



GUARANTEED PERFORMANCE

EQUIPMENT LAYOUT

Brentwood Football
Miami Gardens, FL

INCLUDES:

- Football
- Soccer

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

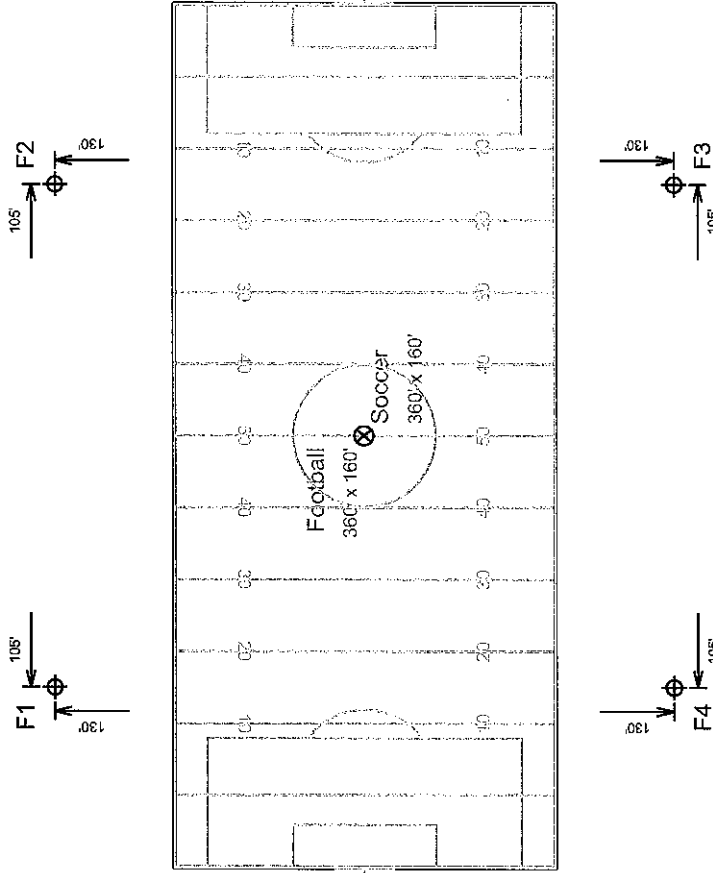
Installation Requirements: Results assume +/- 3% nominal voltage at line side of the ballast and structures located within 3 feet (1m) of design locations.

EQUIPMENT LIST FOR AREAS SHOWN

Pole				Luminaires		
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LAMP TYPE	QTY / POLE
4	F1-F4	70'	-	70'	1500W MZ	6
4	TOTALS					24

SINGLE LUMINAIRE AMPERAGE DRAW CHART

Ballast Specifications		Line Amperage Per Luminaire (90 min power factor)					
		120 (eo)	208 (eo)	220 (eo)	240 (eo)	277 (eo)	347 (eo)
Single Phase Voltage		120	208	220	240	277	347
1500 watt MZ		15.0	8.6	7.7	7.5	6.5	5.1
						4.7	-
						3.7	-



SCALE IN FEET 1 : 80



By: Justin Van Soelen

File #: 146785

Date: 12-May-10

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

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EQUIPMENT LIST FOR AREAS SHOWN

QTY	LOCATION	SIZE	GRADE ELEVATION	Luminaires		
				MOUNTING HEIGHT	LAMP TYPE	OTHER GRIDS
4	F1-F4	70'		70'	1500W MZ	0
4	TOTALS			24	24	0



GUARANTEED PERFORMANCE

ILLUMINATION SUMMARY

Football

Brentwood Football
Miami Gardens, FL

Football

- Size: 360' x 160'
- Grid Spacing = 30.0' x 30.0'
- Values given at 3.0' above grade

- Luminaire Type: Green Generation
- Rated Lamp Life: 5,000 hours
- Avg Lumens/Lamp: 134,000

CONSTANT ILLUMINATION
HORIZONTAL FOOTCANDLES

Entire Grid

No. of Target Points: 72

Average: 30.37

Maximum: 36

Minimum: 22

Avg/Min: 1.36

Max/Min: 1.60

UG (Adjacent Pts): 1.57

CV: 0.13

Average Lamp Tilt Factor:

Number of Luminaires:

Avg KW over 5,000:

Max KW:

1.000
24
37.54
40.8

Guaranteed Performance: The CONSTANT

ILLUMINATION described above is guaranteed for the rated life of the lamp.

Field Measurements: Averages shall be +/- 10% in accordance with IESNA RP-6-01 and CIBSE LG4. Individual measurements may vary from computer predictions.

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.

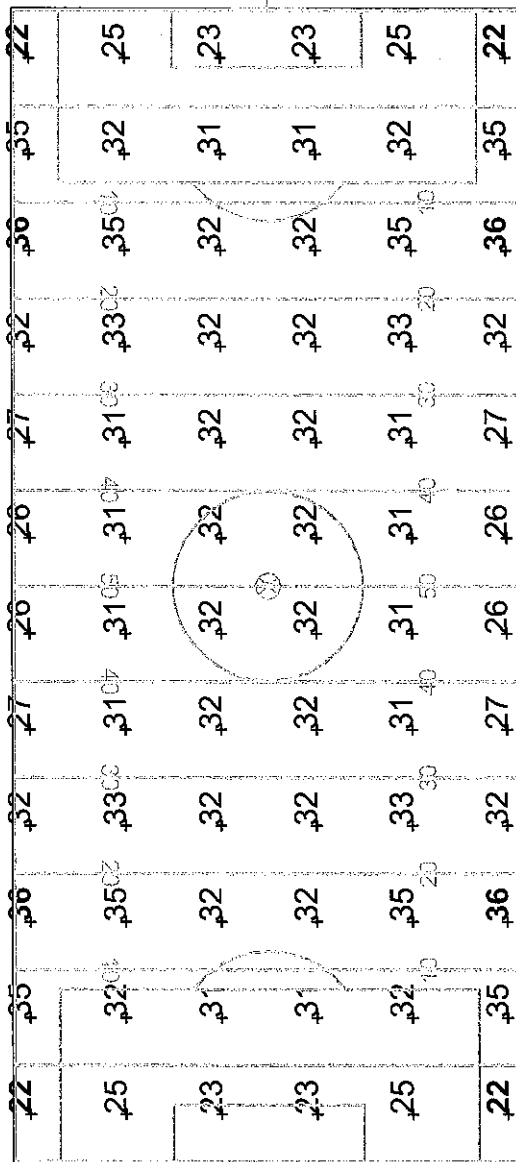
By: Justin Van Soelen

File #: 146785

Date: 12-May-10

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

SCALE IN FEET 1 : 60



EQUIPMENT LIST FOR AREAS SHOWN

QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	Luminaires		
					LAMP TYPE	QTY/ POLE	THIS GRID
4	F1-F4	70"	-	70'	1500W MZ	6	0
4	TOTALS					24	0



GUARANTEED PERFORMANCE

ILLUMINATION SUMMARY

Soccer

Brentwood Football
Miami Gardens, FL

Soccer

- Size: 360' x 160'
- Grid Spacing = 30.0' x 30.0'
- Values given at 3.0' above grade

- Luminaire Type: Green Generation
- Rated Lamp Life: 5,000 hours
- Avg Lumens/Lamp: 134,000

CONSTANT ILLUMINATION
HORIZONTAL FOOTCANDLES

No. of Target Points: 72

Entire Grid
Average: 30.37
Maximum: 36

Minimum: 22
Avg/Min: 1.36

Max/Min: 1.60
UG (Adjacent Pts): 1.57
CV: 0.13

Average Lamp Tilt Factor:

Number of Luminaires:

Avg KW over 5,000:

Max KW:

1,000

24

37.54

40.8

Guaranteed Performance: The CONSTANT

ILLUMINATION described above is guaranteed for the rated life of the lamp.

