANENT DISTURBANCE SQUARE FOOTAGE	290,938 SQFT
LUMENS/SQ.FT	3.08 LUMENS/SQFT
ILLUMINATION AT 1-MILE	<0.1 LUX



1/4"=1'-0" 0 2' 4' 8'

NOTES:

- ALL LIGHT FIXTURES AND INSTALLATION MATERIALS SHALL BE IN ACCORDANCE WITH THE LATEST ISSUE OF LOCAL AND NATIONAL ELECTRICAL CODES, ELECTRICAL SPECIFICATIONS AND DRAWINGS.
- PRODUCTION FACILITY SHALL BE SIMULTANEOUSLY CONSTRUCTED. PERMANENT PRODUCTION FACILITY LIGHTING SHALL NOT BE IN USE DURING DRILLING AND IS NOT TAKEN INTO ACCOUNT IN THESE CALCULATIONS. SEE DRAWING TBONE-ELE-7504 FOR PRODUCTION LIGHTING LAYOUT.
- THIS DRAWING IS BASED ON A TYPICAL DRILLING RIG AND IS SUBJECT TO VARIATIONS IN DESIGN AND LAYOUT. EACH LAYOUT IS DESIGNED BY OTHERS BUT SHALL NOT EXCEED THE FIXTURE COUNTS LISTED ON THIS DRAWING.
- RIG LIGHTING WILL VARY DEPENDING ON PARTICULAR WELL BEING DRILLED.
- DURING DRILLING, COMPLETIONS, AND FLOWBACK SITE IS USING LZ-4 STANDARDS.



REFERENCE DRAWINGS	No	PROJ. NUMBER	REVISIONS	BY	CHKD	APVD	DATE	BY	DATE
	1		ISSUED FOR CONSTRUCTION	CMS	HR	RFD	03/27/24		
	2		REVISED ISSUED FOR CONSTRUCTION	CMS	HR	RFD	06/29/24		
	3		REVISED ISSUED FOR CONSTRUCTION	CMS	ANC	RFD	07/19/24		
	4		ISSUED FOR CONSTRUCTION	CMS	HR	RFD	03/27/24		

