

MY PROJECT

Name: Xaverian Brothers High School
 Location: Westwood, MA

EQUIPMENT LAYOUT

INCLUDES:

- Football

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 ballast and structures located within 3 feet (1m) of design locations.

EQUIPMENT LIST FOR AREAS SHOWN

QTY	LOCATION	Pole		Luminaires		QTY / POLE
		SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LAMP TYPE	
4	F1-F4	70'	-	70'	1500W MZ	15
4	TOTALS					60

SINGLE LUMINAIRE AMPERAGE DRAW CHART

Ballast Specifications (.90 min power factor)	Line Amperage Per Luminaire (max draw)					
	208 VAC	220 VAC	240 VAC	277 VAC	347 VAC	480 VAC
Single Phase Voltage						
1500 watt MZ	8.6	8.3	7.5	6.5	5.1	4.7



SCALE IN FEET 1 : 200



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

ENGINEERED DESIGN

By: Ryan A. Marsh, LC
 File # / Date: 104390

05-Apr-13

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EQUIPMENT LIST FOR AREAS SHOWN

QTY	Pole			Luminaires				
	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LAMP TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
4	F1-F4	70'	-	70'	1500W MZ	15	15	0
4	TOTALS					60	60	0



MY PROJECT

Name: Xaverian Brothers High School
Location: Westwood, MA

GRID SUMMARY

Name: Football
Size: 360' x 160'
Spacing: 30.0' x 30.0'
Height: 3.0' above grade

CONSTANT ILLUMINATION

SUMMARY: HORIZONTAL FOOTCANDLES

	Entire Grid
Guaranteed Average:	70
Scan Average:	71.01
Maximum:	98
Minimum:	50
Avg / Min:	1.43
Guaranteed Max / Min:	2
Max / Min:	1.97
UG (adjacent pts):	1.50
CV:	0.18
No. of Points:	72

LUMINAIRE INFORMATION

Luminaire Type: Green Generation
Rated Lamp Life: 5,000 hours
Avg Lumens / Lamp: 134,000
Avg Lamp Tilt Factor: 1.000
No. of Luminaires: 60
Avg KW: 93.84 (102.0 max)

Guaranteed Performance: The Guaranteed Average CONSTANT ILLUMINATION described above is guaranteed for the rated life of the lamp.

Field Measurements: Illumination measured in accordance with IESNA LM-5-04 and CIBSE LG4. Individual values may vary. See the Warranty document for details.

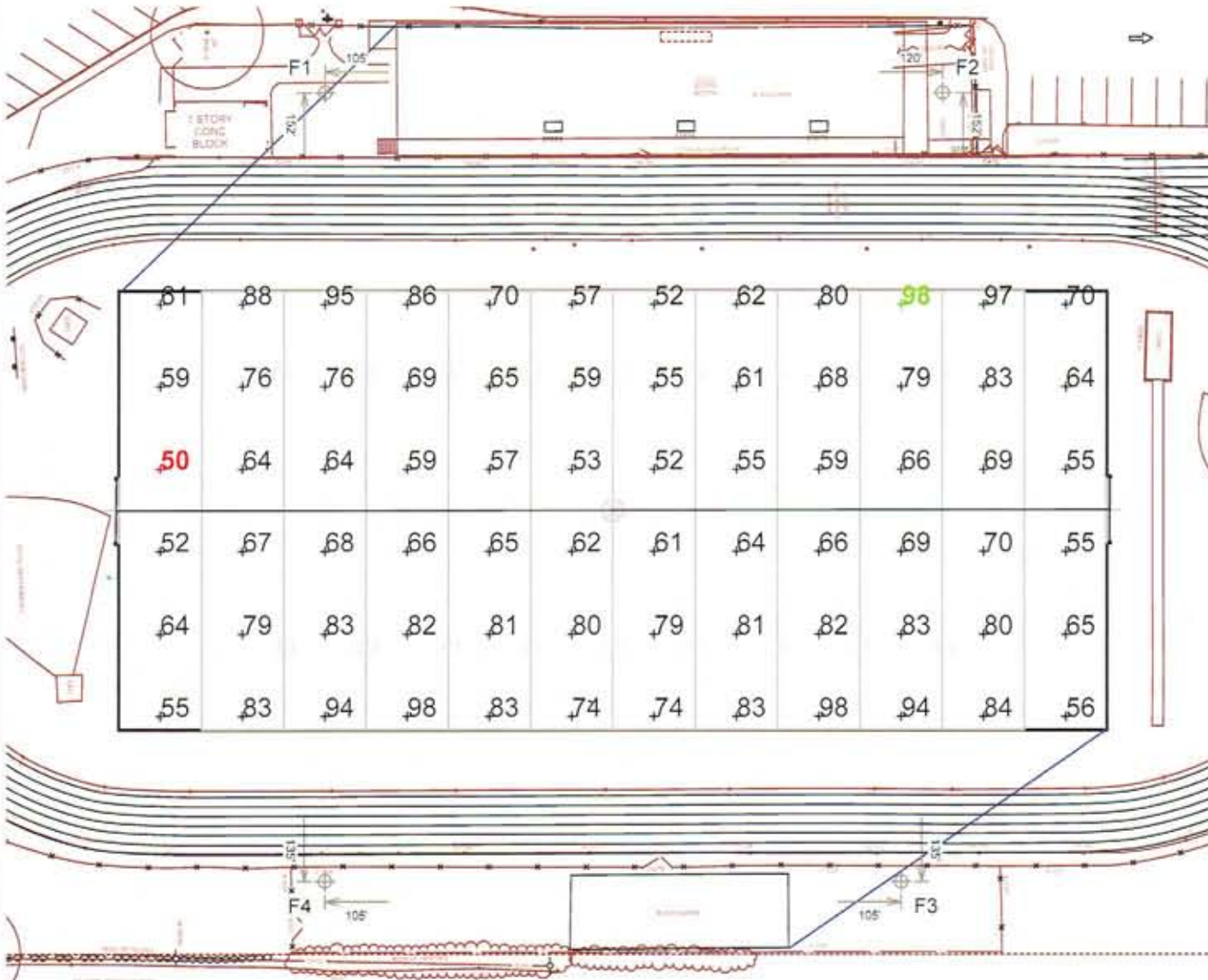
Electrical System Requirements: Refer to Amperage Draw Chart and/or the "Musco Control System Summary" for electrical sizing.