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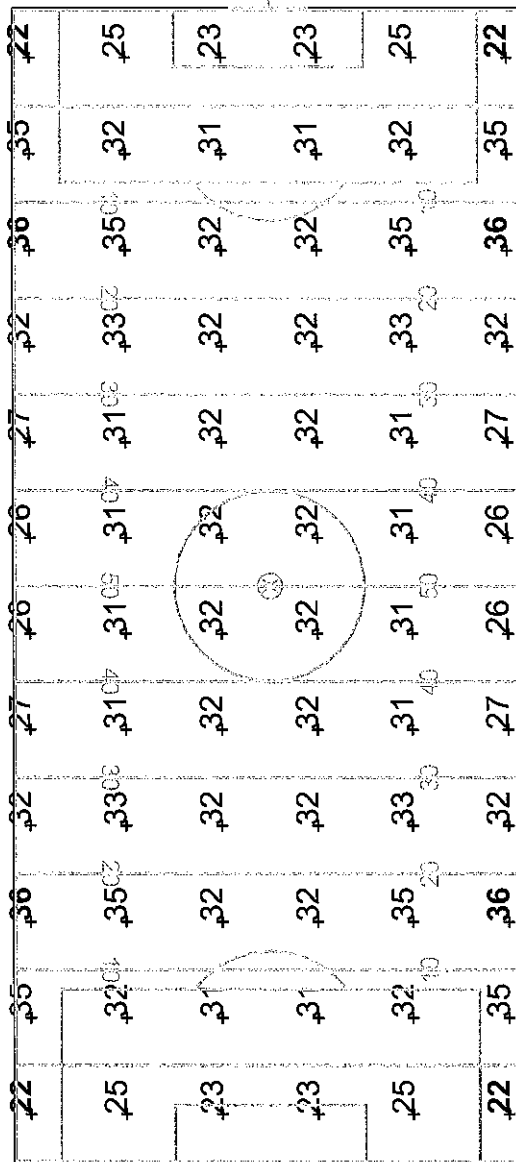
Installation Requirements: Results assume +/- 3% nominal voltage at line side of the ballast and structures located within 3 feet (1m) of design locations.

By: Justin Van Soelen

Date: 12-May-10

File #: 146785
Pole location(s) dimensions are relative
to 0,0 reference point(s) ⊗

SCALE IN FEET 1 : 60





ILLUMINATION SUMMARY

**Brentwood Football
Miami Gardens, FL**

- Grid Spacing = 30.0'
- Values given at 3.0' above grade

- | | |
|------------------|------------------|
| Luminaire Type: | Green Generation |
| Rated Lamp Life: | 5,000 hours |
| Avg Lumens/Lamp: | 134,000 |

CONSTANT ILLUMINATION HORIZONTAL FOOTCANDLES

Entire Grid 16

Average:	0.0601
Maximum:	0.08
Minimum:	0.04

Average Lamp Tilt Factor:	1.000
Number of Luminaires:	24
Avg KW over 5,000:	37.54
Max KW:	40.8

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

Field Measurements: Averages shall be +/-10% in accordance with IESNA RP-6-01 and CIBSE LG4. Individual measurements may vary from computer predictions.

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.

By: Justin Van Soelen

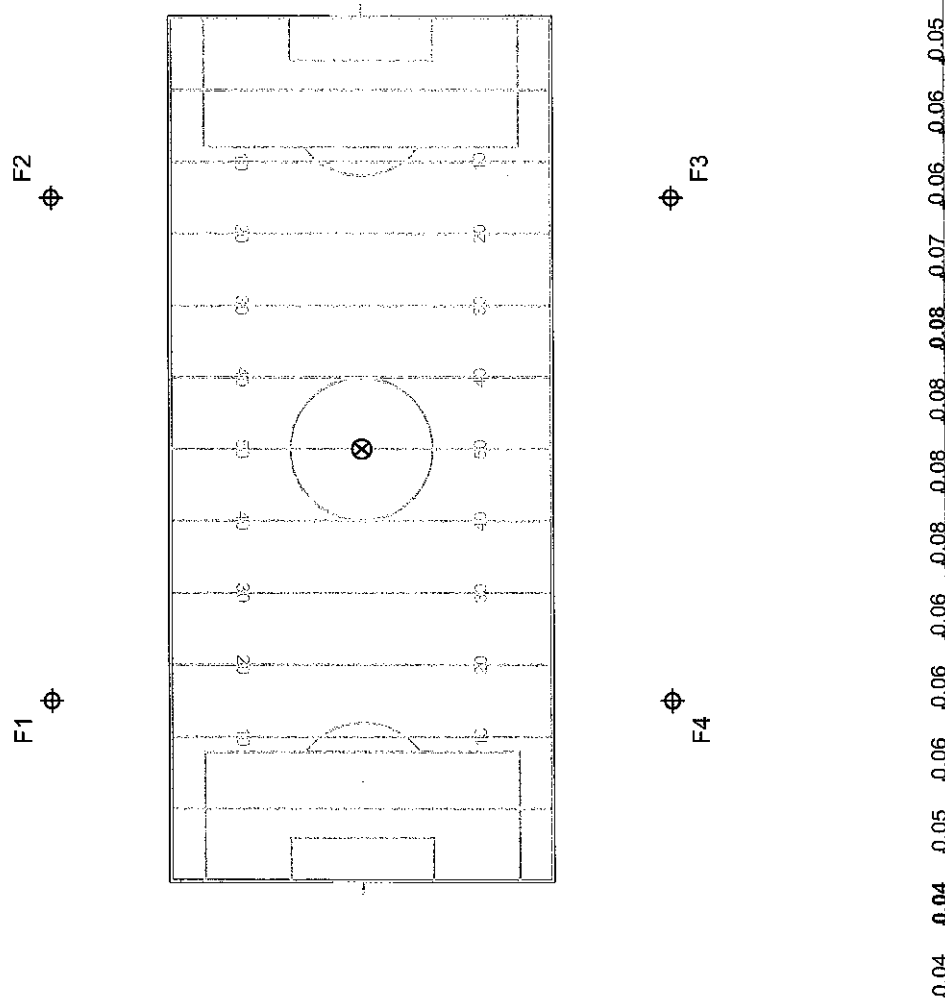
File #: 146785

Pole location(s) Φ dimensions are relative to 0,0 reference point(s) $\otimes$

Print Date (12/May/2010) & Time (09:31)

EQUIPMENT LIST FOR AREAS SHOWN

Pole				Luminaires			
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LAMP TYPE	QTY/ POLE	THIS GRID GRIDS
4	F1-F4	70'		70'	1500W MZ	6	6 0
4				TOTALS		24	24 0



SCALE IN FEET 1 : 80



Pole						Luminaires						
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LAMP TYPE	QTY/ POLE	THIS GRID	OTHER GRIDS				
4	F-1-F4	70'	.	70'	1500W MZ	6	6	0				
4						24	24	0				
						TOTALS						
						←	→					

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LAMP TYPE	QTY/ POLE	THIS GRID	OTHER GRIDS
4	F-1-F4	70'	.	70'	1500W MZ	6	6	0
4						24	24	0
				TOTALS				
				←-----→				



ILLUMINATION SUMMARY

East Property Spill

Brentwood Football
Miami Gardens, FL

East Property Spill

- Grid Spacing = 30.0'
Values given at 3.0' above grade

- | | |
|------------------|------------------|
| Luminaire Type: | Green Generation |
| Rated Lamp Life: | 5,000 hours |
| Avg Lumens/Lamp: | 134,000 |

**CONSTANT ILLUMINATION
MAX VERTICAL FOOTCANDLES**

Entire Grid

16

0.3205

0.39

0.25

Average Lamp Tilt Factor:

Number of Luminaires:

Ava KW over 5,000:

