



San Luis High School Soccer
San Luis, AZ
Date: June 2, 2016

Equipment Description

Musco Light Structure Green™ System delivered to your site

- Precast concrete base
- Galvanized steel pole
- Factory aimed poletop luminaire assemblies
- 1500 watt metal halide or 600 watt LED poletop luminaire
- UL Listed remote electrical component enclosures

LED Benefits Include:

- Cuts energy by 75 percent over standard lighting
- Virtually eliminates offsite spill light and glare
- Delivers enhanced playability
- Includes instant on/off at full intensity
- Backed by an industry leading 10-year parts and labor warranty with guaranteed constant light levels.

Quote

Light Structure Green as described above and delivered to the job site:

30 footcandles\$295,000.00

Pricing furnished is effective for 60 days unless otherwise noted and is considered confidential.

Payment Terms

Per Musco Credit Department

Delivery to the job site from the time of order, submittal approval, and confirmation of order details including voltage and phase, pole locations is approximately 30-45 days. Due to the built-in custom light control per luminaire, pole locations need to be confirmed prior to production. Changes to pole locations after the product is sent to production could result in additional charges.

Notes

Estimate is based on:

- Shipment of entire project together to one location
- System will be manufactured to existing voltage and phasing at site
- Confirmation of pole locations prior to production

Thank you for considering Musco for your sports-lighting needs. Please contact me with any questions.

Dee Smith
Cell: 480-521-8271
Email: dee.smith@musco.com
Fax: 800.374.6402



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San Luis High School Soccer

San Luis, AZ

Lighting System

Pole / Fixture Summary						
Pole ID	Pole Height	Mtg Height	Fixture Qty	Luminaire Type	Load	Group
S1-S4	80'	80'	6	216 LED	3.60 kW	A
		80'	8	228 LED	5.04 kW	A
4			56		34.56 kW	

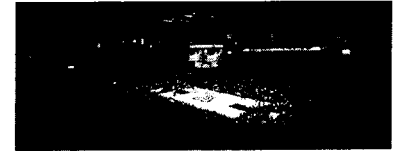
Group Summary			
Group	Description	Load	Fixture Qty
A	Soccer	34.56 kW	56

Fixture Type Summary							
Type	Source	Wattage	Lumens	L90	L80	L70	Quantity
228 LED	LED 5700K - 75 CRI	630W	63,600	38,000	>60,000	>60,000	32
216 LED	LED 5700K - 75 CRI	600W	63,600	38,000	>60,000	>60,000	24

Light Level Summary

Calculation Grid Summary							
Grid Name	Calculation Metric	Illumination				Groups	Fixture Qty
		Ave	Min	Max	Max/Min		
Soccer	Horizontal Illuminance	30.9	25.4	40.6	1.60	A	56
Track	Horizontal Illuminance	7.52	3.50	12.6	3.60	A	56

From Hometown to Professional



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ENGINEERED DESIGN By: Treana Drost • File #176943F • 12-May-16

PROJECT SUMMARY

EQUIPMENT LIST FOR AREAS SHOWN

QTY	LOCATION	Pole		Luminaires			QTY/POLE	THIS GRID	OTHER GRIDS
		SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE				
4	S1-S4	80'	-	80'	228 / 216 LED	14	14	0	
4	TOTALS								
						56	56	0	