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

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SCALE IN FEET 1 : 60



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

EQUIPMENT LIST FOR AREAS SHOWN

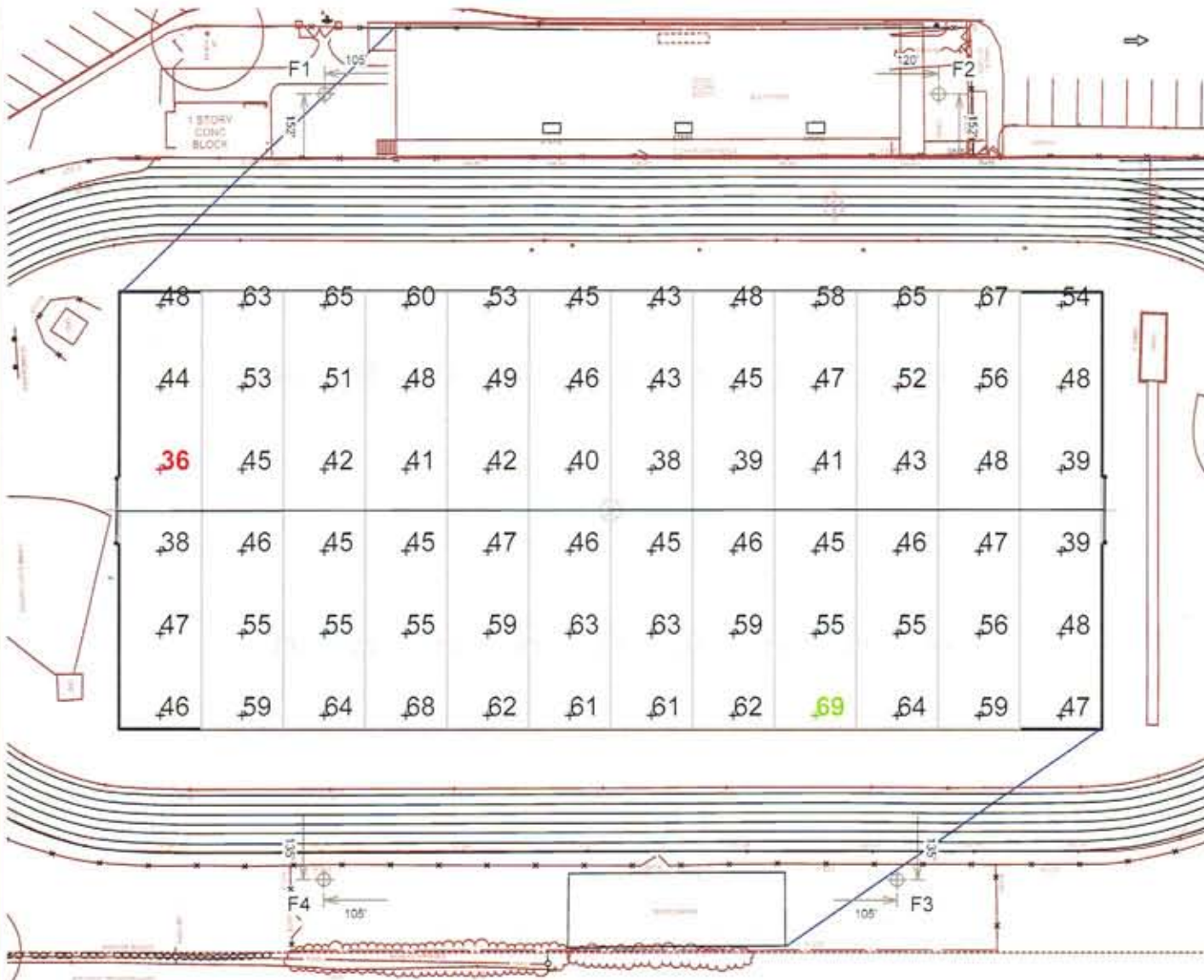
Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LAMP TYPE	QTY/ POLE	THIS GRID	OTHER GRIDS
4	F1-F4	70'	-	70'	1500W MZ	15	11	4
4	TOTALS					60	44	16



MY PROJECT	
Name:	Xaverian Brothers High School
Location:	Westwood, MA

GRID SUMMARY	
Name:	Football - 50 fc
Size:	360' x 160'
Spacing:	30.0' x 30.0'
Height:	3.0' above grade

CONSTANT ILLUMINATION	
SUMMARY	HORIZONTAL FOOTCANDLES
	Entire Grid
Guaranteed Average:	50
Scan Average:	51.02
Maximum:	69
Minimum:	36
Avg / Min:	1.42
Guaranteed Max / Min:	2
Max / Min:	1.90
UG (adjacent pts):	1.39
CV:	0.17
No. of Points:	72
LUMINAIRE INFORMATION	
Luminaire Type:	Green Generation
Rated Lamp Life:	5,000 hours
Avg Lumens / Lamp:	134,000
Avg Lamp Tilt Factor:	1.000
No. of Luminaires:	44
Avg KW:	68.82 (74.8 max)



Guaranteed Performance: The Guaranteed Average CONSTANT ILLUMINATION described above is guaranteed for the rated life of the lamp.

Field Measurements: Illumination measured in accordance with IESNA LM-5-04 and CIBSE LG4. Individual values may vary. See the Warranty document for details.

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 ballast and structures located within 3 feet (1m) of design locations.

ENGINEERED DESIGN		
By:	Ryan A. Marsh, LC	
File # / Date:	104390	05-Apr-13

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

ILLUMINATION SUMMARY

POLE FOUNDATION SCHEDULE, DRILLED PIER OPTION

POLE DESIGNATION	FORCES			DRILLED PIER		
	MOMENT (M) FT-LBS	SHEAR (V) LBS	VERTICAL (P) LBS (1.)	DIAMETER INCHES	EMBEDMENT DEPTH	CONCRETE BACKFILL YD ³ (2.)
F1	148,325	2,958	3,667	30	16'-0"	1.6
F2	151,732	3,007	3,667	30	16'-0"	1.6
F3, F4	144,918	2,909	3,667	30	16'-0"	1.6

1. WEIGHT OF POLE, FIXTURES AND ACCESSORIES.
2. MINIMUM CONCRETE BACKFILL VOLUME, SITE CONDITIONS MAY REQUIRE ADDITIONAL BACKFILL.
3. POTENTIAL FOR ENCOUNTERING ROCK BEFORE REACHING EMBEDMENT DEPTH. ROCK AUGERING EQUIPMENT MAY BE REQUIRED.

PRECAST BASE IDENTIFICATION

PRECAST BASE TYPE	PRECAST BASE WEIGHT	PRECAST BASE LENGTH	PROJECTION ABOVE GRADE	STANDARD EMBEDMENT	OUTSIDE DIAMETER
5B	4,580 LBS	23'-11"	7'-11"	16'-0"	18.36"

PRECAST BASE WEIGHT, LENGTH AND STANDARD EMBEDMENT ARE PRECUT PROPERTIES

POLE IDENTIFICATION

POLE DESIGNATION	POLE TYPE	PRECAST BASE TYPE	FIXTURE CONFIGURATION (FIX. PER XARM)	FIXTURE AND ACCESSORIES EPA (FT ²)
F1	LSS70D	5B	15 (6+5+4)	39.0
F2	LSS70D	5B	15 (6+5+4)	40.5
F3, F4	LSS70D	5B	15 (6+5+4)	37.5

CONCRETE/REINFORCEMENT NOTES

CONCRETE SHALL COMPLY WITH THE FOLLOWING ASTM STANDARDS: MIXTURE WITH ASTM C-94, PORTLAND CEMENT WITH ASTM C-150 TYPE 1-A, AGGREGATES WITH ASTM C-33 AND BE IN CONFORMANCE WITH ACI 318. CONCRETE SHALL BE AIR-ENTRAINED (COMPLY WITH ASTM C-260), HAVE A MAXIMUM WATER-CEMENT RATIO, $w/cm = 0.43$ AND HAVE A MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS OF 4,000 PSI (SPREAD FOOTINGS) AND 3,000 PSI (DRILLED PIERS).