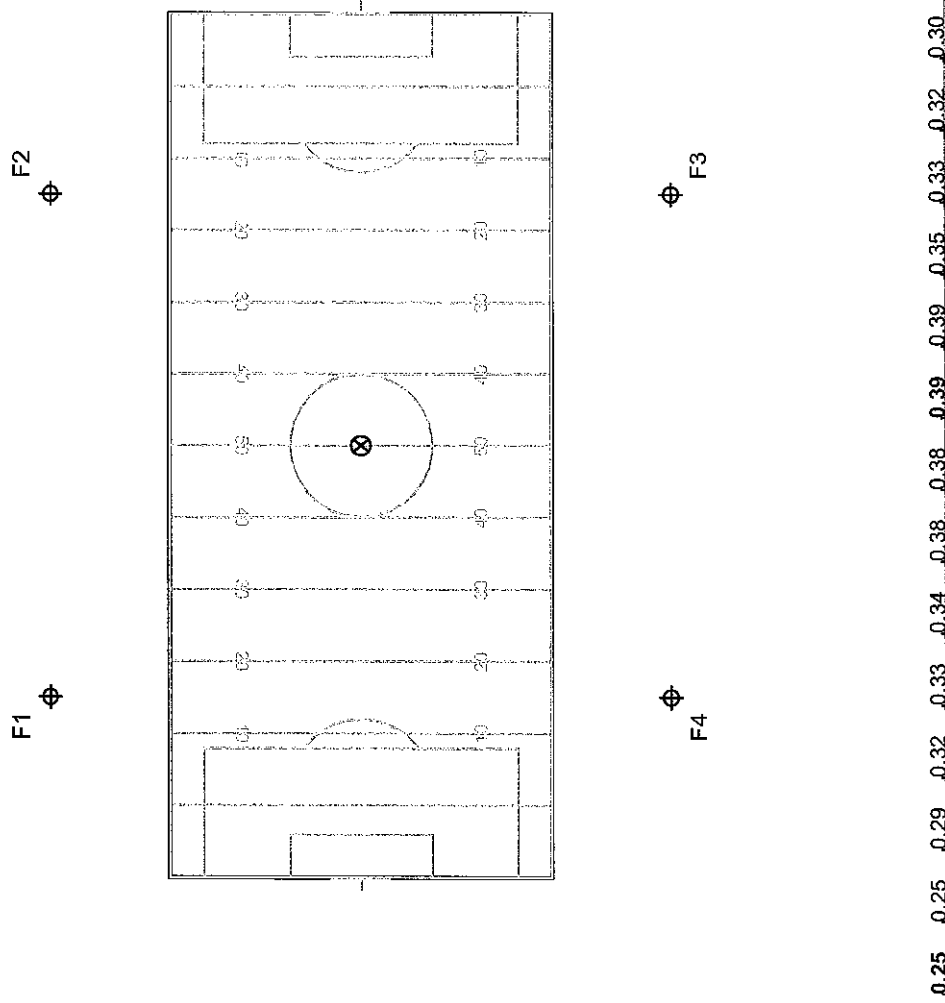
Max KW:

1.000

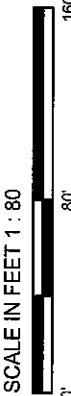
24

37.54

40.8



SCALE IN FEET 1 : 80



Pole location(s) $\neq$ dimensions are relative to 0,0 reference point(s) $\otimes$

Bv: Justin Van Soelen

File #: 146785

Date: 12-May-10

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Control System Summary

Project Specific Notes:

Project Information

Project #: 146785
Project Name: Brentwood Football
Date: 11/11/10
Project Engineer: Joel Stout
Sales Representative: Jason Frucht
Control System Type: Control and Monitoring
Communication Type: Digital Cellular
Scan: 146785
Distribution Panel Location or ID:
Total # of Distribution Panel Locations for Project: 1
Design Voltage / Phase: 208 / 3
Control Voltage: 120

Equipment Listing

DESCRIPTION	APPROXIMATE SIZE	
1. Control and Monitoring Cabinet	24 X 48	
Preliminary Plans:		
Total Contactors	2	30 AMP
Total Contactors	4	60 AMP
Total Off/On/Auto Switches:	2	

of distribution panels, etc.

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 would be required.
- ☐ Electrical distribution panel to provide overcurrent protection for lighting 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 contactor modules
 - 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
- ☐ Hardware to mount cabinets to appropriate surfaces
- ☐ A lock-on device on control power circuit 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

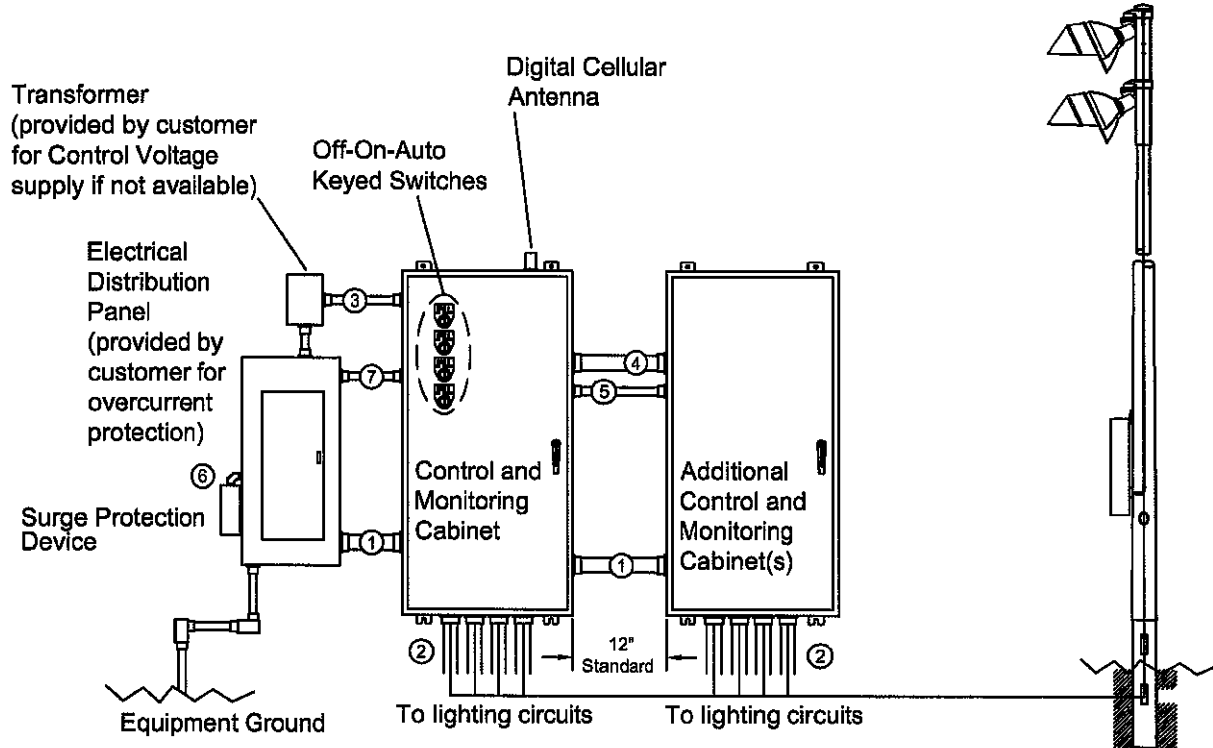
IMPORTANT NOTES

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. Full load amps are based on an assumed power factor of 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

(Quantity of equipment may differ from what is shown below)



WIRE	DESCRIPTION	# OF WIRES	TYP. WIRE SIZE (AWG)	MAX. WIRE LENGTH (FT)	WIRE FROM MUSCO	NOTES
1	LINE POWER & GROUND TO CONTACTORS (AS REQUIRED)	NOTE A	NOTE B	N/A	NO	A-D
2	LOAD POWER TO LIGHTING CIRCUITS (AS REQUIRED)	NOTE A	NOTE B	N/A	NO	A-D
3	CONTROL POWER (DEDICATED, 20A)	3	12	N/A	NO	C, D
4	CONTROL HARNESSSES (AS REQUIRED)	--	--	8*	YES*	C, D
5	COMMUNICATION CABLE (RS-485) (AS REQUIRED)	1	--	8*	YES*	C, D
6	SURGE PROTECTION DEVICE TO DISTRIBUTION PANEL	---	---	N/A	YES	D
7	SURGE PROTECTION DEVICE MONITORING	2	14	N/A	NO	D

- Notes:
- A. Voltage and phasing per the notes on cover page
 - B. Calculate per load and voltage drop
 - C. Minimum conduit diameter
 - a. Wire 4 requires 2" (for connector ends to pass though)
 - b. Wire 5 requires 1" (for connector ends to pass though)
 - c. All other 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.

R60-11-00_C

IMPORTANT: Communication (wire # 5) and control (wire # 4) wiring must each be in separate conduits from any AC power wiring.

*Musco supplied wire harnesses are supplied in standard 8-foot lengths. Musco can provide custom lengths agreed upon by the contractor/customer and Musco's engineers within the maximum length parameters.

