TOWN OF HARWICH
Whitehouse Field Lighting Project

Addendum #1
March 16, 2021

The attention of bidders submitting bids for the subject project:

WHITEHOUSE FIELD LIGHTING PROJECT
INVITATION FOR BID (IFB)

are called to the following addendum.

Bidders shall confirm receipt of Addendum 1 in their bid submission.

Bid Questions & Responses and Additional Information/Clarifications:

1. Contact information for Scoreboard Enterprises (contractor responsible for replacing existing scoreboard) for coordination purposes:

   Mike Renwick
   Scoreboard Enterprises
   274 Fruit Street
   Mansfield, MA 02048
   Cell: 860.948.8112
   Fax: 508.339.0184
   mike@scoreboardenterprises.com

2. Record information for the existing lights to be removed is attached to this addendum for reference.
3. Proposed shop drawing submittal from Musco is attached for reference (note that these shop drawings have not yet been approved)
4. Question: What size are the drawings included in the IFB?
   The Electrical Drawings included in the IFB are 30" x 42" in size.
5. Question: Are the existing catwalks being removed?
   Yes, the electrical contractor shall disconnect, remove, and properly dispose of the entire existing sports lighting system including MH lamps, lighting fixtures, ballasts, cross arms, catwalks, disconnect switches, mounting brackets/straps, and wiring harness.
6. Question: Is the proposed wiring intended to be on the inside or the outside of the poles?
   The proposed wiring is intended to be routed on the interior of the existing poles.

*** END OF ADDENDUM #1 ***

USL

Universal Sports Lighting

www.uslnet.com

Presented to:

Whitehouse Field
Harwich, Massachusetts

Submitted by:

Universal Sports Lighting
2277 Old Route 66
Atlanta, IL 61723
(217) 648-5201

Date: February 12, 2008

UNIVERSAL
SPORTS LIGHTING, Inc.

Provided By:

LIGHTING DESIGN DEPT.
2277 OLD ROUTE 66
P.O. BOX 486
ATLANTA, IL 61723
PHONE: (217) 648-5201
FAX: (217) 648-5209
e-mail: eng@uslnet.com
www.uslnet.com

Provided For:

USL

WHITEHOUSE FIELD

SUBMITTAL

Designer:	
Drawing Scale:	
Sheet No.	Date/Time of Design
Drawing Number:	Rev:

Universal Sports Lighting
www.uslnet.com

Universal Sports Lighting
2277 Old Route 66
PO Box 486
Atlanta, Illinois 61723

Submittal Approval Form

_____ Bill of Material

_____ Warranty Page

_____ Point by Point Design

_____ Pole Location Orientation Drawing

_____ Pole Location Verification Form – MUST BE COMPLETED AND SIGNED

_____ Fixture Option Sheet

_____ Energizing Fixture Test on Ground

_____ Fixture Cut Sheet

_____ Lamp Cut Sheet

_____ Crossarm/Service Basket Cut Sheet

_____ Wiring Diagram

_____ Disconnect Enclosure and Mounting/Remote Enclosure

_____ Electrical Drop Cable

It is standard procedure to have one complete/approved bound submittal returned to the office of Universal Sports Lighting.

As of October 1, 2006 Universal Sports Lighting will NOT ship equipment until all information is returned.

Please sign and date as acknowledgement of this process.

_____ _____
Signature Date

_____
Print

_____
Company

ATTENTION!!!

Important Information

Please Note!!

These drawings are for **RECORD** purpose only. Equipment is being manufactured as per the Released Purchase Order that has been received.

One signed, approved copy of this record submittal **must be returned** before any equipment can be released for shipment.

Failure to return the signed, approved, record drawings will result in the **delay of manufacture and delivery** of your project equipment!

USL

Please Note !!

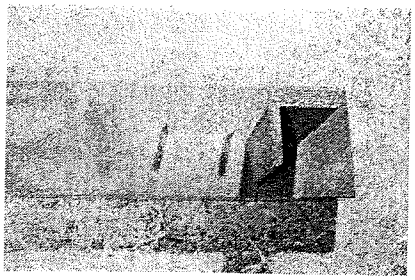
The footcandle and uniformity levels on the photometric design being submitted are based upon laboratory environment conditions.

Field values may vary.

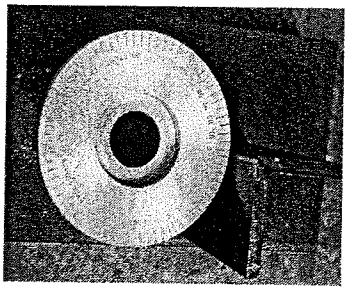
Universal Sports Lighting guarantees the footcandle and uniformity levels will meet the levels required in the **specifications**, but not necessarily the computer generated design results submitted.

The following illustrates the procedures taken by Universal Sports Lighting to assure proper aiming, electrical continuity and loading of equipment.
<u>EVERY</u> USL Fixture is subjected to these procedures

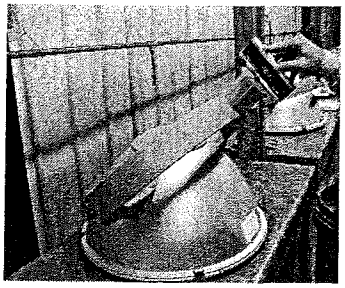
Aiming:



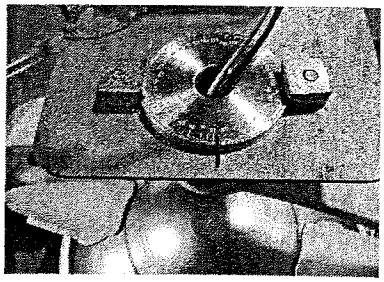
Verifying Hub Protractor and Mounting Holes are correct



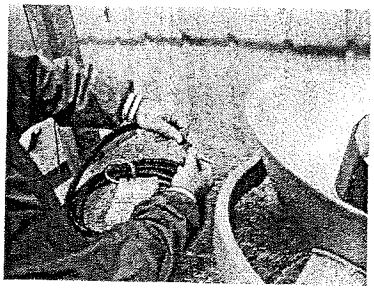
Vertical Aiming



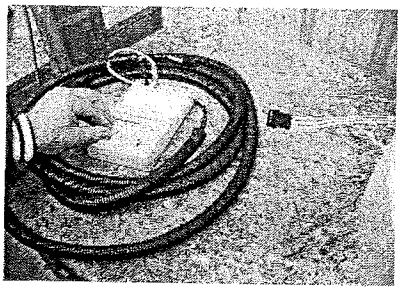
Horizontal Aiming

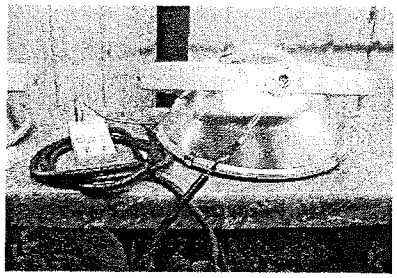


Fixture Wiring:

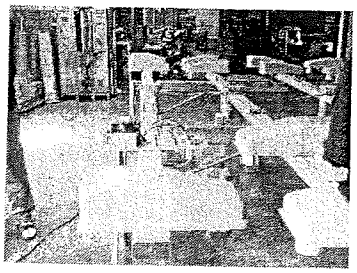


Optic Assembly Wiring Test

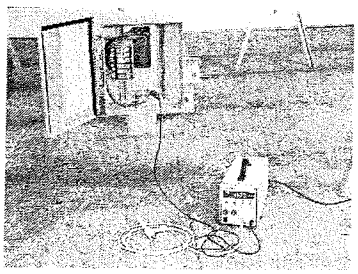




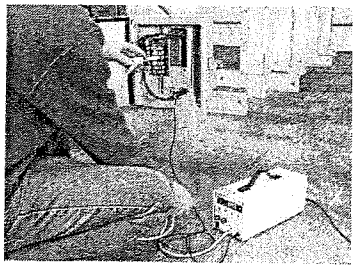
Crossarm Wiring Tests:



Cross-arm

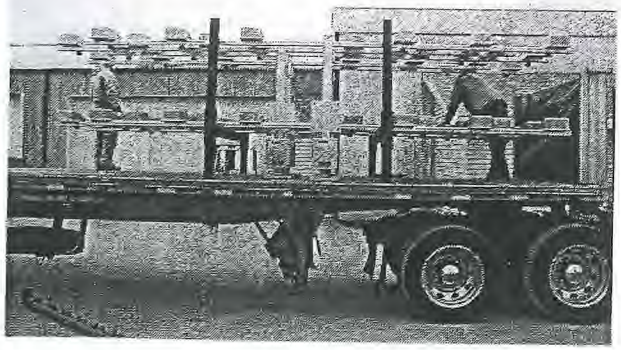


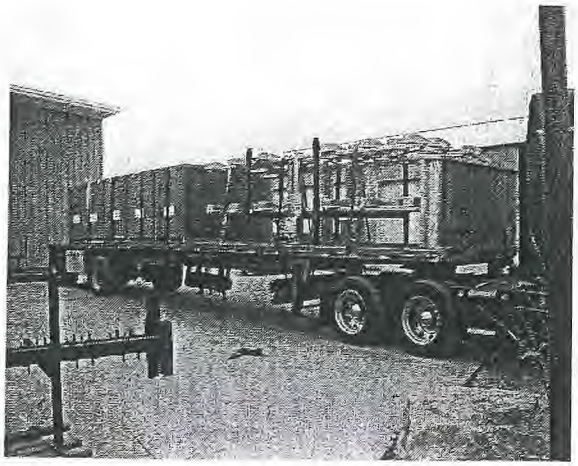
Power Distribution Block



Continuity Check

Preparing for Shipping:





Contractor's Responsibility: So as to assure after shipping and assembly that all fixtures with lamps are fully operative the contractor must energize each pole while on the ground to assure proper performance. Universal Sports Lighting will not pay for any back-charges incurred if the above contractor responsibility has not been performed.

It should be noted a pre-aimed, pre-wired system may incur minor field adjustments due to numerous uncontrollable factors. This field adjustment is not a back charge eligible procedure.

_____

Contractor's Signature

_____

Contractor's Printed Name

_____

Date

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2277 Old Route 66
P.O. Box 486
Atlanta, IL 61723

www.uslnet.com email: info@uslnet.com Phone: 217.648.5201 Fax: 217.648.5209

QUOTE TO

Attn: Direct, USL
USL Customer
n/a
n/a
n/a, na

Quote #	Date	By	Expires
38101	08-Jan-08	GED	2/7/2008

LOCATION

Whitehouse Field
Harwich, MA

USL07628-18B-00

Baseball - See design

Product	Description	Quantity
PS105DB-S	Pole, 105' MH, Galvanized Steel, Direct Burial	2
PS90DB-S	Pole, 90' MH, Galvanized Steel, Direct Burial	4
PSTPCL-U	Steps and Safety Climbing Cable	6
PSFHRN-B	Safety Harness w/Lanyard and Quick Stop Latch	1
SUT18-A	Service Basket, Top Mount, 18 fixture	4
EDE06-A	Disconnect Enclosure, 6 Fuse, Galvanized Steel	4
EDE12-A	Disconnect Enclosure, 12 Fuse, Galvanized Steel	2
EDROP/S-A	Lot of Drop Cable (Integral)	1
FCES15-U	Fixture, USL/CE, 1500 watt, MH, Spill/Glare w/Lamp	136
LMPH15E-W	Lamp, 1500 watt metal halide, Eye Lighting	6
WAR7-U	Standard 7 Year Warranty, Labor Requires USL Preapproval	1
FNDSG-J	Engineer Certified Foundation Design	2
FQB15/277-I	Fixture, Quartz, 1500 watt, w/277 volt Lamp	16
QTZMNT4-A	Quartz Fixture Light Bar, 4 fixture (unwired)	4
SUT16-2-A	Service Basket, Top Mount, 16 fixture, 2 row	2
SUSS16-2-A	Service Basket, Side Mount, Steel Pole, 16 fixture, 2 row	2
QBWIR-A	Wiring, Quartz Fixtures (1-2 Fixtures)	8
EEDESW-A	Disconnect Switch, Extra for Separate Switching	4

Bill of material and design are based on information available to USL. Certain assumptions have been made. USL assumptions are determined to be correct unless notified in writing/e-mail to the contrary. Quote includes freight. Exception: Freight for any preshipments (such as anchor bolts) will be an additional charge. QUOTE VALID FOR 30 DAYS!