DESIGN SLUMP LIMITS ARE 4" MINIMUM AND 6" MAXIMUM. THE JOB SITE SLUMP MAY BE INCREASED BY THE USE OF A WATER REDUCING AGENT MEETING ASTM C494-92.

CONCRETE REINFORCEMENT SHALL COMPLY WITH ASTM A615 GRADE 60, EXCEPT TIES CAN BE OF GRADE 40 AND BE IN CONFORMANCE WITH ACI 315 & 318.

CONCRETE FOR SPREAD FOOTINGS MUST ATTAIN 3,000 PSI STRENGTH PRIOR TO POLE INSTALLATION AND FIXTURE MOUNTING

DESIGN NOTES

DESIGN PARAMETERS:

WIND: 105 MPH (EXP. C, I = 1.0) PER IBC CODE, 2009 EDITION (ASCE 7-05). DESIGN WIND PARAMETERS ARE AS NOTED. ACTUAL WIND SPEED AND EXPOSURE MUST BE VERIFIED FOR THE SITE BY THE PROPER GOVERNING OFFICIAL.

GEOTECHNICAL PARAMETERS:

ALLOWABLE END BEARING SOIL PRESSURE: 1,500 PSF (SPREAD FOOTING)

ALLOWABLE END BEARING SOIL PRESSURE: 2,000 PSF (DRILLED PIER)

ALLOWABLE LATERAL SOIL BEARING PRESSURE:

0 PSF/FT (GRADE TO -2'-0"); VARIES, SEE SOIL BORINGS (BELOW -2'-0")

IN ACCORDANCE WITH THE 2009 EDITION OF THE INTERNATIONAL BUILDING CODE, CHAPTER 18.

DESIGN SOIL PARAMETERS ARE AS NOTED. ACTUAL ALLOWABLE SOIL PARAMETERS MUST BE VERIFIED ON SITE. REFERENCE SOILS AND FOUNDATION REPORT, NO. 39579-002, PREPARED BY HALEY & ALDRICH; BOSTON, MA.

A GEOTECHNICAL ENGINEER OR REPRESENTATIVE OF IS RECOMMENDED (NOT REQUIRED) TO BE AVAILABLE AT THE TIME OF THE FOUNDATION INSTALLATION TO VERIFY THE SOIL DESIGN PARAMETERS AND TO PROVIDE ASSISTANCE IF ANY PROBLEMS ARISE IN FOUNDATION INSTALLATION.

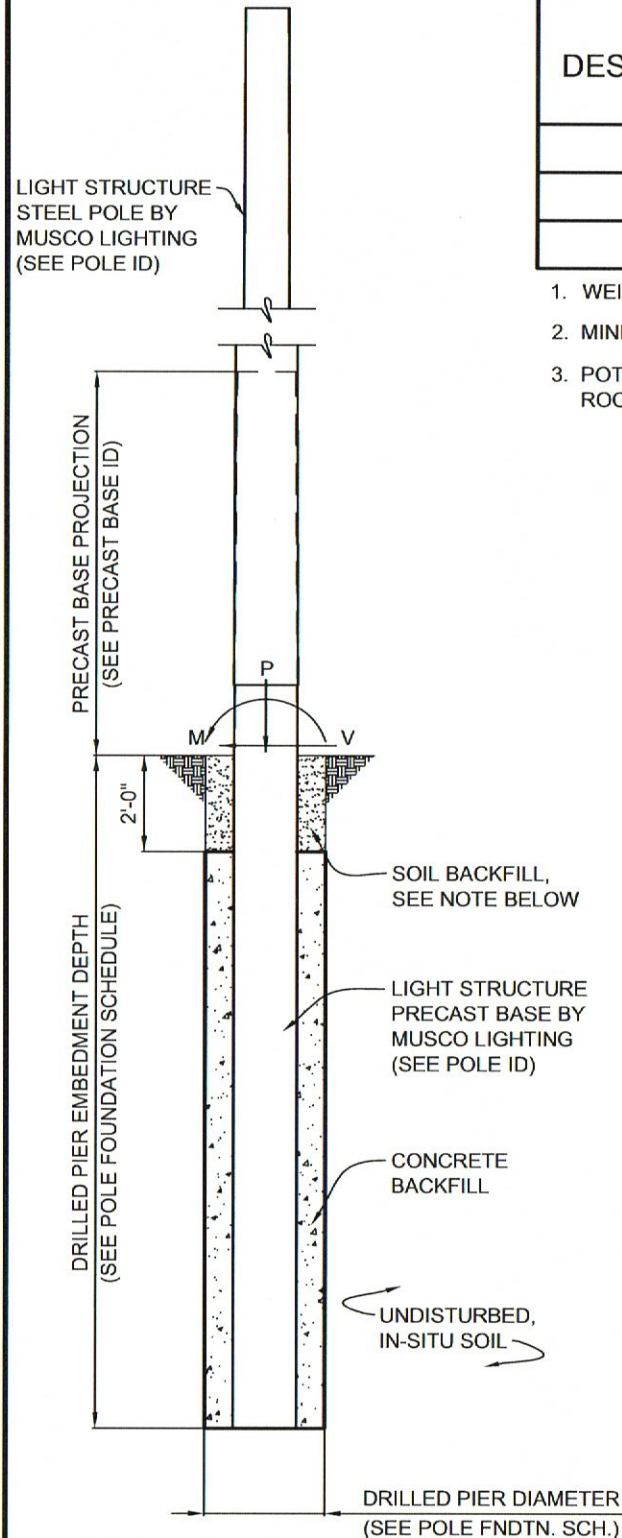
ENCOUNTERING SOIL FORMATIONS THAT WILL REQUIRE SPECIAL DESIGN CONSIDERATIONS OR EXCAVATION PROCEDURES MAY OCCUR. POLE FOUNDATIONS WILL NEED TO BE ANALYZED ACCORDING TO THE SOIL CONDITIONS THAT EXIST. IF ANY DISCREPANCIES OR INCONSISTENCIES ARISE, NOTIFY THE ENGINEER OF SUCH DISCREPANCIES. FOUNDATIONS WILL THEN BE REVISED ACCORDINGLY. REVISIONS WILL BE ANALYZED PER RECOMMENDATIONS DIRECTED BY A REGISTERED ENGINEER.

