GMT EXPLORATION COMPANY, LLC
IRWIN-TAYLOR PAD PROJECT

LIGHT MITIGATION PLAN

SECTION 23, TOWNSHIP 6 SOUTH, RANGE 65 WEST, 6TH P.M.
ELBERT COUNTY, COLORADO

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I. INTRODUCTION

This light mitigation plan is being prepared for the GMT Exploration Company, LLC's Irwin-Taylor Pad project. The project consists of the development of infrastructure to support the drilling and production of 20 oil and gas wells located in Elbert County.

The purpose of this report is to demonstrate compliance with the various State and Local lighting regulations. This report will predict the light impacts that will occur during the different development phases (Pre-Production and Production) of the project and detail the various lighting mitigation standards and practices that will be used to limit light pollution and conform to the required lighting regulations. The intent of the project's lighting plan is to provide a safely lit workplace environment that protects the surrounding public and wildlife environment.

II. GENERAL LOCATION AND DESCRIPTION

A. LOCATION AND EXISTING CONDITIONS

The Irwin-Taylor Pad is located on a 500-acre parcel of land owned by Jordan Family Limited Partnership in the SE1/4 of Section 23, Township 6 South, Range 65 West, 6th P.M. The site is located approximately 0.9 mile south and 1.9 miles east of the intersection of E Parker Rd and Delbert Rd. The parcel is zoned agricultural-A, and the existing land-use is dry farm agricultural.

B. PROPOSED DEVELOPMENT

The proposed development will include construction of infrastructure to support oil & gas gathering from a proposed well pad. The total combined proposed working pad surface (WPS) will be 8.41-acres (366,200 SF). The Pre-Production Phase will be the initial phase of the project beginning with the pad construction and will remain until all the wells have been drilled and hydraulically stimulated. The Production Phase will be the project's final phase and will include drill-out, flowback, and production activities. Due to the continuous nature of oil and gas operations, many of the pre-production activities mentioned above must be performed during night-time hours.

C. PROPOSED LIGHTING

Proposed lighting to facilitate low-light working conditions will be exterior flood and spot type lighting. During drilling and completions operations, the proposed lighting will be temporary and be provided by portable light towers and lights permanently affixed to equipment (e.g., the drilling rig). The development of the project will require most of the work operations to be performed continuously (7-days a week & 24-hour a day). Proposed lighting will change for each work operation of each phase of the project. The light fixture schedules for the proposed lighting are included below in each work operation section.

Lighting Best Management Practices (see Section V, below) will be used to minimize light pollution during all work operations of the proposed project. All lighting shall conform to Federal, State, and Industry recognized standards for both on-site workplace safety and off-site public and wildlife protection (OSHA, FAA, COGCC, IESNA, and ANSI). Care will be taken to keep lighting levels at the specified levels on the lighting plans while providing safe, well-lit working areas. Care will also be taken to prevent unintended light from leaving the site and becoming a hazard or nuisance to the public or surrounding wildlife habitat.

III. PRE-PRODUCTION PHASE FACILITY LIGHTING PLAN

The Pre-Production Phase will consist of the following work operations: Pad Construction Operations, Drilling Operations, and Hydraulic Stimulation Operations. The state and local governing lighting regulations for this section will be the COGCC's Rule 424, specifically 424.a.(2).A., which also includes Rule 424.c.. Lighting photometric plans for all operations of the Pre-Production Phase should address adequate lighting to ensure on- and off-site safety during work operations while assessing the lighting impacts to the health, safety, and welfare of persons occupying building units within 2,000-feet, motorists on roads within 2,000-feet, and wildlife in high priority habitats within 2,000-feet. During this phase of the project, wall panels (e.g., visual/sound walls) will be placed along the south and west sides of the drilling pad.

A. PAD CONSTRUCTION OPERATIONS

Pad Construction Operations typically consist of structure demolition, equipment haul-off, and grading of the existing well pad to facilitate the development of the new wells. Pad Construction Operations also includes placing necessary utilities to support the wells. It is anticipated that work for this operation will only occur during daylight hours, which is adequate for safely completing Pad Construction Operations. No lighting, permanent or temporary, is planned for Pad Construction Operations.

B. DRILLING OPERATIONS

Drilling Operations consist of bringing a drill rig onto the site and drilling the proposed wells. This work operation will take place continuously (7-days a week & 24-hour a day). Current development plans include utilizing a single drilling rig development scenario during Drilling Operations. Lighting will be temporary and be provided by portable light towers and lights permanently affixed to the drilling rig. A Drilling Operations Photometric Plan and a Drilling Rig Photometric Plan are attached as Appendix A. All proposed lighting for safely completing the Drilling Operations is listed below:

Table 1 – Drilling Operations Lighting Fixture Schedule.

Light Type	Number of Units	Approximate Height, FT (above GE)	Wattage per Unit	Lumens per Unit	Total Lumens
LED Flood Light Tower	6	25	1,400	135,513	813,078
Lights Permanently Affixed to Drill Rig	1	Varying		See Plan	See Plan
				Total Lumens	813,078

**Plus, additional lighting permanently affixed to the drill rig.*

All lighting shall conform to the Lighting Photometric Plans and the Lighting Standards and Best Management Practices (BMPs) section of this report, fixture specification sheet and BUG calculation are included in Appendix F. If deemed necessary, additional light units may be utilized to address safety concerns. Contact a lighting engineer to verify that any additional lighting units and lighting BMPs will remain within the required lighting standards stated in this report.

C. HYDRAULIC STIMULATION OPERATIONS

Hydraulic Stimulation Operations consist of hydraulically fracturing (frac) the proposed wells. This work operation will take place continuously (7-days a week & 24-hour a day). Current development plans include utilizing a single frac crew development scenario during Hydraulic Stimulation Operations. Lighting will be temporary and be provided by portable light towers. A Hydraulic Stimulation Operations Lighting Plan is attached as Appendix

B. All proposed lighting for safely completing the Hydraulic Stimulation Operations is listed below:

Table 2 – Hydraulic Stimulation Operations Lighting Fixture Schedule.

Light Type	Number of Units	Approximate Height, FT (above GE)	Wattage per Unit	Lumens per Unit	Total Lumens
LED Flood Light Tower	6	25	1,400	135,513	813,078
				Total Lumens	813,078

All lighting shall conform to the Lighting Photometric Plans and the Lighting Standards and Best Management Practices (BMPs) section of this report, fixture specification sheet and BUG calculation are included in Appendix F. If deemed necessary, additional light units may be utilized to address safety concerns. Contact a lighting engineer to verify that any additional lighting units and lighting BMPs will remain within the required lighting standards stated in this report.

D. Regulations for Lighting Impacts to Health, Safety, and Welfare

All lighting shall conform to the Lighting Photometric Plans and the Lighting Standards and Best Management Practices (BMPs) section of this report. As shown on the Drilling Operations Photometric Plan, Drilling Rig Photometric Plan, and Hydraulic Stimulation Operations Lighting Plan (Appendix A and Appendix B), lighting levels will be contained within the 100-foot offset of the WPS boundary during all work operations of Pre-Production Phase. As noted, lighting impacts for this phase of the project will be governed by Rule 424 of the COGCC. The following discusses the impacts to the public and surrounding habitat as defined Rule 424.c.(3).:

1. Persons Occupying Building Units within 2,000-feet of the Oil and Gas Facility:
    a. There are two Residential Building Units within 2,000-feet of the Oil and gas Facility. They are approximately 1,954 feet and 1,570 feet to the southwest of the WPS. No impacts are anticipated to the Residential Building Units due to the implemented lighting BMPs and no direct light reaching the Residential Building Units.
2. Motorists on Roads within 2,000-feet of the Oil and Gas Facility:
    a. The Carlson Rd is approximately 2,433 feet to the south of the WPS. No impacts are anticipated to motorists on the road due to the implemented lighting BMPs and no direct light reaching the road.
3. Wildlife occupying any High Priority Habitat within 2,000-feet of the Oil and Gas Facility:
    a. No High Priority Habitat within 2,000 feet of the WPS.

IV. PRODUCTION PHASE FACILITY LIGHTING PLAN

The Production Phase will be the final phase of the project. The Production Phase will consist of the following work operations: Drill-Out and Flowback Operations and Productions Operations. The state and local governing lighting regulations for this section will be the COGCC's Rule 424, specifically 424.a.(2).B., which also includes Rule 424.d.&e.. Lighting photometric plans for all operations of the Production Phase should address adequate lighting to ensure on- and off-site safety during work operations while assessing the lighting impacts to the health, safety, and welfare of persons occupying building units within 2,000-feet, motorists on roads within 2,000-feet, and wildlife in high priority habitats within 2,000-feet. Additionally, lighting photometric plans for all operations of the Production Phase are required to conform to a zoning/land-use maximum permissible light level defined in Rule 424.d. The permissible light level is an overall average of the site's light intensity and is calculated by the

total lumens divided by the total WPS. The site is within an agricultural zoning/land-use, with a maximum permissible light level of 2.5 lumens per square foot (LM/SF). During this phase of the project, wall panels (e.g., visual/sound walls) will be placed along the south and west sides of the drilling pad.

A. Drill-Out and Flowback Operations

Drill-Out and Flowback Operations consist of recovering fluids following Hydraulic Stimulation Operations. Flowback Operations also consist of equipment and material mobilization from the site. The mobilization activities may continue approximately 7 days following the drill-out work. These work operations will take place continuously and simultaneously (7-days a week & 24-hour a day). Lighting will be temporary and be provided by portable light towers. The Drill-Out Operations Photometric Plan is attached as Appendix C. All proposed lighting for safely completing Drill-Out Operations is listed below:

Table 3 – Drill-Out Operations Lighting Fixture Schedule.

Light Type	Number of Units	Approximate Height, FT (above GE)	Wattage per Unit	Lumens per Unit	Total Lumens
LED Flood Light Tower	6	25	1,400	135,513	813,078
				Total Lumens	813,078

All lighting shall conform to the Lighting Photometric Plans and the Lighting Standards and Best Management Practices (BMPs) section of this report, fixture specification sheet and BUG calculation are included in Appendix F. If deemed necessary, additional light units may be utilized to address safety concerns. Contact a lighting engineer to verify that any additional lighting units and lighting BMPs will remain within the required lighting standards stated in this report.

It is expected that the temporary lighting utilized during Drill-Out Operations will not exceed the maximum permissible light level of 2.5 lumens per square foot (LM/SF) of the total WPS. The following is the calculated light levels for the Drill-Out Operations:

Table 4 – Calculated Drill-Out Operations Permissible Light Levels.

Description	Total Lumens	WPS (SF)	Maximum Permissible Light LM/SF	Calculated Permissible Light LM/SF
Drill-Out Temporary Lighting	813,078	366,200	2.5	2.2
			TOTAL LIGHT LEVEL	2.2

The Drill-Out Operations Photometric Plan in Appendix C, shows the calculated light distribution at the site during Drill-Out Operations. With this lighting configuration, this work operation is within the recommended regulatory limits. No direct light is anticipated to leave the 100-foot offset of the WPS.

The Flowback Operations Photometric Plan is attached as Appendix D. All proposed lighting for safely completing Flowback Operations is listed below:

Table 5 – Flowback Operations Lighting Fixture Schedule.

Light Type	Number of Units	Approximate Height, FT (above GE)	Wattage per Unit	Lumens per Unit	Total Lumens
LED Flood Light Tower	2	25	1,400	135,513	271,026
				Total Lumens	271,026

All lighting shall conform to the Lighting Photometric Plans and the Lighting Standards and Best Management Practices (BMPs) section of this report, fixture specification sheet and BUG calculations are included in Appendix F. If deemed necessary, additional light units may be utilized to address safety concerns. Contact a lighting engineer to verify that any additional lighting units and lighting BMPs will remain within the required lighting standards stated in this report.

It is expected that the temporary lighting utilized during Flowback Operations will not exceed the maximum permissible light level of 2.5 lumens per square foot (LM/SF) of the total WPS. The following is the calculated light levels for the Flowback Operations:

Table 6 – Calculated Flowback Operations Permissible Light Levels.

Description	Total Lumens	WPS (SF)	Maximum Permissible Light LM/SF	Calculated Permissible Light LM/SF
Flowback Temporary Lighting	271,026	366,200	2.5	0.7
			TOTAL LIGHT LEVEL	0.7

The Flowback Operations Photometric Plan in Appendix C, shows the calculated light distribution at the site during Flowback Operations. With this lighting configuration, this work operation is within the recommended regulatory limits. No direct light is anticipated to leave the 100-foot offset of the WPS.

