



DOUBLE HEADED POLE
LIGHT MOUNTED ON 22FT
POLE WITH 3FT
CONCRETE BASE. ONE
HEAD WITH T3
DISTRIBUTION AND THE
OTHER WITH T4.



SINGLE HEAD POLE LIGHT
MOUNTED ON 22FT POLE
WITH 3FT CONCRETE BASE
WITH T4 DISTRIBUTION.



WALL MOUNTED LUMINAIRE
WITH FORWARD THROW
DISTRIBUTION.



SMALL PROFILE SQUARE
SURFACE DOWNLIGHT
MOUNTED TO TRELLIS.



FESTOON LIGHTS WITH
PERFORATED BARREL SHADES
SPACED 3FT APART ON LINE.



SIDE BENDING EXTERIOR
RATED ENCLOSED TAPE LIGHT



6 EXTERIOR FLOODLIGHT
WITH 45 DEGREE
GLARE SHIELD AND
AMBER FILTER LENS



EXTERIOR FLOODLIGHT WITH
15 DEGREE GLARE SHIELD AND
AMBER FILTER LENS TO WASH
POLE WITH LIGHT



SITE MEDIUM OUTPUT
FLOODLIGHT WITH
MEDIUM FLOOD 4X4 BEAM
AND VISOR



SITE LOW OUTPUT
FLOODLIGHT WITH MEDIUM
FLOOD 6X4 BEAM AND
VISOR



LOW PROFILE BULLET
LANDSCAPE UPLIGHT



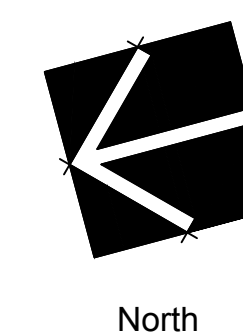
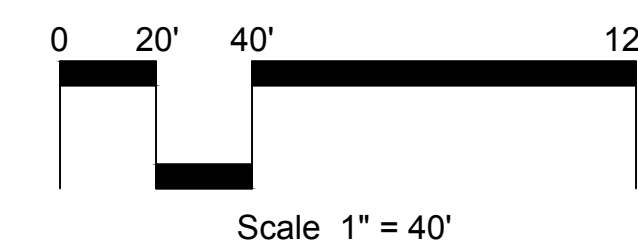
42IN TALL CROSS
SECTIONED BOLLARD WITH
ASYMMETRIC THROW