ALL EXCAVATIONS MUST BE FREE OF LOOSE SOIL AND DEBRIS PRIOR TO FOUNDATION INSTALLATION AND CONCRETE BACKFILL PLACEMENT. TEMPORARY CASINGS OR DRILLERS SLURRY MAY BE USED TO STABILIZE THE EXCAVATION DURING INSTALLATION. CASINGS MUST BE REMOVED DURING CONCRETE BACKFILL PLACEMENT. CONCRETE BACKFILL MUST BE PLACED WITH A TREMIE WHEN SLURRY OR WATER IS PRESENT WITHIN THE EXCAVATION OR WHEN THE FREE DROP EXCEEDS 6'-0".

CONTRACTOR MUST BE FAMILIAR WITH THE COMPLETE SOIL INVESTIGATION REPORT AND BORINGS, AND CONTACT THE GEOTECHNICAL FIRM (IF NECESSARY) TO UNDERSTAND THE SOIL CONDITIONS AND THE POSSIBILITY OF GROUND WATER PUMPING AND EXCAVATION STABILIZATION OR BRACING DURING PRECAST BASE INSTALLATION AND PLACEMENT OF CONCRETE BACKFILL.

GENERAL NOTES:

FIXTURES MUST BE LOCATED TO MAINTAIN 10'-0" MINIMUM HORIZONTAL CLEARANCE FROM ANY OBSTRUCTION. POLES, FIXTURES, PRECAST BASES, ELECTRICAL ITEMS AND INSTALLATION PER MUSCO LIGHTING.



POLE FOUNDATION ELEV., DRILLED PIER OPTION

SCALE: NOT TO SCALE

SOIL BACKFILL NOTE:

THE TOP TWO FEET OF ANNULUS MAY BE BACKFILLED WITH SOIL, WITH A CLASSIFICATION OF CLASS 5 OR BETTER IN ACCORDANCE WITH IBC - TABLE 1806.2.

XAVERIAN BROTHERS
HIGH SCHOOL
FIELD LIGHTING
WESTWOOD, MASSACHUSETTS

CORPORATE: 100 1st AVE WEST
 OSKALOOSA, IA 52577
 (800) 825-6020

STRUCTURAL ENGINEERS, P.C.
 114 NICHOLAS DRIVE
 MARSHALLTOWN, IOWA 50158
 PHONE NUMBER: 641-752-6334
 EMAIL: MSL.INFO@SEPC.BIZ

DRAWING TITLE:
 POLE AND FOUNDATION
 SCALE: SEE PLAN
 NOTES:
 SCAN #104390

PROJECT NUMBER
 104390

DATE
 19 APRIL 2013

DRAWING NUMBER
C1

OF TWO

PRELIMINARY

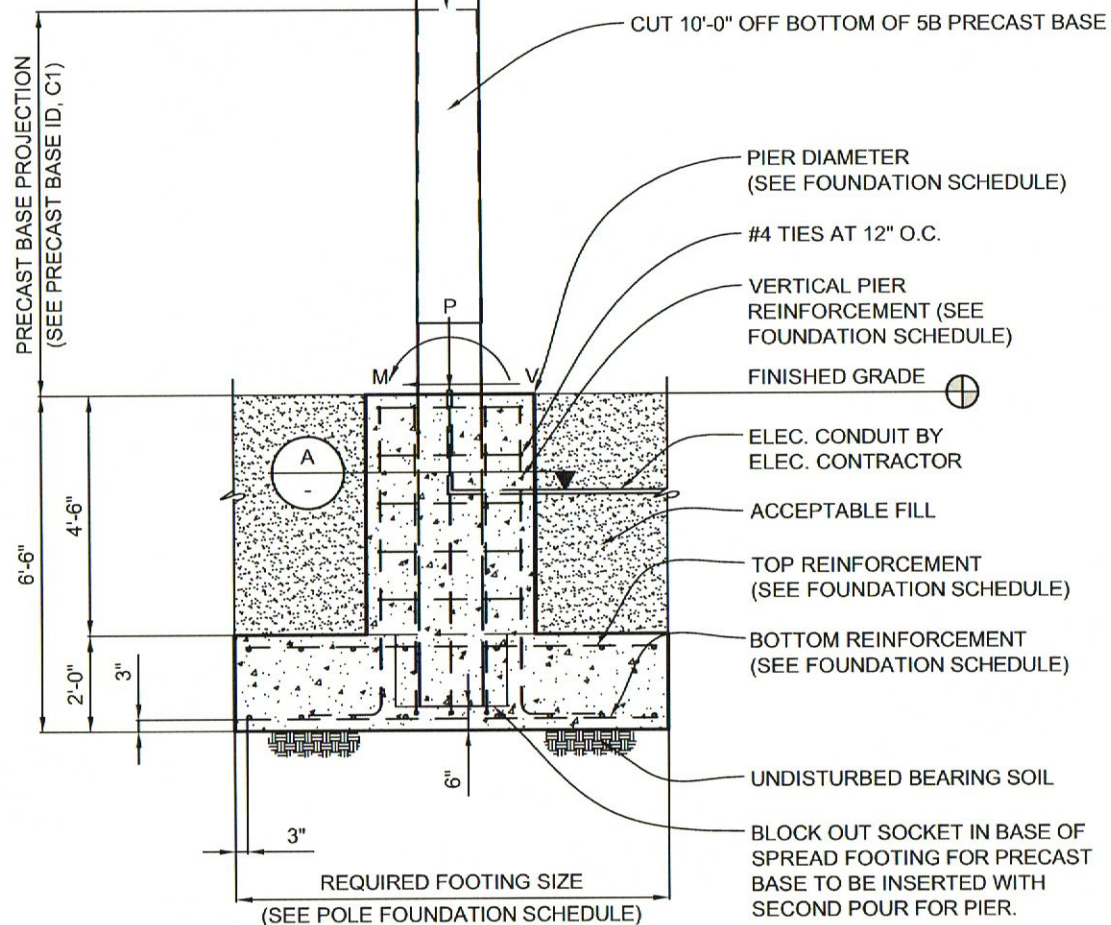
POLE FOUNDATION SCHEDULE, SPREAD FOOTING OPTION

POLE DESIGNATION	FORCES			FOOTING			PIER		
	MOMENT (M) FT-LBS	SHEAR (V) LBS	VERTICAL (P) LBS (1.)	SIZE	THICKNESS	REINFORCEMENT TOP & BOTTOM (TOTAL) QUANTITY - SIZE	DIAMETER INCHES	CORE DIA. INCHES (2.)	VERTICAL REINFORCING
F1	148,325	2,958	3,667	12'-0" x 12'-0"	2'-0"	(48) 12 - #7's EACH WAY	48	41	18 - #7
F2	151,732	3,007	3,667	12'-0" x 12'-0"	2'-0"	(48) 12 - #7's EACH WAY	48	41	18 - #7
F3, F4	144,918	2,909	3,667	12'-0" x 12'-0"	2'-0"	(48) 12 - #7's EACH WAY	48	41	18 - #7