B. PRODUCTION OPERATIONS

Production operations consist of the daily gathering of the resources from the wells and maintenance of the permanent production equipment. Lighting will be permanent and will be installed on poles and stanchions. The Production Operations Photometric Plan is attached as Appendix E. All proposed lighting for safely completing Production Operations is listed below:

Table 7 – Production Operations Lighting Fixture Schedule.

Light Type	Number of Units	Approximate Height, FT (above GE)	Wattage per Unit	Lumens per Unit	Total Lumens
LED Flood Light Tower	4	25	450	19,720	78,880
LED Flood Light Tower	2	25	450	19,720	39,440
				Total Lumens	118,320

All lighting shall conform to the Lighting Photometric Plans and the Lighting Standards and Best Management Practices (BMPs) section of this report, fixture specification sheet and BUG calculation are included in Appendix F. If deemed necessary, additional light units may be utilized to address safety concerns. Contact a lighting engineer to verify that any additional lighting units and lighting BMPs will remain within the required lighting standards stated in this report.

It is expected that the permanent lighting utilized during Production Operations will not exceed the maximum permissible light level of 2.5 lumens per square foot (LM/SF) of the total WPS. The following is the calculated light levels for the Production Operations:

Table 8 – Calculated Production Operations Permissible Light Levels.

Description	Total Lumens	WPS (SF)	Maximum Permissible Light LM/SF	Calculated Permissible Light LM/SF
Production Permanent Lighting	118,320	366,200	2.5	0.3
			TOTAL LIGHT LEVEL	0.3

The Production Operations Photometric Plan in Appendix E, shows the calculated light distribution at the site during Production Operations. With this lighting configuration, this work operation is within the recommended regulatory limits. No direct light is anticipated to leave the 100-foot offset of the WPS.

C. Regulations for Lighting Impacts to Health, Safety, and Welfare

All lighting shall conform to the Lighting Photometric Plans and the Lighting Standards and Best Management Practices (BMPs) section of this report. As shown on the Drill-Out Operation Photometric Plan, Flowback Operations Photometric Plan, and Production Operation Plan (Appendix C, Appendix, D, and Appendix E), lighting levels will be contained within the 100-foot offset of the WPS boundary during all work operations of the Production Phase. As noted, lighting impacts for this phase of the project will be governed by Rule 424 of the COGCC. The impacts to the public and surrounding habitat as defined Rule 424.d.(3). :

1. Persons Occupying Building Units within 2,000-feet of the Oil and Gas Facility:
    a. There are two Residential Building Units within 2,000-feet of the Oil and gas Facility. They are approximately 1954 feet and 1570 feet to the southwest of the WPS. No impacts are anticipated to the Residential Building Units due to the implemented lighting BMPs and no direct light reaching the Residential Building Units.
2. Motorists on Roads within 2,000-feet of the Oil and Gas Facility:
    a. The Carlson Rd is approximately 2433 feet to the south of the WPS. No impacts are anticipated to motorists on the road due to the implemented lighting BMPs and no direct light reaching the road.
3. Wildlife occupying any High Priority Habitat within 2,000-feet of the Oil and Gas Facility:
    a. No High Priority Habitat within 2,000 feet of the WPS.

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V. LIGHTING STANDARDS AND BEST MANAGEMENT PRACTICES (BMPS) – RULE 424.b.

The following lighting BMPs will be used to minimize and control light pollution:

- Most work operations will take place 7-days a week & 24-hour a day. Care will be taken to keep lighting levels at the specified levels on the lighting plans while providing safe, well-lit working areas during night-time and other low-light conditions. Care will also be taken to prevent unintended light from leaving the site and becoming a hazard or nuisance to the public or surrounding wildlife habitat.
- During the Pad Construction Operations, no night-time work is anticipated. Daylight work will be performed during this work operation.
- All lighting shall conform to Federal, State, and Industry recognized standards for both on-site workplace safety and off-site public protection (OSHA, FAA, COGCC, IESNA, and ANSI). No direct light, except those governed by FAA standards, shall shine beyond the boundaries of the WPS, especially onto public roads, adjacent properties, and/or high priority habitats. All lighting shall conform with all COGCC, county, municipal, and any applicable governing body's standards.
- Temporary lighting will be 3-head LED flood lights on mobile 25-foot telescoping towers (BUG Rating is B3-U3-G5). All lighting will be capable of adjustment and will be directed inward and between 45-65° downward towards working areas on the WPS. No light should shine above the horizontal plane passing through the center point of the light source. Lights will be shielded with a photometric diffusion fabric or membrane tint to prevent direct or reflected direct light from leaving the site.
- Permanent lighting will be pole and stanchion mounted floodlights (BUG Rating is B3-U0-B3). All lighting will be capable of adjustment and be directed downward.
- Wall panels (e.g., visual/sound walls) during drilling and completion operations will be placed along the south and west sides of the drilling pad and will be removed for production operations. For workplace safety, no direct or reflected direct light shall shine towards the entrance of the WPS.
- Watch for and remove glare and reflection points during all work operations of the project from temporary or permanent structures, temporary lighting, vehicles, construction equipment, and clothing/PPE.
- Any lighting damaged and/or improperly directed or angled will be promptly fixed and/or corrected to conform to the lighting plan.
- Equipment shall be operated and/or orientated and/or shielded in such a manner that lights permanently affixed to equipment do not shine above the horizontal plane passing through the center point of the light source or shine beyond the boundary of the WPS.
- For all work operations, once temporary lighting is in place, a lighting self-audit of the site will be performed to ensure that no unintended light will leave the site and become a hazard or a nuisance.
- For any change to the lighting during any work operations, a lighting self-audit of the site will be performed to ensure that no unintended light will leave the site and become a hazard or a nuisance.
- For non-working or shut-down days where no personnel are on-site or in working areas, non-essential temporary lighting will be turned off. If no personnel are on-site and essential temporary lighting is needed, the essential temporary lighting will be inspected every 24 hours.
- All redundant, unused, or not-needed lights will be turned off.
- Any additional light units used to address workplace safety concerns that are not shown on the lighting photometric plans will be verified by a lighting engineer to ensure that the modified lighting will remain within the required lighting standards stated in this report.
- Where safely applicable, the following are suggestions to aid in controlling and minimizing the site's lighting levels:
    - Using automation, timers, or motion sensors
    - Using or changing fixtures to full cut-off lighting fixtures to shield and direct light
    - Using or changing to lighting colors that reduce light intensity
    - Adjusting or adding additional light shields such as photometric diffusion fabric or tinted membranes
    - Adjusting or adding additional temporary wall panels (e.g., visual/sound walls)

VI. PRE-PRODUCTION PHASE FACILITY LIGHTING – 424.c.

Pre-Production Phase facility lighting will be temporary exterior lighting. To ensure the safety of all persons on- and off-site and to wildlife and their habitats, all lighting shall conform to the Lighting Photometric Plans, the Lighting Standards and the Best Management Practices (BMPs) section of this report.

The requirements of this section have already been incorporated in this report in Section III, above. Please refer to that section for the governing rules concerning safety and lighting impacts for this phase of the project.

VII. PRODUCTION PHASE FACILITY LIGHTING WHEN PERSONNEL ARE ON-SITE AND NOT ON-SITE – 424.d.& e.

To ensure the safety of all persons on- and off-site and to wildlife and their habitats, all lighting shall conform to the Lighting Photometric Plans, the Lighting Standards and the Best Management Practices (BMPs) section of this report which discusses BMPs when personnel are both on-site and off-site.

For Drill-Out and Flowback Operations, lighting will be temporary and be provided by portable light towers and lights permanently affixed to construction and maintenance equipment. All temporary lighting shall conform to the Lighting Photometric Plans, the Lighting Standards and the Best Management Practices (BMPs) section of this report. For Production Operations, lighting will be permanent and provided by pole and stanchion mounted lights. All permanent lighting shall confirm to the Lighting Photometric Plans and the Lighting Standards and Best Management Practices (BMPs) section of this report.

The requirements of this section have already been incorporated in this report in Section IV and Section V, above. Please refer to those sections for the governing rules concerning lighting BMPs, safety, and lighting impacts for this phase of the project.

VIII. CUMULATIVE IMPACTS – 424.f.

No cumulate impacts according to COGCC's Rule 424.f. are anticipated due to the implemented lighting BMPs and no direct light reaching a building unit within 1-mile. The lighting plan for this project was developed so that the cumulative impact of the proposed lighting will conform to the required 4 lux at any residential building unit or high occupancy building unit within 1-mile of the site, measured at 5.5 feet above grade in a direct line of sight to the brightest light fixture on-site (Rule 424). For further reference, additional lighting levels at various points of interest around and from the WPS have been provided for each work operation below. Proposed lighting for this project will be contained within the 100-foot offset of the WPS boundary.

Light intensity calculations shown on the lighting plans are in foot-candles, which is defined as one lumen per square foot (LM/SF). Light intensity levels vary across the site and are dependent on the height, location, and brightness of the light source. Light intensity levels are affected by the relative position and reflexibility of objects and/or surfaces on the site. Foot-candles can be converted to lux (LM/SM) by using the following conversion: 1 Fc = 10.8 lux.

A. PAD CONSTRUCTION OPERATIONS

No lighting, permanent or temporary, is planned for Pad Construction Operations, so there will be no light intensity calculations.

B. DRILLING OPERATIONS

Based upon the light intensity calculations shown on the Drilling Operations Photometric Plan in Appendix A, the maximum foot-candle (Fc) observed within the WPS during Drilling Operations will be located directly beneath the temporary portable light tower on the middle-east side, between the proposed rows of wells, calculated as 51.1 Fc. The maximum foot-candle at the entrance of the WPS is calculated at 0.0 Fc. The maximum foot-candle at the edge of the WPS will be located on the middle-east edge of the WPS, calculated as 0.4 Fc. The maximum foot-candle at the 100-foot offset of the WPS boundary will be 0.0 Fc. The maximum foot-candle at public roads within 1-mile of the WPS boundary will be 0.0 Fc. The maximum foot-candle at building units within 1-mile of the WPS boundary will be 0.0 Fc. The following is a summary of the calculated and required light intensity levels:

Table 9 – Drilling Operations Calculated Maximum Light Intensity at Points of Interest.

Point of Interest	Foot-Candle	Lux	Required
Within the WPS	51.1	551.9	N/A
At the Entrance of the WPS	0.0	0.0	N/A
At the Edge of the WPS	0.4	4.3	N/A
100-foot offset of the WPS boundary	0.0	0.0	N/A
Public Roads within 1-Mile of the WPS	0.0	0.0	N/A
Building Units within 1-Mile of the WPS	0.0	0.0	4 Lux

C. HYDRAULIC STIMULATION OPERATIONS

Based upon the light intensity calculations shown on the Hydraulic Stimulation Operations Photometric Plan in Appendix B, the maximum foot-candle (Fc) observed within the WPS during Hydraulic Stimulation Operations will be located directly beneath the temporary portable light tower on the middle-south side of the proposed south row of wells, calculated as 60.9 Fc. The maximum foot-candle at the entrance of the WPS is calculated at 0.0 Fc. The maximum foot-candle at the edge of the WPS will be located on the middle-east edge of the WPS, calculated as 0.1 Fc. The maximum foot-candle at the 100-foot offset of the WPS boundary will be 0.0 Fc. The maximum foot-candle at public roads within 1-mile of the WPS boundary will be 0.0 Fc. The maximum foot-candle at building units within 1-mile of the WPS boundary will be 0.0 Fc. The following is a summary of the calculated and required light intensity levels:

Table 10 – Hydraulic Stimulation Operations Calculated Maximum Light Intensity at Points of Interest.