42IN TALL CROSS
SECTIONED BOLLARD WITH
SYMMETRIC THROW

LIGHTING CONCEPT PLAN

Karve Ski Park



NOCTILUCA
LIGHTING DESIGN AND CONSULTING

May 4, 2023

KARVE SKI PARK - SITE

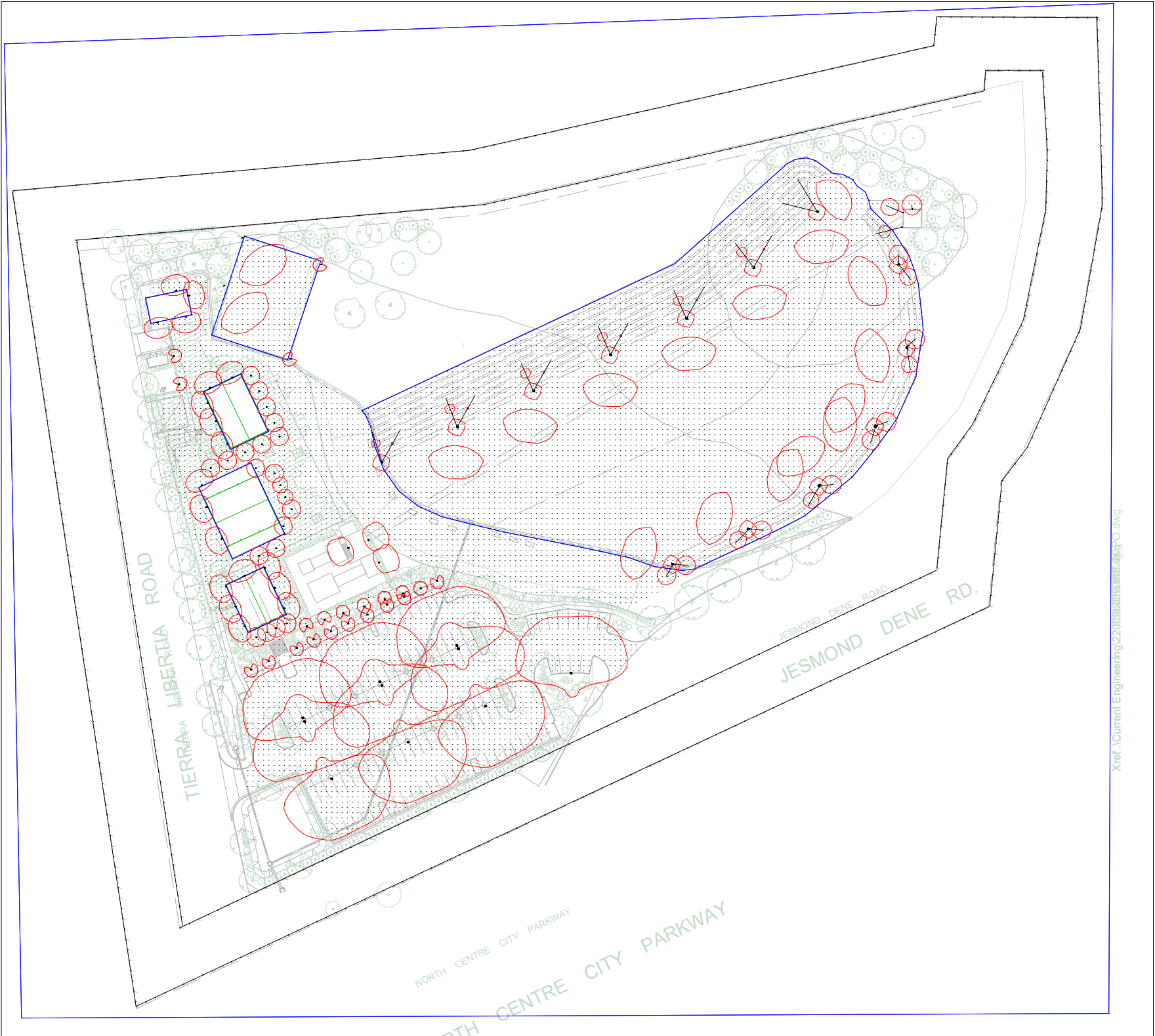
LIGHTING CALCULATIONS: NORMAL CALCULATIONS

Date:5/12/2023
Filename: KARVE SKI PARK AGI CALCULATIONS.AGI
Calculation by: LS

*Lighting photometric calculation results are based on data provided by the manufacturers and industry standards regarding reflectances of surfaces.



Reflectances -
Walls: 50%
Floor: 20%
Slopes: 80%



SITE PLAN

Calculation Summary							
Label	Units	Avg	Max	Min	Avg/Min	Max/Min	Grid Z
BOUNDARY +25FT - EAST HORIZ	Fc	0.00	0.0	0.0	N.A.	N.A.	N.A.
BOUNDARY +25FT - EAST VERTICAL	Fc	0.00	0.0	0.0	N.A.	N.A.	N.A.
BOUNDARY +25FT - NORTH HORIZ	Fc	0.00	0.00	0.00	N.A.	N.A.	N.A.
BOUNDARY +25FT - NORTH VERTICAL	Fc	0.00	0.0	0.0	N.A.	N.A.	N.A.
BOUNDARY +25FT - SOUTH HORIZ	Fc	0.00	0.00	0.00	N.A.	N.A.	N.A.
BOUNDARY +25FT - SOUTH VERTICAL	Fc	0.00	0.0	0.0	N.A.	N.A.	N.A.
BOUNDARY +25FT - WEST HORIZONTAL	Fc	0.00	0.0	0.0	N.A.	N.A.	N.A.
BOUNDARY +25FT - WEST VERTICAL	Fc	0.03	0.1	0.0	N.A.	N.A.	N.A.
BOUNDARY - EAST HORIZ	Fc	0.00	0.0	0.0	N.A.	N.A.	N.A.
BOUNDARY - EAST VERTICAL	Fc	0.04	0.19	0.00	N.A.	N.A.	N.A.
BOUNDARY - NORTH HORIZ	Fc	0.00	0.0	0.0	N.A.	N.A.	N.A.
BOUNDARY - NORTH VERTICAL	Fc	0.02	0.06	0.00	N.A.	N.A.	N.A.
BOUNDARY - SOUTH HORIZ	Fc	0.00	0.0	0.0	N.A.	N.A.	N.A.
BOUNDARY - SOUTH VERTICAL	Fc	0.02	0.05	0.00	N.A.	N.A.	N.A.
BOUNDARY - WEST HORIZ	Fc	0.14	0.49	0.00	N.A.	N.A.	N.A.
BOUNDARY - WEST VERTICAL	Fc	0.18	1.43	0.01	18.00	143.00	N.A.
PARKING LOT	Fc	1.66	4.8	0.5	3.32	9.60	
SLOPES	Fc	0.43	5.9	0.1	4.30	59.00	