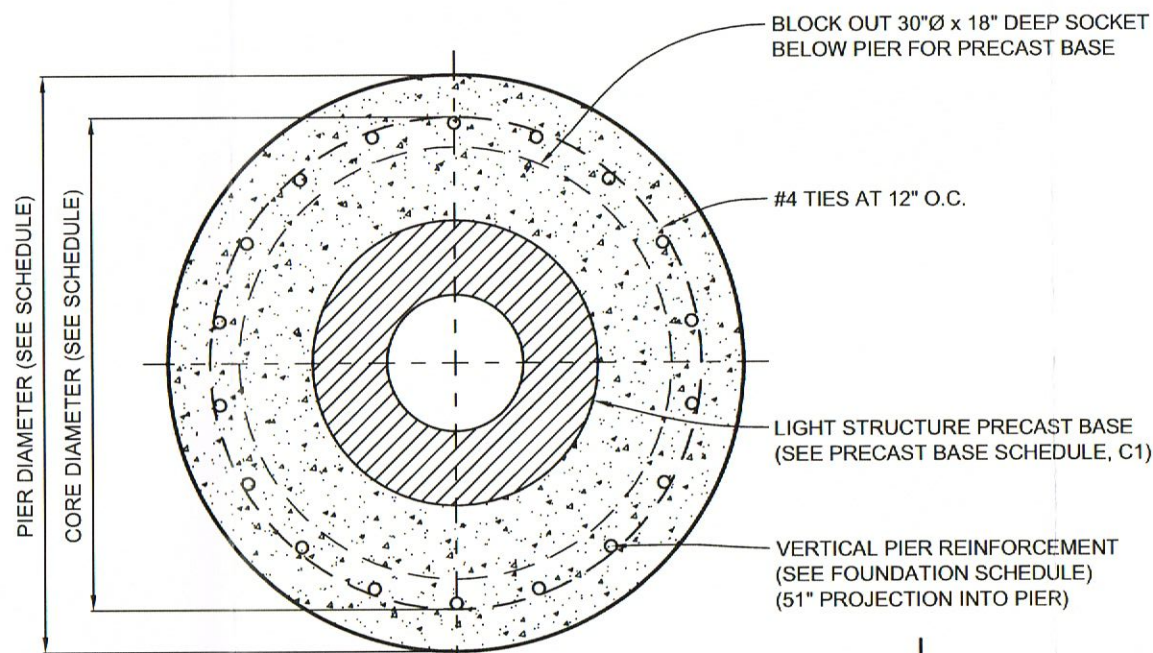
1. WEIGHT OF POLE, FIXTURES AND ACCESSORIES.
2. CORE DIAMETER EQUAL TO INSIDE DIAMETER OF TIES.

LIGHT STRUCTURE STEEL POLE BY MUSCO LIGHTING (SEE POLE ID, C1)

LIGHT STRUCTURE PRECAST BASE TO BE CUT BY MUSCO OR IN THE FIELD. CONTRACTOR TO VERIFY CUT IN DIRECT COORDINATION WITH MUSCO LIGHTING. NEW BOTTOM SURFACE SHOULD BE EPOXY COATED. PRECAST BASE HAS A MINIMUM EMBEDMENT INTO PIER / SPREAD FTG OF 6'-0".



POLE FOUNDATION ELEVATION, SPREAD FOOTING OPTION
SCALE: NOT TO SCALE



A PIER DETAIL
SCALE: NOT TO SCALE

PRELIMINARY

XAVERIAN BROTHERS
HIGH SCHOOL
FIELD LIGHTING
WESTWOOD, MASSACHUSETTS


 CORPORATE: 100 1st AVE WEST
 OSKALOOSA, IA 52577
 (800) 825-6020

STRUCTURAL ENGINEERS, P.C.
 114 NICHOLAS DRIVE
 MARSHALLTOWN, IOWA 50158
 PHONE NUMBER: 641-752-6334
 EMAIL: MSL.INFO@SEPC.BIZ

DRAWING TITLE:
 POLE AND FOUNDATION
 SCALE: SEE PLAN
 NOTES:
 SCAN #104390

PROJECT NUMBER
 104390

DATE
 19 APRIL 2013

DRAWING NUMBER
C2

OF TWO



Control System Summary

Project Information

Project Specific Notes:

Project #: 104390
 Project Name: Xaverian Brothers High School
 Date: 04/05/13
 Project Engineer: RMarsh
 Sales Representative: Mike Berry
 Control System Type: Control and Monitoring
 Communication Type: Digital Cellular
 Scan: 104390
 Distribution Panel Location or ID: Electrical #1
 Total # of Distribution Panel Locations for Project: 1
 Design Voltage/Hertz/Phase: 480/60/3
 Control Voltage: 120

Equipment Listing

DESCRIPTION	APPROXIMATE SIZE	
1. Control and Monitoring Cabinet	24 X 72	
2. Surge Protection Device	6 X 10	
	QTY	SIZE
Total Contactors	8	30 AMP
Total Off/On/Auto Switches:	2	

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
 - Monitoring circuit from surge protection device to Control and Monitoring cabinet 1
 - 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

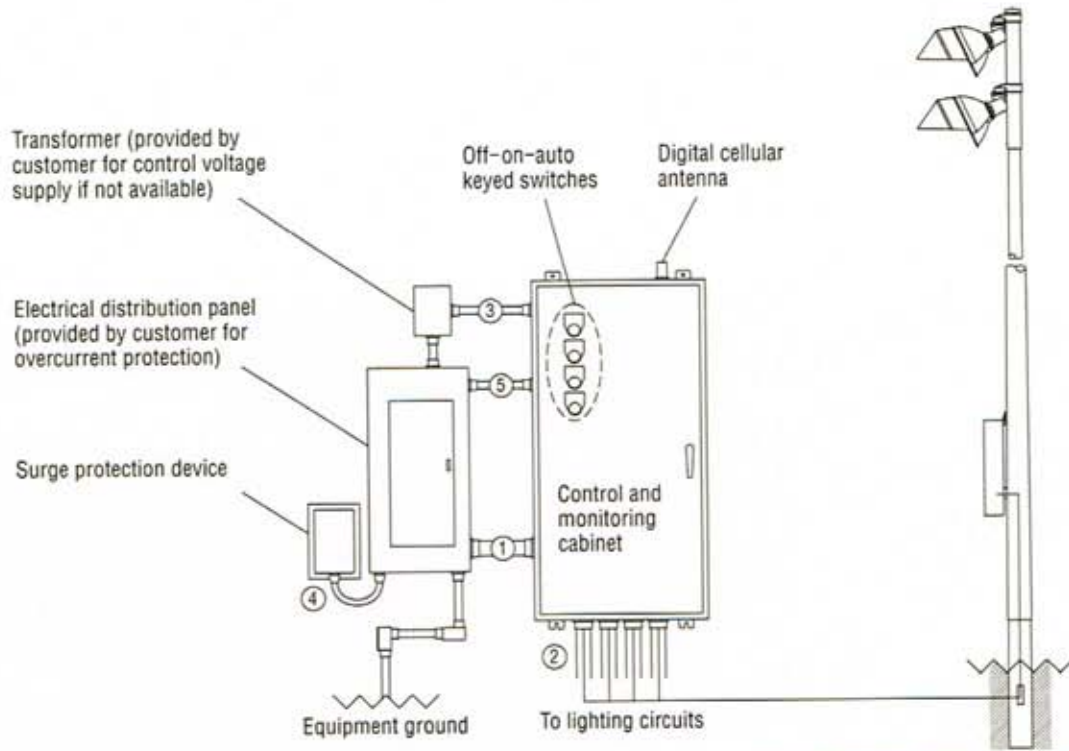
Call Control-Link Central(TM) operations center at 877/347-3319 to schedule activation of the control system upon completion of the installation.
 Note: Activation may take up to 1 1/2 hours