Point of Interest	Foot-Candle	Lux	Required
Within the WPS	60.9	657.7	N/A
At the Entrance of the WPS	0.0	0.0	N/A
At the Edge of the WPS	0.1	1.1	N/A
100-foot offset of the WPS boundary	0.0	0.0	N/A
Public Roads within 1-Mile of the WPS	0.0	0.0	N/A
Building Units within 1-Mile of the WPS	0.0	0.0	4 Lux

D. Drill-Out Operations

Based upon the light intensity calculations shown on the Drill-out Operations Photometric Plan in Appendix C, the maximum foot-candle (Fc) observed within the WPS during drill-out operations will be located directly beneath the temporary portable light tower on the east side of the proposed south row of wells, calculated as 42.4 Fc. The maximum foot-candle at the entrance of the WPS is calculated at 0.0 Fc. The maximum foot-candle at the edge of the WPS will be located on the northwest edge of the drilling pad, calculated as 9.0 Fc. The maximum foot-candle at the 100-foot offset of the WPS boundary will be 0.0 Fc. The maximum foot-candle at public roads within 1-mile of the WPS boundary will be 0.0 Fc. The maximum foot-candle at building units within 1-mile of the WPS boundary will be 0.0 Fc. The following is a summary of the calculated and required light intensity levels:

Table 11 – Drill-Out Operations Calculated Maximum Light Intensity at Points of Interest.

Point of Interest	Foot-Candle	Lux	Required
Within the WPS	42.4	457.9	N/A
At the Entrance of the WPS	0.0	0.0	N/A
At the Edge of the WPS	9.0	97.2	N/A
100-foot offset of the WPS boundary	0.0	0.0	N/A
Public Roads within 1-Mile of the WPS	0.0	0.0	N/A
Building Units within 1-Mile of the WPS	0.0	0.0	4 Lux

E. Flowback Operations

Based upon the light intensity calculations shown on the Flowback Operations Photometric Plan in Appendix D, the maximum foot-candle (Fc) observed within the WPS during flowback operations will be located directly beneath the temporary portable light tower on the middle-west side, between the proposed rows of wells, calculated as 28.9 Fc. The maximum foot-candle at the entrance of the WPS is calculated at 0.0 Fc. The maximum foot-candle at the edge of the WPS will be located on the northwest edge of the drilling pad, calculated as 6.7 Fc. The maximum foot-candle at the 100-foot offset of the WPS boundary will be 0.0 Fc. The maximum foot-candle at public roads within 1-mile of the WPS boundary will be 0.0 Fc. The maximum foot-candle at building units within 1-mile of the WPS boundary will be 0.0 Fc. The following is a summary of the calculated and required light intensity levels:

Table 12 – Flowback Operations Calculated Maximum Light Intensity at Points of Interest.

Point of Interest	Foot-Candle	Lux	Required
Within the WPS	28.9	312.1	N/A
At the Entrance of the WPS	0.0	0.0	N/A
At the Edge of the WPS	6.7	72.4	N/A
100-foot offset of the WPS boundary	0.0	0.0	N/A
Public Roads within 1-Mile of the WPS	0.0	0.0	N/A
Building Units within 1-Mile of the WPS	0.0	0.0	4 Lux

F. Production Operations

Based upon the light intensity calculations shown on the Production Operations Photometric Plan in Appendix E, the maximum foot-candle (Fc) observed within the WPS during production operations will be located directly beneath the middle permanent light tower on the north side of the proposed production pad, calculated as 5.5 Fc. The maximum foot-candle at the entrance of the WPS is calculated at 0.0 Fc. The maximum foot-candle at the edge of the WPS will be located on the northwest edge of the WPS, calculated as 0.3 Fc. The maximum

foot-candle at the 100-foot offset of the WPS boundary will be 0.0 Fc. The maximum foot-candle at public roads within 1-mile of the WPS boundary will be 0.0 Fc. The maximum foot-candle at building units within 1-mile of the WPS boundary will be 0.0 Fc. The following is a summary of the calculated and required light intensity levels:

Table 13 – Production Operations Calculated Maximum Light Intensity at Points of Interest.

Point of Interest	Foot-Candle	Lux	Required
Within the WPS	5.5	59.4	N/A
At the Entrance of the WPS	0.0	0.0	N/A
At the Edge of the WPS	0.3	3.2	N/A
100-foot offset of the WPS boundary	0.0	0.0	N/A
Public Roads within 1-Mile of the WPS	0.0	0.0	N/A
Building Units within 1-Mile of the WPS	0.0	0.0	4 Lux

IX. CONCLUSION

This report was prepared in compliance with State and Local lighting regulations, specifically COGCC's Rule 424. The proposed lighting configurations, as shown on the Lighting Photometric Plans for the Irwin-Taylor Pad project, conforms with the State and Local lighting regulations requirements. To ensure the safety of all persons on- and off-site and to wildlife and their habitats, all lighting shall conform to the Lighting Photometric Plans and the Lighting Standards and Best Management Practices (BMP section of this report.

X. APPENDIX

APPENDIX A – DRILLING OPERATIONS LIGHTING PLAN

N

1" = 100'

Project Disturbance Boundary

Edge of Pad

PRODUCTION PAD

Iso-Footcandle

DRILLING PAD

100' Edge of Pad Offset

DRILLING RIG

100'

Well (Typ.)

Mobile Lighting Tower (Typ)

Sound / Visual Wall

MLVT PAD

PROPOSED ACCESS ROAD

TYPICAL MOBILE TOWER LIGHTING

NOTES:

1. MEASURED LIGHT INTENSITY LEVEL WITH RESPECT TO WORK AREAS, OUTDOOR SPACES, AND UNATTENDED EQUIPMENT AREAS. ILLUMINANCE UNITS IS GIVEN IN Fc [1 fc = 10.8 Lux].
   MAXIMUM = 51.1 Fc
   MINIMUM = 0.0 Fc
2. LIGHTING LEVELS SHOWN ON THIS PLAN ARE IN ADDITION TO LEVELS ON THE DRILLING RIG. DIRECT LIGHTING FROM DRILLING OPERATIONS WILL BE CONFINED WITHIN THE 100 FT EDGE OF PAD OFF-SET BOUNDARY.
3. DRILLING RIG LIGHTING WILL BE PRESENT ONLY DURING THE DRILLING PHASE.
4. TOTAL PAD AREA = ± 8.41 ACRES

1 DRILLING PAD SITE LIGHTING PHOTOMETRIC PLAN

SCALE: 1" = 100'

LIGHTING FIXTURE SCHEDULE

SYMBOL	LIGHT UNIT DESCRIPTION	BUG RATING	MOUNTING INFO	VOLTS	LAMP QUANTITY	LUMENS / LAMP	UNITS QUANTITY	LUMENS / UNIT	TOTAL LUMENS
	3 HEAD LED FLOOD LIGHTS, MOBILE TELESCOPING TOWER	B3-U3-G5	25' TOWER	120	3	45,171	6	135,513	813,078

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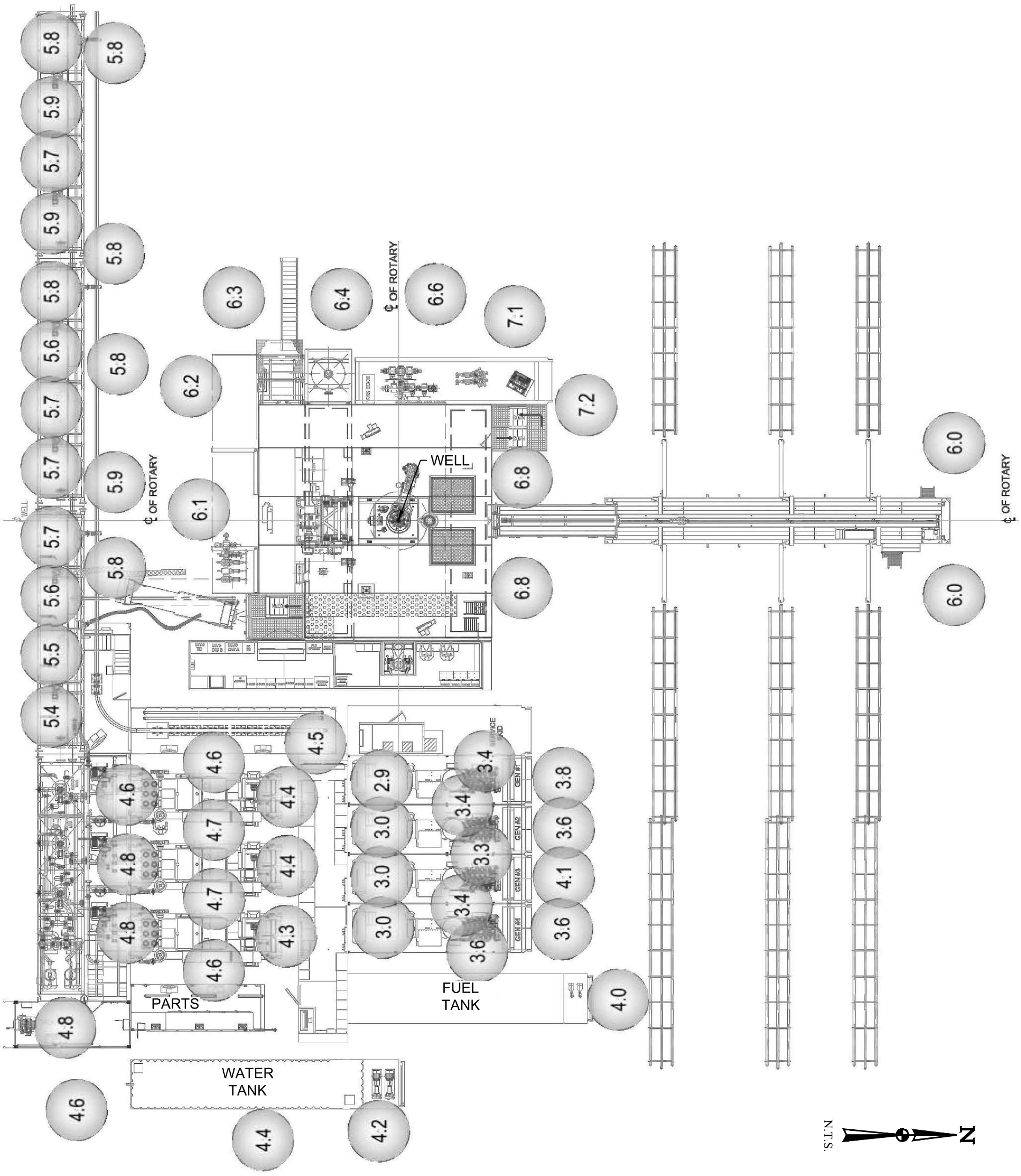
UELS, LLC
Corporate Office * 85 South 200 East
Vernal, UT 84078 * (435) 789-1017

GMT EXPLORATION COMPANY LLC

IRWIN-TAYLOR PAD
SE 1/4 SE 1/4, SECTION 23, T6S, R65W, 6th P.M.
ELBERT COUNTY, COLORADO

SCALE: AS NOTED	DRAWN BY: C.C.	DATE DRAWN: 03-04-22
UELS FILE NO.: G - 1 6 7 9	REVISED:	

DRILLING OPERATIONS PHOTOMETRIC PLAN



2 DRILLING RIG SITE LIGHTING PHOTOMETRIC PLAN

SCALE: NO SCALE

NOTES:

1. MEASURED LIGHT INTENSITY LEVEL WITH RESPECT TO WORK AREAS, OUTDOOR SPACES, AND UNATTENDED EQUIPMENT AREAS. ILLUMINANCE UNITS IS GIVEN IN Fc [1 fc = 10.8 Lux].
   MAXIMUM = 9.1
   MINIMUM = 2.9

2. LIGHTING LEVELS SHOWN ON THIS PLAN ARE IN ADDITION TO LEVELS ON THE DRILLING PAD SITE. DIRECT LIGHTING FROM DRILLING OPERATIONS WILL BE CONFINED WITHIN THE 100 FT EDGE OF PAD OFF-SET BOUNDARY.