COMMENTS

Wired to disconnect enclosure at 10' on pole. 480 V/3 phase. Other voltage/phase may increase cost. Poles are rated for 125 mph winds AASHTO 2002. Lead time is 8-10 weeks from a released purchase order. Geotechnical report by others.

Equipment is fully warranted to be free of defects. Any back charges on this bill of material are only valid with written prior approval of USL. It is recognized that a Pre-Aimed system may require minor field adjustments. Back charging for such is not acceptable. Equipment should be checked within 48 hours of delivery to allow replacement of damaged or missing parts. It is NOT USL responsibility to incur overnight or back charges for damaged equipment discovered at time of installation.

USL
Universal Sports Lighting

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Atlanta, Illinois 61723

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e-mail: info@uslnet.com

Seven Year Standard Warranty

Universal Sports Lighting warrants the system (excluding fuses and lamps) to be free from defects in materials and workmanship for a period of seven years starting from date of delivery. Labor and materials are provided for a period of two years to replace defective parts. Any warranty work requires prior authorization from Universal Sports Lighting. Reasonable labor cost shall be the interpretation of Universal Sports Lighting and at our discretion can be substituted with an alternative contractor. For the remainder of the warranty period, replacement parts will be provided at no charge. Labor cost will be the owner's expense.

Lamps are warranted not to fail for two years from date of delivery. Lamps which fail during the first year of warranty period will be replaced and installed at no cost to the owner. Warranty work requires prior authorization from Universal Sports Lighting. Clear and easy access to the poles is a requirement. If there are unusual site circumstances to access poles, labor will not be included.

Lamps which fail during the second year of the warranty period will be replaced but installation expense to be covered by owner.

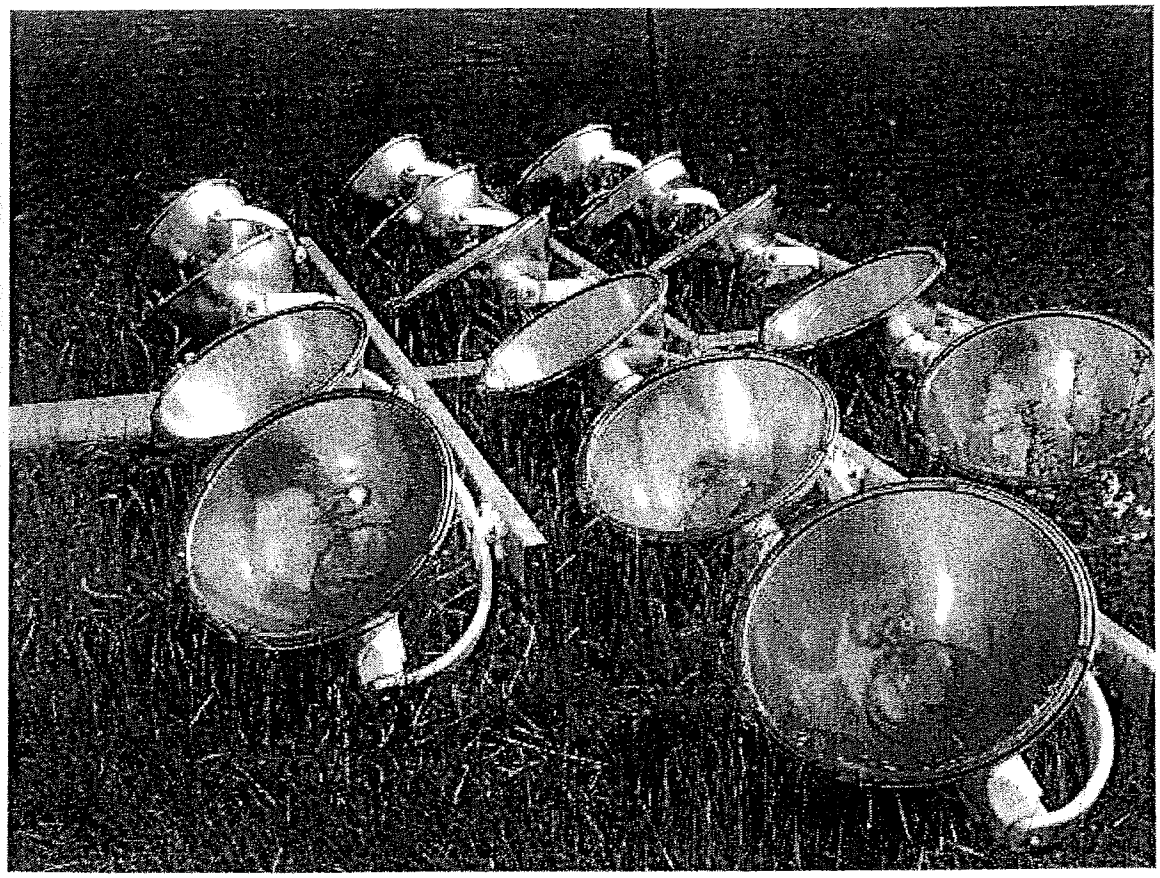
Lamps damaged by electrical surges are not covered by this warranty.

Accurate alignment of the luminaires warranted for seven years from date of delivery.

The following are not covered by this warranty:

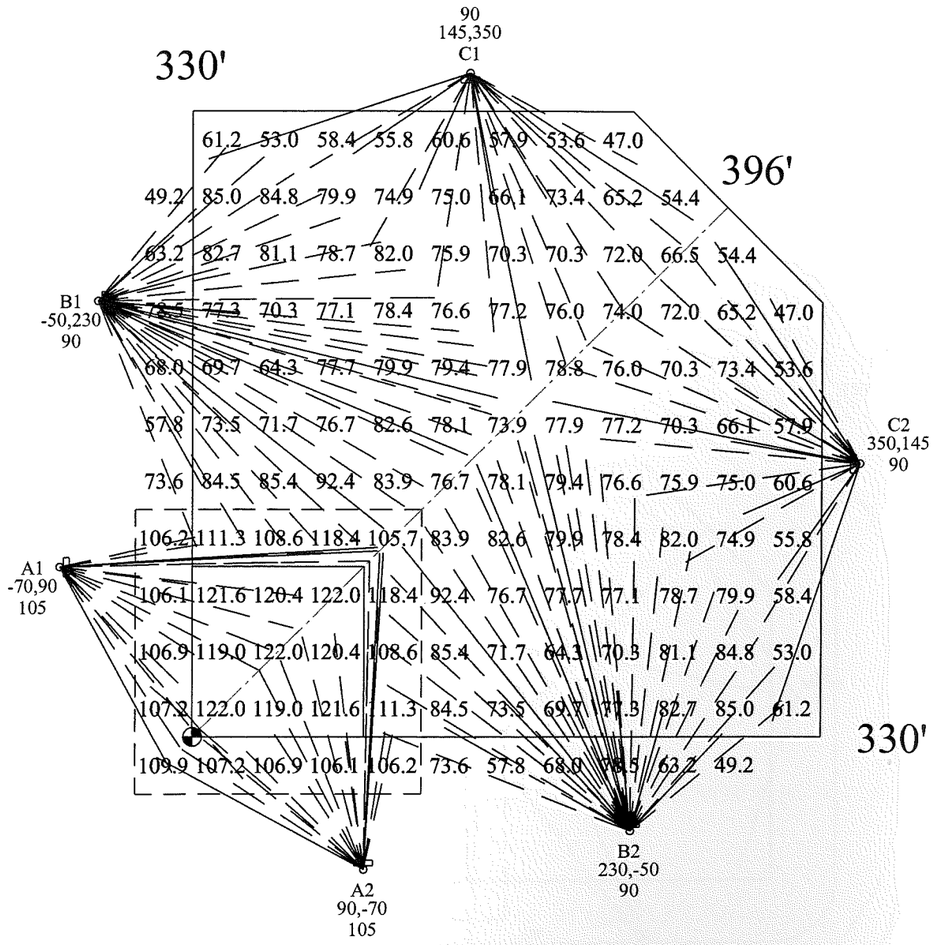
- Fuses
- Acts of God (Includes Harmonics)
- Improper installation, vandalism or abuse
- Unauthorized repairs or alterations

WARRANTY INFORMATION



ALL FIXTURES MUST BE ENERGIZED ON THE GROUND AND PHOTOGRAPHED BEFORE ERECTING.

WITHOUT DOCUMENTATION THAT THIS PROCEDURE HAS BEEN COMPLETED UNIVERSAL SPORTS LIGHTING WILL NOT ISSUE WARRANTY WORK AUTHORIZATION.



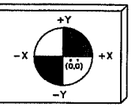
Pole	x-loc	y-loc	height	CE-NS	CE-MS	CE-WS	Total	kw
A1	-70	90	105ft	3	15		18	29.3
A2	90	-70	105ft	3	15		18	29.3
B1	-50	230	90ft	3	23	6	32	52.2
B2	230	-50	90ft	3	23	6	32	52.2
C1	145	350	90ft	3	10	5	18	29.3
C2	350	145	90ft	3	10	5	18	29.3
Total				18	96	22	136	221.7

CE-NS
Narrow w/Internal Glare Louver
Initial Lumens per lamp = 180000
Light Loss Factor = 0.800
Watts per luminaire = 1630
Candela file name: CE-NS.ies
Number luminaires used = 18
kw these luminaires = 29.3

CE-MS
Medium w/Internal Glare Louver
Initial Lumens per lamp = 180000
Light Loss Factor = 0.800
Watts per luminaire = 1630
Candela file name: CE-MS.IES
Number luminaires used = 96
kw these luminaires = 156.5

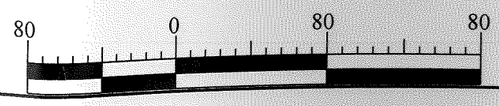
CE-WS
Wide w/Internal Glare Louver
Initial Lumens per lamp = 180000
Light Loss Factor = 0.800
Watts per luminaire = 1630
Candela file name: CE-WS.ies
Number luminaires used = 22
kw these luminaires = 35.9

NOTE:
ALL POLE LOCATIONS ARE REFERENCED FROM ORIGIN (0,0) AT HOMEPLATE OF BASEBALL FIELD



Baseball
136 points (25 infield, 111 outfield) at z=3, sp 30ft by 30ft
HORIZONTAL FOOTCANDLES

	Outfield	Infield
Average	72.2	113.3
Maximum	92.4	122.0
Minimum	47.0	105.7
Avg:Min	1.54	1.07
Max:Min	1.97	1.15
Coef Var	0.14	0.06
UnifGrad	1.73	1.15



Calculated light levels are based on specific information that has been supplied to us. Any differences in the luminaire installation, lighted area geometry and any obstructions in the lighted area may produce different results from the predicted values. Normal tolerances of voltage, lamp output, and ballast and luminaire manufacture will affect results.
Ref: IES LM-61-1986
Identifying Operating Factors for HID Luminaires