SWITCHING SCHEDULE

Field Type	Zones	Zone Description
Football	1	Football
Soccer	1	Soccer
Basketball	2	Future Basketball

CONTROL POWER CONSUMPTION	
120V Single Phase	
VA loading of Musco Supplied Equipment	INRUSH: 1555.0
	SEALED: 241.0

BALLAST SPECIFICATIONS	VOLTAGE: 208v THREE PHASE							
.90 Minimum Power Factor								
Single Phase Voltage (Also applicable to each single phase of a 3 phase system)	120	208	240	277	347	380	415	480
1500 Watt Metal Halide Lamp Operating line amperage per fixture, max draw	15.0	8.6	7.5	6.5	5.1	4.7	4.2	3.7
1000 Watt Metal Halide Lamp Operating line amperage per fixture, max draw	11.4	6.5	5.8	4.9	4.0	3.6	3.2	2.9

CIRCUIT SUMMARY BY ZONE

POLE	CIRCUIT DESCRIPTION	# OF FIXTURES	FULL LOAD AMPS	CONTACTOR SIZE (AMPS)	CONTACTOR ID	ZONE
F1	Football	6	34.4	60	C1	1
F2	Football	6	34.4	60	C2	1
F3	Football	6	34.4	60	C3	1
F4	Football	6	34.4	60	C4	1
B1	Future Basketball	0	0	30	C5	2
B2	Future Basketball	0	0	30	C6	2

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	34.4		
1	1	C2	Pole F2	34.4		
1	1	C3	Pole F3	34.4		
1	1	C4	Pole F4	34.4		
1	1	C5	Pole B1	0.0		
1	1	C6	Pole B2	0.0		

ZONE SCHEDULE

ZONE	SELECTOR SWITCH	ZONE DESCRIPTION	CIRCUIT DESCRIPTION	
			POLE ID	CONTACTOR ID
Zone 1	1	Football	F1	C1
			F2	C2
			F3	C3
			F4	C4
Zone 2	2	Future Basketball	B1	C5
			B2	C6

EQUIPMENT LIST FOR AREA STATION									
Pole				Luminaires					
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LAMP TYPE	QTY/POLE	THIS GRID	OTHER GRIDS	
4	F1-F4	70'	-	70'	1500W MZ	6	6	0	
4						24	24	0	
				← TOTALS					



GUARANTEED PERFORMANCE

ILLUMINATION SUMMARY

East Property Spill

**Brentwood Football
Miami Gardens, FL**

East Property Spill

- Grid Spacing = 30.0'
- Values given at 3.0' above grade

- Luminaire Type: Green Generation
- Rated Lamp Life: 5,000 hours
- Avg Lumens/Lamp: 134,000

CONSTANT ILLUMINATION HORIZONTAL FOOTCANDLES

Entire Grid

16

0.0601

0.08

0.04

1.000

24

37.54

40.8

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

Field Measurements: Averages shall be +/-10% in accordance with IESNA RP-6-01 and CIBSE LG4. Individual measurements may vary from computer predictions.

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Bv: Justin Van Soelen

File #: 146785

Pole location(s) $\leftrightarrow$ dimensions are relative to 0,0 reference point(s) $\otimes$

Print Date (12/May/2010) & Time (09:31)

SCALE IN FEET 1 : 80



EQUIPMENT LIST FOR AREAS SHOWN

QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	Luminaires		
					LAMP TYPE	QTY/ POLE	THIS GRID
4	F1-F4	70'	-	70'	1500W MZ	6	6
4	TOTALS					24	24



GUARANTEED PERFORMANCE

ILLUMINATION SUMMARY

East Property Spill

Brentwood Football
Miami Gardens, FL

East Property Spill

- Grid Spacing = 30.0'
- Values given at 3.0' above grade

- Luminaire Type: Green Generation
- Rated Lamp Life: 5,000 hours
- Avg Lumens/Lamp: 134,000

CONSTANT ILLUMINATION
MAX VERTICAL FOOTCANDLES

No. of Target Points: 16

Entire Grid
Average: 0.3205
Maximum: 0.39
Minimum: 0.25

1.000

24

37.54

40.8

Average Lamp Tilt Factor:

Number of Luminaires:

Avg KW over 5,000:

Max KW:

Guaranteed Performance: The CONSTANT

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SCALE IN FEET 1 : 80



F2



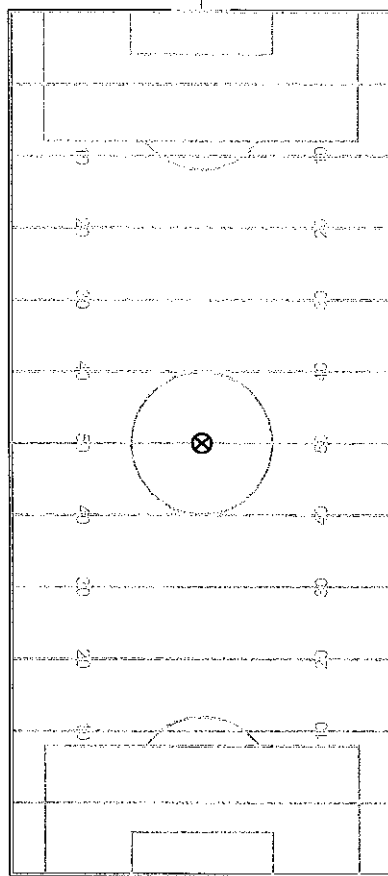
F1



F3



F4



0.25 0.25 0.29 0.32 0.33 0.34 0.38 0.38 0.38 0.39 0.39 0.39 0.35 0.33 0.32 0.30 0.26 0.25



Manufacturer's Model Number

Brentwood
Football/Soccer Lighting Project
Miami Gardens, FL

# of Poles	Pole Designation	Catalog #
4	F1,F2,F3,F4	LSG - 70 - 1500W MZ - 6



Manufacturer's Model Number

Brentwood
Football/Soccer Lighting Project
Miami Gardens, FL

Controls and Monitoring

Catalog #
CM - 24 X 48 - 6



UL Listing

UL Listed Under

Musco Sports-Lighting LLC
100 1st Ave W
PO Box 808
Oskaloosa, IA 52577



**Underwriters
Laboratories Inc.®**
LISTED

UL Category	Covers	UL Number
High-Intensity Discharge Surface-Mounted Luminaires	• SportsCluster Green™ and Light-Structure Green™ luminaires and remote ballast assemblies • Sports Cluster® and SportsCluster-2® luminaires and remote ballast assemblies • Light-Structure 2™ and Light-Structure System™ luminaires and remote ballast assemblies • 1000 W Light-Pak™ and Light-Pak with Multi-Watt™ indoor luminaires • 1000 W ShowLight™ and ShowLight Green™ with hooded light actuator system and remote ballast assemblies • 2000 W Mirtran™ luminaire • Stadium 2K Fixture™ 2000 W luminaire and Hot Restrike Green™ 2000 W hot restrike luminaire	E33316
Management Equipment, Energy	Lighting control systems for • Control-Link® Control and Monitoring System • Control-Link Retrofit Control System	E139944