3. DRILLING RIG LIGHTING WILL BE PRESENT ONLY DURING THE DRILLING PHASE.

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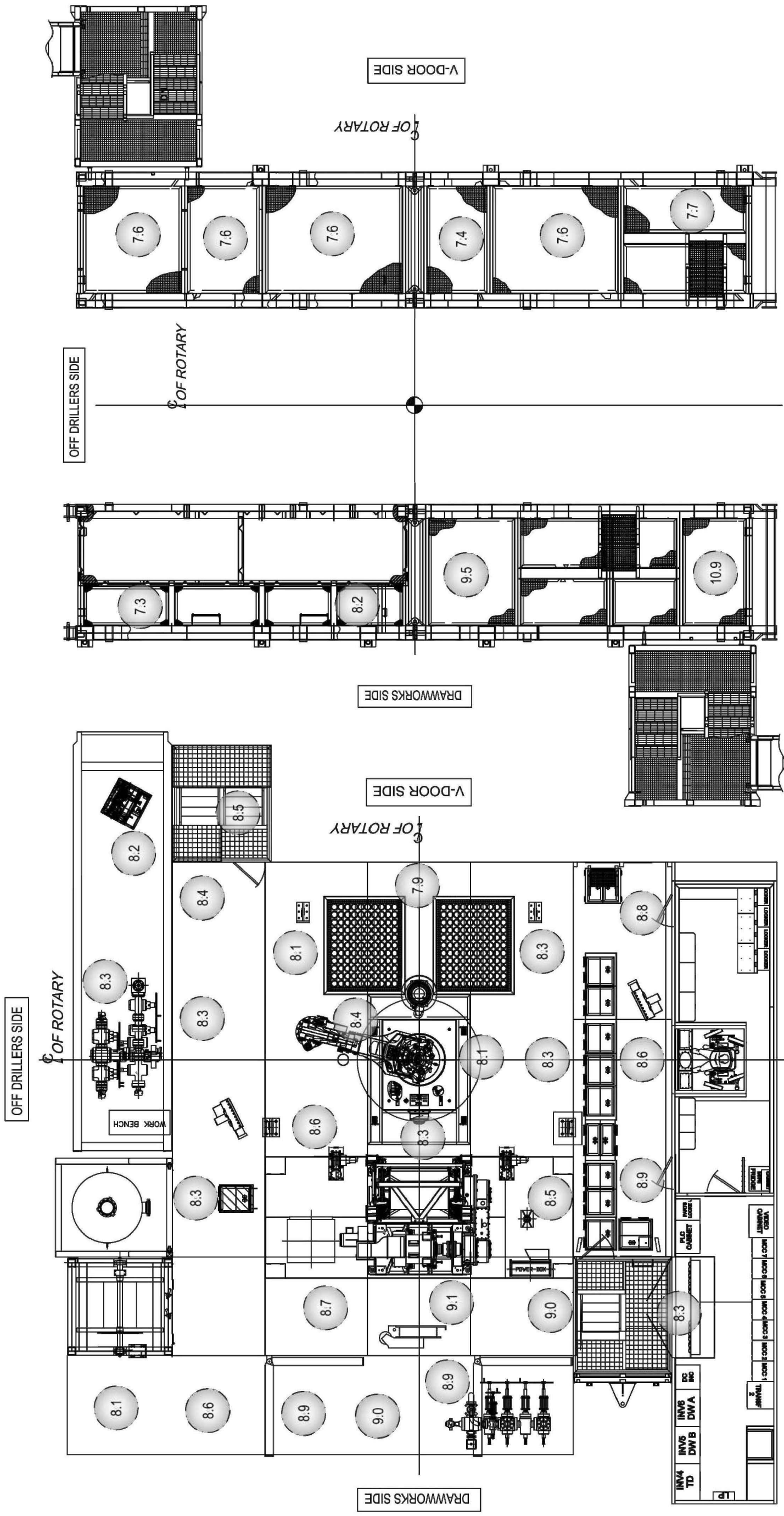
UELS FILE NO.: G - 1 6 7 9	REVISED:	

DRILLING OPERATIONS RIG PHOTOMETRIC PLAN



PLAN VIEW @ MIDDLE SUBSTRUCTURE BOX

PLAN VIEW @ DRILLFLOOR

DRILLING RIG LIGHTING PHOTOMETRIC PLAN

3 SCALE: NO SCALE

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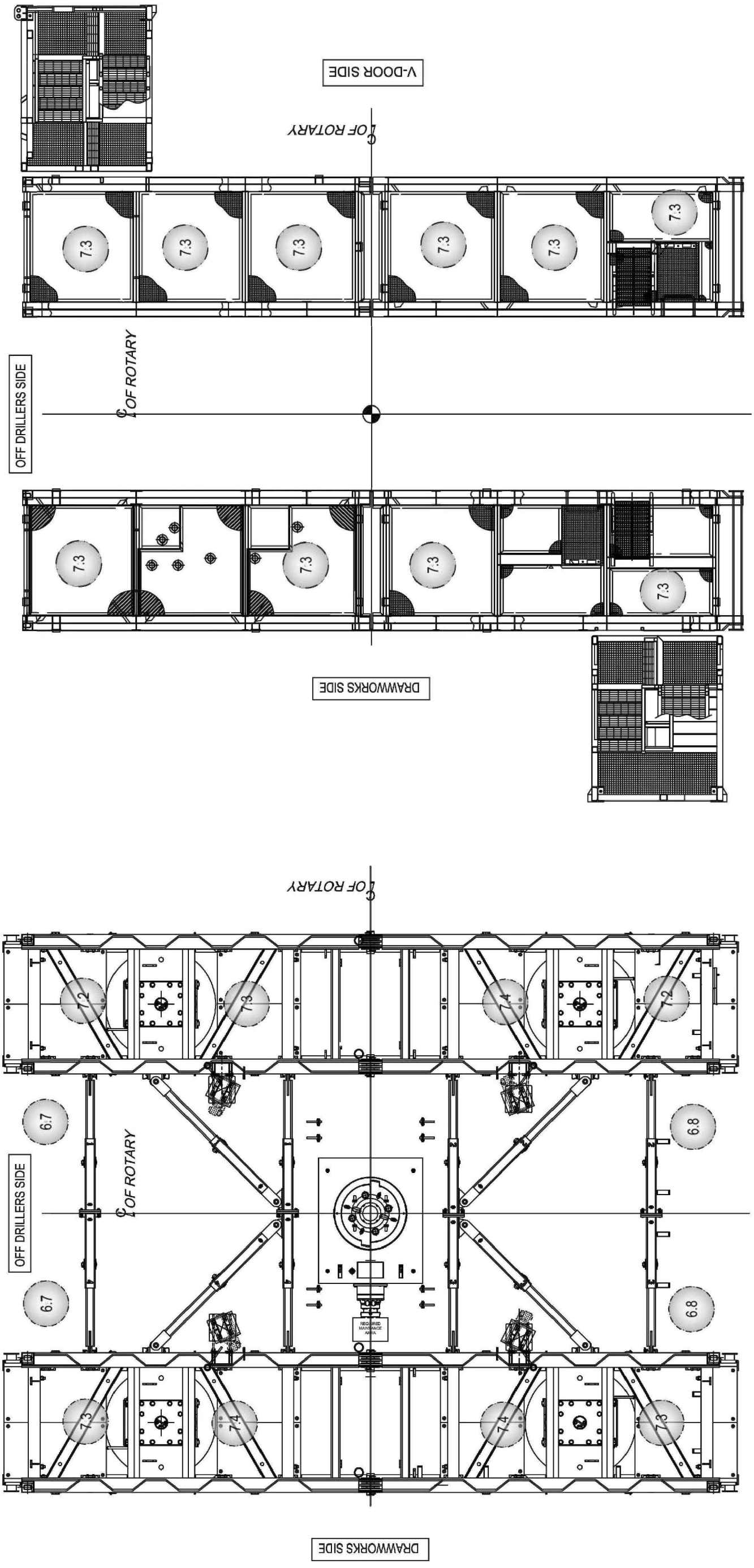
UELS FILE NO.: G - 1 6 7 9	REVISED:	

DRILLING OPERATIONS RIG PHOTOMETRIC PLAN



PLAN VIEW @ TOP
SUBSTRUCTURE BOX

PLAN VIEW @ BOTTOM
SUBSTRUCTURE BOX

4 DRILLING RIG LIGHTING PHOTOMETRIC PLAN

SCALE: NO SCALE

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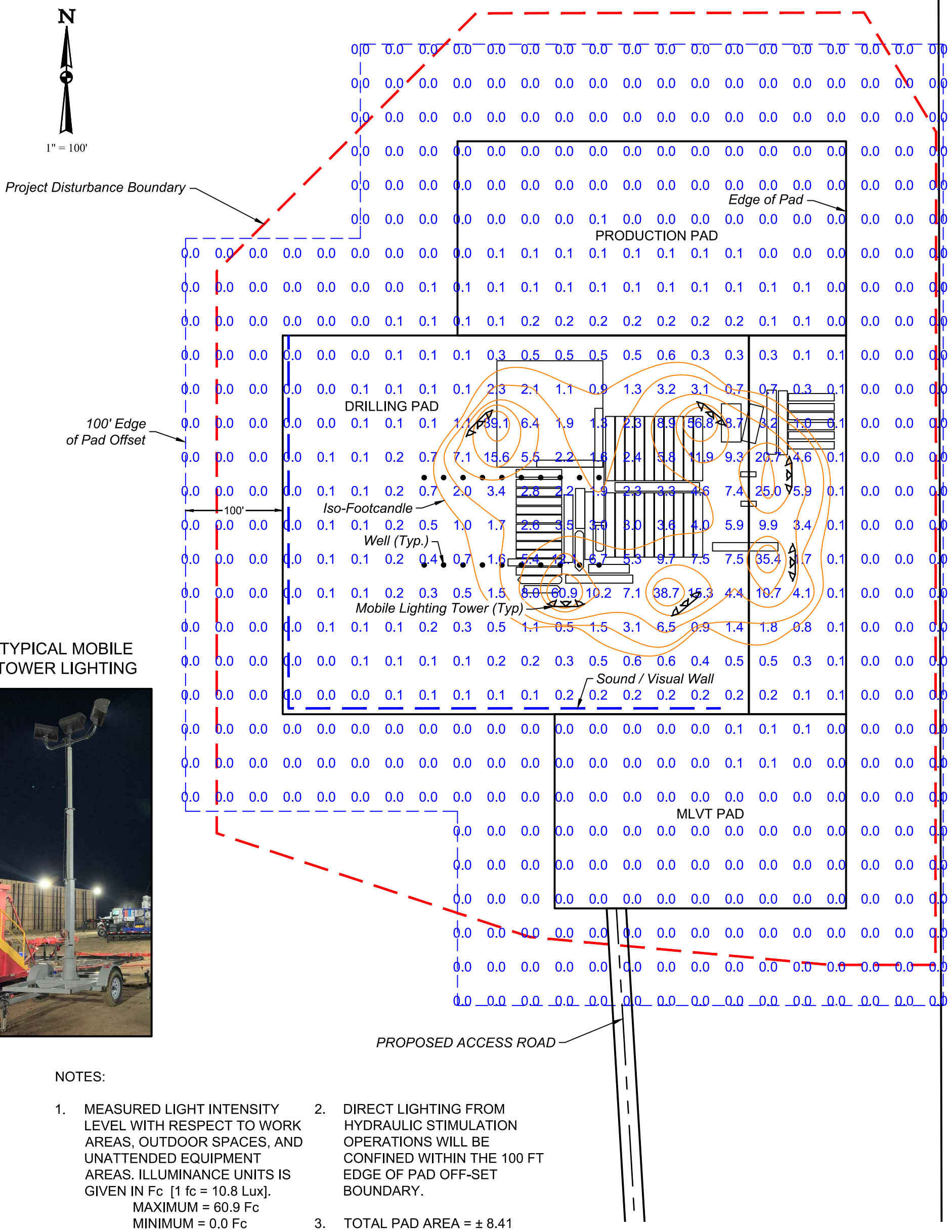
DRILLING OPERATIONS RIG PHOTOMETRIC PLAN

APPENDIX B – HYDRAULIC STIMULATION OPERATIONS LIGHTING PLAN



TYPICAL MOBILE TOWER LIGHTING

NOTES:

1. MEASURED LIGHT INTENSITY LEVEL WITH RESPECT TO WORK AREAS, OUTDOOR SPACES, AND UNATTENDED EQUIPMENT AREAS. ILLUMINANCE UNITS IS GIVEN IN Fc [1 fc = 10.8 Lux].
   MAXIMUM = 60.9 Fc
   MINIMUM = 0.0 Fc
2. DIRECT LIGHTING FROM HYDRAULIC STIMULATION OPERATIONS WILL BE CONFINED WITHIN THE 100 FT EDGE OF PAD OFF-SET BOUNDARY.
3. TOTAL PAD AREA = ± 8.41 ACRES

1 HYDROLIC STIMULATION SITE LIGHTING PHOTOMETRIC PLAN

SCALE: 1" = 100'

LIGHTING FIXTURE SCHEDULE

SYMBOL	LIGHT UNIT DESCRIPTION	BUG RATING	MOUNTING INFO	VOLTS	LAMP QUANTITY	LUMENS / LAMP	UNITS QUANTITY	LUMENS / UNIT	TOTAL LUMENS
◁▽▷	3 HEAD LED FLOOD LIGHTS, MOBILE TELESCOPING TOWER	B3-U3-G5	25' TOWER	120	3	45,171	6	135,513	813,078

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HYDRAULIC STIMULATION OPERATIONS PHOTOMETRIC PLAN

APPENDIX C – DRILL-OUT OPERATIONS PHOTOMETRIC PLAN

N

1" = 100'

Project Disturbance Boundary

Edge of Pad

PRODUCTION PAD

Iso-Footcandle

DRILLING PAD

100' Edge of Pad Offset

100'

Well (Typ.)