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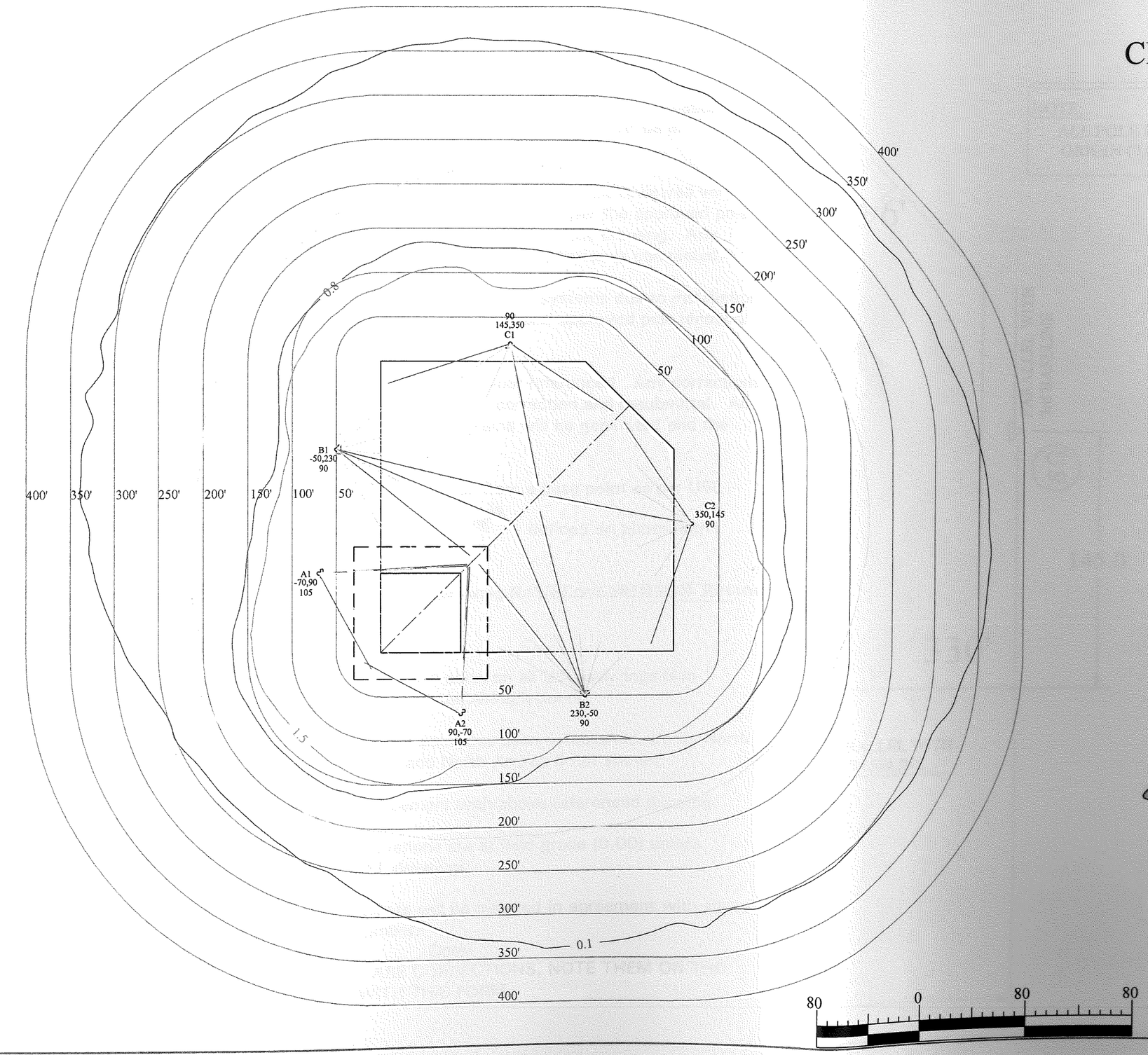
WHITEHOUSE FIELD
HARWICH, MASSACHUSETTS

MAINTAINED HORIZONTAL FOOTCANDLES
6 POLE/136 FIXTURE DESIGN
POLES A1 & A2 - 105' M.H. w/18 FIXTURES EACH
POLES B1 & B2 - 90' M.H. w/32 FIXTURES EACH
POLES C1 & C2 - 90' M.H. w/18 FIXTURES EACH

1500 WATT METAL HALIDE FIXTURES
TOTAL KILOWATT CONSUMPTION = 221.7 KW

Sheet No.	Designer:	Date/Time of Design	Drawing Number:	Rev:
1 of 2	CCL	2/8/08 12:29 P.M.	USL07628-18B	00



CIE's Four Environmental Zones

Zone E1: "Areas with intrinsically dark landscapes."
Examples are national parks, areas of outstanding natural beauty, or residential areas where inhabitants have expressed a strong desire that all light trespass be strictly limited. (This is the most sensitive zone.)
[0.1 FC Max]

Zone E2: "Areas of low ambient brightness."
These may be outer urban and rural residential areas. Roadways may be lighted to typical residential standards.
[0.3 FC Max]

Zone E3: "Areas of medium ambient brightness."
These will generally be urban residential areas. Roadways will normally be lighted to typical traffic route standards.
[0.8 FC Max]

Zone E4: "Areas of high ambient brightness."
Normally these are urban areas having both residential and commercial use and experiencing high levels of night time activity.
[1.5 FC Max]

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WHITEHOUSE FIELD
HARWICH, MASSACHUSETTS

MAINTAINED HORIZONTAL FOOTCANDLES
6 POLE/136 FIXTURE DESIGN
POLES A1 & A2 – 105' M.H. w/18 FIXTURES EACH
POLES B1 & B2 – 90' M.H. w/32 FIXTURES EACH
POLES C1 & C2 – 90' M.H. w/18 FIXTURES EACH
SPILL LIGHT SHOWN
1500 WATT METAL HALIDE FIXTURES
TOTAL KILOWATT CONSUMPTION = 221.7 KW

Sheet No.	Designer:	Date/Time of Design	Drawing Number:	Rev:
2 of 2	CCL	2/8/08 12:29 P.M.	USL07628-18B	00

USL

Universal Sports Lighting

POLE LOCATION
VERIFICATION FORM

The aiming of all lighting fixtures is based upon the correct pole location information. **For a preaimed system to be accurate, all pole locations/orientations must be in agreement with the computer generated lighting design.**

Therefore, it is CRITICAL that the Pole Location/Orientation drawing be reviewed very carefully. Furthermore, it is critical that the poles be installed as per the approved pole locations with the correct orientation to the field as illustrated on the drawing. Any deviance from this will result in improper aiming when field installation is completed.

Universal Sports Lighting is not responsible for costs to reaim systems due to installation of poles in a manner other than illustrated on the submitted and approved pole location/ orientation drawing.

Please verify the following items as per the drawing number referenced. Any corrections should be noted on the drawing and returned to USL for correction and resubmittal. All items must be signed approved before the aiming diagrams will be generated and the fixtures produced.

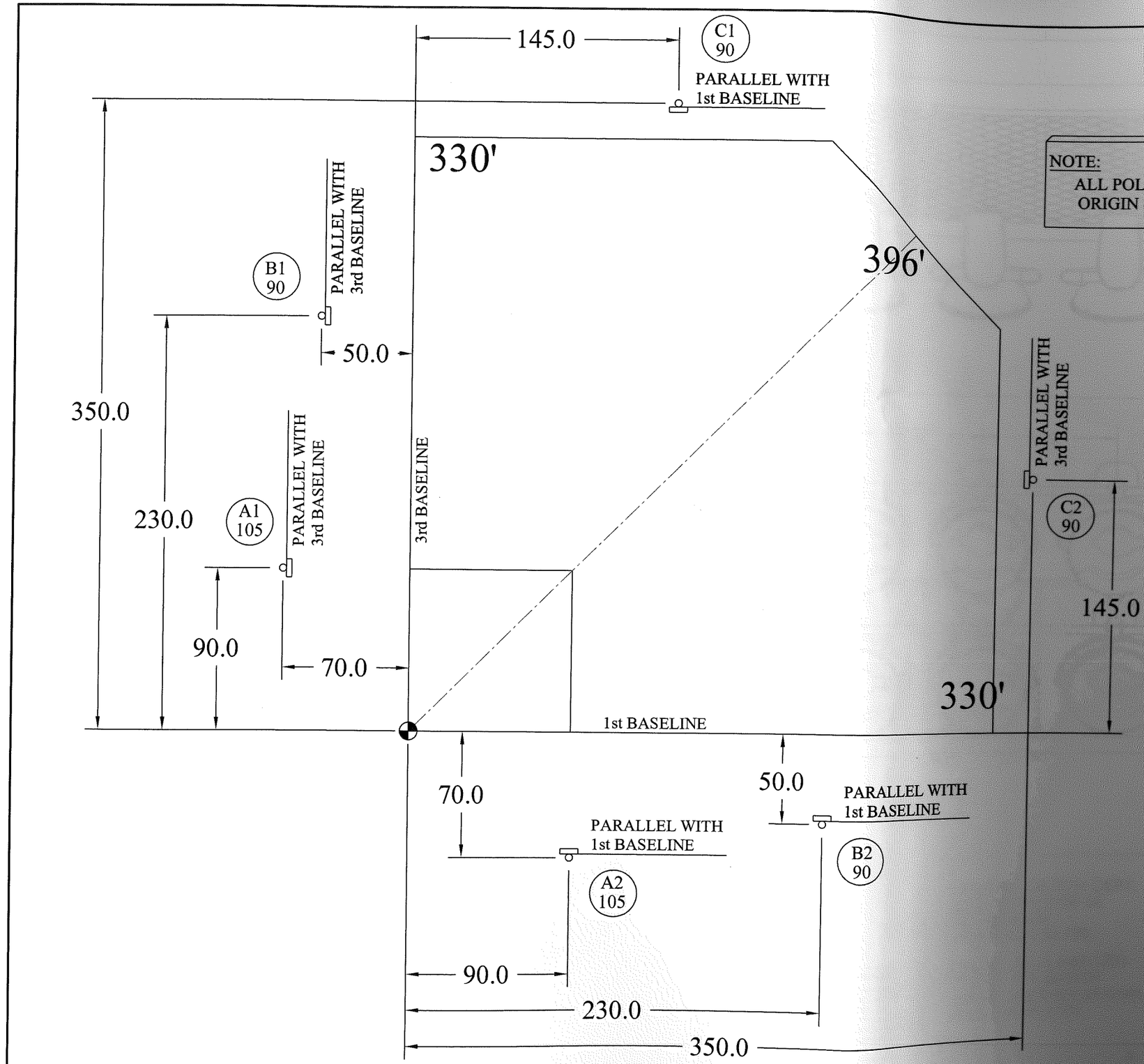
Note: All locations are based upon X & Y coordinates from a base point as per USL photometric design. (i.e., from origin symbol -  - defined on photometric design)

Project Name: Whitehouse Field **Drawing No** USL07628DIM18 **Rev:**00

YES	NO	
____	____	The numbering/lettering of the poles on all USL drawings is in agreement with the site plan numbering/lettering.
____	____	Proper directional reference point has been established. Verify North Arrow on USL drawing or add North Arrow, if not shown.
____	____	Pole Locations are in agreement with above referenced drawing.
____	____	Pole Location Grade Elevations are at field grade (0.00) unless noted otherwise on USL drawings.
____	____	Crossarms/Service Baskets will be oriented in agreement with above referenced drawing number.

Reviewed by: _____ **Date:** _____

RETURN THIS FORM TO USL. IF THERE ARE CORRECTIONS, NOTE THEM ON THE REFERENCED DRAWING AND RETURN WITH THIS FORM.



NOTE:
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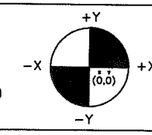

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WHITEHOUSE FIELD
HARWICH, MASSACHUSETTS

POLE LOCATION
&
SERVICE BASKET ORIENTATION

NOTE: ALL POLES MUST BE LOCATED AND ALL SERVICE BASKETS MUST BE ORIENTED AS SHOWN TO ENSURE PROPER PREAIMING OF FIXTURES.

Sheet No.	Designer:	Date/Time of Design	Drawing Number:	Rev:
1 of 1	CCL	2/8/08 12:40 P.M.	USL07628DIM18	00

USL

Universal Sports Lighting

www.uslnet.com

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CRITICAL LAMP INFORMATION

ALL LAMPS SHOULD BE CHECKED TO BE SURE THEY ARE PROPERLY INSTALLED IN THE LAMP SOCKET.

Lamps have been known to work loose in shipment.

USL is NOT responsible for any cost incurred for lamps that will not function due to improper installation in the fixture lamp socket.

Please be sure that the installing contractor is advised of this information.