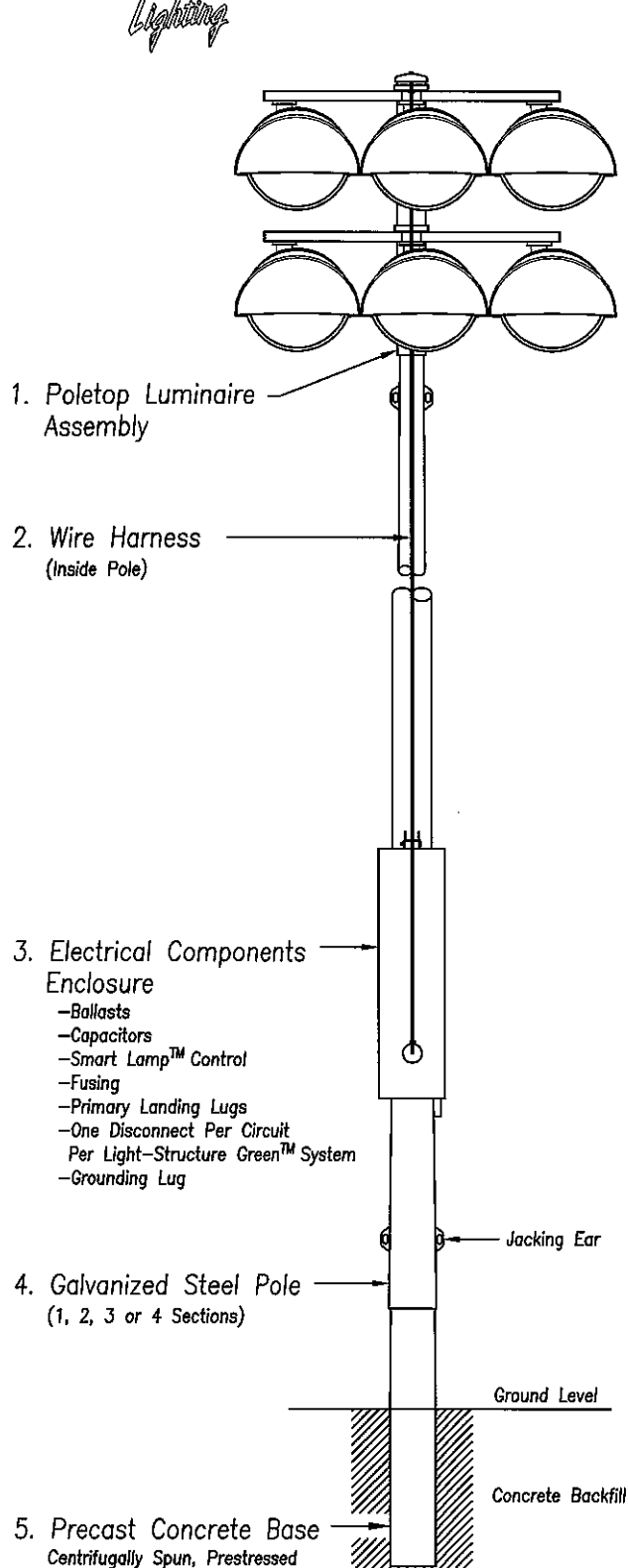
UL Listing

UL Category	Covers	UL Number
Industrial Control Panels	Control panels and enclosures for - Control-Link Control and Monitoring System - Control-Link Retrofit Control System - Lighting Contactor Cabinets - Multi-Watt systems	E204954
Emergency Lighting and Power Equipment	Control-Link Automatic Transfer Switch (ATS CL)	R311491
Luminaire Fittings	Galvanized steel poles 12 feet or less for - Mirtran poles - Rooftop poles - Special applications	E132445
Luminaire Pole in excess of 12 feet	Galvanized steel poles greater than 12 feet for - Light-Structure Green System - Light-Structure System - Sportspole™ and special applications	E325078
Devices, Scaffolding	Service platforms for - Light-Structure Green System - Light-Structure System - SportsCluster Green System - Sports Cluster System	SA7004

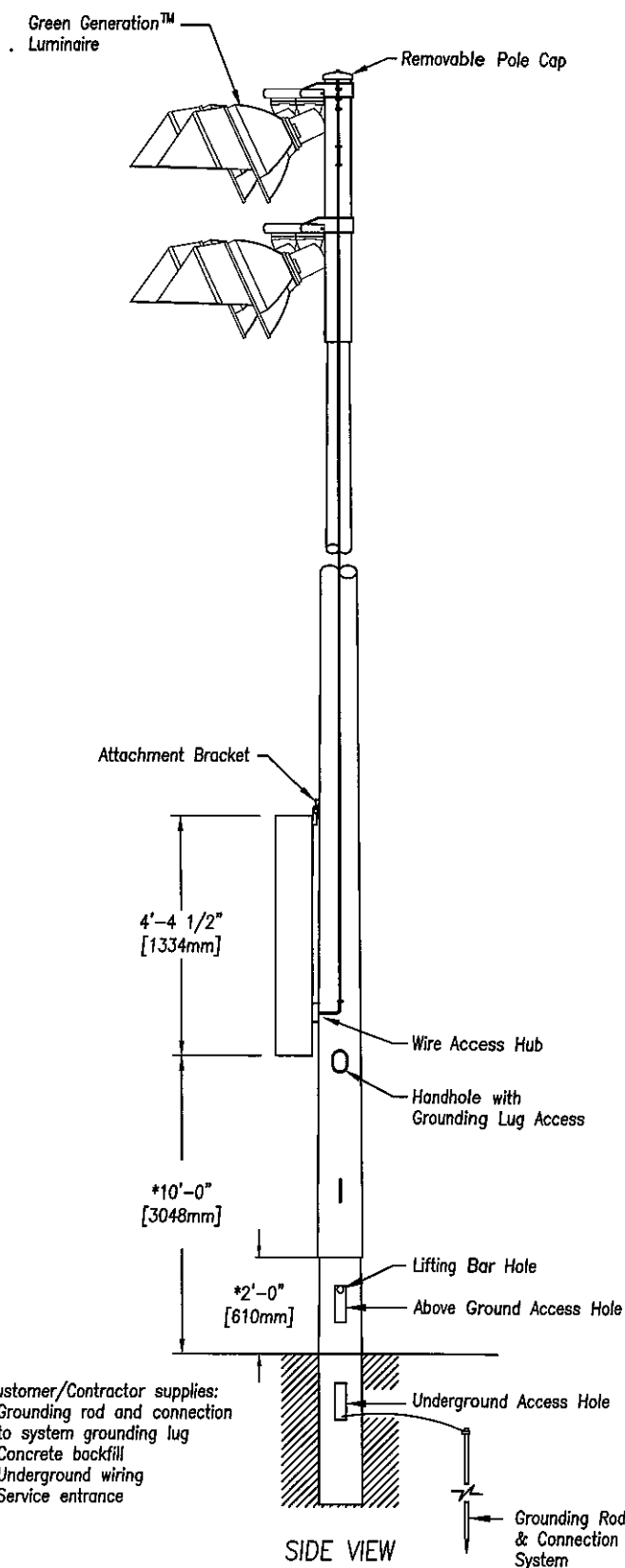
A copy of the UL Certificate of Compliance is available upon your request.



Typical Light-Structure Green™ System Detail – 6 Luminaires



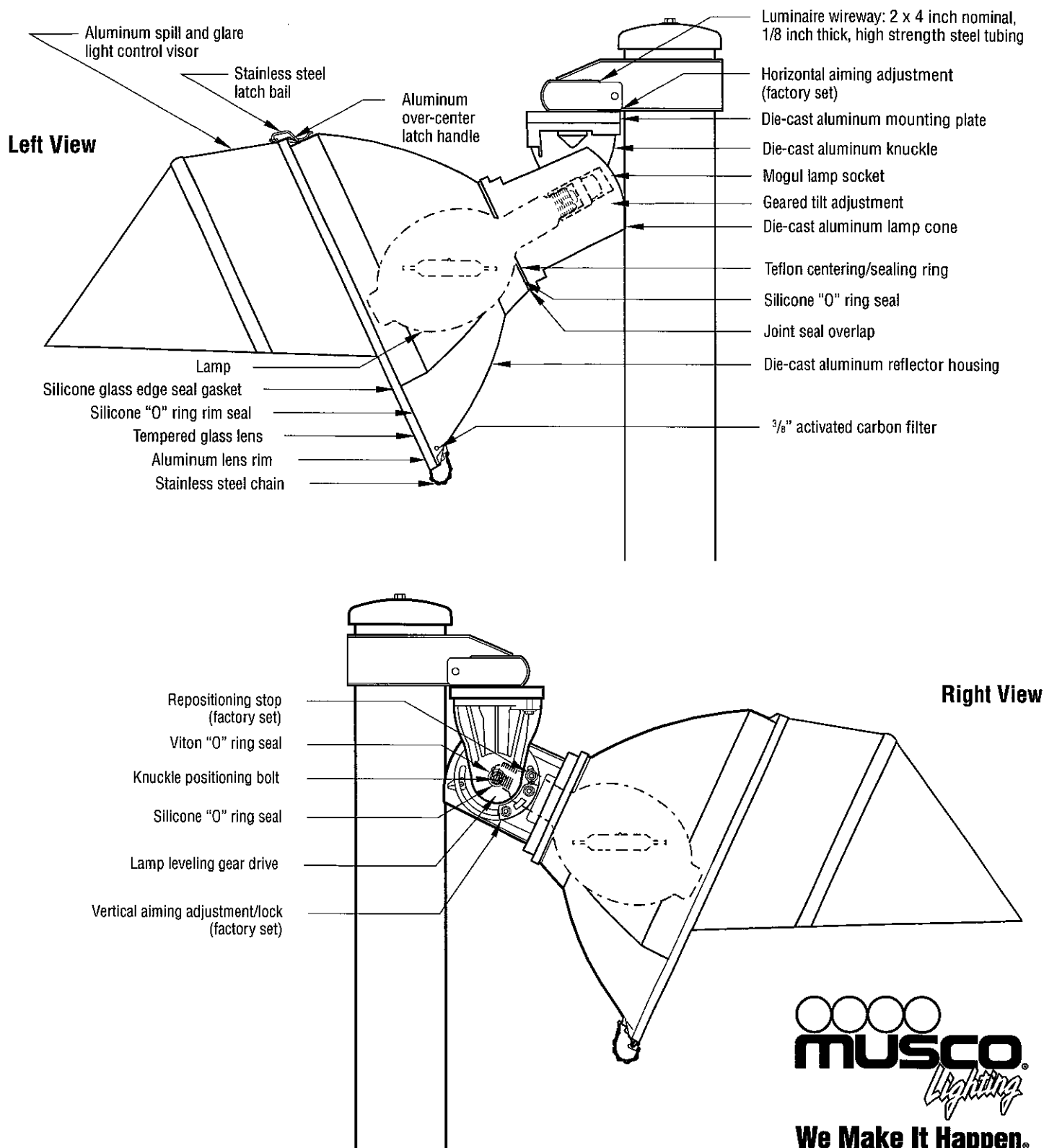
FRONT VIEW
FIELD SIDE



SIDE VIEW

Notes:

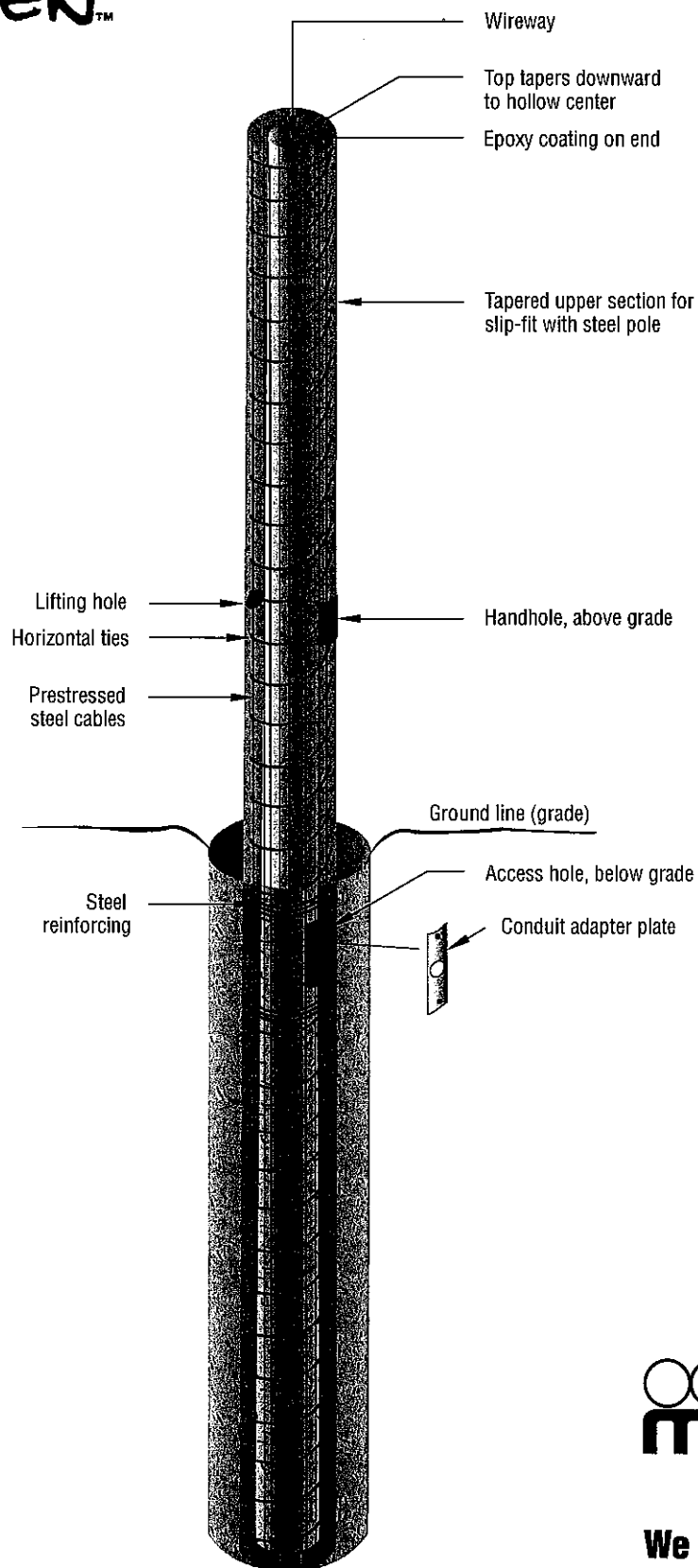
1. This drawing is not to scale.
2. * This dimension for reference only. Variances may occur depending on steel pole tolerances, concrete tolerances, galvanizing thickness, hole depth accuracy.
3. Musco provides a base installation bar, an installation level modified for taper, and installation wedges.
4. Provisions for auxiliary equipment such as speaker or security lighting can be incorporated.
5. Copyright 1991, 2005 Musco Lighting. Patents issued and pending.



We Make It Happen.

800/825-6030
www.musco.com
lighting@musco.com

Musco products referenced or shown are protected by one or more of the following U.S. Patents: 4450507; 4725934; 4729077; 4811181; 4816974; 4947303; 4994718; 5012398; 5075829; 5134557; 5161883; 6211473; 5229681; 5377611; 5398478; 5423281; 5426577; 5600537; 5707142; 5794387; 5800048; 5816691; 5856721; 6036338; 6203176; 6250596; 6340790; 6398392; 6446408; 6692142; D337168; D353797; D353911; D411096. Australia Patents: 708912; Canada Patents: 70479; 73755; 74939; 89366; 2009749; 2026850; 2027033; 2035014; 2050585; 2110014; 2204958; 2200511; 2200515; 2217872; 2378279. EPC Patents: 440531; 821776. Germany Patents: 69601867.5. Mexico Patents: 175863; 183225. New Zealand Patents: 307705; 333806. South Korea Patents: 405147. Other patents pending.