Mobile Lighting Tower (Typ)

Sound / Visual Wall

MLVT PAD

PROPOSED ACCESS ROAD

TYPICAL MOBILE TOWER LIGHTING

NOTES:

1. MEASURED LIGHT INTENSITY LEVEL WITH RESPECT TO WORK AREAS, OUTDOOR SPACES, AND UNATTENDED EQUIPMENT AREAS. ILLUMINANCE UNITS IS GIVEN IN Fc [1 fc = 10.8 Lux].
   MAXIMUM = 42.4 Fc
   MINIMUM = 0.0 Fc
2. DIRECT LIGHTING FROM DRILL-OUT OPERATIONS WILL BE CONFINED WITHIN THE 100 FT EDGE OF PAD OFF-SET BOUNDARY.
3. TOTAL PAD AREA = ± 8.41 ACRES

1 DRILL-OUT PAD SITE LIGHTING PHOTOMETRIC PLAN

SCALE: 1" = 100'

LIGHTING FIXTURE SCHEDULE

SYMBOL	LIGHT UNIT DESCRIPTION	BUG RATING	MOUNTING INFO	VOLTS	LAMP QUANTITY	LUMENS / LAMP	UNITS QUANTITY	LUMENS / UNIT	TOTAL LUMENS
◁▷◁▷	3 HEAD LED FLOOD LIGHTS, MOBILE TELESCOPING TOWER	B3-U3-G5	25' TOWER	120	3	45,171	6	135,513	813,078

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ELBERT COUNTY, COLORADO

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DRILL-OUT OPERATIONS PHOTOMETRIC PLAN

APPENDIX D – FLOWBACK OPERATIONS PHOTOMETRIC PLAN

N

1" = 100'

Project Disturbance Boundary

Edge of Pad

PRODUCTION PAD

DRILLING PAD

100' Edge of Pad Offset

Iso-Footcandle

100'

Mobile Lighting Tower (Typ)

Well (Typ.)

Sound / Visual Wall

MLVT PAD

PROPOSED ACCESS ROAD

TYPICAL MOBILE TOWER LIGHTING

NOTES:

1. MEASURED LIGHT INTENSITY LEVEL WITH RESPECT TO WORK AREAS, OUTDOOR SPACES, AND UNATTENDED EQUIPMENT AREAS. ILLUMINANCE UNITS IS GIVEN IN Fc [1 fc = 10.8 Lux].
   MAXIMUM = 28.9 Fc
   MINIMUM = 0.0 Fc
2. DIRECT LIGHTING FROM FLOWBACK OPERATIONS WILL BE CONFINED WITHIN THE 100 FT EDGE OF PAD OFF-SET BOUNDARY.
3. TOTAL PAD AREA = ± 8.41 ACRES

1 FLOWBACK PAD SITE LIGHTING PHOTOMETRIC PLAN

SCALE: 1" = 100'

LIGHTING FIXTURE SCHEDULE

SYMBOL	LIGHT UNIT DESCRIPTION	BUG RATING	MOUNTING INFO	VOLTS	LAMP QUANTITY	LUMENS / LAMP	UNITS QUANTITY	LUMENS / UNIT	TOTAL LUMENS
◁▷▷	3 HEAD LED FLOOD LIGHTS, MOBILE TELESCOPING TOWER	B3-U3-G5	25' TOWER	120	3	45,171	2	135,513	271,026

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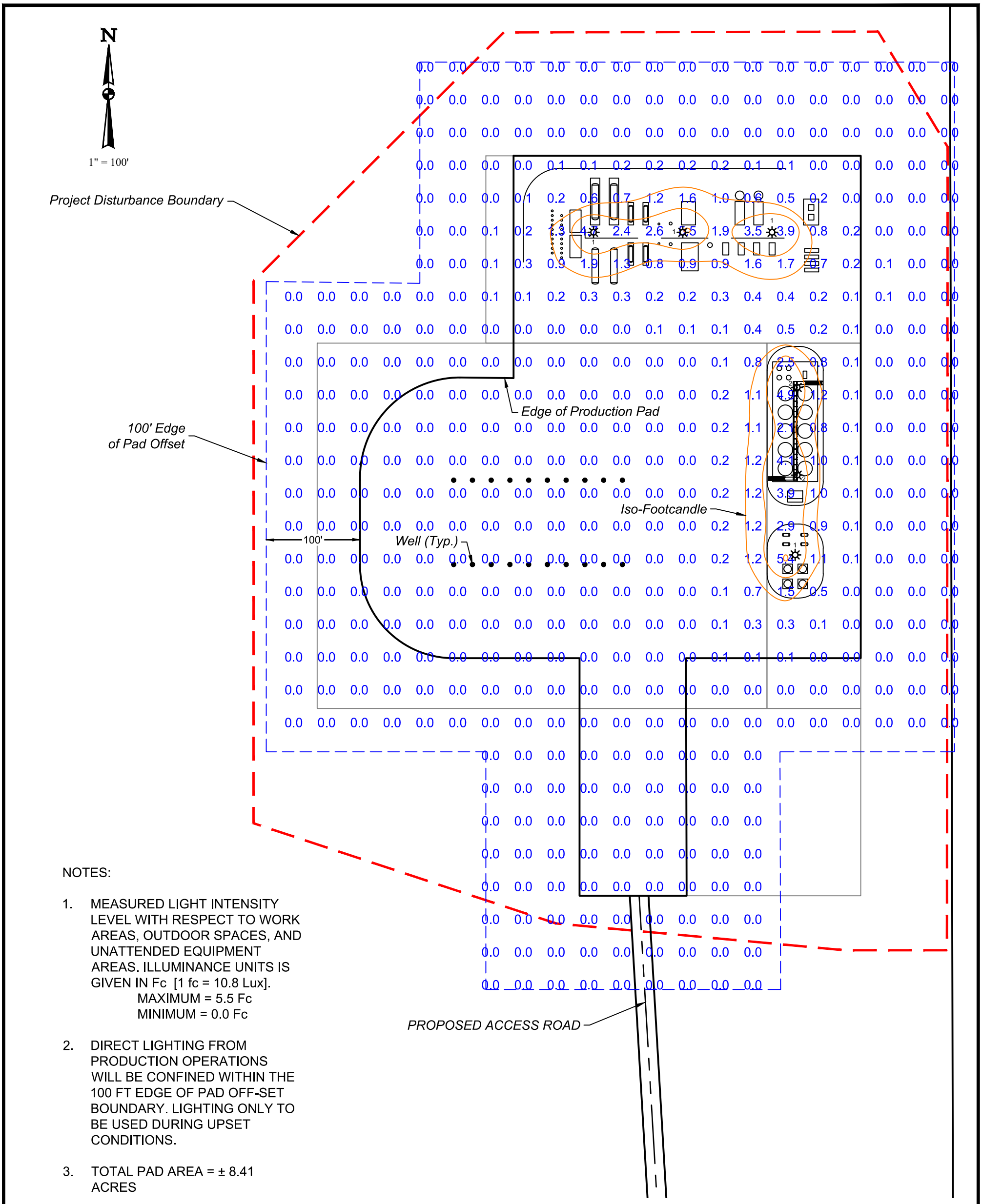
FLOWBACK OPERATIONS PHOTOMETRIC PLAN

APPENDIX E – PRODUCTION OPERATIONS PHOTOMETRIC PLAN



NOTES:

1. MEASURED LIGHT INTENSITY LEVEL WITH RESPECT TO WORK AREAS, OUTDOOR SPACES, AND UNATTENDED EQUIPMENT AREAS. ILLUMINANCE UNITS IS GIVEN IN Fc [1 fc = 10.8 Lux].
   MAXIMUM = 5.5 Fc
   MINIMUM = 0.0 Fc

2. DIRECT LIGHTING FROM PRODUCTION OPERATIONS WILL BE CONFINED WITHIN THE 100 FT EDGE OF PAD OFF-SET BOUNDARY. LIGHTING ONLY TO BE USED DURING UPSET CONDITIONS.

3. TOTAL PAD AREA = ± 8.41 ACRES

1 PRODUCTION PAD SITE LIGHTING PHOTOMETRIC PLAN

SCALE: 1" = 100'

LIGHTING FIXTURE SCHEDULE

SYMBOL	LIGHT UNIT DESCRIPTION	BUG RATING	MOUNTING INFO	VOLTS	LAMP QUANTITY	LUMENS / LAMP	UNITS QUANTITY	LUMENS / UNIT	TOTAL LUMENS
$\circ_1$	LED POLE LIGHTING FIXTURE, COOPER LIGHTING LAS45S-T4, 4000K	B3-U0-G3	25' TOWER	120	1	19,720	4	19,720	78,880
$\circ_2$	LED POLE LIGHTING FIXTURE, COOPER LIGHTING LAS45S-T4, 4000K	B3-U0-G3	25' STANCHION	120	1	19,720	2	19,720	39,440

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ELBERT COUNTY, COLORADO

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PRODUCTION OPERATIONS PHOTOMETRIC PLAN

APPENDIX F – LIGHT FIXTURE SPECIFICATION SHEETS

Project		Catalog #		Type	
Prepared by		Notes		Date	

Lumark

LAS

Area / Site Luminaire

Product Features

Selectable lumens

DUSK-TO-DAWN

Product Certifications

CERTIFIED

CLASS A CAN ICES-005

RoHS COMPLIANT

1.5G VIB

5 YEAR LIMITED WARRANTY

DLC DLC PREMIUM

IP65

Interactive Menu

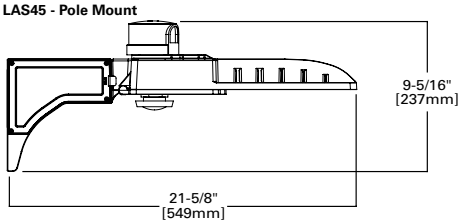
- Stock Ordering Information page 2
- Ordering Information page 2
- Product Specifications page 2
- Mounting Details page 3
- Energy and Performance Data page 3
- Controls Options page 4

Quick Facts

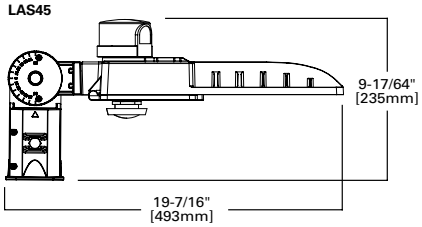
- 10-position lumen selectable across 2 housing sizes
- Lumen packages range from 4,900 - 34,000 lumens (30W - 250W)
- Replaces up to 450W and 1,000W HID equivalent
- Efficacies up to 135 lumens per watt at maximum output
- Energy and maintenance savings up to 79% versus HID solutions

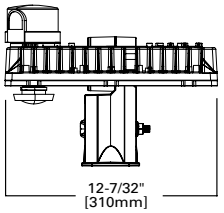
Dimensional Details

LAS45 - Pole Mount

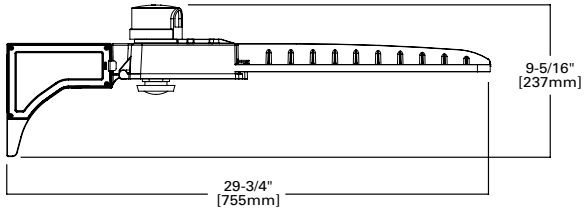


LAS45

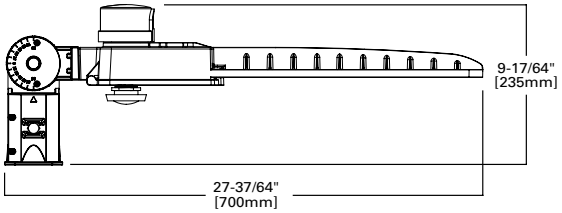


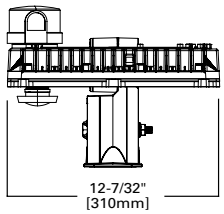


LAS100 - Pole Mount



LAS100





Stock Ordering Information

SAMPLE NUMBER: **LAS45S-T4**

Model Number [1]		Distribution		Voltage
LAS45P=Pole Mount Arm, 450W HID Equivalent **LAS45S**=Slipfitter Mount, 450W HID Equivalent	**LAS100P**=Pole Mont Arm, 1,000W HID Equivalent **LAS100S**=Slipfitter Mount, 1,000W HID Equivalent	**T3**=Type III **T4**=Type IV	**T5**=Type V	**[Blank]**=Universal, 120-277V **HV**=High Voltage, 347-480V [2]

NOTES:
1. DesignLights Consortium® Qualified. Refer to www.designlights.org Qualified Products List under Family Models for details.
2. Supplied with shorting cap. Use NEMA 3-PIN twistlock photocontrol that matches the input voltage used (either 347V or 480V) as desired.