DRAWING NUMBER		SCALE	REVISION
TBONE-ELE-7501		1/4" = 1'-0"	3

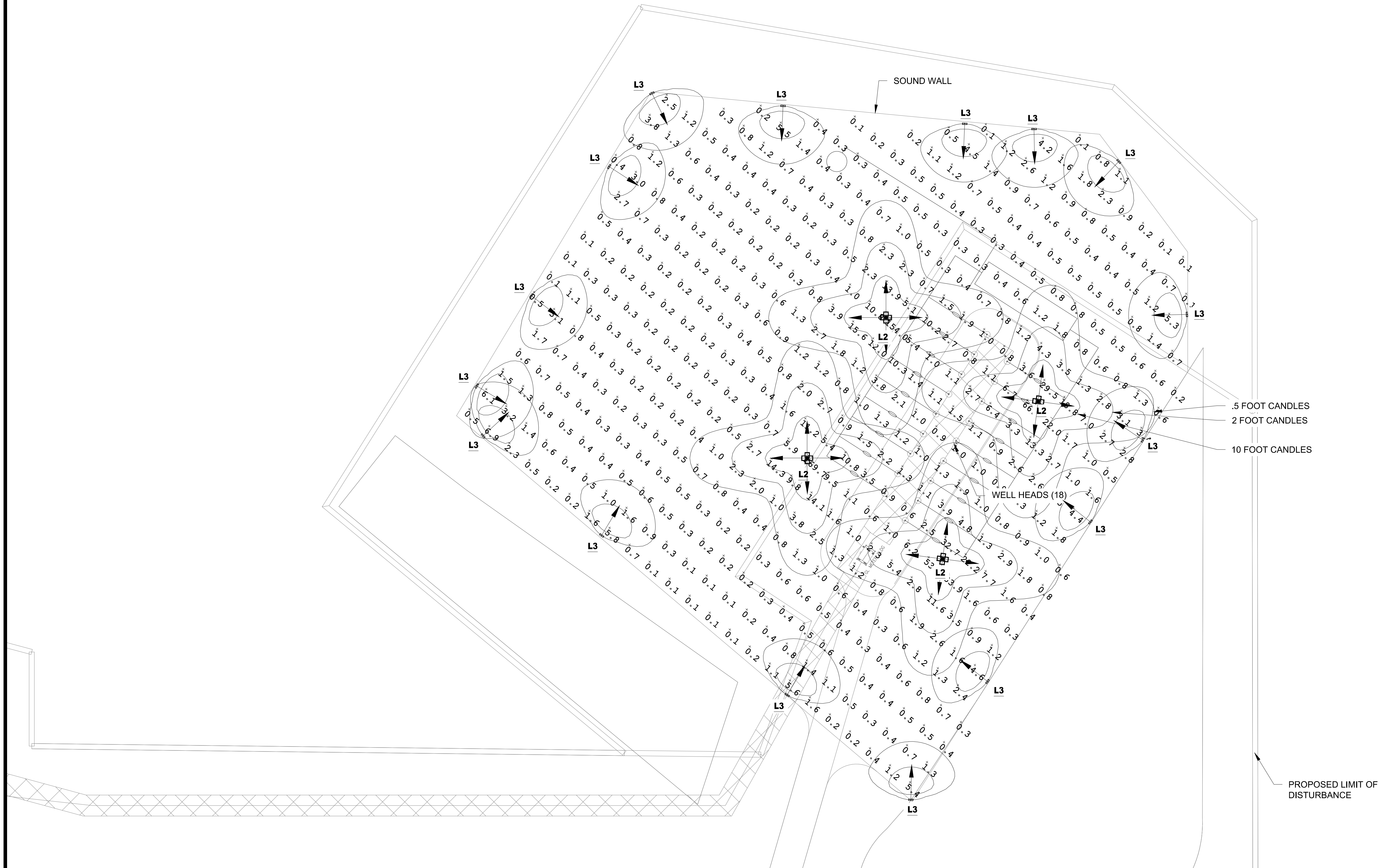
T-BONE WELL PAD ELECTRICAL LIGHTING PLAN - WELL COMPLETION

PLOTTED BY: Shari, Corey, 08/26/2024 9:30:47 AM
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LIGHTING FIXTURE SCHEDULE								
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SITE PERMANENT DISTURBANCE SQUARE FOOTAGE	290,938 SQFT
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ILLUMINATION AT 1-MILE	<0.1 LUX



1/4"=1'-0" 0 2' 4' 8'

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- THIS DRAWING IS BASED ON A TYPICAL DRILLING RIG AND IS SUBJECT TO VARIATIONS IN DESIGN AND LAYOUT. EACH LAYOUT IS DESIGNED BY OTHERS BUT SHALL NOT EXCEED THE FIXTURE COUNTS LISTED ON THIS DRAWING.
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REFERENCE DRAWINGS	No	PROJ. NUMBER	REVISIONS	BY	CHKD	APVD	DATE	BY	DATE
								CMS	03/27/24
			REVISED ISSUED FOR CONSTRUCTION	CMS	ANC	RFD	07/19/24		
			REVISED ISSUED FOR CONSTRUCTION	CMS	HR	RFD	06/29/24		
			REVISED ISSUED FOR CONSTRUCTION	CMS	HR	RFD	04/03/24		
			ISSUED FOR CONSTRUCTION	CMS	HR	RFD	03/27/24		

1
T-BONE WELL PAD
ELECTRICAL
LIGHTING PLAN - FLOW BACK

DRAWING NUMBER: TBONE-ELE-7502

SCALE: 1/4" = 1'-0"

REVISION: 3

PLOTTED BY: slurr, Corey, 06/28/2024 9:49:09 AM
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APPENDIX B