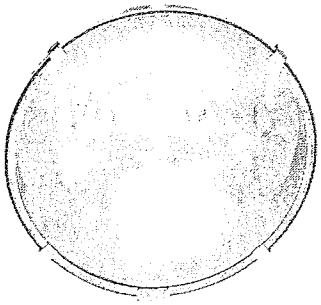
USL

Universal Sports Lighting

OPTICAL OPTIONS

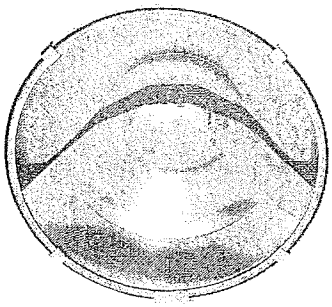
NO SPILL CONTROL

[ ]



INTERNAL LOUVER

[X]



INTERNAL LOUVER
WITH TOP VISOR

[ ]

USL CE FIXTURE

DESCRIPTION

The CE floodlight features industry leading computer designed horizontal optics with optional internal glare/spill control louvers. The CE fixture is the perfect choice for all sports lighting applications. The CE fixture offers the coolest operating temperature rating in the industry which increases performance and extends component life. For detailed listing reports visit the CE ETL reports at www.USLNET.com

FEATURES

A - Ballast Cover

One piece hot dipped galvanized cover allows the CE fixture to operate in extreme corrosive environments.

B - Socket Castings

Die-cast aluminum socket castings are sealed with a high temperature silicone gasket to keep out contaminants.

C - Optical Yoke

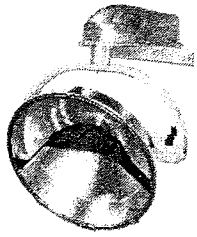
Rugged cast aluminum yoke finished in a powder coated gray finish features internal wiring with a quick connect and a simple two fastener attachment for easy installation. Optical module features locked in re-aiming allowing for either front or rear relamping without affecting aiming integrity.

D - Lens/Door Frame

1/8" tempered, heat and shock-resistant glass lens is sealed with high temperature silicone gasket to protect optics from dirt and contaminants and is mounted in hinged stainless steel door frame with stainless steel latches.

E - Reflector and Internal Glare/ Spill Light Control

Computer designed spun aluminum reflectors feature optional internal glare/spill light control louvers for maximum lighting control without unwanted glare and light trespass. Horizontal optics feature standard BT56 mogul base lamps for safe, reliable operation.

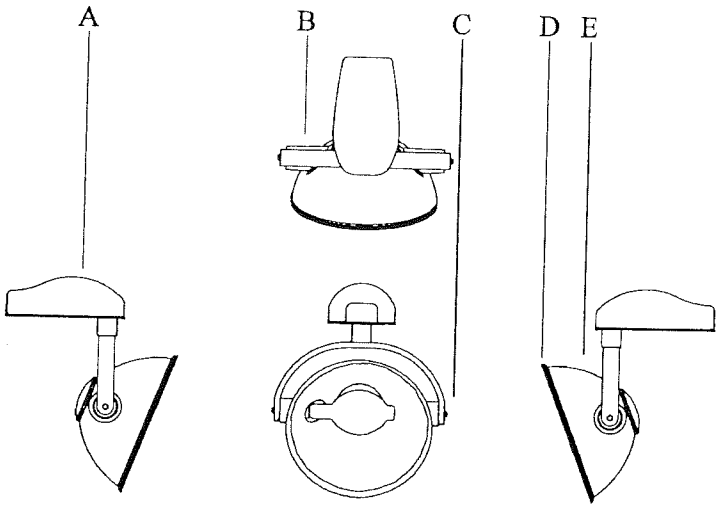


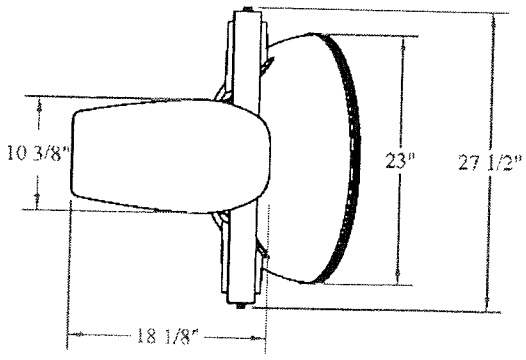
1000 – 1650 w

ENERGY DATA

CWA Ballast Input Watts

1000 w MH (1080)
1500 w MH (1625)
1650 w MH (1770)



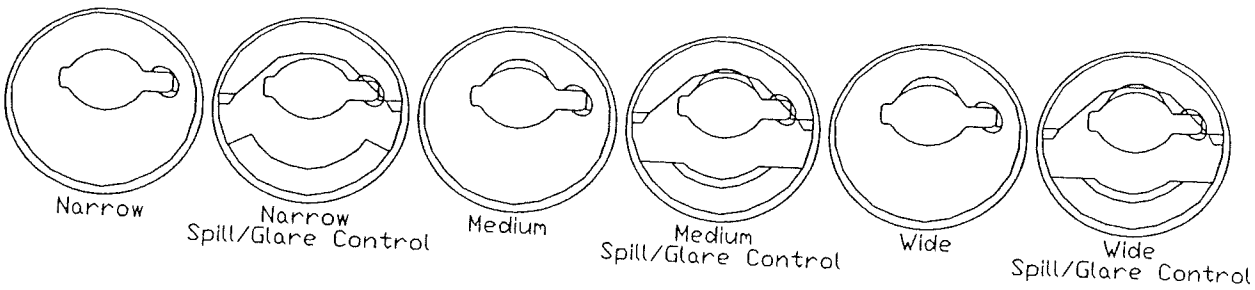


Universal Sports Lighting
2277 Old Route 66
PO Box 486
Atlanta, IL 61723

Tel (217) 648-5201
Fax (217) 648-5209
www.uslnet.com

DISTRIBUTION	BEAM SPREAD HxV (DASGREES)
Narrow	40 X 15
Medium	56 X 45
Wide	72 X 75

DISTRIBUTION



Model # FCES15-U
EPA
2.9

USL
Universal Sports Lighting

TYPE:

CATALOG #:

COOPER LIGHTING—LUMARK®

DESCRIPTION

The Lumark LQL1500 has a heat- and impact-resistant clear glass lens, mounted in a gasketed, die-cast hinged aluminum door with captive screw fasteners for positive latching. U.L. listed and labeled for wet locations. CSA certified.

APPLICATION

Designed for use in a variety of areas, this flood is suited for small parking lots, lighting signs and billboards, auto sales lots and other outdoor display areas, loading docks, construction areas and small outdoor sports areas.

SPECIFICATION FEATURES

A ···Closure
Captive screw fasteners provide positive weatherproof seal.

B ···Finish
Finished in dark bronze paint.

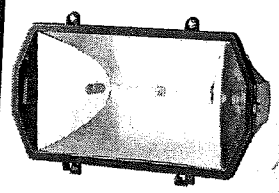
C ···Lens
Clear tempered glass lens is heat- and impact-resistant.

D ···Lamp
Quartz lamp provides white light for excellent color rendition.

E ···Door
Die-cast aluminum door is sealed with full-circumference gasketing to die-cast aluminum housing.

F ···Hinges
Integral hinge design permits hands-free relamping and easy door removal.

G ···Mounting
Adjustable stem mounting arm fits 1/2" NPT outlet box cover.

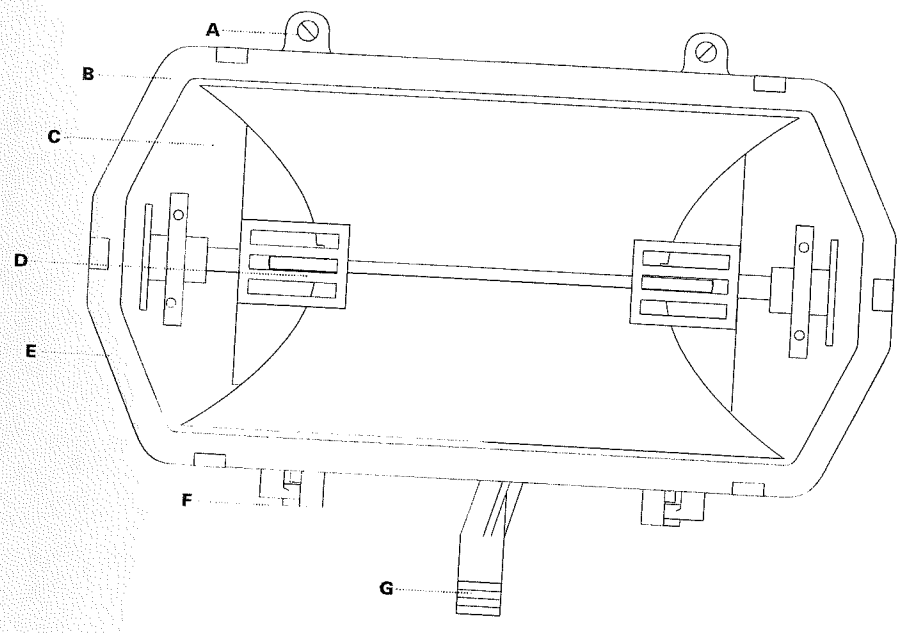


LQL1500QUARTZ FLOOD

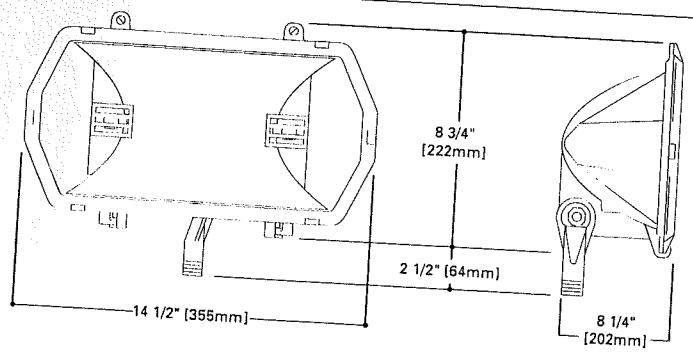
1500W (Max.) Quartz

FLOODLIGHT

240V LAMP INCLUDED



DIMENSIONS



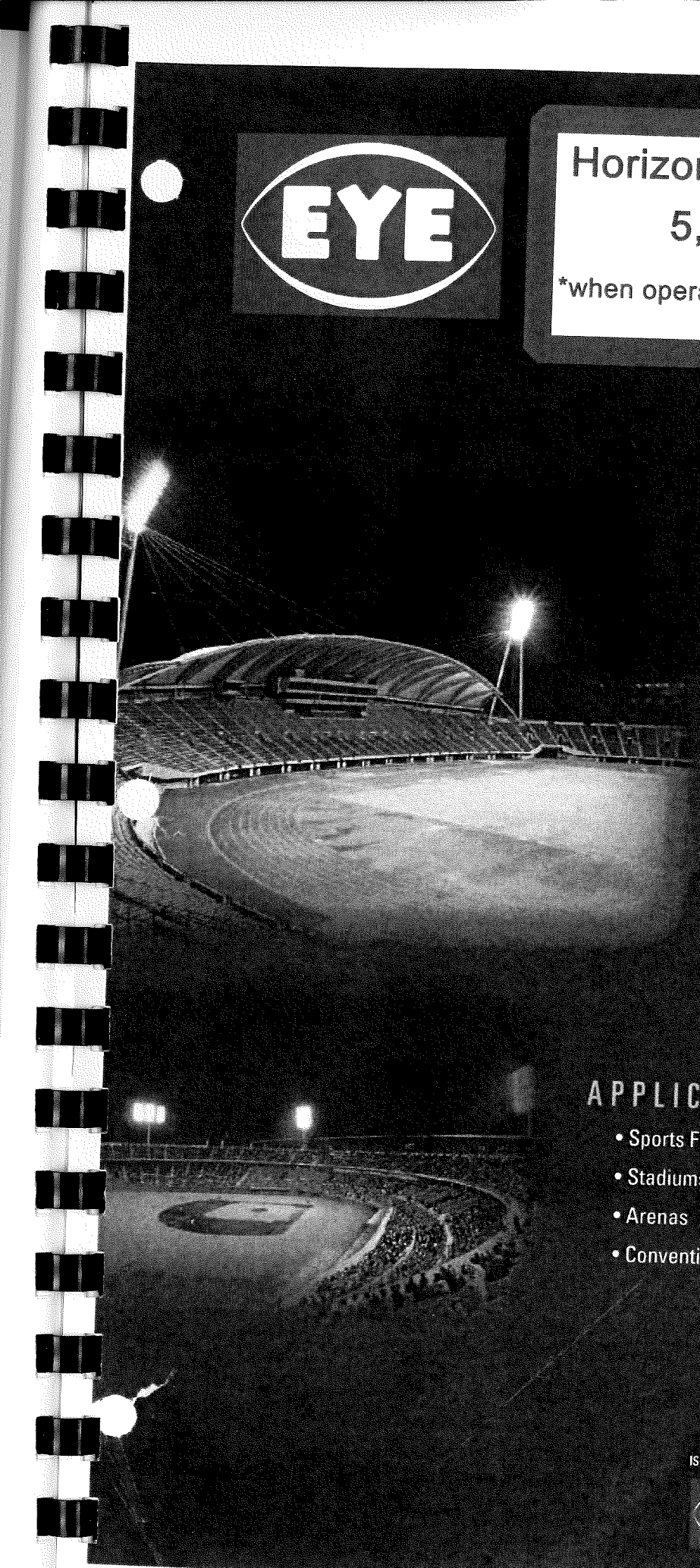
EPA: 1.06
WT: 4.50

ENERGY DATA
Quartz Input Watts
Input watts are dependent on lamp wattage and voltage. Contact factory for more details.