Ordering Information

SAMPLE NUMBER: **LAS45S-T4-MS/DIM-L40W**

Model Number [1,2]	Distribution	Voltage	Options	Accessories (Order Separately)
LAS45P=Pole Mount Arm, 450W HID Equivalent **LAS45S**=Slipfitter Mount, 450W HID Equivalent **LAS100P**=Pole Mount Arm, 1,000W HID Equivalent **LAS100S**=Slipfitter Mount, 1,000W HID Equivalent	**T3**=Type III **T4**=Type IV **T5**=Type V	**[Blank]**=Universal, 120-277V **HV**=High Voltage, 347-480V [3]	**MS/DIM-L40W**=Motion Sensor for Dimming Operation, 21' - 40' Mounting Height	**FSIR-100**=Wireless Configuration Tool for Motion Sensor [4] **RABBZ=**Wall Mount Tenon Adapter **RABX-BZ=**Pole Mount Tenon Adapter

NOTES:
1. DesignLights Consortium® Qualified. Refer to www.designlights.org Qualified Products List under Family Models for details.
2. Standard lead times apply. Sensor versions do not include lumen select switch. Max light output can be field-programmed via the motion sensor with the accessory configuration tool.
3. Supplied with shorting cap. Use NEMA 3-PIN twistlock receptacle photocontrol that matches the input voltage used (either 347V or 480V) as desired.
4. This tool enables adjustment to Motion Sensor (MS) parameters including high and low modes, sensitivity, time delay, cutoff and more. Consult your lighting representative for more information.

Product Specifications

Construction

- Die-cast aluminum housing with hinged, die-cast aluminum door
- Pole mount arm mounts directly to minimum 4 inch round or square poles (recommended Type N drill pattern)
- Slipfitter mounts 2-3/8" vertical or horizontal tenons; Downward facing only
- IP65 rated housing enclosure
- 10-position lumen select switch accessible via hinged housing door

Optics

- UV-resistant polycarbonate optics
- Full cutoff when mounted at 0 degrees tilt
- 4000K CCT, 70CRI minimum standard
- IP66 optical enclosures

Electrical

- -40°C minimum operating temperature
- 40°C maximum operating temperature
- >0.9 power factor
- <20% total harmonic distortion
- Class P drivers incorporate internal MOVs designed to withstand 6kV of surge
- 0-10V dimming driver is standard
- 3-PIN NEMA twistlock photocontrol receptacle and photocontrol included (UNV configurations)

Finish

- Standard color is bronze
- Finish only warrantied for a period of 1 year

Shipping Data

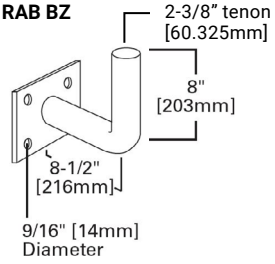
- LAS45S / LAS45P: 14.0 lbs. (6.4 kgs.)
- LAS100SS / LAS100P: 18.0 lbs. (8.2 kgs.)

Mounting Details

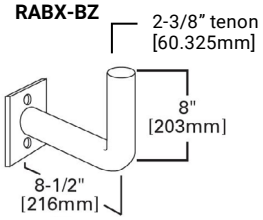
Mounting Configurations and EPAs

Housing Size	Mounting	Tilt	1	2 @ 90°	2 @ 120°	2 @ 180°	3 @ 90°	3 @ 120°	4 @ 90°
LAS45	Slipfitter	0°	0.488	0.772	1.110	0.973	1.258	1.320	1.262
LAS45	Slipfitter	10°	0.488	0.854	1.217	0.975	1.305	1.532	1.307
LAS45	Slipfitter	20°	0.488	1.158	1.440	0.977	1.644	2.102	1.646
LAS45	Slipfitter	30°	0.488	1.413	1.661	0.972	1.892	2.582	1.896
LAS45	Slipfitter	45°	0.488	1.733	1.972	0.974	2.220	3.208	2.224
LAS45	Pole Mount	N/A	0.560	0.930	1.090	1.120	1.400	1.440	1.460
LAS100	Slipfitter	0°	0.604	0.888	1.237	1.208	1.489	1.521	1.492
LAS100	Slipfitter	10°	0.604	1.171	1.541	1.204	1.765	2.100	1.765
LAS100	Slipfitter	20°	0.604	1.597	1.920	1.202	2.191	2.908	2.195
LAS100	Slipfitter	30°	0.603	1.996	2.290	1.204	2.591	3.670	2.595
LAS100	Slipfitter	45°	0.603	2.478	2.776	1.201	3.070	4.651	4.375
LAS100	Pole Mount	N/A	0.670	1.030	1.250	1.340	1.610	1.610	1.660

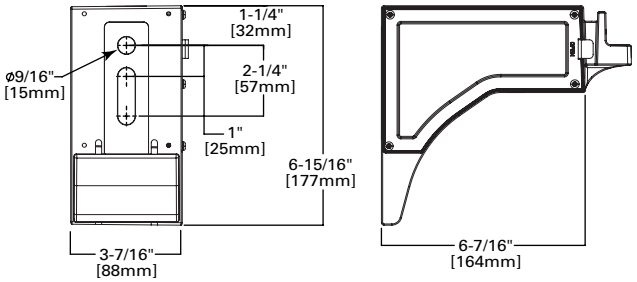
RAB BZ



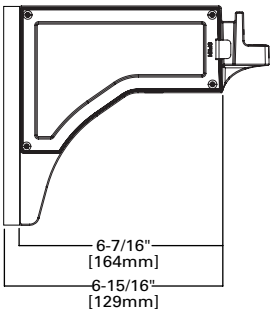
RABX-BZ



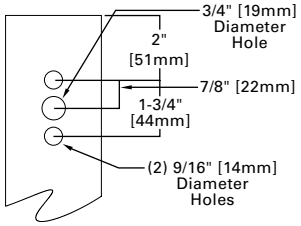
Pole Mount Arm



Round Pole Mount



Type "N" Drill Pattern



Energy and Performance Data

Lumen Maintenance

Ambient Temperature	TM-21 Lumen Maintenance (54,000 Hours)	Theoretical L70 (Hours)
Up to 40°C	85.80%	126,000

Energy and Performance Data (cont.)

View LAS IES files

Power and Lumens (LAS45)

Lumen Select Switch		Position 0 (Factory Preset)	1	2	3	4	5	6	7	8	9
Power (Watts)		152.7	135.4	119.7	99.2	89.5	79.2	75.2	68.8	29.3	29.3
Input Current @ 120V (A)		1.27	1.13	1.00	0.83	0.75	0.66	0.63	0.57	0.27	0.27
Input Current @ 277V (A)		0.58	0.53	0.48	0.42	0.39	0.36	0.34	0.32	0.19	0.19
Input Current @ 347V (A)		0.45	0.40	0.36	0.30	0.27	0.24	0.23	0.21	0.10	0.10
Input Current @ 480V (A)		0.33	0.30	0.27	0.23	0.21	0.19	0.19	0.17	0.09	0.09
Distribution											
T3 (Type III)	Lumens	20,089	18,434	16,810	14,515	13,360	12,083	11,550	10,705	4,901	4,901
	BUG Rating [1]	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3	B2-U0-G2	B1-U0-G1	B1-U0-G1
	Lumens per Watt	132	136	140	146	149	153	154	156	167	167
T4 (Type IV)	Lumens	19,720	18,095	16,502	14,249	13,115	11,862	11,338	10,509	4,811	4,811
	BUG Rating [1]	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3	B2-U0-G3	B2-U0-G3	B2-U0-G3	B1-U0-G2	B1-U0-G2
	Lumens per Watt	129	134	138	144	147	150	151	153	164	164
T5 (Type V)	Lumens	19,956	18,311	16,698	14,418	13,271	12,003	11,473	10,634	4,868	4,868
	BUG Rating [1]	B3-U0-G3	B4-U0-G2	B4-U0-G2	B3-U0-G2	B3-U0-G2	B3-U0-G2	B3-U0-G1	B3-U0-G1	B2-U0-G1	B2-U0-G1
	Lumens per Watt	131	135	139	145	148	152	153	155	166	166

NOTES:
1. All BUG Ratings reported with fixture oriented at 0 degrees.

Power and Lumens (LAS100)

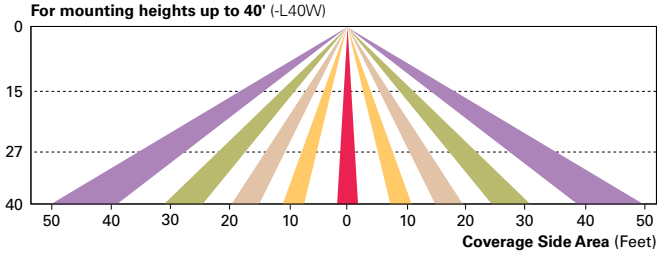
Lumen Select Switch		Position 0 (Factory Preset)	1	2	3	4	5	6	7	8	9
Power (Watts)		251.0	222.2	196.4	162.8	146.8	129.9	123.4	112.9	48.0	48.0
Input Current @ 120V (A)		2.09	1.86	1.64	1.36	1.23	1.09	1.03	0.95	0.41	0.41
Input Current @ 277V (A)		0.90	0.82	0.73	0.62	0.57	0.52	0..50	0.46	0.28	0.28
Input Current @ 347V (A)		0.74	0.66	0.59	0.49	0.44	0.40	0.38	0.34	0.15	0.15
Input Current @ 480V (A)		0.55	0.49	0.44	0.37	0.34	0.30	0.29	0.27	0.13	0.13
Distribution											
T3 (Type III)	Lumens	33,965	31,166	28,421	24,541	22,588	20,429	19,527	18,100	8,286	8,286
	BUG Rating [1]	B4-U0-G4	B4-U0-G4	B4-U0-G4	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3	B2-U0-G2	B2-U0-G2
	Lumens per Watt	135	140	145	151	154	157	158	160	173	173
T4 (Type IV)	Lumens	33,342	30,594	27,900	24,090	22,174	20,055	19,169	17,768	8,134	8,134
	BUG Rating [1]	B4-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3	B2-U0-G2	B2-U0-G2
	Lumens per Watt	133	138	142	148	151	154	155	157	169	169
T5 (Type V)	Lumens	33,740	30,959	28,232	24,378	22,438	20,294	19,398	17,980	8,231	8,231
	BUG Rating [1]	B5-U0-G3	B5-U0-G3	B4-U0-G2	B4-U0-G2	B4-U0-G2	B4-U0-G2	B4-U0-G2	B4-U0-G2	B3-U0-G1	B3-U0-G1
	Lumens per Watt	134	139	144	150	153	156	157	159	171	171

NOTES:
1. All BUG Ratings reported with fixture oriented at 0 degrees.

Control Options

Dimming Occupancy Sensor (MS)
These sensors are factory installed in the luminaire housing. When a sensor for dimming operation (/DIM) option is selected, the luminaire will dim down to approximately 50 percent power after five minutes of no activity detected. When activity is detected, the luminaire returns to full light output. These occupancy sensors include an integral photocell that can be activated or inactivated with the programming remote / configuration tool for "dusk-to-dawn" control or "daylight harvesting". Note: For MS sensors, the factory preset is OFF (Disabled). The programming remote / tool is a wireless tool that can be utilized to change the dimming level, time delay, sensitivity and other parameters. The sensor lens optimizes the coverage pattern for mounting heights from 21'-40'.