Specification Sheets



THE INFORMATION CONTAINED HEREIN SHALL BE CONSIDERED THE SOLE PROPERTY OF JCA COMPANIES, JCA RENTALS, LLC/C&M OILFIELD RENTALS, LLC/C-MOR ENERGY SERVICES, LLC AND RECIPIENT THEREOF AGREES NOT TO DISCLOSE SAID INFORMATION TO PARTIES OUTSIDE THE RECIPIENTS ORGANIZATION AND TO USE, MODIFY, CHANGE OR DUPLICATE SAID INFORMATION FOR ANY PURPOSES EXCEPT AS SPECIFIED BY JCA RENTALS, LLC/C&M OILFIELD RENTALS, LLC/C-MOR ENERGY SERVICES, LLC WITH THE WRITTEN PERMISSION OF JCA COMPANIES, JCA RENTALS, LLC/C&M OILFIELD RENTALS, LLC/C-MOR ENERGY SERVICES, LLC.

TECHNICAL INFORMATION SHEET FOR CROWN JEWEL LIGHT SYSTEM

INTENDED USE

The C-MOR Crown Jewel system is designed to be installed on the crown handrails of most drilling rigs

SPECIFICATIONS:

- Designed to mount to undamaged guardrails which meet OSHA 1910.29(b)(1)
- Engineered mount system (RADesign 1085035) meets API 4F 4th Edition land-based wind loads (180' @ 90 mph)
- 600 W LED instant start lights
- Dropped object report RADTM-18-1001-01
- Light and junction box retention nets: Dropsafe 7500185
- Rig light safety cables: Kennedy 250 LBS WLL
- Mount system weight: 21 lbs/ light
- Light and bracket assembly weight: 32 lbs/ light
- Junction box weight: 33 lbs/ rig
- Appleton Locking connectors + cable 3.2 lbs/ light
- Complete individual light/mount/cable weight 57 lbs.
- Typical 8 light Crown Jewel full installation: 489 lbs



Description

The FL series is a compact LED fixture designed for high performance sport lighting applications. Compare the FL500 to 1500 WATTS metal halide.

Certification

CONFIDENTIAL AND PROPRIETARY

PATENT PENDING

ETL / DLC



Specifications

Part No.:	FL600
Wattage:	600 W
Efficacy:	150 LM/W
Lumens:	120,500 LM
Input Voltage:	100-277 V
Power Factor:	.92
CCT:	5000K
CRI:	80+
IP Rating:	IP66
Dimensions:	15.7" x 15.7" x 10"
Weight:	38 lbs. 17.2 kg
Lifespan:	80,000 L70 Hours
EPA Rating	1.2 ft ²
Standard Colors:	Black



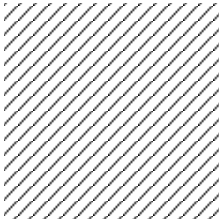
C-MOR™
ENERGY SERVICES

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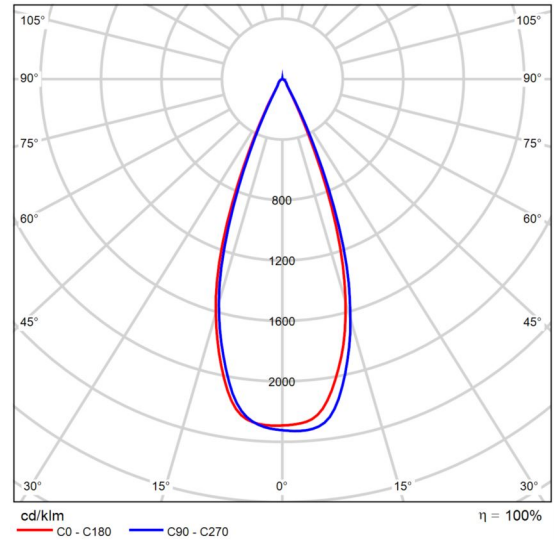
300 x 300 ft Area With 500W GEN IV 8 Pcs

Product data sheet

LED LIGHTING DYNAMO 3 STADIUM FLOOD LIGHT 600W



P	600.0 W
Φ_{Lamp}	96000 lm
$\Phi_{Luminaire}$	95951 lm
η	99.95 %
Luminous efficacy	159.9 lm/W
CCT	5000 K
CRI	100