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 – Digital Cellular



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
4	Surge protection device to distribution panel	--	--	N/A	Yes	F
5	Surge protection device monitoring	3	14	N/A	Yes	C, D, F

R60-25-00_D

- 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.
 - F. Refer to surge protection device installation instructions for more details on equipment information and the installation requirements.

IMPORTANT: Control (3) and monitoring (5) wires must be in separate conduit from line and load power wiring (1, 2).



Control System Summary

Xaverian Brothers High School / 104390 - 104390
Electrical #1 - Page 3 of 4

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Form: T-5030-1

SWITCHING SCHEDULE

Field/Zone Description	Zones
Football	1,2
-Football - 50 fc	1
-Football	2

CONTROL POWER CONSUMPTION	
120V Single Phase	
VA loading of Musco Supplied Equipment	INRUSH: 2045.0
	SEALED: 293.0

BALLAST SPECIFICATIONS 90 Minimum Power Factor	VOLTAGE: 480v THREE PHASE						
BALLAST OPERATING VOLTAGE	208	220	240	277	347	380	480
1500 Watt Metal Halide Lamp Operating line amperage per fixture- maximum	8.6	8.3	7.5	6.5	5.1	4.7	3.7
1000 Watt Metal Halide Lamp Operating line amperage per fixture- maximum	6.5	6.4	5.8	4.9	4.0	3.6	2.9

CIRCUIT SUMMARY BY ZONE

POLE	CIRCUIT DESCRIPTION	# OF FIXTURES	FULL LOAD AMPS	CONTACTOR SIZE (AMPS)	CONTACTOR ID	ZONE
F1	Football - 50 fc	11	29.6	30	C1	1
F2	Football - 50 fc	11	29.6	30	C2	1
F3	Football - 50 fc	11	29.6	30	C3	1
F4	Football - 50 fc	11	29.6	30	C4	1
F1	Football	4	11.1	30	C5	2
F2	Football	4	11.1	30	C6	2
F3	Football	4	11.1	30	C7	2
F4	Football	4	11.1	30	C8	2



Control System Summary

Xaverian Brothers High School / 104390 - 104390
Electrical #1 - Page 4 of 4

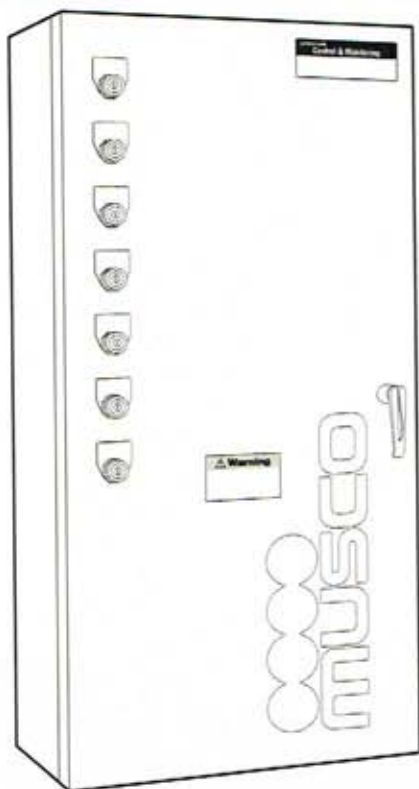
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Form: T-5030-1

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 F1	29.60		
1	1	C2	Pole F2	29.60		
1	1	C3	Pole F3	29.60		
1	1	C4	Pole F4	29.60		
1	1	C5	Pole F1	11.10		
1	1	C6	Pole F2	11.10		
1	1	C7	Pole F3	11.10		
1	1	C8	Pole F4	11.10		

ZONE SCHEDULE

ZONE	SELECTOR SWITCH	ZONE DESCRIPTION	CIRCUIT DESCRIPTION	
			POLE ID	CONTACTOR ID
Zone 1	1	Football - 50 fc	F1	C1
			F2	C2
			F3	C3
			F4	C4
Zone 2	2	Football	F1	C5
			F2	C6
			F3	C7
			F4	C8



Overview

Control-Link® control and monitoring system provides flexible remote on/off control, monitoring, and management of your lighting system.

Features

Control

- Lighting system and auxiliary equipment
- Customized on/off control via phone, website, smartphone application, email, or fax up to 10 years in advance
- Multi-level user security settings
- Key-activated on/off/auto switches allow manual or automated control
- Seven controllable lighting zones

Monitoring

- Detects lamp outages and other issues that affect light quality

Management and Support

- Control-Link Central™ service center provides support 24 hours a day, 7 days a week for scheduling, monitoring, and reporting
- Luminaire outage notification within the next business day
- Customized usage reports through website

Technical Specifications

Ratings

UL 508A Listed E204954

FCC Part 15 Class A compliant

Operating temperature -4 °F to 140 °F (-20 °C to 60 °C)

Weight for 72 inch (1829 mm) cabinet 150 lb (70 kg)