LUMINAIRE SCHEDULE										
Symbol	Tag	Description	Lum. Watts	Lum. Lumens	LLD	LDD	BF	UDF	LLF	BUG Rating
	F01 T3	RSX1 LED P3 30K R3	109	12763	0.950	0.800	1.000	1.000	0.760	B2-U0-G2
	F01 - T4	RSX1 LED P3 30K R4	109	12930	0.950	0.800	1.000	1.000	0.760	B2-U0-G2
	F01A	RSX1 LED P3 30K R4	109	12930	0.950	0.800	1.000	1.000	0.760	B2-U0-G2
	F02 WD	WDGE1 LED P1 30K 80CRI VW	10	1164	0.950	0.800	1.000	1.000	0.760	B0-U0-G0
	F03	FM-W47206-30	12	527	0.950	0.800	1.000	1.000	0.760	B1-U1-G0
	F06	Aspen P1 80CRI 27K 120 45DEG FLC	11	574	0.950	0.800	1.000	1.000	0.760	B1-U0-G0
	F06A	Aspen P1 80CRI 27K 120 15DEG FLC	11	625	0.950	0.800	1.000	1.000	0.760	B1-U0-G0
		DSXF2 LED P1 30K 70CRI WFR FV	52.42 6	3978	0.950	0.800	1.000	1.000	0.760	N.A.
	F07A	DSXF1 LED P1 30K HMF	21	2329	0.950	0.800	1.000	1.000	0.760	N.A.
	F09	RADB LED P2 27K ASY DBLXD	8	507	0.950	0.800	1.000	1.000	0.760	B0-U1-G0
	F09A	RADB LED P2 27K SYM DBLXD	8	559	0.950	0.800	1.000	1.000	0.760	B0-U1-G0