San Luis High School Soccer
San Luis, AZ

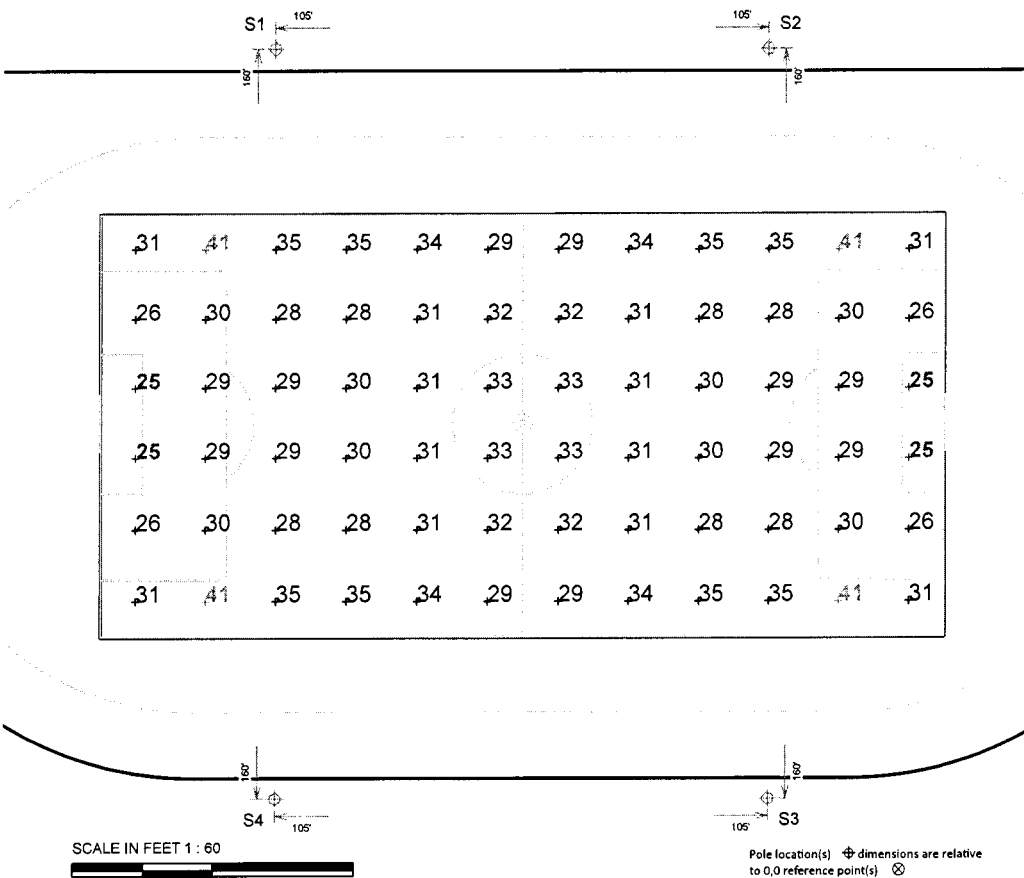
GRID SUMMARY

Name: Soccer
Size: 360' x 180'
Spacing: 30.0' x 30.0'
Height: 3.0' above grade

ILLUMINATION SUMMARY

MAINTAINED HORIZONTAL FOOTCANDLES			
Entire Grid			
Guaranteed Average:	30		
Scan Average:	30.91		
Maximum:	40.6		
Minimum:	25.4		
Avg / Min:	1.22		
Guaranteed Max / Min:	2		
Max / Min:	1.60		
UG (adjacent pts):	1.35		
CU:	0.55		
No. of Points:	72		
LUMINAIRE INFORMATION			
Color / CRI:	5700K - 75 CRI		
Luminaire Output:	63,600 / 63,600 lumens		
Total LLF:	1.000		
No. of Luminaires:	56		
Total Load:	34.56 kW		
<small>Luminaire Maintenance</small>			
Luminaire Type	L90 hrs	L80 hrs	L70 hrs
228 LED	38,000	>60,000	>60,000
216 LED	38,000	>60,000	>60,000

Reported per TM-21-11. See cutsheets for details.



Guaranteed Performance: The ILLUMINATION described above is guaranteed per your Musco Warranty document and includes a 0.95 dirt depreciation factor.

Field Measurements: Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

Electrical System Requirements: Refer to Amperage Draw Chart and/or the "Musco Control System Summary" for electrical sizing.

Installation Requirements: Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.