For mounting heights up to 40' (-L40W)



FXLED300SF

Ultra high output, high efficiency LED floodlight with NEMA Types: 7H x 6V, 6H x 4V, 4H x 6V, 5H x 5V and 3H x 3V. patent-pending "Air-Flow" technology ensures long LED and driver lifespan. Use for general and security lighting for large areas, building façades, signs and landscapes.

Color: Bronze

Weight: 66.1 lbs

Project:	**Type:**
Prepared By:	**Date:**

Driver Info

Type	Constant Current
120V	2.65A
208V	1.59A
240V	1.38A
277V	1.17A
Input Watts	325.9W

LED Info

Watts	300W
Color Temp	5000K (Cool)
Color Accuracy	72 CRI
L70 Lifespan	100,000 Hours
Lumens	45,171
Efficacy	138.6 lm/W

Technical Specifications

Compliance

UL Listed:

Suitable for wet locations. Suitable for ground mounting.

IESNA LM-79 & LM-80 Testing:

RAB LED luminaires and LED components have been tested by an independent laboratory in accordance with IESNA LM-79 and LM-80.

Optical

NEMA Type:

NEMA Beam Spread of 7H x 6V

Performance

Lifespan:

100,000-Hour LED lifespan based on IES LM-80 results and TM-21 calculations

Construction

IP Rating:

Ingress Protection rating of IP66 for dust and water

Maximum Ambient Temperature:

Suitable for use in up to 40°C (104°F)

Effective Projected Area:

EPA = 4

Cold Weather Starting:

Minimum starting temperature is -40°C (-40°F)

Thermal Management:

Superior thermal management with external "Air-Flow" fins

Lens:

Tempered glass lens

Housing:

Die-cast aluminum housing and door frame

Mounting:

Heavy-duty slipfitter for 2 3/8"OD pipe

Reflector:

Specular and semi-specular vacuum-metalized polycarbonate

Gaskets:

High-temperature silicone gaskets

Technical Specifications (continued)

Construction

Finish:

Formulated for high durability and long-lasting color

Green Technology:

Mercury and UV free. RoHS-compliant components.

Tilt Increment:

Rotates in 6 degree increments

LED Characteristics

LEDs:

Multip-chip, high-output, long-life LEDs

Color Consistency:

7-step MacAdam Ellipse binning to achieve consistent fixture-to-fixture color

Color Stability:

LED color temperature is warrantied to shift no more than 200K in color temperature over a 5-year period

Color Uniformity:

RAB's range of Correlated Color Temperature follows the guidelines of the American National Standard for Specifications for the Chromaticity of Solid State Lighting (SSL) Products, ANSI C78.377-2017.

Electrical

Drivers:

Constant Current, 1050mA, 50/60 Hz, 120-277V, 4 kV surge protection, 120V: 2.65A, 208V: 1.59A, 240V: 1.38A, 277V: 1.17A, THD <20%, Power Factor: 99%

THD:

9.26% at 120V, 12.56% at 277V

Power Factor:

99.3% at 120V, 96.6% at 277V

Note:

All values are typical (tolerance +/- 10%)

Other

Equivalency:

Equivalent to 1000W Metal Halide

Warranty:

RAB warrants that our LED products will be free from defects in materials and workmanship for a period of five (5) years from the date of delivery to the end user, including coverage of light output, color stability, driver performance and fixture finish. RAB's warranty is subject to all terms and conditions found at rablighting.com/warranty.

Buy American Act Compliance:

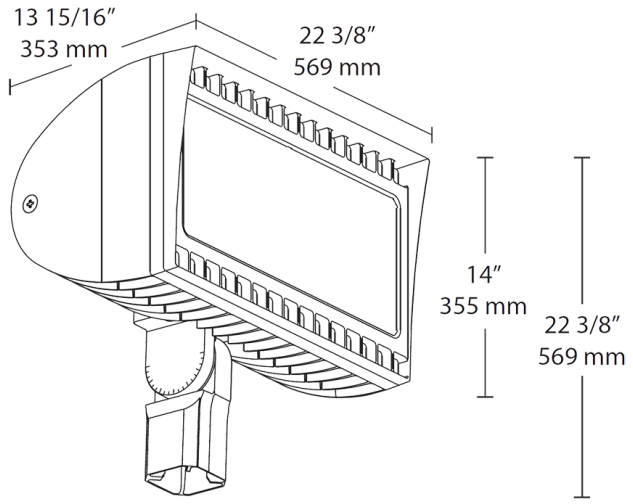
RAB values USA manufacturing! Upon request, RAB may be able to manufacture this product to be compliant with the Buy American Act (BAA). Please contact customer service to request a quote for the product to be made BAA compliant.

Listings

DLC Listed:

This product is listed by Design Lights Consortium (DLC) as an ultra-efficient premium product that qualifies for the highest tier of rebates from DLC Member Utilities. DLC Product Code: PF5PMFXJ

Dimensions



Features

- 300W replaces 1000 MH floodlights
- 100,000-hour LED lifespan
- 5-Year, No-Compromise Warranty

Ordering Matrix

Family	Wattage	Mounting	Color Temp	NEMA Type	Finish	Driver Options	Options	Other Options
FXLED	300	SF						
	200 = 200W **300 =** 300W	**SF =** Slipfitter **T =** Trunnion	**Blank =** 5000K (Cool) **N =** 4000K (Neutral) **Y =** 3000K (Warm)	**Blank =** 7H x 6V **B64 =** 6H x 4V **B55 =** 5H x 5V **B33 =** 3H x 3V **B46 =** 4H x 6V	**Blank =** Bronze **W =** White	**Blank =** 120-277V **/480 =** 480V **/BL =** Bi-Level (Slipfitters only) [1] **/D10 =** 0-10V Dimming	**Blank =** No option **/PCS =** 120V Swivel **/PCS2 =** 277V Swivel **/PCT =** 120-277V Twistlock **/PCT4 =** 480V Twistlock **/PCS4 =** 480V Swivel **/LC =** Lightcloud® Controller	**USA =** BAA Compliant **Blank =** Standard

[1] Slipfitter models only

IES ROAD REPORT
PHOTOMETRIC FILENAME : RABFXLED300SF_30D.IES

DESCRIPTIVE INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] DLF20180512001-1a
[TESTLAB] Deliver Co. Ltd.
[MANUFAC] RAB LIGHTING INC. RC LIGHTING
[ISSUEDATE] 05/12/18
[_CONVERT] Luminaire test position and photometric web converted from original test data

CHARACTERISTICS

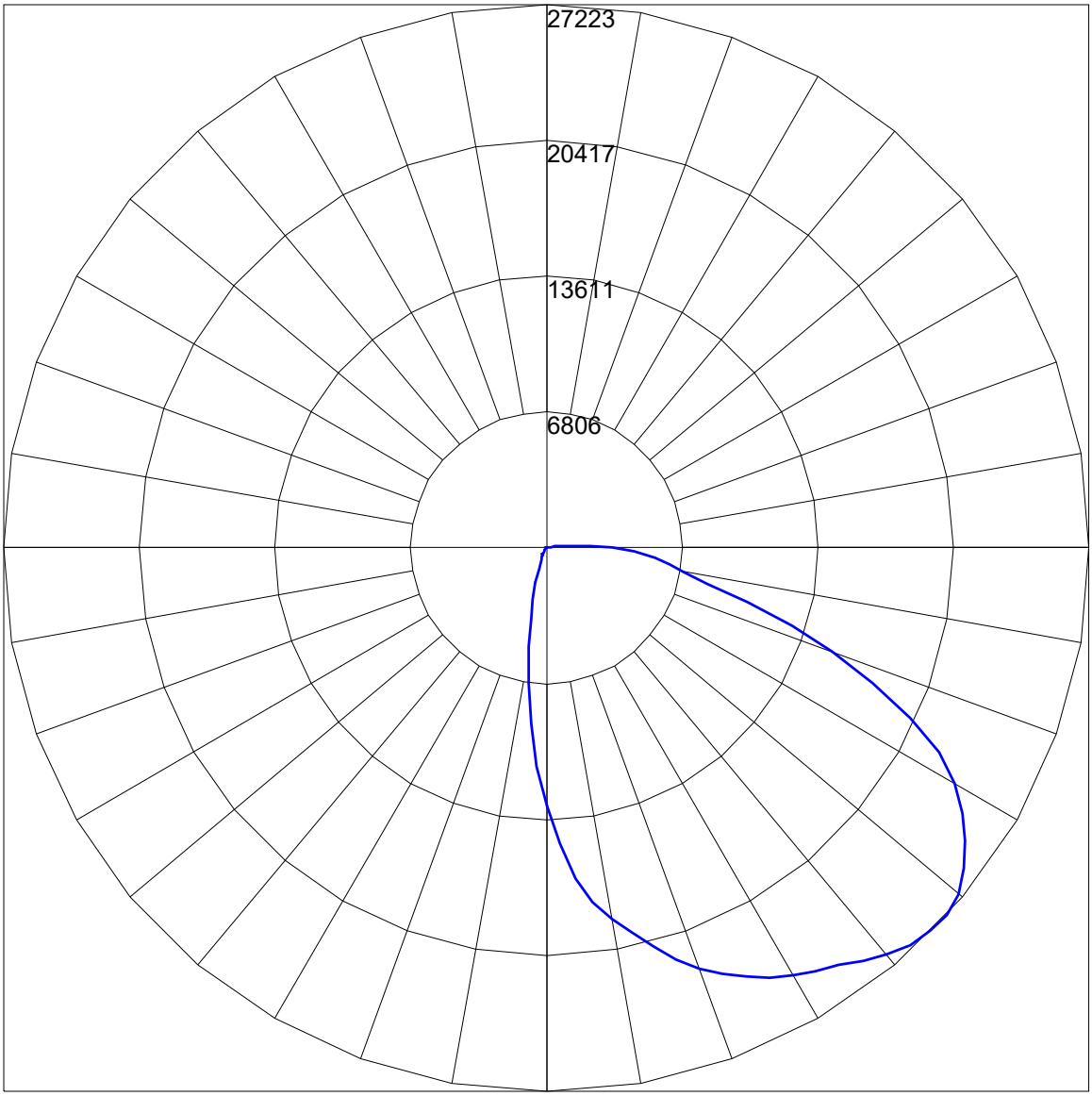
IES Classification	Type IV
Longitudinal Classification	Very Short
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	45134
Downward Total Efficiency	N.A. (absolute)
Total Luminaire Efficiency	N.A. (absolute)
Luminaire Efficacy Rating (LER)	138
Total Luminaire Watts	325.921
Ballast Factor	1.00
Upward Waste Light Ratio	0.01
Maximum Candela	27222.949
Maximum Candela Angle	360H 47.5V
Maximum Candela (<90 Degrees Vertical)	27222.949
Maximum Candela Angle (<90 Degrees Vertical)	360H 47.5V
Maximum Candela At 90 Degrees Vertical	3383.779 (7.5% Luminaire Lumens)
Maximum Candela from 80 to <90 Degrees Vertical	7519.438 (16.7% Luminaire Lumens)
Cutoff Classification (deprecated)	N.A. (absolute)

LUMINAIRE CLASSIFICATION SYSTEM (LCS)

	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	7859.9	N.A.	17.4
FM - Front-Medium (30-60)	21395.0	N.A.	47.4
FH - Front-High (60-80)	10409.2	N.A.	23.1
FVH - Front-Very High (80-90)	1598.0	N.A.	3.5
BL - Back-Low (0-30)	2114.1	N.A.	4.7
BM - Back-Medium (30-60)	1264.3	N.A.	2.8
BH - Back-High (60-80)	112.0	N.A.	0.2
BVH - Back-Very High (80-90)	3.2	N.A.	0.0
UL - Uplight-Low (90-100)	305.4	N.A.	0.7
UH - Uplight-High (100-180)	72.5	N.A.	0.2
Total	45133.6	N.A.	100.0
BUG Rating	B3-U3-G5		