EYE

Horizontal Operating Metal Halide 5,000 Hour Lamp Life*

*when operated in a Universal Sports Lighitng System



High lumen output in a horizontal operating position increases light levels on the field, or maintains the same brightness with fewer fixtures.

HOR ±60° operating position covers a wide range of sports' lighting applications.

Operates on standard M48 system

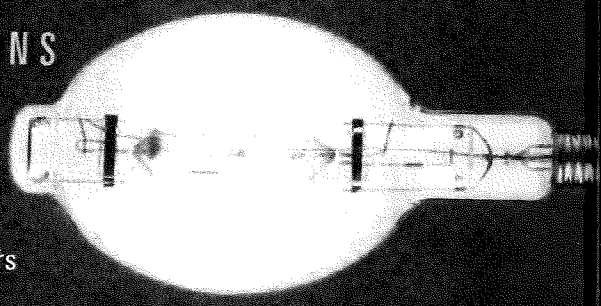
Reliable long-life, high lumens and color stability as a result of EYE's unique Metal Halide lamp technology and commitment to quality.

EYE's superior base features nickel plated threads, is lead-free, with a ceramic insulator and robust eyelet.

All lamps are operated & inspected before leaving the factory, maximizing performance and relability.

APPLICATIONS

- Sports Fields
- Stadiums
- Arenas
- Convention Centers



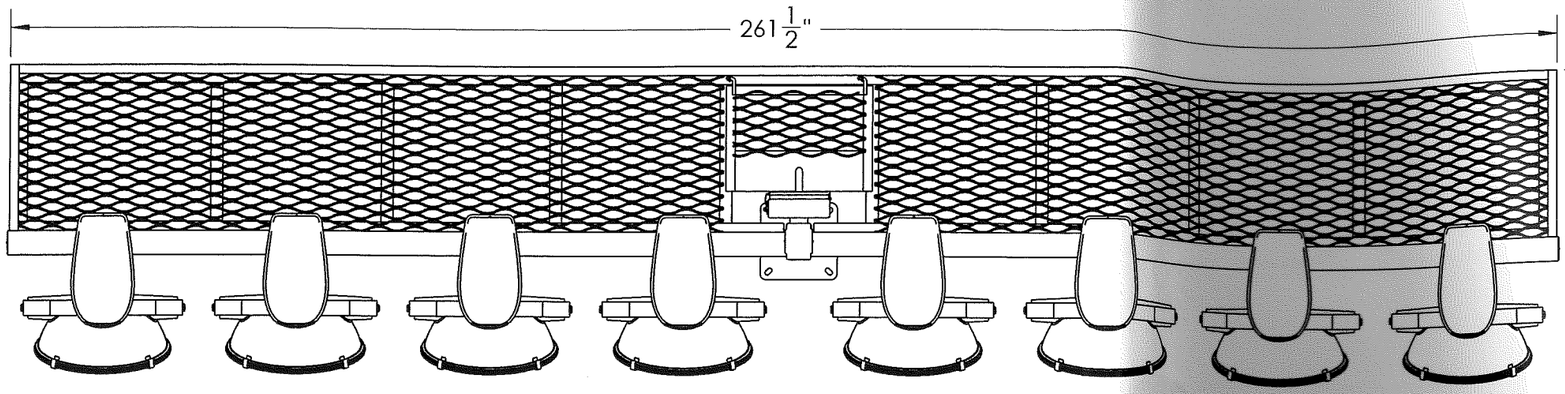
ISO 9001:2000 Certified, ISO 14001:2004 Certified, OHSAS 18001: 1999 Certified, ISO 17025: 2005 Accredited

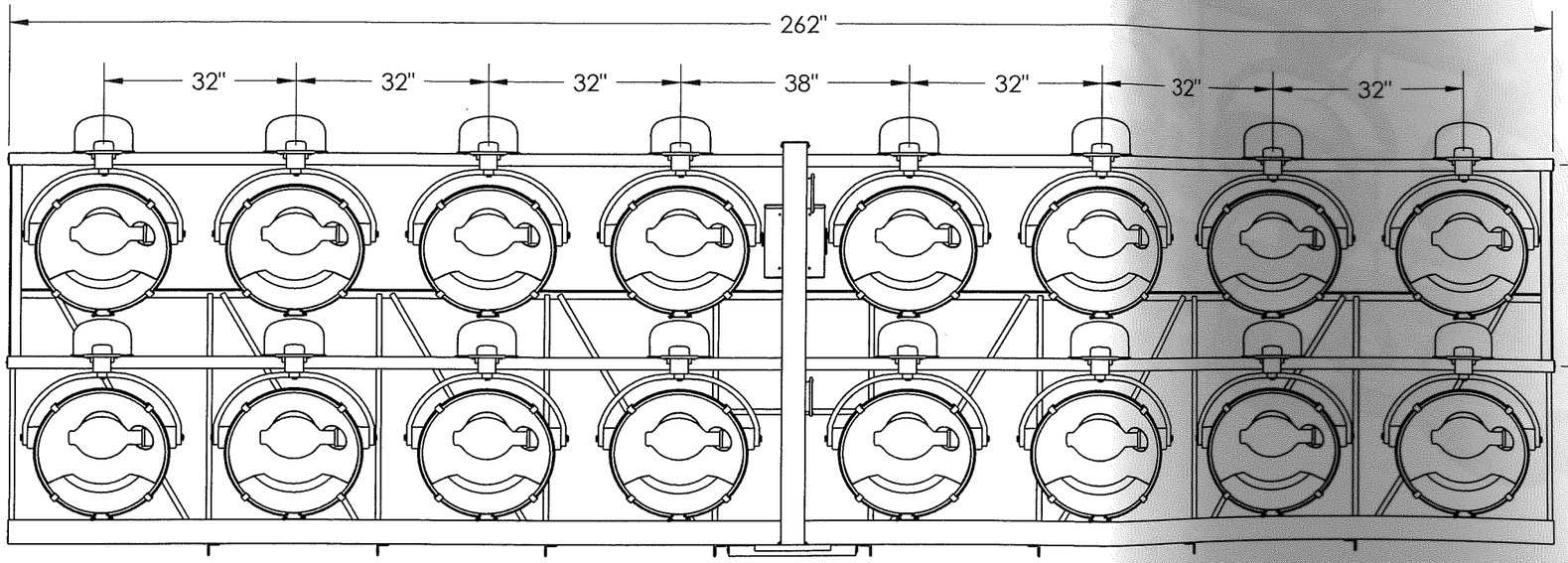
EYE

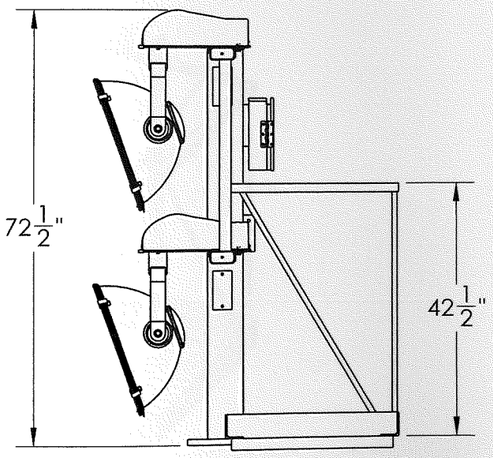
EYE LIGHTING INTERNATIONAL OF NORTH AMERICA, INC.

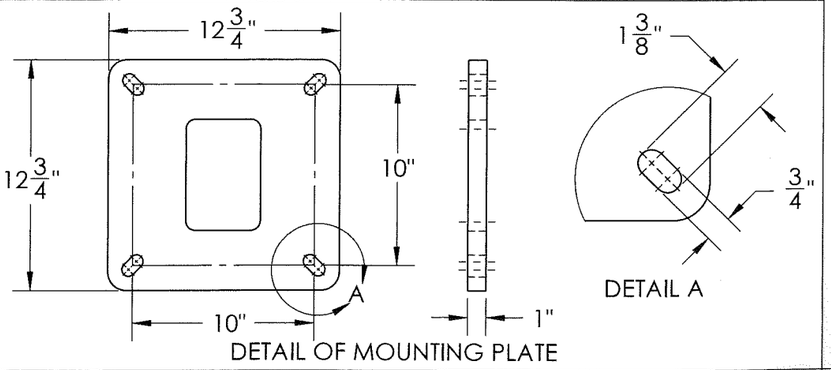
A SUBSIDIARY OF IWASAKI ELECTRIC CO., LTD.

High Output, Horizontal Operating Metal Halide Lamp		
Product Code	54025	
Product Description	Long Life *	
ANSI Code	M48	
* when operated in a Universal Sports Lighting System		
Performance Date		
Initial lumens at rated watts after 100 hours operation	158,000	lm
Mean lumens at 5 hours/start	142,000	lm
Rated average life	5,000	h
Warm up time, maximum	4	min
Correlated color temperature	4,000	k
CIE chromaticity	0.380, 0.382	x, y
Color rendering index (CRI)	65	
Operating position	Horizontal +- 60°	
Field Factor Booster	10%	
Electrical Characteristics		
Nominal lamp wattage	1500	W
Nominal lamp voltage	268	V
Nominal lamp current	6.2	Arms
Maximum current crest factor	1.8	-
Maximum starting current	9	Arms
Minimum starting cvurrent	6.2	Arms
Ballast Requirements	Use with ballast rated for ANSI M48 lamp	
Open circuit voltage (CWA)	530	Vrms
-30°C (-22°F)	None	
Pulse requirements	None	
Lampholder voltage rating	600	V
Physical Description		
Maximum overall length	386 (15.375)	mm (in)
Light center length	241 (9.484)	mm (in)
Bulb diameter	178 (7.0)	mm (in)
Maximum base - bulb eccentricity	3	Degrees
Maximum base temperature	210 (410)	°C (°F)
Maximum bulb temperature	400 (752)	°C (°F)
Bulb designation	BT56	
Bulb Material	Borosilicate (Hard Glass)	
Arc tube material	Quartz	
Effective arc length	102 (4.016)	mm (in)
Bulb finish	Clear	
Base designation	E39 Mogul	
Fixture Requirement		
E Rated - Enclosed fixture required		









DETAIL OF MOUNTING PLATE

DETAIL A

LIGHTING DESIGN DEPT.
2277 OLD ROUTE 66
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USL UNIVERSAL SPORTS LIGHTING