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ILLUMINATION SUMMARY

EQUIPMENT LIST FOR AREAS SHOWN

Pole			Luminaires					
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY/ POLE	THIS GRID	OTHER GRIDS
4	S1-S4	80'	-	80'	228 / 216 LED	14	14	0
4	TOTALS					56	56	0

San Luis High School Soccer
San Luis, AZ

GRID SUMMARY

Name: Track
Size: 360' x 180'
Spacing: 30.0' x 30.0'
Height: 3.0' above grade

ILLUMINATION SUMMARY

MAINTAINED HORIZONTAL FOOTCANDLES

Entire Grid

Scan Average: 7.52
Maximum: 12.6
Minimum: 3.5
Avg / Min: 2.15
Max / Min: 3.60
UG (adjacent pts): 0.00
CU: 0.09
No. of Points: 47

LUMINAIRE INFORMATION

Color / CRI: 5700K - 75 CRI
Luminaire Output: 63,600 / 63,600 lumens
Total LLF: 1.000
No. of Luminaires: 56
Total Load: 34.56 kW

Lumen Maintenance

Luminaire Type	L90 hrs	L80 hrs	L70 hrs
228 LED	38,000	>60,000	>60,000
216 LED	38,000	>60,000	>60,000

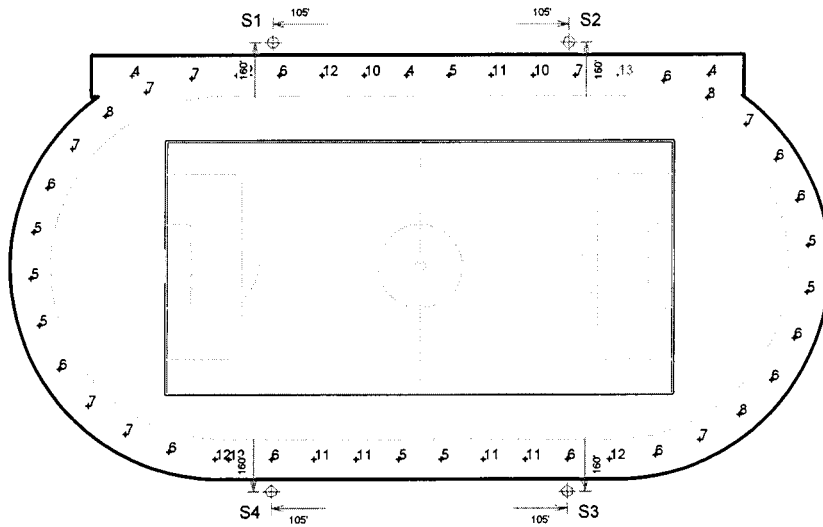
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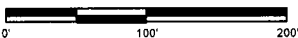
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SCALE IN FEET 1 : 100



Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊗

ENGINEERED DESIGN By: Treana Drost • File #176943F • 12-May-16



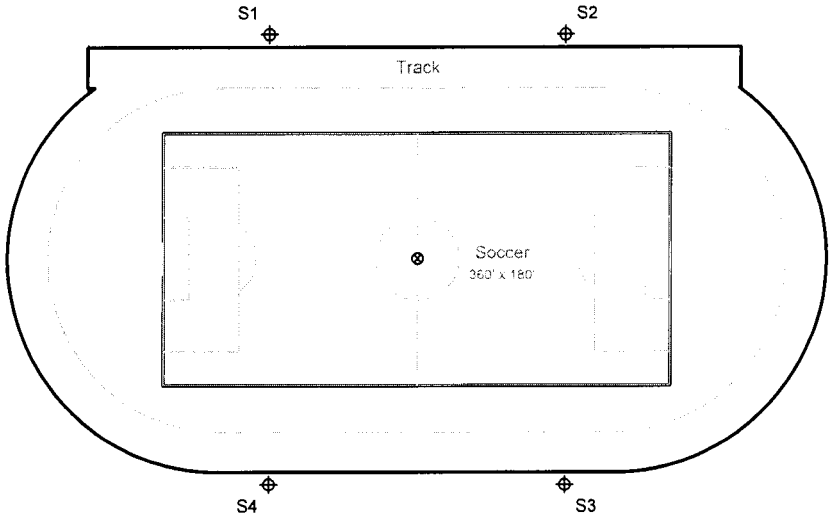
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ILLUMINATION SUMMARY

San Luis High School Soccer

San Luis, AZ



EQUIPMENT LAYOUT

INCLUDES:

- Soccer
- Track

Electrical System Requirements: Refer to Amperage Draw Chart and/or the "Musco Control System Summary" for electrical sizing.