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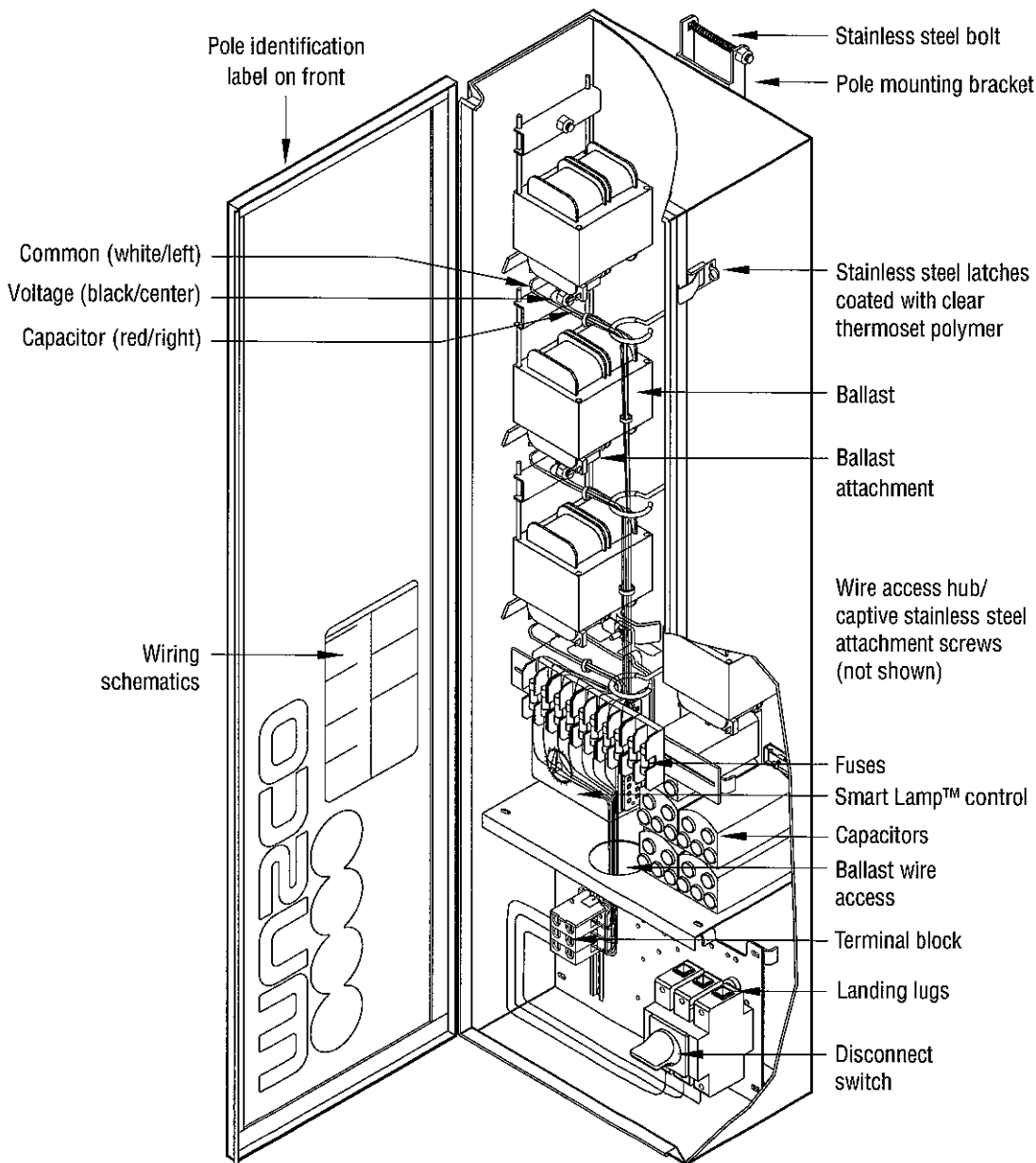
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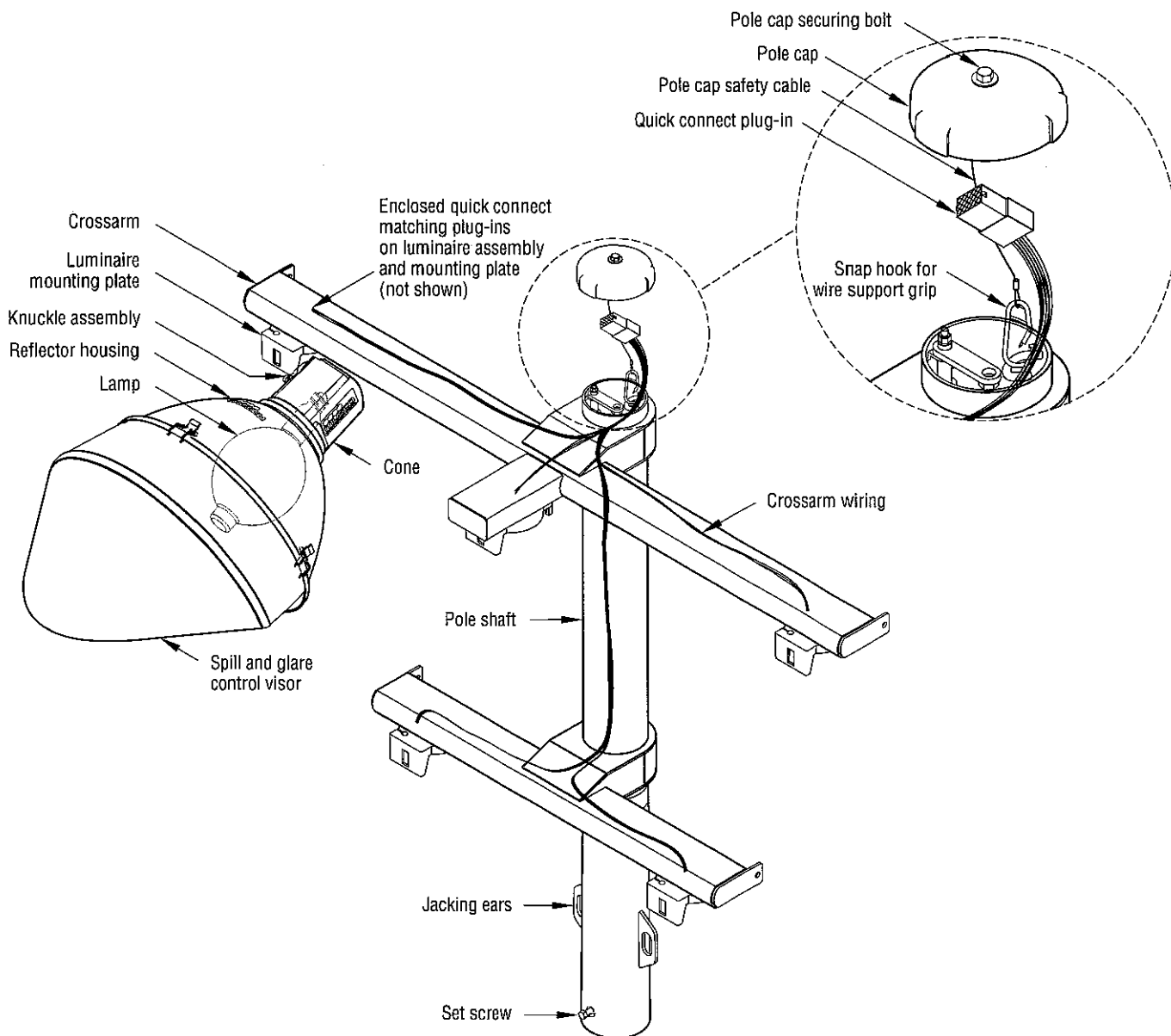


We Make It Happen.