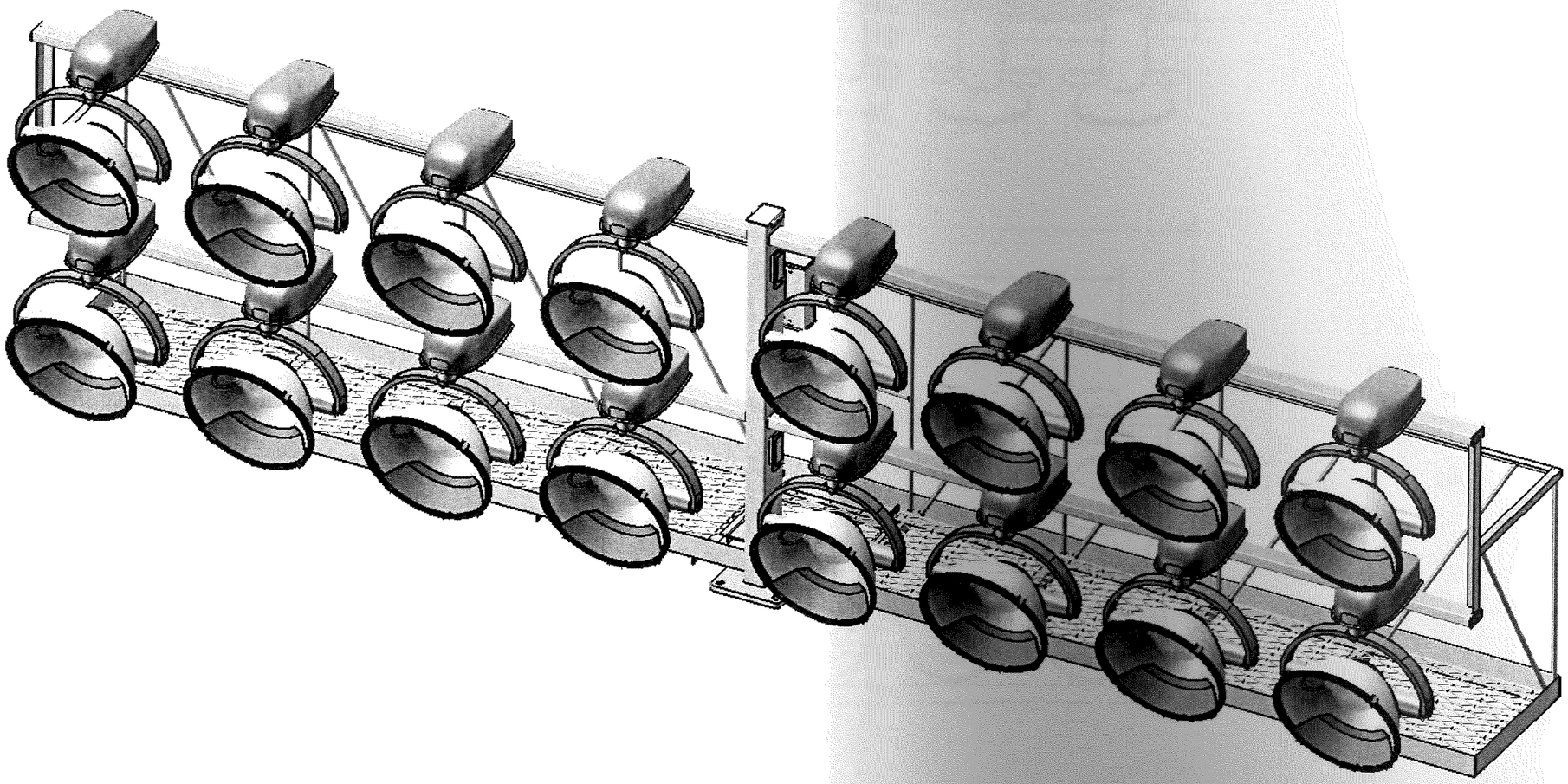
16 FIXTURE SERVICE BASKET CONFIGURATION

INTERGRAL BALLAST SYSTEM
TOP MOUNT - STEEL POLE

ALL PLATE ASTM A36 ALL TUBE ASTM A500	DWG. NO. **SUT16-2**	REV 00
DO NOT SCALE DRAWING	DRAWN BY: C.D.OWENS	DATE: 02/04/08

SHEET 1 OF 2

USL-B-P / 11OCT07



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USL UNIVERSAL SPORTS LIGHTING