LUMINAIRE FIXTURE SCHEDULE										
KARVE SKI PARK - EXTERIOR LIGHTING										
TYPE	MOUNTING	DESCRIPTION	SPECIFICATION	LUMENS/ CCT/ CRI	TOTAL	REMOTE DRIVER REQUIRED?	FINISH	PRODUCT IMAGE	LOCATION	
F01	22FT STRAIGHT ROUND POLE WITH 3FT ROUND CONCRETE BASE	TWO AREA POLE TOP MOUNTED ON A 22FT ROUND METAL POLE. ONE HEAD WITH FULL CUTOFF WIDE THROW TYPE 3 DISTRIBUTION AND ONE HEAD WITH FORWARD THROW TYPE 4 DISTRIBUTION. FIXTURE IS NOMINALLY 13IN WIDE X 22IN LONG X 3IN DEEP. POLE IS NOMINALLY 4.5IN IN DIAMETER. INTEGRATED OCCUPANCY SENSOR DIMS TO 30% WHEN UNOCCUPIED. UL WET LOCATION LISTED. MAXIMUM BUG RATING B4-U0-G2.	LITHONIA T3: RSX1-P3-30K-R3-MVOLT-~RPA-DBLXD T4: RSX1-P3-30K-R4-MVOLT-~RPA-DBLXD POLE: RSS-22-4-5B-DM2BAS-DBLXD	T3: 12763LM T4: 12930 LM 3000K 70 CRI	T3: 109W T4: 109W TOTAL: 218W 120V / 277V	<input type="checkbox"/>	BLACK		PARKING LOT	
F01A	22FT STRAIGHT ROUND POLE WITH 3FT ROUND CONCRETE BASE	POLES MOUNTED WITH AN ANCHOR BASE TO 3 FT CONCRETE BASE PER STRUCTURAL ENGINEER.	LITHONIA RSX1-P3-30K-R4-MVOLT-~RPA-DBLXD POLE: RSS-22-4-5B-DM19AS-DBLXD	12930 LM 3000K 70 CRI	109W 120V / 277V	<input type="checkbox"/>	BLACK		SLOPES	
F02 F02E	SURFACE WALL	ARCHITECTURAL WALL MOUNTED LUMINAIRE WITH SURFACE MOUNTING BRACKET AND FORWARD THROW DISTRIBUTION. NOMINALLY 9IN WIDE X 8IN HIGH X 5.5IN DEEP. UL WET LOCATION LISTED. MAXIMUM BUG RATING B1-U3-G0.	LITHONIA WDGE1 LED-P1-30K-80CRI-VF-MVOLT-SRM-DBLXD	1122 LM 3000K 70 CRI	10W 120V / 277V	<input type="checkbox"/>	BLACK		EXTERIOR BUILDING FACADE GENERAL	
F03 F03E	SURFACE TRELLIS HORIZONTAL BEAM	F02E (SHADED); CONNECTED TO BUILDING EMERGENCY POWER CAPABLE OF MINIMUM 90 MINUTE OPERATION. SMALL PROFILE SQUARE SURFACE TRELLIS MOUNTED DOWNLIGHT. FLUSH 90 DEGREE GLARE SHIELD AND REGRESSED LENS WITH WIDE FLOOD DISTRIBUTION. NOMINALLY 5IN WIDE X 5IN TALL X 4.5IN DEEP. UL WET LISTED. MAXIMUM BUG RATING B1-U3-G1. MANUFACTURER PRESET CCT TO 3000K.	WAC FM-W47206-30-BK	527LM 3000K 90 CRI	12W 120V / 277V	<input type="checkbox"/>	BLACK		BUILDING OUTDOOR TRELLIS	
F04	SUSPENDED BETWEEN BUILDINGS	F03E (SHADED); CONNECTED TO BUILDING EMERGENCY POWER CAPABLE OF MINIMUM 90 MINUTE OPERATION. FESTOON LIGHTS WITH G-SHAPED FILAMENT LAMPS AND BARREL PERFORATED SHADES. 3FT ON CENTER SPACING. NOMINALLY 4.5IN IN DIAMETER CANOPY X 8.5IN TALL. MINIMUM MOUNTING HEIGHT OF 12FT, MAXIMUM SWAY OF 1FT BETWEEN MOUNTING POINTS. UL WET LOCATION LISTED. MAXIMUM BUG RATING B1-U3-G1. DIMENSIONS TO BE DETERMINED IN THE FIELD. STRUNG FROM TWO OUTSIDE EXTERIOR BUILDING FACADES. HARDWARE INSTALLATION TO JOINTURE BOX.	ALUZ AS-ZOZO-BRL-36"-30K-GSFL-DM-WET-"LENGTH" END CAP: AS-ZOZO-EC	256LM/LAMP 3000K 90 CRI	3W/LAMP 120V DIMMABLE	<input type="checkbox"/>	BLACK		BUILDING STRING LIGHTS	
F05	INGRADE SKI SLOPES	EXTERIOR RATED FLEXIBLE CONDUCTOR WITH INDIVIDUAL LED MODULES SPACED 6IN APART WITH A 120 DEGREE BEAM SPREAD LENS AND FIXED BRACKET. MOUNTED WITH MOUNTING CLIPS TO MAGIC CARPET MATERIAL ON SKI SLOPE RUNS. NOMINALLY 1.3IN WIDE X 0.7IN TALL X LENGTH PER SITE LIGHTING PLANS. UL WET LISTED. MAXIMUM BUG RATING B1-U3-G1.	TOKISTAR RVC-150-3000K-120D-MOD FINISH TRANSFORMER: T12-1200	55LM/MODULE 3000K 90 CRI	1.8W/MODULE 12VAC DIMMABLE	<input checked="" type="checkbox"/>	WHITE		SLOPE RUNS	