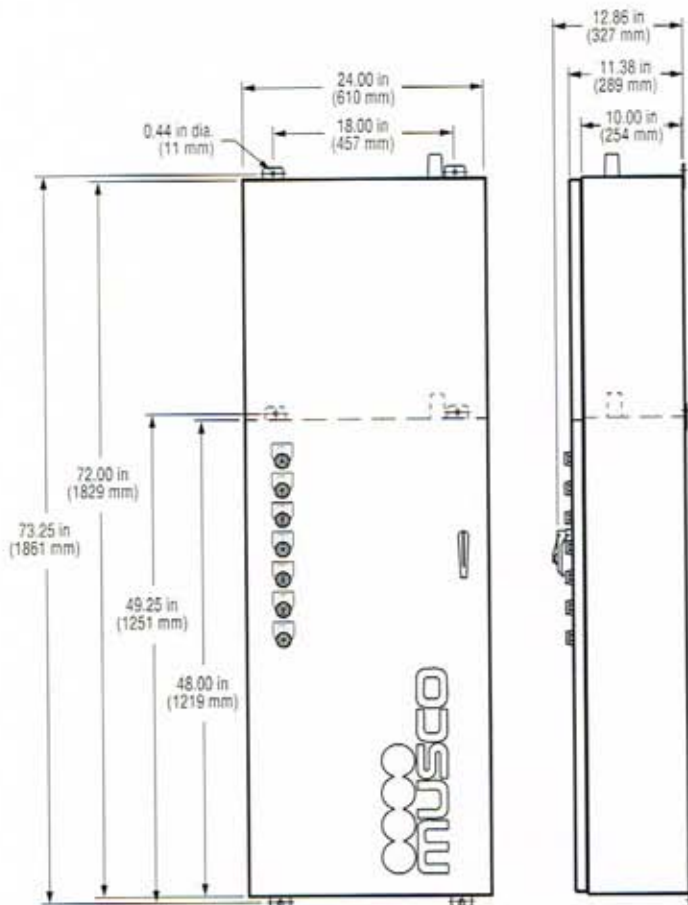
Weight for 48 inch (1219 mm) cabinet 125 lb (60 kg)

Short Circuit Current Rating (SCCR)

with 30 A contactors* 18 kA

with 60 or 100 A contactors* 25 kA

*Minimum circuit breaker interrupt rating must be greater than or equal to SCCR rating listed above.



Technical Specifications

Construction

- NEMA type 4 cabinet
- Powder-coated aluminum 5052 H32 cabinet and panel
- Lockable, 3-point latch
- Supports lighting system voltage up to 600 V
- Requires 120 V phase-to-neutral control voltage

Internal Details

- Factory wired, programmed, and tested
- Internally fused
- Control power terminal blocks provided
- One control circuit operates entire cabinet
- Plug-in wire harnesses provided to connect multiple cabinets

Control Module

Receives and stores schedules from Control-Link Central™ service center, operates your equipment, and verifies schedules were carried out.

- Stores and executes schedules for up to 7 days
- Reboots automatically and executes current schedule when power is restored, in case of power interruption

Monitoring Modules

Monitors Musco lighting system and reports issues to keep facilities operating and to help plan routine maintenance.

- Alerts Control-Link Central service center to schedule appropriate action or maintenance

Communication Module

Integrated communication system providing two-way reliable, high speed communication to Control-Link Central service center with no additional monthly charges during warranty period.

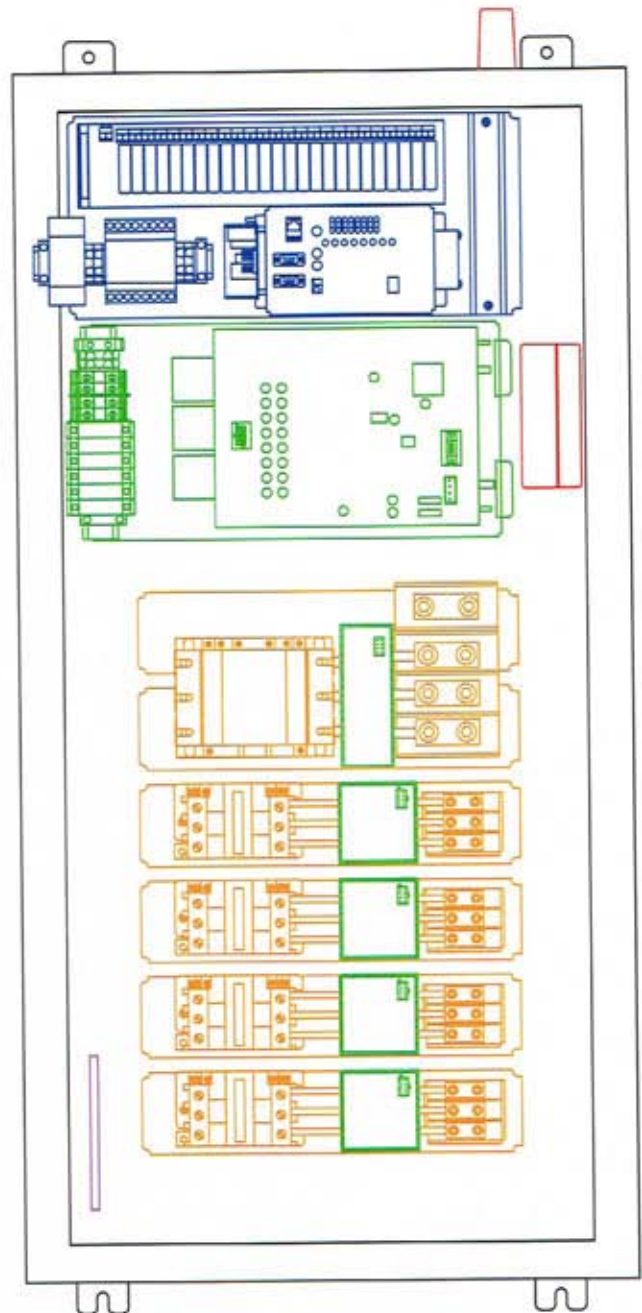
Contactors Modules

Switches equipment based on control module schedules.

- Tested and UL-listed for continuous operation at 100% of rated current
- Contactors rated for 30, 60, or 100 A

Ground Bar

Provides integral ground bar for lighting equipment grounding.



Spill Light Control

Musco Light-Structure Green™ Technology reduces spill light by 50% over typical floodlighting.