16 FIXTURE SERVICE BASKET CONFIGURATION

INTERGRAL BALLAST SYSTEM
TOP MOUNT - STEEL POLE

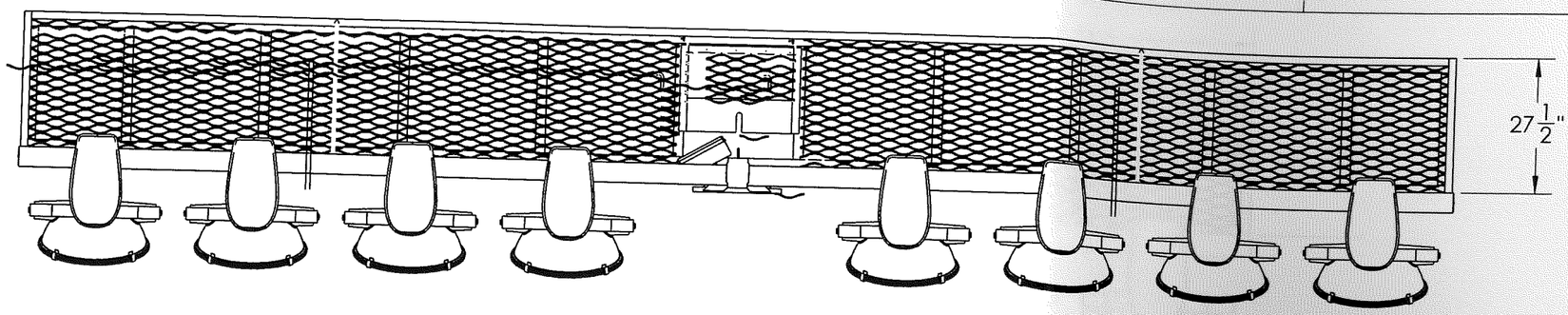
ALL PLATE ASTM A36
ALL TUBE ASTM A500

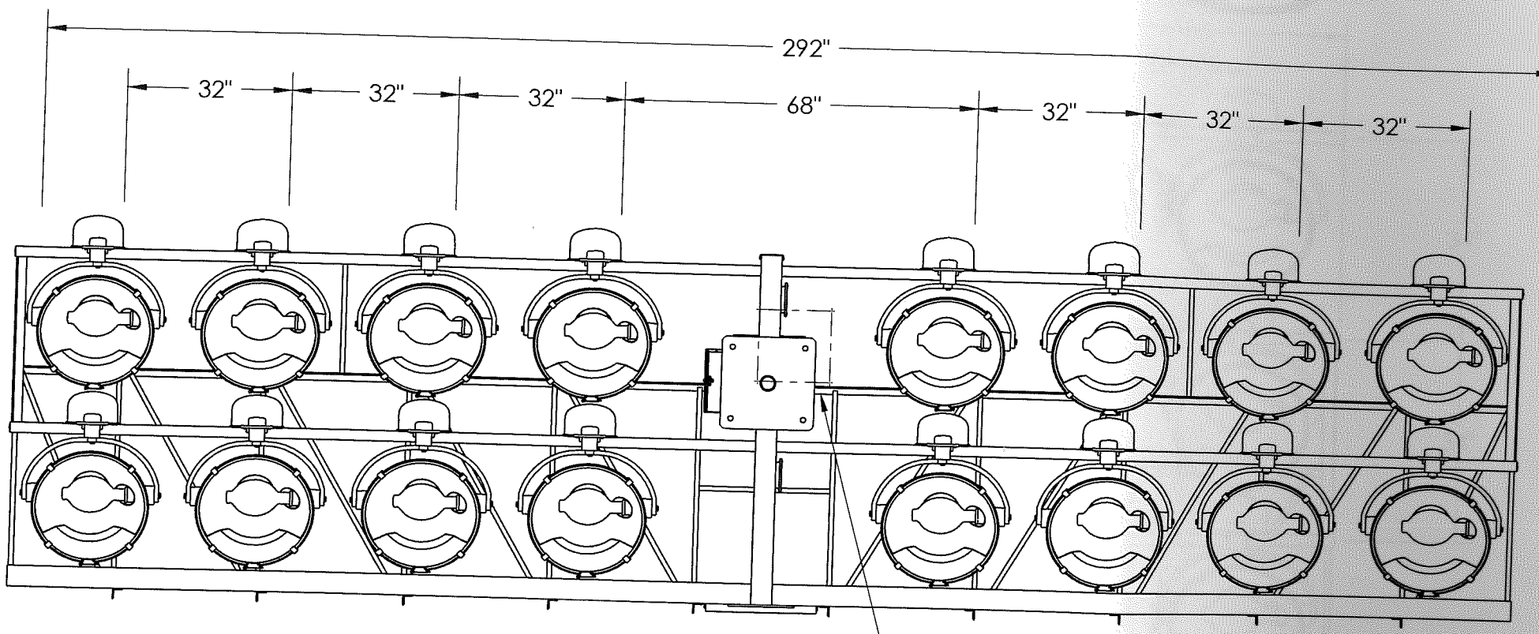
DWG. NO. **SUT16-2**

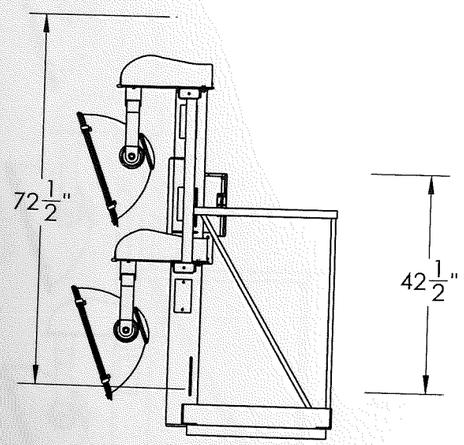
REV 00

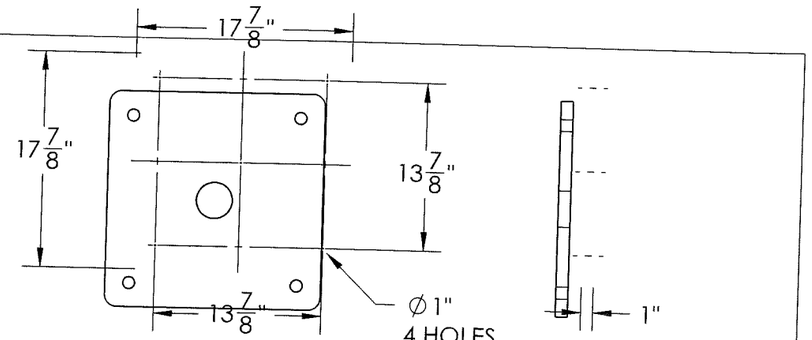
DO NOT SCALE DRAWING | DRAWN BY: C.D.OWENS | DATE: 02/04/08 | SHEET 2 OF 2

USL-B-P / 11OCT07









DETAIL OF MOUNTING PLATE

LIGHTING DESIGN DEPT.
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UNIVERSAL SPORTS LIGHTING

16 FIXTURE SERVICE BASKET CONFIGURATION

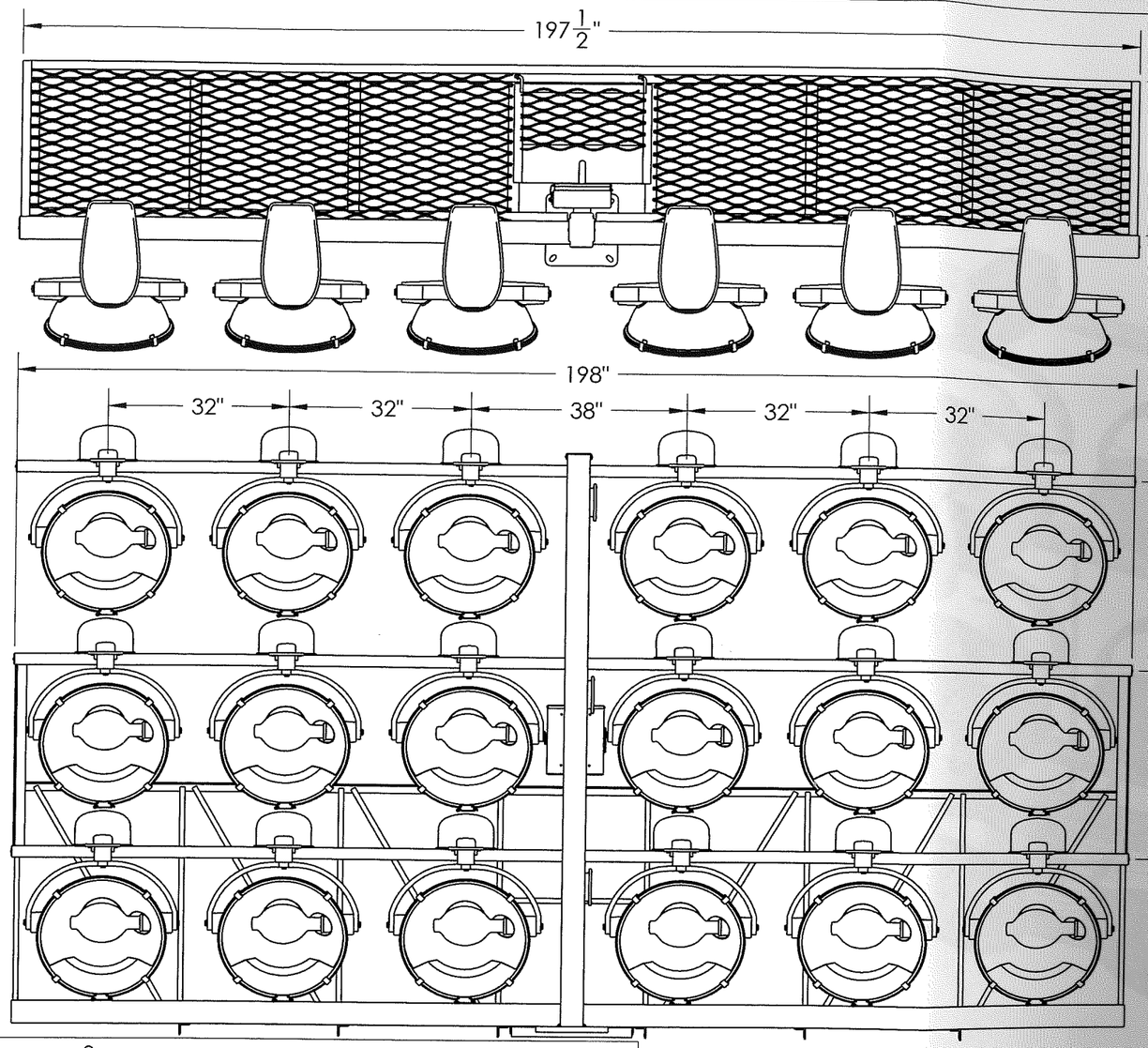
INTERGRAL BALLAST SYSTEM
SIDE MOUNT - STEEL POLE

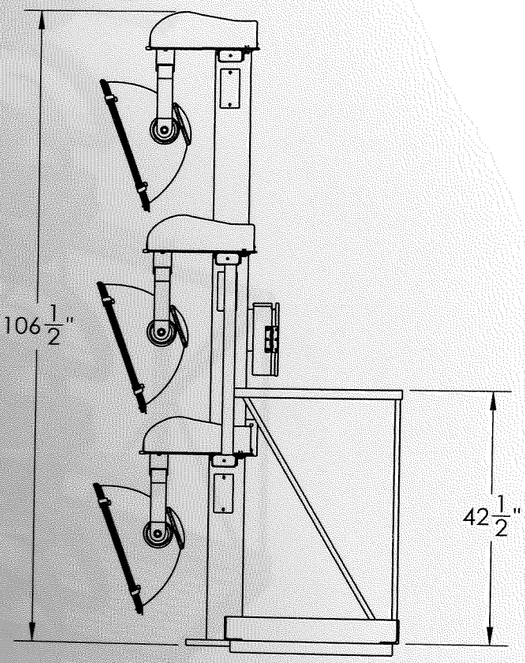
ALL PLATE ASTM A36
ALL TUBE ASTM A500

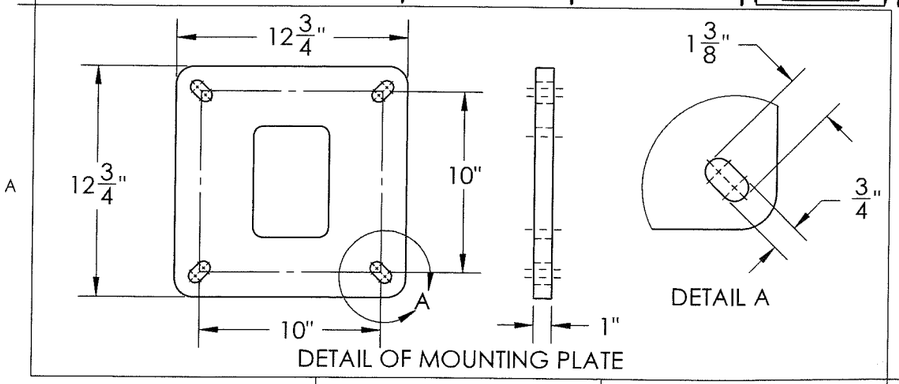
DWG. NO. SUSS16-2 REV 00

DO NOT SCALE DRAWING DRAWN BY: C.D.OWENS DATE: 02/01/08 SHEET 1 OF 2

USL-B-P / 11OCT07







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USL UNIVERSAL SPORTS LIGHTING

18 FIXTURE SERVICE BASKET CONFIGURATION

INTERGRAL BALLAST SYSTEM
TOP MOUNT - STEEL POLE

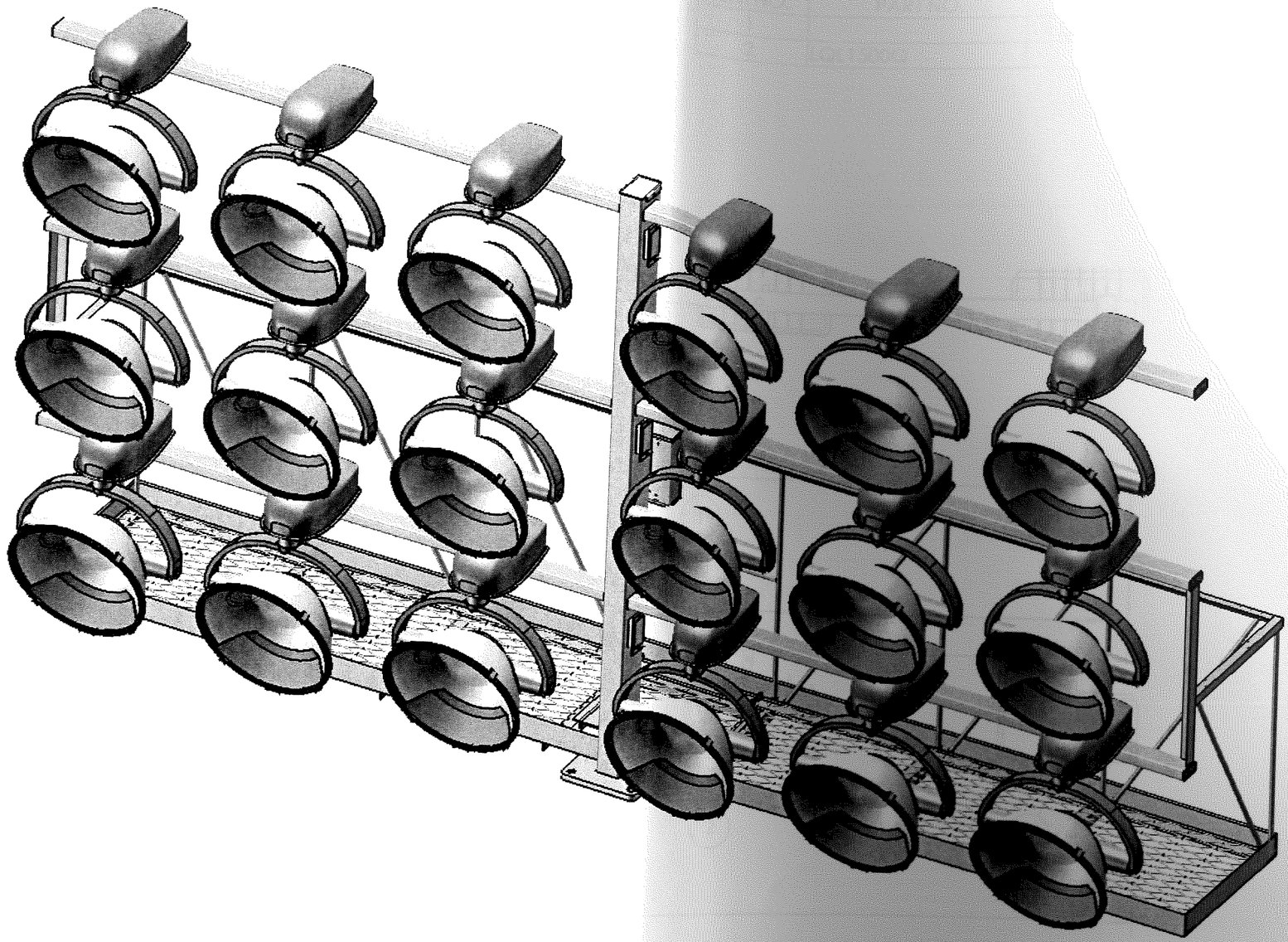
ALL PLATE ASTM A36
ALL TUBE ASTM A500

DWG. NO. SUT18

REV 00

DO NOT SCALE DRAWING | DRAWN BY: C.D.OWENS | DATE: 02/04/08 | SHEET 1 OF 2

USL-B-P / 11OCT07



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USL UNIVERSAL SPORTS LIGHTING

18 FIXTURE SERVICE BASKET CONFIGURATION

INTERGRAL BALLAST SYSTEM
TOP MOUNT - STEEL POLE

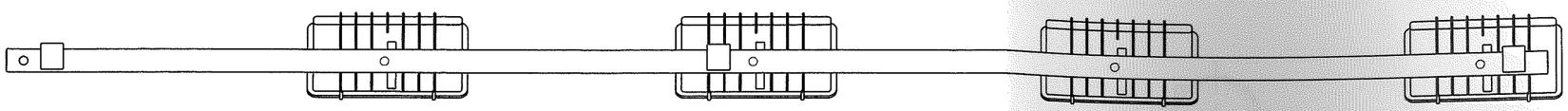
ALL PLATE ASTM A36
ALL TUBE ASTM A500

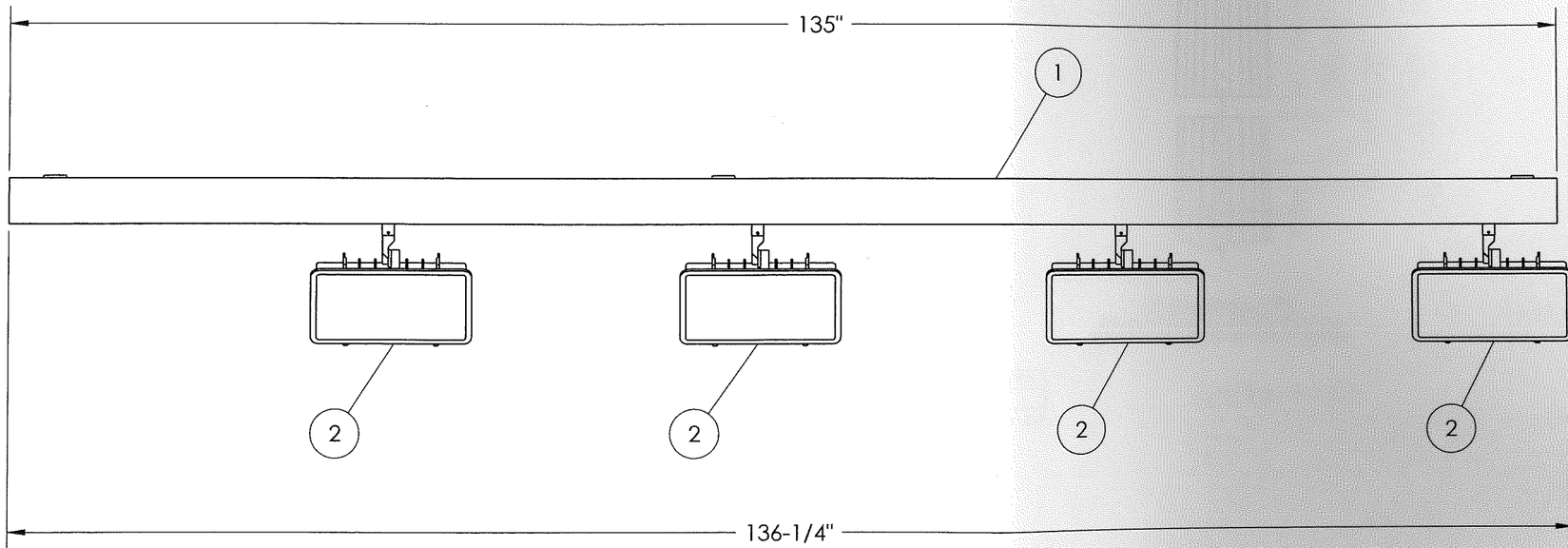
DWG. NO. **SUT18**

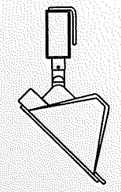
REV 00

DO NOT SCALE DRAWING | DRAWN BY: C.D.OWENS | DATE: 02/04/08 | SHEET 2 OF 2

ITEM NO.	PART NO.	DESCRIPTION	EL-4EFX-TUBE/QTY.
1		4 EMERGENCY FIXTURE LIGHT BAR	1
2	LQL1500Q	QUARTZ LAMP	4







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USL UNIVERSAL SPORTS LIGHTING