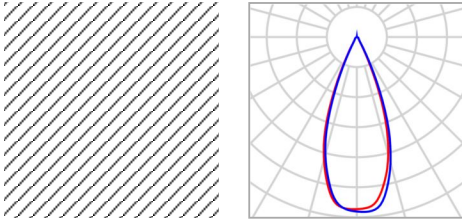


Polar LDC

300 x 300 ft Area With 500W GEN IV 8 Pcs

Site 1

Luminaire layout plan



Manufacturer	LED LIGHTING
Article name	DYNAMO 3 STADIUM FLOOD LIGHT 600W

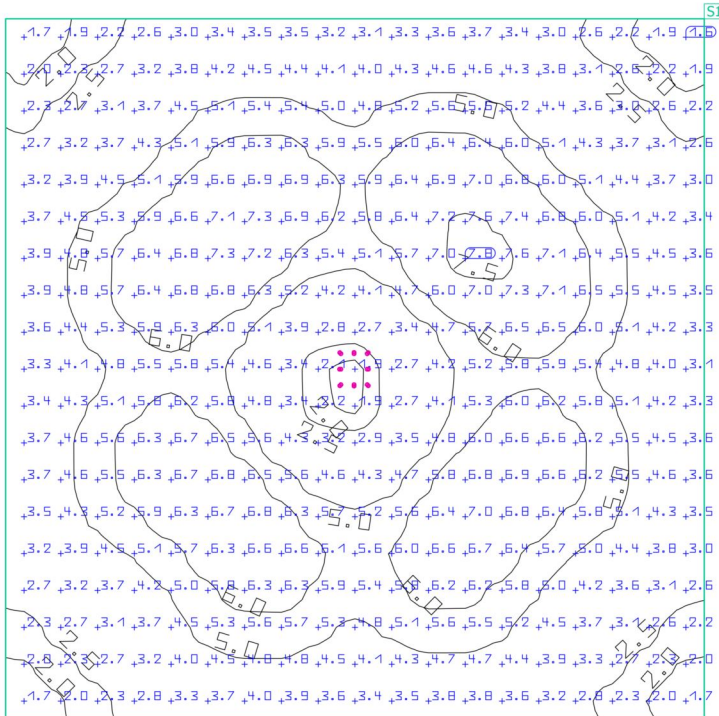
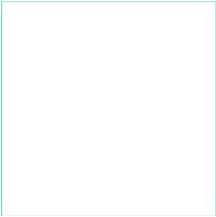
Individual luminaires

X	Y	Mounting height	Luminaire
133.270 ft	-131.361 ft	180.400 ft	1
144.270 ft	-131.361 ft	180.400 ft	2
133.270 ft	-144.361 ft	180.400 ft	3
144.270 ft	-144.361 ft	180.400 ft	4
133.270 ft	-137.861 ft	180.400 ft	5
138.770 ft	-131.361 ft	180.400 ft	6
144.270 ft	-137.861 ft	180.400 ft	7
138.770 ft	-144.361 ft	180.400 ft	8

300 x 300 ft Area With 500W GEN IV 8 Pcs

Site 1

Calculation surface 1



Properties	\bar{E}	E_{min}	E_{max}	\bar{E}/E_{min}	E_{max}/E_{min}	Index
Calculation surface 1 Perpendicular illuminance Height: 1.000 ft	4.70 fc	1.61 fc	7.78 fc	2.92	4.83	S1

Utilisation profile: DIALux preset, Default (Drive Aisles/Parking Areas)

ENGINE

- Mitsubishi® L3E- liquid cooled, diesel engine; Final Tier 4
 - Standby - 12.2 hp @ 1800 rpm
 - Prime - 10.5 hp @ 1800 rpm
 - 3 cylinder
 - 0.95 L displacement
- Polyethylene Fuel Tank:
 - Fuel Type: Diesel
 - Fuel Capacity: 39.9 gal (151.04 L)
 - External 3.5 in. (89 mm) fill port
- Fuel Consumption:
 - Full Load: 0.59 gph (2.24 Lph)*
 - Lights Only: 0.43 gph (1.62 Lph)*
 - Maximum Runtime (Lights Only): 93 hours*
- Cooling system capable of operating at 120°F (49°C) ambient
- 750-hour** service interval
- Full flow filter, spin on type
- Dry type cartridge air filter
- 60 Hz engine/generator
- Wind Rating: 65 mph (105 kph)