F06	F07P	EXTERIOR FLOODLIGHT WITH HONEYCOMB LOUVER, EXTENDED 6IN 45 DEGREE GLARE SHROUD AND AMBER FILTER LENS MOUNTED TO 25 FT POLE. NOMINALLY 3IN DIAMETER X 10IN LONG. UL WET LISTED. MAXIMUM BUG RATING B3-U3-G2.	WAC 5012-30-BK SHROUD: 5010-LSHR-BK LENS: LENS-20-AMB	900LM 3000K + AMBER FILTER 85 CRI	14.5W 120V DIMMABLE INTEGRAL	<input type="checkbox"/>	SMOOTH BLACK		TUBE RUNS	
F06A	F07P	MANUFACTURER PRESET TO 45 DEGREE BEAM DISTRIBUTION.	WAC 5012-30-BK SHROUD: 5010-LSHR-BK LENS: LENS-20-AMB	900LM 3000K + AMBER FILTER 85 CRI	14.5W 120V DIMMABLE INTEGRAL	<input type="checkbox"/>	SMOOTH BLACK		TUBE RUNS	
F07	F07P	SIMILAR TO FIXTURE TYPE "F06" EXCEPT WITH 15 DEGREE BEAM ANGLE MOUNTED AT 25FT AIMED STRAIGHT DOWN POLE. MAXIMUM BUG RATING B3-U3-G2.	LITHONIA DSXF2-LED-P1-40K-70CRI-WFR-MVOLT-IS-DMG-FV-DBLXD	7,375LM 4000K 80 CRI	52W 120V / 277V DIMMABLE	<input type="checkbox"/>	BLACK		SLOPES	
F07A	F07P	MANUFACTURER PRESET TO 15 DEGREE BEAM DISTRIBUTION.	LITHONIA DSXF2-LED-P1-40K-HMF-MVOLT-IS-DMG-FV-DBLXD	8200 LM 4000K 80 CRI	64W 120V / 277V DIMMABLE	<input type="checkbox"/>	BLACK		SLOPE JUMPS	
F07B	F07P/ WALL	SIMILAR TO TYPE "F07" EXCEPT LOWER OUTPUT. HORIZONTAL MEDIUM FLOOD 6X4 DISTRIBUTION AND SMALLER 9IN WIDE X 8IN HIGH.	LITHONIA DSXF1-LED-P1-40K-HMF-MVOLT-MOUNTING-FV-DBLXD	2,575LM 4000K 80 CRI	21W 120V / 277V DIMMABLE	<input type="checkbox"/>	BLACK		TOP OF SLOPE/ SKI JUMPS	
F07P	FLUSH CONCRETE BASE	ROUND STRAIGHT STEEL POLE WITH ANCHOR BASE AND POLE TOP AND SIDE MOUNTING. REINFORCED HANDHOLE IS PROVIDED 12IN FROM THE BASE END OF THE POLE. NOMINALLY 4.5IN DIAMETER X 25 FT TALL. EPA RATING OF AT LEAST 2.7.	LITHONIA RSS-25'-4-5B-MOUNTING-DBLXD	-	-	<input type="checkbox"/>	BLACK		SLOPES	
F08	GRADE STAKE	LOW PROFILE LED BULLET LANDSCAPE UPLIGHT. PROVIDE WITH 45 DEGREE GLARE SHIELD, REGRESSED DIFFUSE LENS. NOMINALLY 2.5 IN DIAMETER X 4IN HIGH X 5IN DEEP. UL WET LISTED. MAXIMUM BUG RATINGS B1-U3-G1.	WAC 5111-30-BK GLARE SHIELD: 5111-LSHR-BK LENS: LENS-16-FR	45LM-365LM 3000K 85 CRI	1-7W 9-15VAC DIMMABLE INTEGRATED	<input checked="" type="checkbox"/>	BLACK		LANDSCAPE UPLIGHTS	
F09	GRADE ON 3IN CONCRETE BASE	42IN TALL CROSS SECTION ASYMMETRIC BEAM DISTRIBUTION BOLLARD WITH FLAT TALL TOP AND INTEGRATED MOTION SENSOR. NOMINALLY 8IN DIAMETER X 42IN TALL. UL WET LISTED. MAXIMUM BUG RATING B1-U3-G0.	LITHONIA RAD8-LED-P2-30K-ASM-MVOLT-PIR-BTT-BCF-H42-DBLXD	613LM 3000K 80 CRI	8W 120 / 277V DIMMABLE	<input type="checkbox"/>	BLACK		WALKWAYS	
F09A	GRADE ON 3IN CONCRETE BASE	SIMILAR TO TYPE "F09" EXCEPT WITH SYMMETRIC 4-SEGMENTED CROSS SECTION BEAM DISTRIBUTION.	LITHONIA RAD8-LED-P2-30K-SYM-MVOLT-PIR-BTT-BCF-H42-DBLXD	677LM 3000K 80 CRI	8W 120 / 277V DIMMABLE	<input type="checkbox"/>	BLACK		WALKWAY INTERSECTIONS	