Installation Requirements: Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.

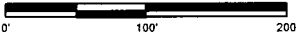
EQUIPMENT LIST FOR AREAS SHOWN

QTY	LOCATION	SIZE	GRADE ELEVATION	Luminaires		
				MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE
4	S1-S4	80'	-	80'	228 / 216 LED	14
TOTALS						56

SINGLE LUMINAIRE AMPERAGE DRAW CHART

Ballast Specifications (.90 min power factor)	Line Amperage Per Luminaire (max draw)						
	208 (60)	220 (60)	240 (60)	277 (60)	347 (60)	380 (60)	480 (60)
228 LED	3.9	3.7	3.4	3.0	2.4	2.2	1.7
216 LED	3.8	3.6	3.3	2.8	2.3	2.1	1.6

SCALE IN FEET 1 : 100



Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊗



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San Luis High School Soccer

San Luis, AZ

GLARE IMPACT

Summary

Map indicates the maximum candela an observer would see when facing the brightest light source from any direction.

A well-designed lighting system controls light to provide maximum useful on-field illumination with minimal destructive off-site glare.

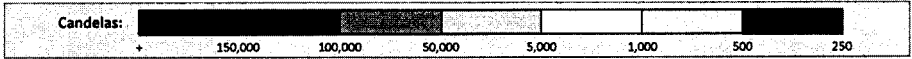
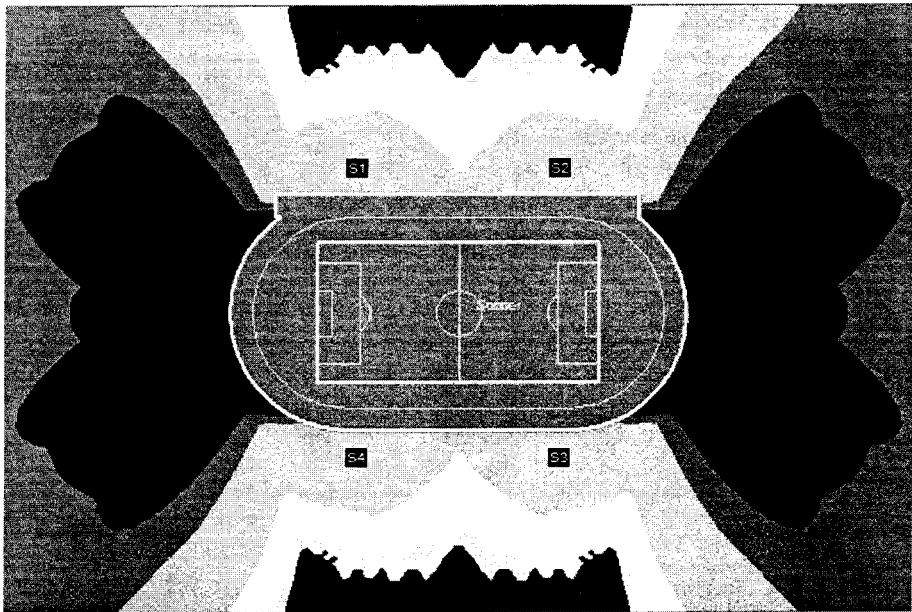
GLARE

Candela Levels

High Glare: 150,000 or more candela
Should only occur on or very near the lit area where the light source is in direct view. Care must be taken to minimize high glare zones.