IES ROAD REPORT
PHOTOMETRIC FILENAME : RABFXLED300SF_30D.IES

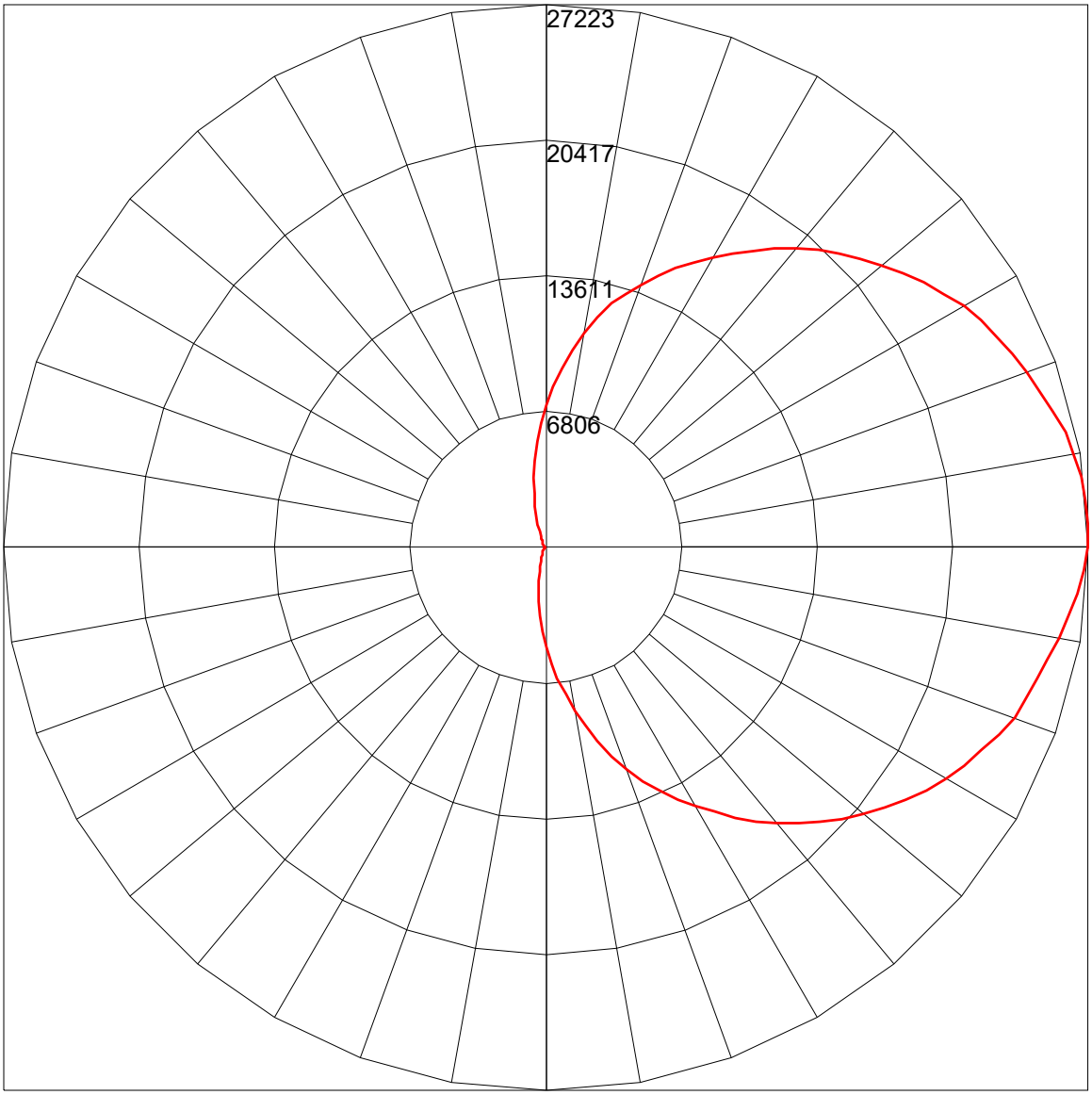
POLAR GRAPH



Maximum Candela = 27222.949 Located At Horizontal Angle = 360, Vertical Angle = 47.5
Vertical Plane Through Horizontal Angles (360 - 180) (Through Max. Cd.)

IES ROAD REPORT
PHOTOMETRIC FILENAME : RABFXLED300SF_30D.IES

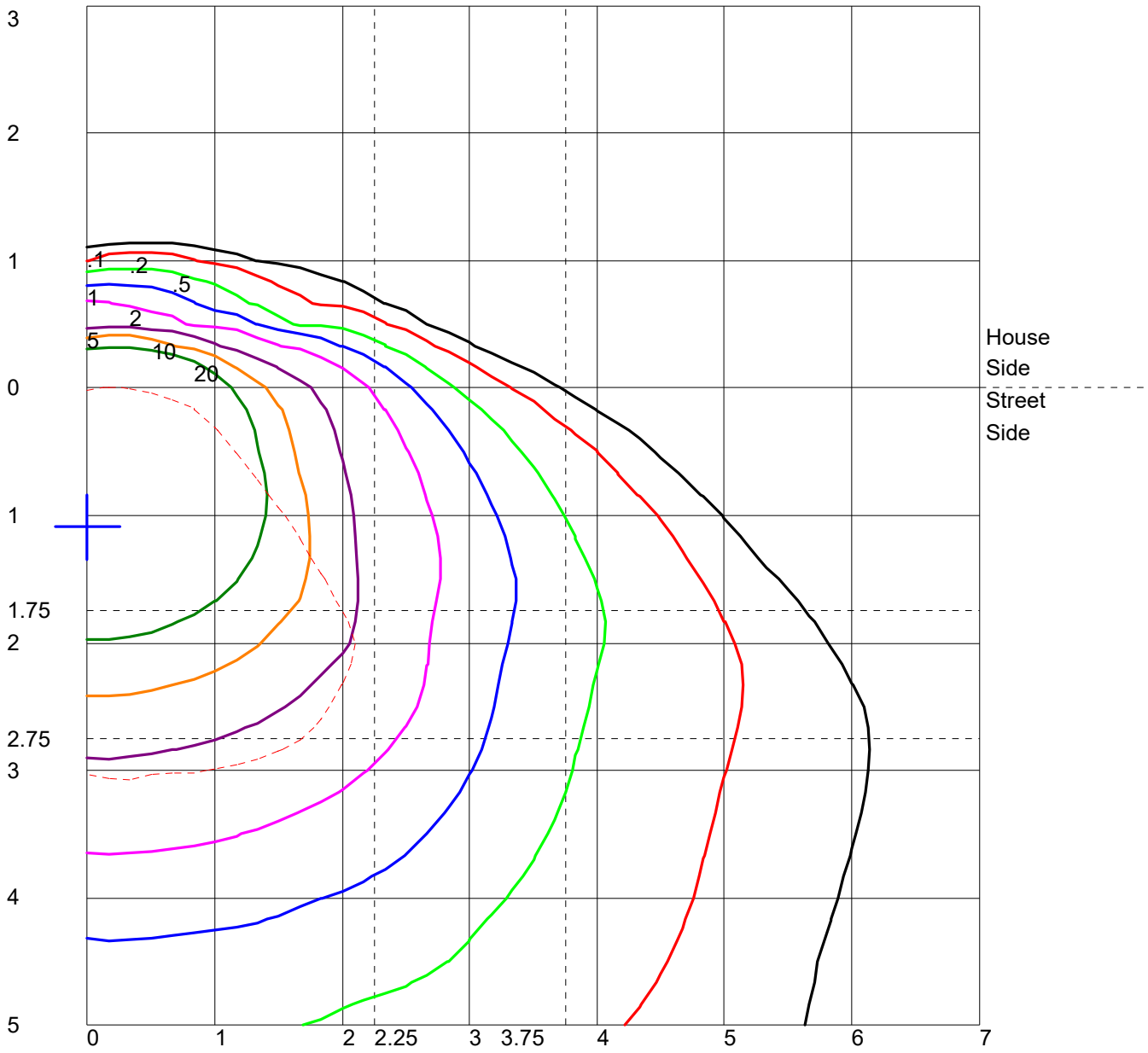
POLAR GRAPH



Maximum Candela = 27222.949 Located At Horizontal Angle = 360, Vertical Angle = 47.5
Horizontal Cone Through Vertical Angle (47.5) (Through Max. Cd.)

IES ROAD REPORT
PHOTOMETRIC FILENAME : RABFXLED300SF_30D.IES

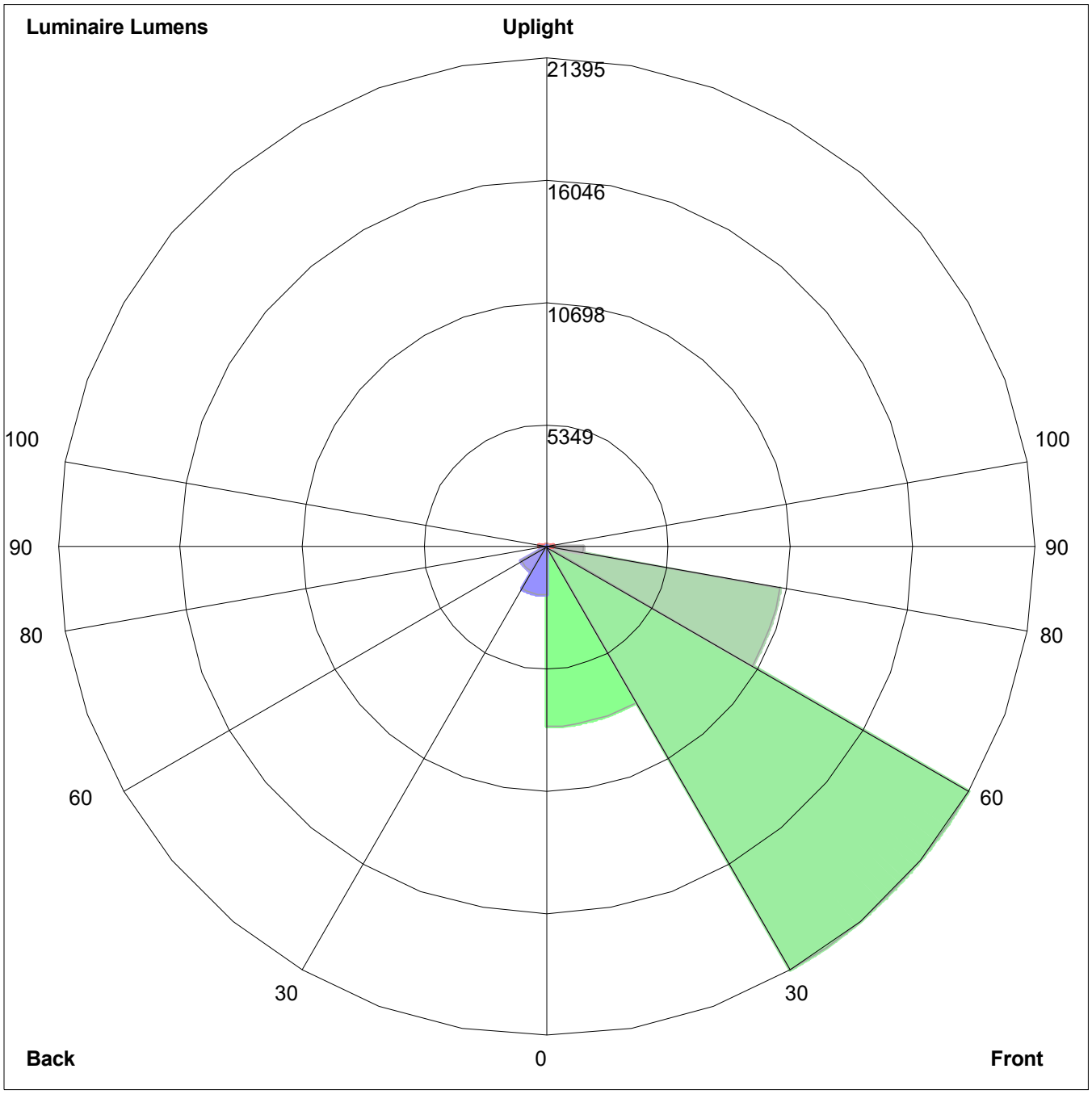
ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINANCE



Distance In Units Of Mounting Height
Values Based On 10 Foot Mounting Height
1/2 Maximum Candela Trace Shown As Dashed Curve
(+) = Maximum Candela Point

IES ROAD REPORT
PHOTOMETRIC FILENAME : RABFXLED300SF_30D.IES

LUMINAIRE CLASSIFICATION SYSTEM (LCS) GRAPH



Luminaire Lumens:
Front: Low=7859.9, Medium= 21395.0, High=10409.2, Very High= 1598.0
Back: Low=2114.1, Medium=1264.3, High=112.0, Very High=3.2
Uplight: Low=305.4, High=72.5

BUG Rating : B3-U3-G5