Project Submittal: Manufacturer's Model Number

Xaverian Brothers High School
Football Field Lighting Project
Westwood, MA

# of Poles	Pole Designation	Catalog #
4	F1,F2,F3,F4	LSG - 70 - 1500W MZ - 15



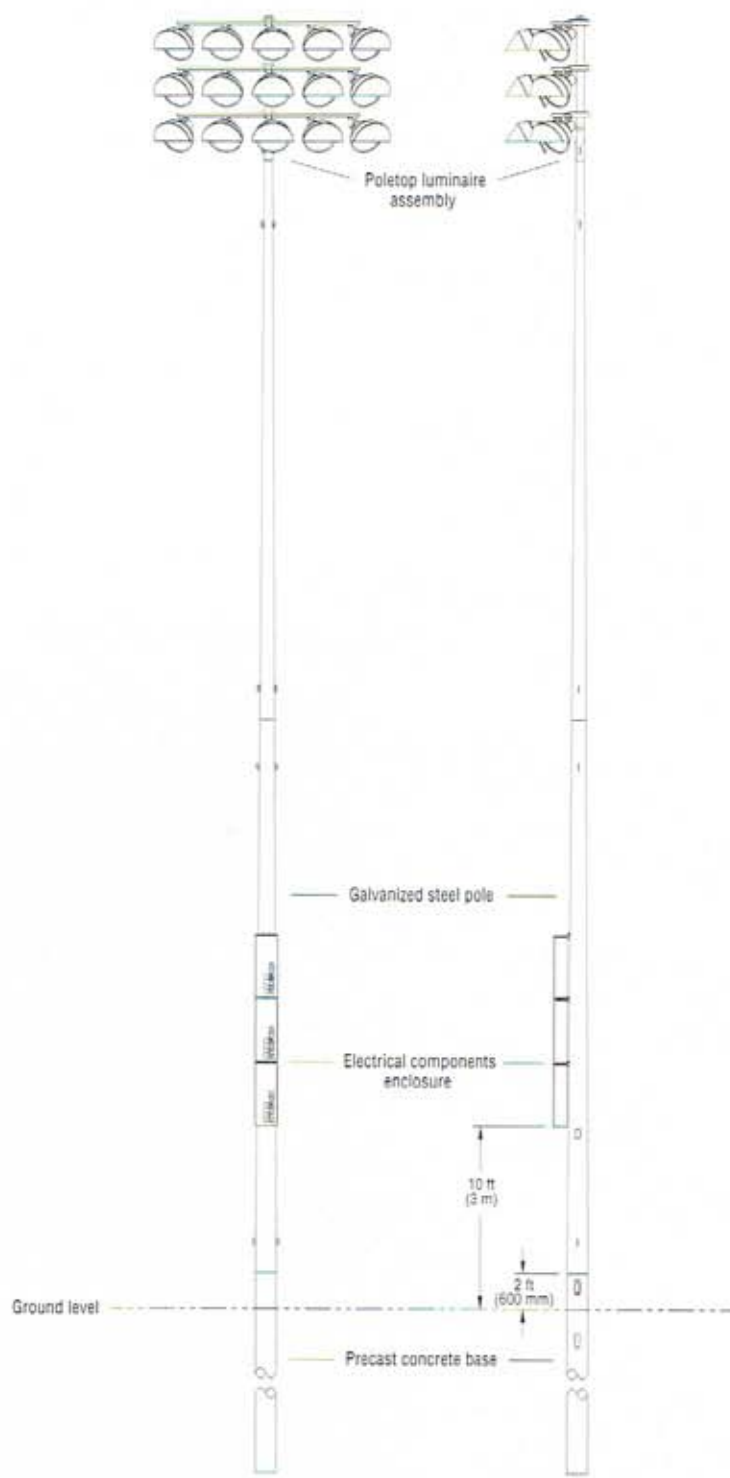
Xaverian Brothers High School
Football Field Lighting Project
Westwood, MA

Controls and Monitoring

Catalog #
CM - 24 x 72 - 8



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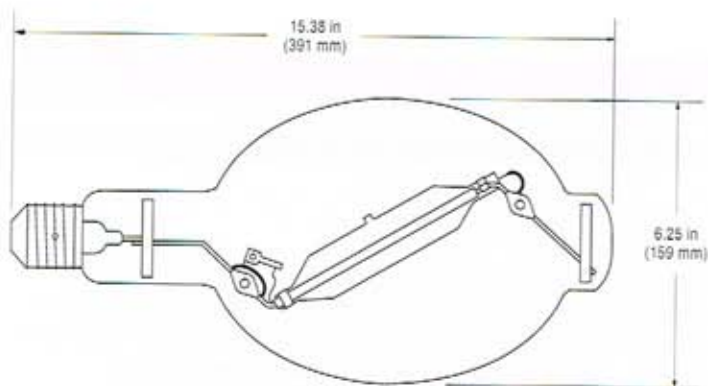
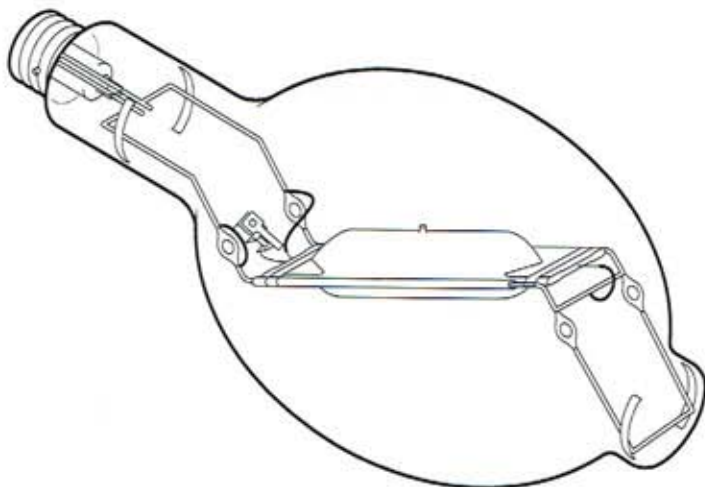
PRELIMINARY

PROJECT NO. LSG-15
 DRAWN BY RWS
 DATE 07/03/12
 NOT TO SCALE
 M-1203-en-US-4

Musco Light-Structure System™ pole
 (15) metal halide Green Generation™ luminaires
 Typical configuration


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Z-Lamp™ Lamp and Ballast — 1500 Watt, 60 Hertz



Lamp Data

Physical Characteristics

Lamp type.....	Z-Lamp™ HID metal halide (MH 1500/MZ)
Lamp designation.....	M48
Bulb designation.....	BT-56
Bulb finish.....	Clear
Operating position.....	Arc tube horizontal
Base.....	Mogul screw position oriented

Smart Lamp® Operating System Characteristics¹

Constant lumens ²	134 000 lm
Useful lamp life ³	5000 h
CIE correlated color temperature (approximate).....	4200 K
Color rendering index (CRI).....	R _s = 65 – 70
Warm-up time (80% output).....	3 – 5 min
CIE chromaticity coordinates (X, Y).....	(0.370, 0.390)
Average lamp wattage ²	1450 W
Restrike time for hot lamp.....	10 – 15 min
Maximum operating lamp current.....	6.0 A
Minimum ambient starting temperature.....	-20 °F (-30 °C)

Footnotes:

1) Operating characteristics are per the Musco Smart Lamp® operating system on a commercial ballast with arc tube horizontal. Lamp lumen measurements in accordance with IES LM-51-00. Lamp color data in accordance with IES LM-58-94. Lamp operating cycle of five hours per start to reflect expected field use in the sports lighting industry.

2) Lamp starts out at a reduced wattage and increases over life to offset lumen loss as lamp ages. Power dissipated by auxiliary equipment such as ballast, is not included in the lamp wattage shown.

3) Beyond 5000 hours is the time when constant lumens are no longer maintained by the Smart Lamp operating system. Average rated lamp life before failure is substantially greater than 5000 hours as tested and defined per IES LM-47-01 with five hours per start.