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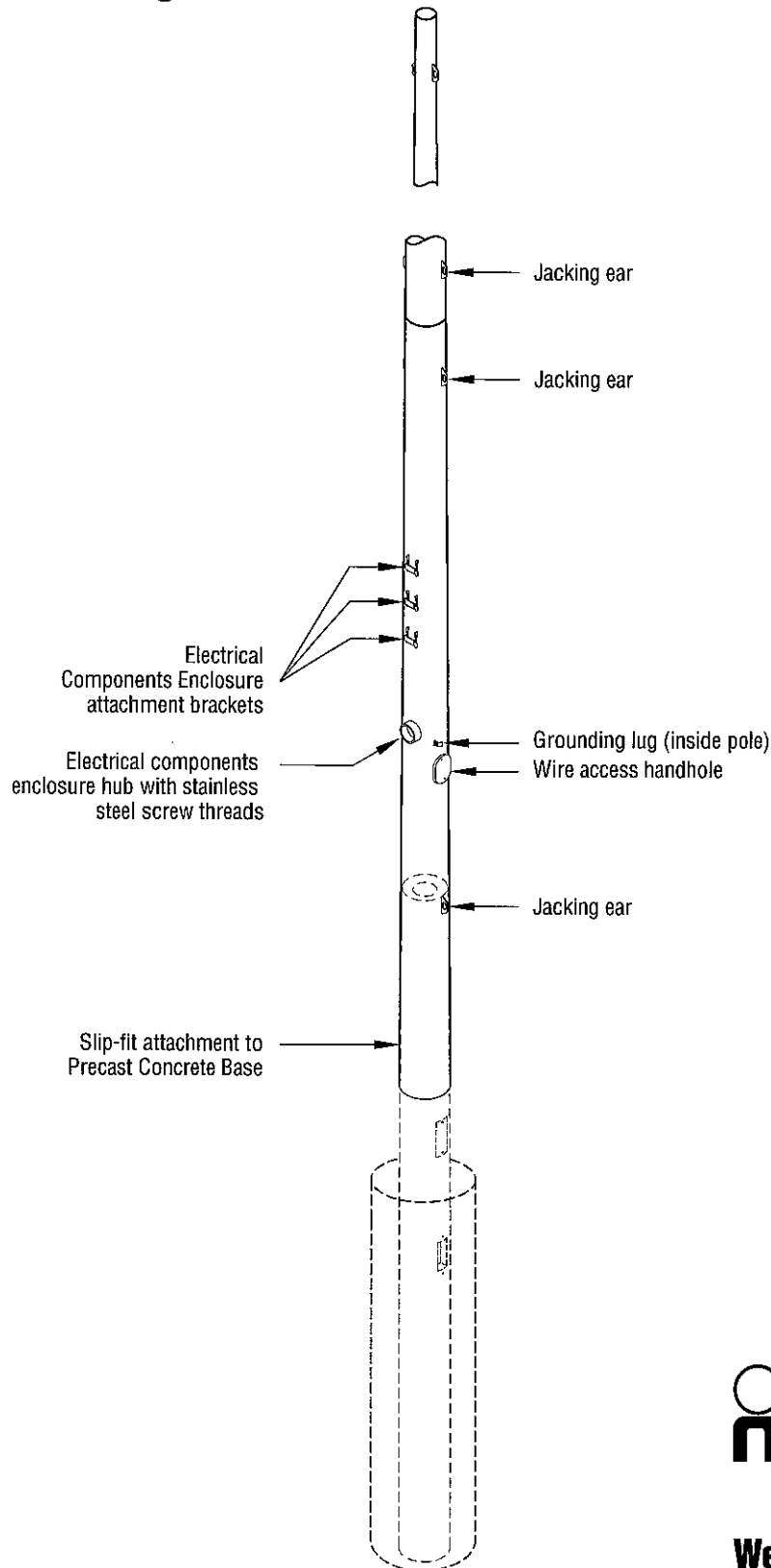
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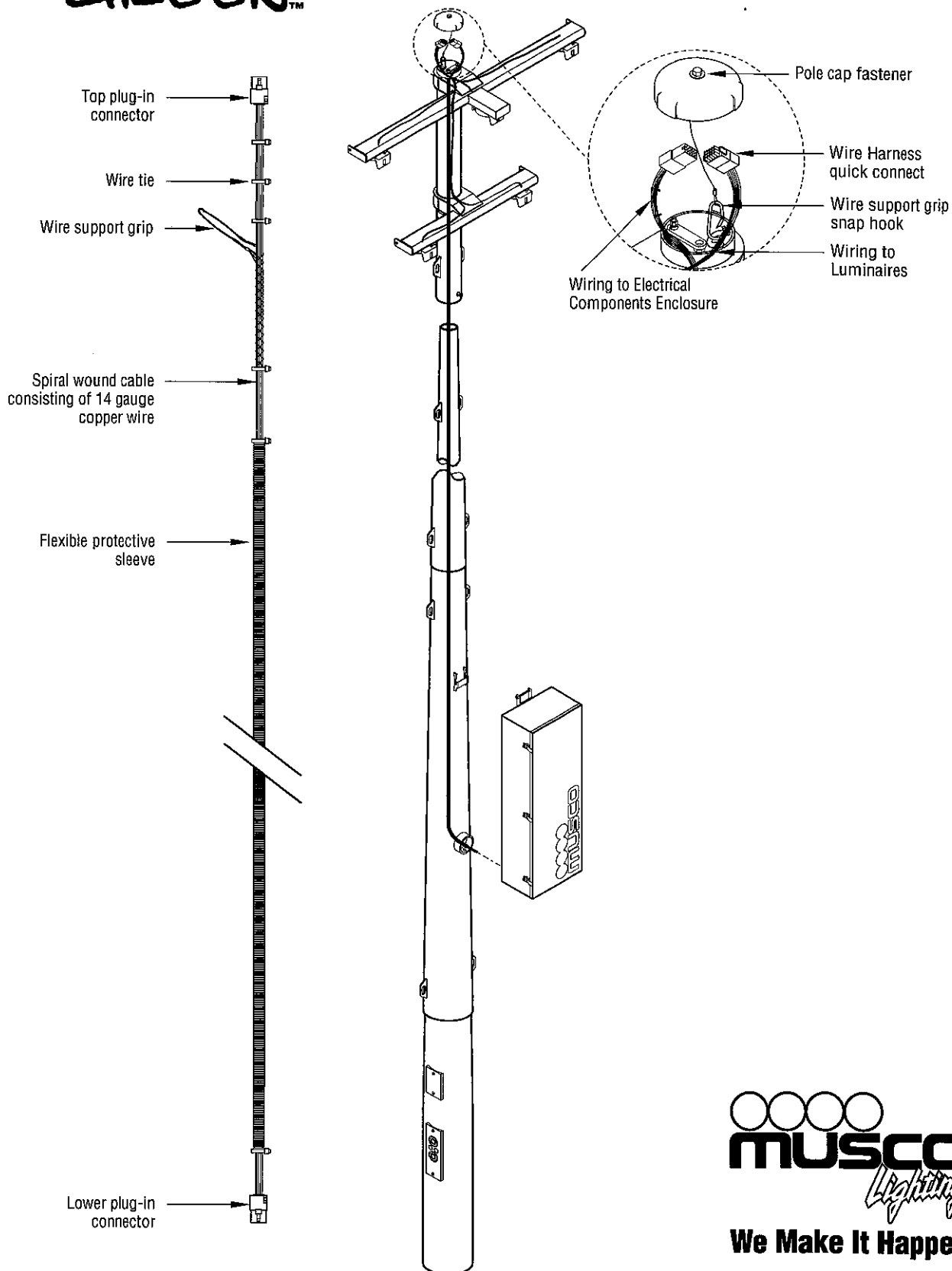
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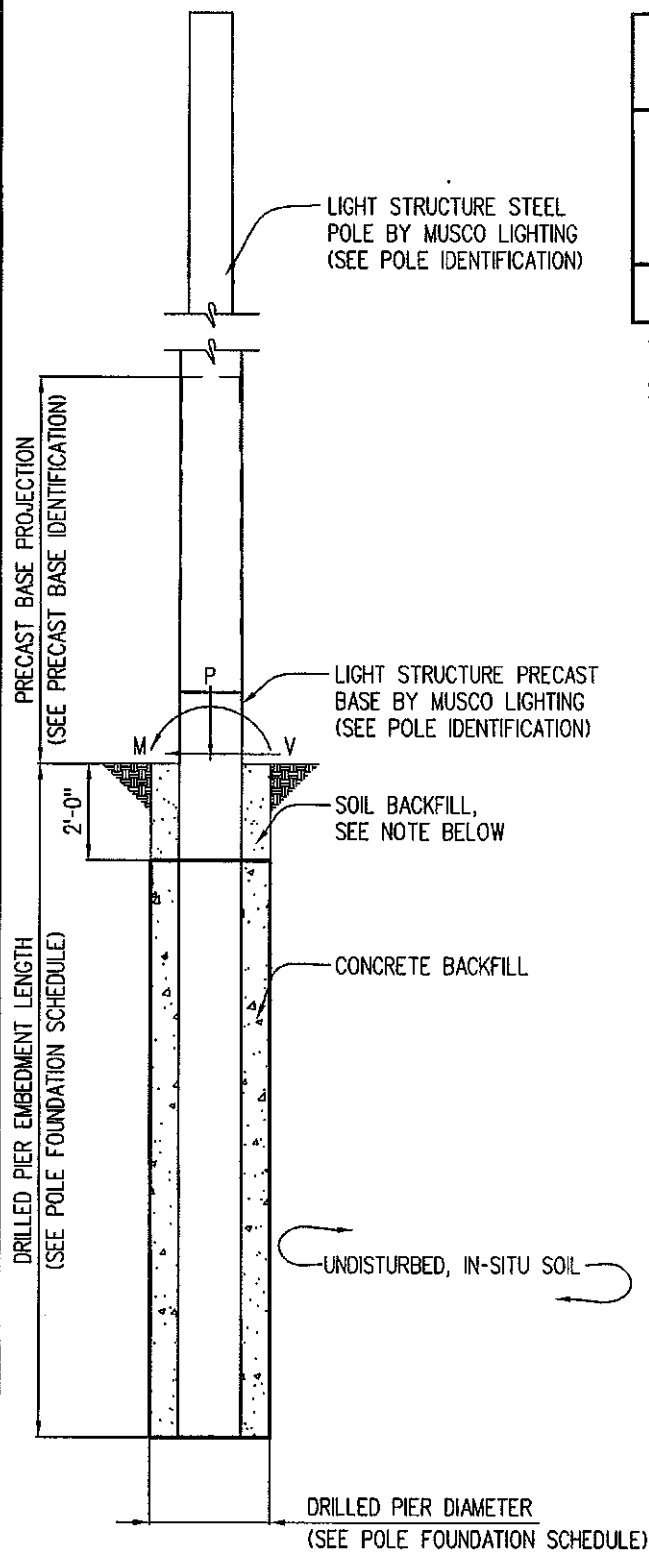


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POLE FOUNDATION SCHEDULE

POLE DESIGNATION	FORCES			DR
	MOMENT (M) FT-LBS	SHEAR (V) LBS	VERTICAL (P) LBS (1.)	DIAMETER INCHES
F1-F4	193,736	4,650	3,261	36

1. WEIGHT OF POLE, FIXTURES AND ACCESSORIES.
2. MINIMUM CONCRETE BACKFILL VOLUME, SITE CONDITIONS MAY REQUIRE AD

PRECAST BASE IDENTIFICATION

PRECAST BASE TYPE	PRECAST BASE WEIGHT	PRECAST BASE LENGTH	PROJECTION ABOVE GRADE	S
6B	6,930	26'-1"	8'-1"	EM

POLE IDENTIFICATION

POLE DESIGNATION	POLE TYPE	PRECAST BASE TYPE	FIXTURE CONFIGURATION (FIX. PER
F1-F4	LSS70E	6B	6 (6

POLE FOUNDATION ELEVATION

SCALE: NOT TO SCALE

SOIL BACKFILL NOTE:

THE TOP TWO FEET OF ANNULUS MAY BE BACKFILLED WITH SOIL, WITH A CLASSIFICATION OF CLASS 4 (TABLE 1804.2) OR BETTER. COMPACTION, 95% FOR COHESIVE SOIL AND 98% FOR A COHESIONLESS SOIL BASED UPON STANDARD PROCTOR TESTING (ASTM D698).