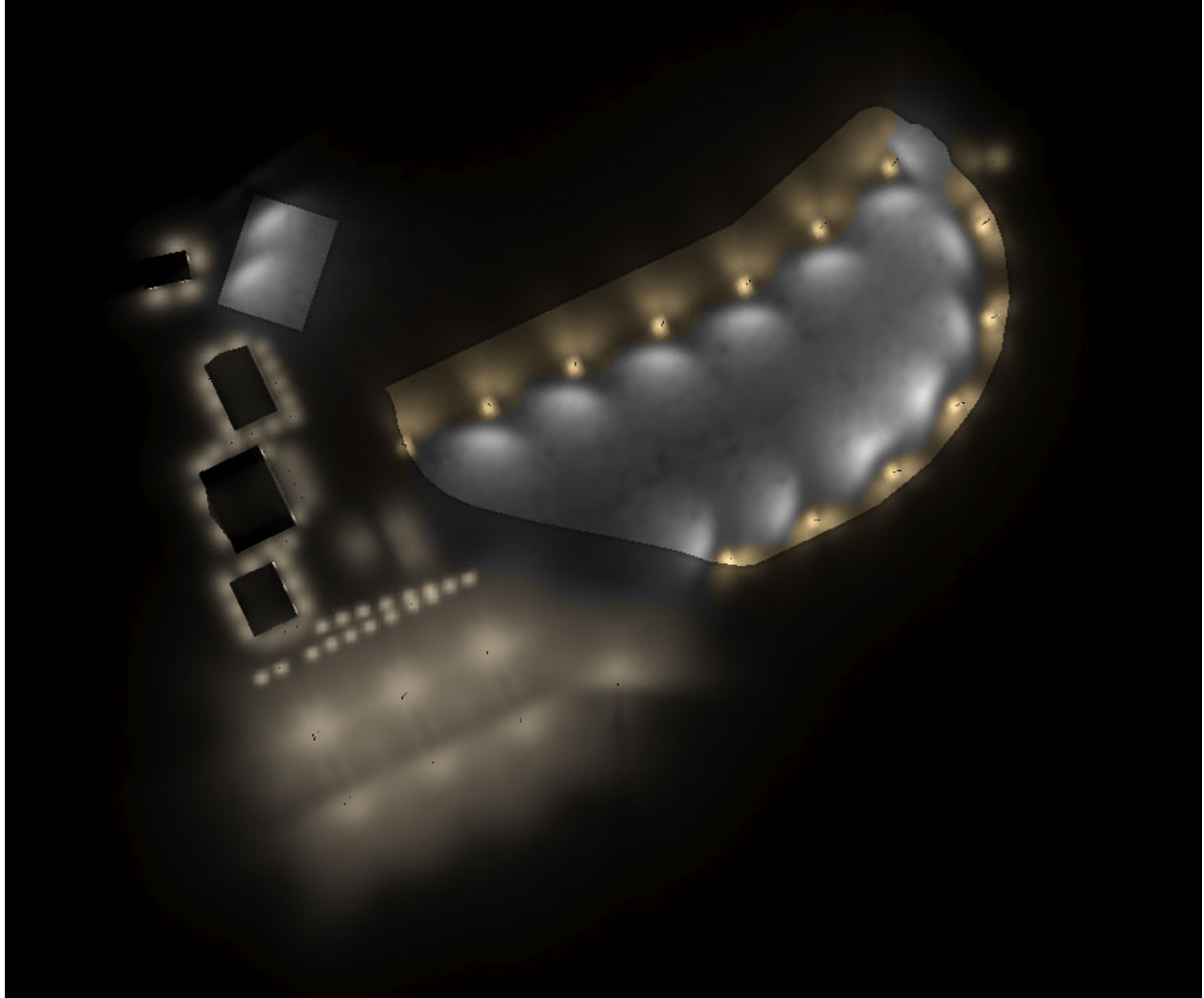
NOTES

- 1 ALL LIGHTS TO BE FLICKER-FREE DIMMABLE LED
- 2 ALL LIGHTS AND COMPONENTS TO COMPLY WITH CALIFORNIA TITLE 20 AND TITLE 24
- 3 ALL LOW VOLTAGE LIGHTING REQUIRES REMOTE TRANSFORMER. SIZED ACCORDINGLY IN ACCESSIBLE LOCATION.
- 4 LINEAR TAPE LIGHT ACCESSORIES AND LENGTH TO BE PROVIDED ACCORDING TO FIELD REQUIREMENTS.
- 5 ALL TRACK TYPES FINAL BILL OF MATERIALS TO BE PROVIDED BASED ON FINAL PLANS AND VERIFIED ACCORDING TO FIELD REQUIREMENTS.
- 6 ALL LIGHTING SUBMITTALS AND QUESTIONS SHALL BE DIRECTED TO THE LIGHTING DESIGNER, NOCTILUCA LIGHTING, INFO@NOCTILUCALIGHTING.COM
- 7 ALL FIXTURE TYPES ARE "OR APPROVED EQUIVALENT" UNLESS NOTED OTHERWISE
- 8 ALL EXTERIOR UPLIGHTS TO TURN OFF AT 11PM PER SAN DIEGO COUNTRY REGULATIONS
- 9 ALL EXTERIOR MOUNTED LUMINAIRES AND LAMP TYPES SHALL COMPLY WITH CITY OF SAN DIEGO OUTDOOR LIGHTING REGULATIONS 142.740

Karve Ski Park

Photometric Analysis - Boundary Spill Light

May 5, 2023



Created by:

Noctiluca Lighting, LLC
3525 Del Mar Heights Rd #221
San Diego, CA 92130
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EXECUTIVE SUMMARY

The purpose of this report is to demonstrate the computer simulation results of the photometric analysis with regards to quantity of light spill at the property boundary and at 25 feet beyond, to demonstrate designed lighting intent on the subject project is controlling the lighting within its boundaries to comply with Local, State and City requirements.

The Karve Ski Park project's proposed exterior lighting design provides shielded, full cut-off lighting specifications. Glare and Spill Light and lighting fixture placement and heights have been intentionally evaluated and considered in the design, while still maintaining safety and security within the project boundaries. Sports lighting to illuminate the proposed ski slopes contain full glare visors, and are aimed at the slope, away from neighboring property.

Spill light is reduced on all boundaries, except where pedestrian walkways or driveways from or onto the project directly cross over the boundary from the public right-of-way (Public sidewalk, Public Street). The design team's professional opinion is that all efforts to control and reduce spill light have been achieved and that these areas of light spill should be considered allowed, as reducing the lighting at the boundary would cause a noticeable safety and security concern at these areas.

STUDY OVERVIEW

SPILL LIGHT PARAMETERS

Photometrics were evaluated for the project with respect to design intent and required or recommended light levels for exterior spaces within the project. All considerations were taken into account to ensure lighting is controlled, shielded and aimed away from neighboring properties, while still providing a safe and secure environment on the property.