**Results based on engine manufacturer and field test data after 100-hour engine break-in period and may vary based on factors including age and maintenance of equipment, environmental conditions and fuel density. Consult the Owner's Manual for fuel and maintenance recommendations.*

***To achieve maximum service interval, replacement of oil filter after 50-hour break-in period is required. Consult Owner's Manual for required oil filter model number.*

GENERATOR

- Marathon Electric®, Brushless
- Up to 6kW power output
- 120/240 VAC – 50/25A
- +/-6% capacitor voltage regulation

ENGINE CONTROLS

- External, illuminated control panel with sealed switches
- Four position keyed switch – (off, run, glow start)
- Digital hour meter
- Automatic low oil pressure/high temperature shutdown system

ELECTRICAL SYSTEM

- 30A start trip breaker (assures no load condition exists before starting)
- Individual floodlight circuits with sealed 15A breakers
- Standard individually breakered convenience outlets:
 - (1) 120 VAC 20 Amp GFCI duplex outlet (NEMA 5-20R type)
 - (1) 240 VAC 30 Amp twist lock outlet (NEMA L6-30R type)
- Wiring is sized and fused to the amperage draw required
- 440CCA wet cell battery

FLOODLIGHTS

- Four (4) 1,100 watt metal halide
 - 132,000 bare bulb lumens each
 - 70,356 fixture lumens each
 - Total bare bulb lumens (x4): 528,000
 - Total fixture lumens (x4): 281,424
- Coverage @ 0.5 ft-c: 31,863 ft² (2,960 m²)
- Efficiency: 120 lumens per watt
- Oval aluminum reflector
- Tempered glass lens
- Silicone gaskets for moisture and dust protection
- Friction disc mounting for tool less positioning
- Individual floodlight On/Off switches

MAST

- Vertical mast; 23 ft. (7 m), 5-section with ground adjustable light fixtures
- Dual handle manual winch for ease of deployment; electric winch optional
- Distinctive angle fixture mount for common light distribution
- 359° ground rotational mast with mast fully extended
- Industrial black powder coat finish with polymer guides

ENCLOSURE

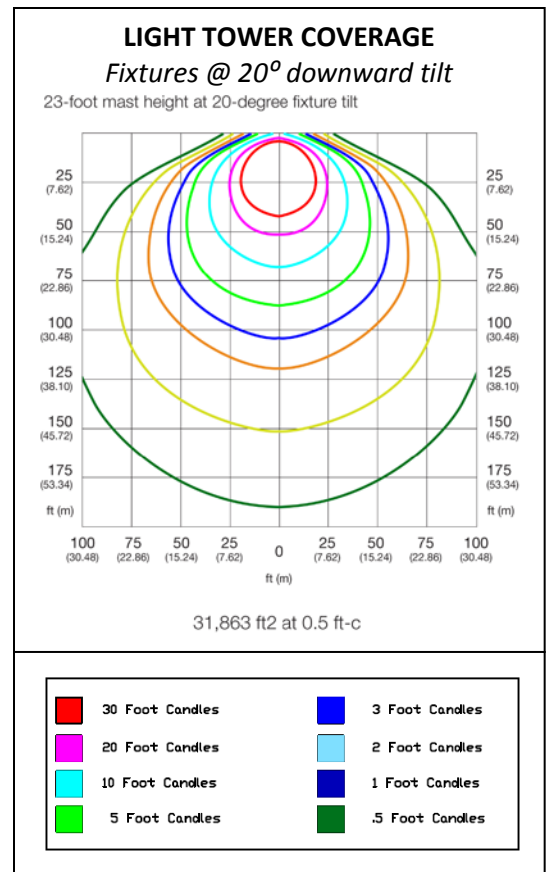
- Injection-molded hood enclosure with UV protected colorant
- Flip hood engine compartment for ease of service
- Multi-lingual operating/safety decals
- License plate holder with light
- Manual holder with operating manual
- 68 dB(A) at 23 ft. (7 m) – prime power