Significant Glare: 25,000 to 75,000 candela
Equivalent to high beam headlights of a car.

Minimal to No Glare: 500 or less candela
Equivalent to 100W incandescent light bulb.



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Control System Summary

Project Specific Notes:

Project Information

Project #: 176943
 Project Name: San Luis High School Soccer
 Date: 05/12/16
 Project Engineer: TrDrost
 Sales Representative: Dee Smith
 Control System Type: Control and Monitoring
 Communication Type: Digital Cellular
 Scan: 176943F
 Document ID: 176943P1V2-0512154206
 Distribution Panel Location or ID: Service
 Total # of Distribution Panel Locations for Project: 1
 Design Voltage/Hertz/Phase: 480/60/3
 Control Voltage: 120

Equipment Listing

DESCRIPTION	APPROXIMATE SIZE	QTY	SIZE
1. Control and Monitoring Cabinet	24 X 72		
Total Contactors		4	30 AMP
Total Off/On/Auto Switches:		1	

Materials Checklist

Contractor/Customer Supplied:

- A single control circuit must be supplied per distribution panel location.
 - If the control voltage is NOT available, a control transformer is required.
- Electrical distribution panel to provide overcurrent protection for circuits
 - Thermal/Magnetic circuit breaker sized per full load amps on Circuit Summary by Zone Chart
- Wiring:
 - Dedicated control power circuit
 - Power circuit to and from lighting contactors
 - Harnesses for cabinets at remote locations
 - Means of grounding, including lightning ground protection
- Electrical conduit wireway system
 - Entrance hubs rated NEMA 4: must be die-cast zinc, PVC, or copper-free die-cast aluminum
- Mounting hardware for cabinets
- Control circuit lock-on device to prevent unauthorized power interruption to control power
- Anti-corrosion compound to apply to ends of wire, if necessary

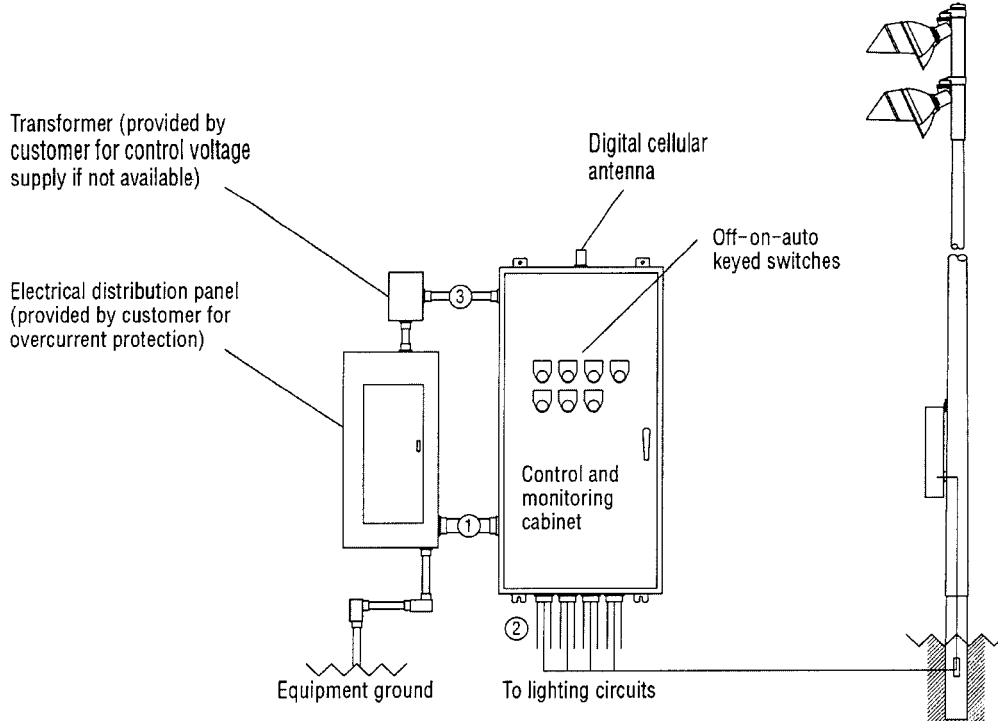
Call Control-Link Central™ operations center at 877/347-3319 to schedule activation of the control system upon completion of the installation.
 Note: Activation may take up to 1 1/2 hours