Specified exterior lighting fixtures are:

- Full cut-off distribution
- Shielded from direct view
- CALGreen BUG (Backlight, Uplight, Glare) compliant
- Title 24-2022 compliant
- ADA Compliant
- Help achieve recommended IESNA illumination levels on the property
- Controlled via automatic photocell controlled astronomical time clock

Refer to Lighting Sheets for lighting fixture specifications and locations and for Site Photometric Plan.

Industry standard surface reflectances were modeled per the IESNA guidelines (80% Ceilings, 50% Walls, 20% Floors). Exterior Lighting from all buildings that could contribute to lighting spill are modeled. Landscape features are not modeled, but will further reduce and shield light contributions. Light Loss Factor (LLF) was included per IESNA standards (as 0.76) and takes into consideration lamp and dirt depreciation.

Vertical calculation values are taken from the grade up to 20 ft above finished grade, spaced 10ft horizontally and every 2ft vertically.

Moonlight, skyglow and adjacent property light contributions are not modeled. Note that a full moon's light contribution can contribute up to 0.1 fc on a clear night.

TERMINOLOGY:

- *Above Finished Grade (AFG)*
- *Foot candles (fc):* quantitative lighting intensity imperial units (1 fc = ~10 lux)
- *Horizontal Calculations:* measured at grade (0'-0" AFG) with light meter pointed up at sky
- *Vertical Calculations:* measured from 0-50ft AFG with light meter pointed perpendicular towards subject project site
- *Property Boundary:* as defined by project
- *Property Boundary +15ft:* calculations measured at 15ft beyond the defined property boundary

PHOTOMETRIC RESULTS

Refer to Lighting Sheets for Site Photometric Plan for quantitative results of calculation points. Elevations depicting Vertical spill calculation points are available upon request.

WITHIN THE PROJECT SITE:

- The public exterior surface parking lot within the project site meets the recommended IESNA RP-20 minimum light levels of 0.5fc.

SOUTH BOUNDARY (Public Access Street):

Property Boundary

- There is no calculated horizontal light (0.00fc) spill
- A maximum of only 0.05fc of calculated vertical light spill occurs between 0-20ft AFG, due to reflected light bounce upwards off of the ground plane.

Property Boundary +25FT

- There is no calculated horizontal light (0.00fc) spill
- There is no calculated vertical light (0.0fc) spill between 0-20ft AFG.

NORTH BOUNDARY (Public Access Street):

Property Boundary

- There is no calculated horizontal light (0.00fc) spill

- A maximum of only 0.06fc of calculated vertical light spill occurs between 0-4ft AFG, due to reflected light bounce upwards off of the ground plane. This only occurs where the parking drive aisle crosses the boundary. There is no calculated vertical light (0.0fc) spill between 5-20ft AFG.

Property Boundary +25FT

- There is no calculated horizontal light (0.00fc) spill.
- There is no calculated vertical light (0.0fc) spill between 0-20ft AFG.

WEST BOUNDARY (Public Access Street):

There is an existing public right of way access street that crosses the property boundary. Existing to remain lighting that illuminates this street was not calculated.

Property Boundary

- A maximum of only 0.49fc of calculated horizontal light spill.
- A maximum of only 1.43fc of calculated vertical light spill occurs between 0-20ft AFG

Property Boundary +25FT

- There is no calculated horizontal light (0.00fc) spill
- A maximum of only 0.1fc of calculated vertical light spill occurs between 0-20ft AFG.

The calculated spill light occurs where the edge of the parking lot runs parallel to the property boundary. Reducing the lighting for the parking lot to reduce this spill would cause the parking lot to not comply with the requirements for parking lot lighting.

EAST BOUNDARY (Private Property):

There is a private property with a single family home located more than 50ft east of the property boundary.

Property Boundary

- There is no calculated horizontal light (0.0fc) spill
- A maximum of only 0.19fc of calculated vertical light spill occurs between 0-20ft AFG due to reflected light bounce upwards off of the ground plane near the bunny slope.

Property Boundary +25FT

- There is no calculated horizontal light (0.00fc) spill
- There is no calculated vertical light (0.0fc) spill between 0-20ft AFG.