TRAILER

- Tubular steel frame
- (3) 1200 lb. (544 kg) tube and sleeve leveling jacks
- All jacks transport and lock in position for storage
- Side outriggers deployed – 10 in. (25.4 cm) span
- 7800 lb. (3538 kg) safety chains with spring loaded safety hooks
- 2 in. (50.8 mm) ball hitch
- Molded polyethylene fenders
- DOT-approved LED tail, side, brake, and directional lights
- 2200 lb. (907 kg) leaf spring axle
- ST175/80D13 – 6 ply
- 47 in. (119.4 cm) track width

WEIGHT & DIMENSIONS

- Dry weight: 1290 lbs. (585 kg)
- Operating weight: 1560 lbs. (708 kg)
- Mast stowed: 118 x 57 x 101 in (3 x 1.45 x 2.6 m)



WARRANTY

1 Year, Unlimited Hours / 2 Years, 2000 Hours

CERTIFICATIONS

CSA Approved / Listed

OPTIONS

Contact sales representative or factory for a list of current available options.

For more information, consult the Owner's Manual at <http://www.generacmobileproducts.com/resources-tools/manuals>

LAS45S-T4.ies

COOPER LIGHTING SOLUTIONS - LUMARK (FORMERLY EATON)

LAS45S-T4

AREA SITE SMALL HOUSING, TYPE IV

Single (Arm)


Luminaire Watts 153 W

Ballast/Driver Factor 1.00

Light Loss Factor 1.00

Total Proration Factor 1.00

Luminaire Lumens 19720 lms

 25 ft

Min: 0.50 fc ✕
Max/Avg: 3.6

Avg: 1.6 fc
Avg/Min: 3.2

Max: 5.7 fc +
Max/Min: 11

Eaton FMVA-13-76-DG-UNV1-M2

Catalog Number: FMVA-13-76-DG-UNV1-M2

Eaton Crouse-Hinds series Champ FMVA LED floodlight, 0.91 - 0.32A, Cool white, 3/4" entry, Diffused glass lens, 13000 lumens, 154 lm/W, Die cast aluminum, Yoke mount, 7x6 optics, Gray epoxy powder coat, 100-277 Vac, 90W

General specifications



Product Name

Eaton Crouse-Hinds series Champ
FMVA LED floodlight

Catalog Number

FMVA-13-76-DG-UNV1-M2

UPC

662277148801

Product Length/Depth

16.12 in

Product Height

14.94 in

Product Width

9.94 in

Product Weight

24.95 lb

Certifications and compliances

Area classification

Hazardous/Classified Locations

Standards type

NEC/CEC

NEC hazardous rating

Class I, Division 2

Class II, Division 2

NEMA Rating

4X

Ingress protection (IP) ratings

IP67

Product specifications

Lamp type

LED

Lumens

13000

Lumens per watt

154

Color temperature

Cool white

Mounting Method

Yoke

Voltage rating

100-277 Vac

Frequency rating

50/60 Hz

Optical distribution

7x6

Entry size

3/4"

Lens material

Diffused glass

Wattage

90W

Power factor

> 0.90

Amperage Rating

0.91 - 0.32A

Material

Die cast aluminum

Special features

Gray epoxy powder coat

Resources

3D models

[SP3D Design Package - Champ FMVA LED Hazardous Area Floodlights](#)

Brochures

[Crouse-Hinds series Champ FMVA LED Floodlights - 9,000 to 15,000 lumens brochure](#)

Catalogs

[Crouse-Hinds series Champ FMVA LED Floodlights - 9,000 to 15,000 lumens catalog page](#)

Installation instructions

[IF 1956 - Champ FMVA M2 9L-15L LED Luminaire](#)

Specifications and datasheets

[Crouse-Hinds series FMVA LED Floodlights IES photometric files](#)



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