IMPORTANT NOTES

1. Please confirm that the design voltage listed above is accurate for this facility. Design voltage/phase is defined as the voltage/phase being connected and utilized at each lighting pole's ballast enclosure disconnect. Inaccurate design voltage/phase can result in additional costs and delays. Contact your Musco sales representative to confirm this item.
2. In a 3 phase design, all 3 phases are to be run to each pole. When a 3 phase design is used Musco's single phase luminaires come pre-wired to utilize all 3 phases across the entire facility.
3. One contactor is required for each pole. When a pole has multiple circuits, one contactor is required for each circuit. All contactors are UL 100% rated for the published continuous load. All contactors are 3 pole.
4. If the lighting system will be fed from more than one distribution location, additional equipment may be required. Contact your Musco sales representative.
5. A single control circuit must be supplied per control system.
6. Size overcurrent devices using the full load amps column of the Circuit Summary By Zone chart- Minimum power factor is 0.9.

NOTE: Refer to Installation Instructions for more details on equipment information and the installation requirements

Control-Link. Control and Monitoring System



Wire	Description	# of Wires	Typ. Wire Size (AWG)	Max. Wire Length (FT)	Wire from Musco	Notes
1	Line power to contactors, and equipment grounding conductor	Note A	Note B	27	No	A - E
2	Load power to lighting circuits	Note A	Note B	N/A	No	A - D
3	Control power (dedicated, 20A)	3	12	N/A	No	C, D

R60-32-00_C

- Notes:
- A. Voltage and phasing per the notes on cover page.
 - B. Calculate per load and voltage drop.
 - C. All conduit diameters should be per code.
 - D. Refer to control and monitoring system installation instructions for more details on equipment information and the installation requirements.
 - E. Contact Musco if maximum wire length from circuit breaker to contactor exceeds value in chart.

IMPORTANT: Control (3) wires must be in separate conduit from line and load power wiring (1, 2).



Control System Summary

San Luis High School Soccer / 176943 - 176943F
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SWITCHING SCHEDULE

Field/Zone Description	Zones
Soccer	1

CONTROL POWER CONSUMPTION	
120V Single Phase	
VA loading of Musco Supplied Equipment	INRUSH: 1568.0 SEALED: 194.8

CIRCUIT SUMMARY BY ZONE

POLE	CIRCUIT DESCRIPTION	# OF FIXTURES	# OF DRIVERS	*FULL LOAD AMPS	CONTACTOR SIZE (AMPS)	CONTACTOR ID	ZONE
S1	Soccer	14	7	15.9	30	C1	1
S2	Soccer	14	14	16.0	30	C2	1
S3	Soccer	14	7	15.9	30	C3	1
S4	Soccer	14	14	16.0	30	C4	1

*Full Load Amps based on amps per driver.



Control System Summary

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PANEL SUMMARY						
CABINET #	CONTROL MODULE LOCATION	CONTACTOR ID	CIRCUIT DESCRIPTION	FULL LOAD AMPS	DISTRIBUTION PANEL ID (BY OTHERS)	CIRCUIT BREAKER POSITION (BY OTHERS)
1	1	C1	Pole S1	15.93		
1	1	C2	Pole S2	16.04		
1	1	C3	Pole S3	15.93		
1	1	C4	Pole S4	16.04		

ZONE SCHEDULE				
ZONE	SELECTOR SWITCH	ZONE DESCRIPTION	CIRCUIT DESCRIPTION	
			POLE ID	CONTACTOR ID
Zone 1	1	Soccer	S1	C1
			S2	C2
			S3	C3
			S4	C4