4 EMERGENCY FIXTURE CONFIGURATION

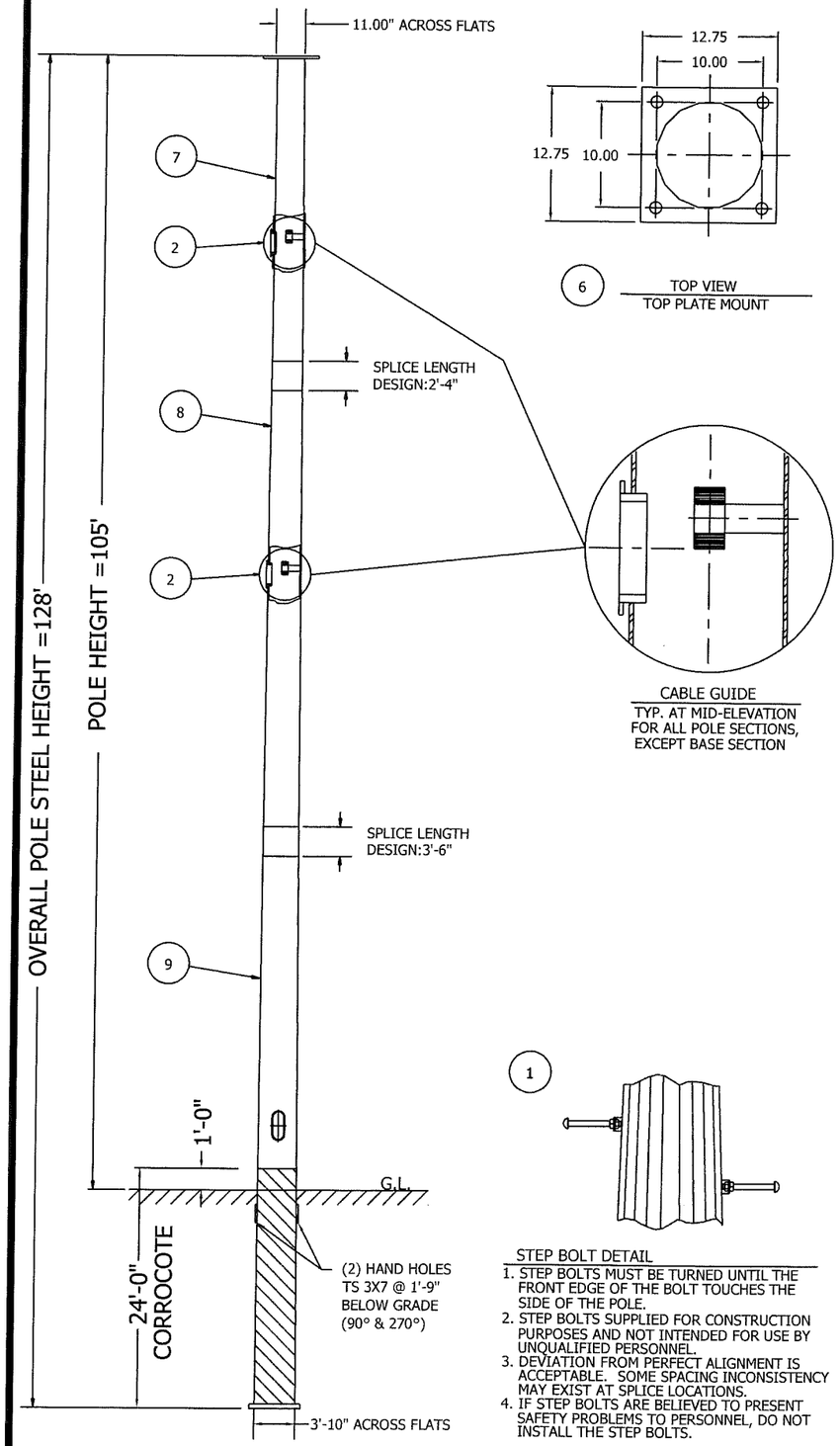
ALL PLATE ASTM A36
ALL TUBE ASTM A500

DWG. NO. **QTZMNT4**

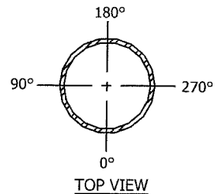
REV 00

DO NOT SCALE DRAWING | DRAWN BY: C.D.OWENS | DATE: 10/12/07 | SHEET 1 OF 1

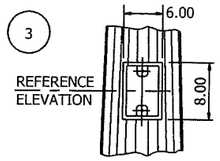
USL-B-P / 11OCT07



6 TOP VIEW
TOP PLATE MOUNT



TOP VIEW
DETAILS 3, 4 & 5

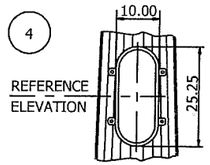


HAND HOLES

HAND HOLE QUANTITY	HAND HOLE ELEVATION
1 PORT {0°}	10'±

* ELEVATIONS ARE MEASURED FROM THE GROUND LEVEL

CABLE GUIDE
TYP. AT MID-ELEVATION
FOR ALL POLE SECTIONS,
EXCEPT BASE SECTION



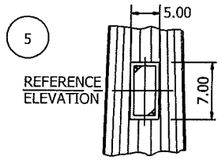
ACCESS PORTS

COVER PLATE P/N: VL5266
SELF TAP SCREW P/N: (4) 210508

ACCESS PORT QUANTITY	ACCESS PORT ELEVATION
1 PORT {0°}	2'-6"±

* ELEVATIONS ARE MEASURED FROM THE GROUND LEVEL

STEP BOLT DETAIL
1. STEP BOLTS MUST BE TURNED UNTIL THE FRONT EDGE OF THE BOLT TOUCHES THE SIDE OF THE POLE.
2. STEP BOLTS SUPPLIED FOR CONSTRUCTION PURPOSES AND NOT INTENDED FOR USE BY UNQUALIFIED PERSONNEL.
3. DEVIATION FROM PERFECT ALIGNMENT IS ACCEPTABLE. SOME SPACING INCONSISTENCY MAY EXIST AT SPLICE LOCATIONS.
4. IF STEP BOLTS ARE BELIEVED TO PRESENT SAFETY PROBLEMS TO PERSONNEL, DO NOT INSTALL THE STEP BOLTS.



HAND HOLES

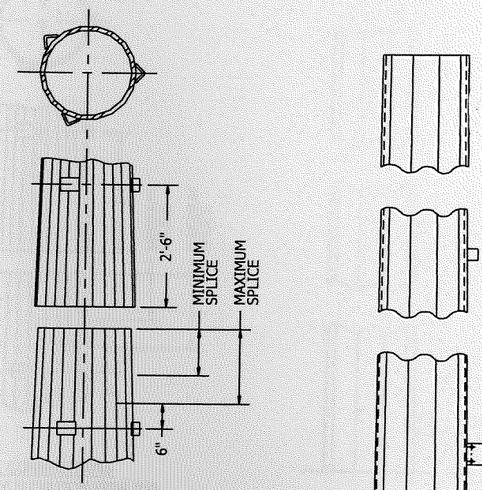
COVER PLATE P/N: VL5279
SELF TAP SCREW P/N: (2) 210508

HAND HOLE QUANTITY	HAND HOLE ELEVATION
1 PORT {90° & 270°}	1'-9"±

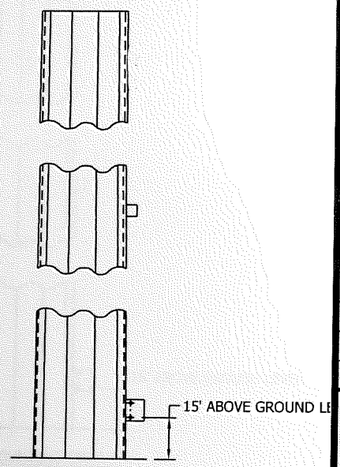
* ELEVATION IS BELOW GROUND LEVEL

1. STEP BOLTS FROM 15' A.G.L. TO TOP OF POLE AT 0°
2. CABLE GUIDE LOCATED INTERNALLY AT MID-ELEVATION IN TOP TWO SECTIONS
3. HANDHOLE FOR ELECTRICAL ENCLOSURE
4. STANDARD ACCESS PORT AT POLE BASE
5. STANDARD HAND HOLE AT MOUNT ELEVATIONS AND CABLE GUIDE
6. 12.75" SQ TOP MOUNTING PLATE FOR USE WITH 11.00" TIP
7. POLE SECTION 37.83', 11.00" TOP O.D., 19.00" BOTTOM O.D.
8. POLE SECTION 48.00', 17.97" TOP O.D., 28.12" BOTTOM O.D.
9. POLE SECTION 48.00', 26.72" TOP O.D., 36.86" BOTTOM O.D.

GALVANIZED POLE WEIGHT = 8691.00 KIPS



SPLICE CONNECTIONS
REFER TO POLE ELEVATION VIEW FOR
MINIMUM AND MAXIMUM SPLICE VALUES



TUF - TUG MOUNTING DETAIL

GENERAL NOTES

1. THE POLE PART NUMBER IS STAMPED AT THE BOTTOM OF EACH POLE SECTION.
2. DESIGN ASSUMES LEVEL GRADE AT POLE SITE.
3. TOLERANCE ON POLE STEEL HEIGHT IS EQUAL TO PLUS 1 % OR MINUS 1/2%.
4. POLE MEMBER DESIGN DOES NOT INCLUDE STRESSES DUE TO ERECTION SINCE ERECTION EQUIPMENT AND CONDITIONS ARE UNKNOWN. DESIGN ASSUMES COMPETENT AND QUALIFIED PERSONNEL WILL ERECT THE POLE.
5. NUMBERS SHOWN IN BALLOONS DENOTE ITEM NUMBERS IN DESCRIPTION TABLE.
6. POLE ORIENTATION TO BE DETERMINED BY OTHERS.
7. MOUNTS TO BE SUPPLIED BY OTHERS.
8. STEP BOLTS WITH TUF-TUG SAFETY DEVICE ARE SUPPLIED FOR CLIMBING FROM 15' ± TO THE TOP OF THE POLE.
9. JACKING ANGLES ARE PROVIDED ABOVE AND BELOW EACH SLIP JOINT TO FACILITATE THE USE OF JACKING DEVICES. THE SECTIONS SHOULD OVERLAP BETWEEN THE SPECIFIED MINIMUM AND MAXIMUM LENGTHS WITH THE DESIGN LENGTH AS OPTIMUM. NON-STAINING LUBRICANTS MAY BE APPLIED TO THE SLIP JOINTS. JACKING FORCES SHOULD BE APPLIED UNTIL THE JOINT IS TIGHT WITH NO GAPS GREATER THAN 1/4".
10. IT IS THE RESPONSIBILITY OF THE ERECTOR TO REPAIR ANY DAMAGE TO GALVANIZING, CAUSED BY CADWELD, WITH COLD GALV. IT IS THE CUSTOMER'S REPONSIBILITY TO PERIODICALLY INSPECT THE REPAIRED SURFACE.
11. GROUNDING IS TO BE SUPPLIED BY OTHERS AND MUST MEET ALL APPLICABLE CODES.
12. CORROSION CONTROL COATING IS PROVIDED FROM 12" ABOVE GRADE LINE TO THE BUTT OF THE POLE.

PROJECT: 0604555
LOCATION A1 & A2

FILE NO.

REVISIONS

REV.	DESCRIPTION	DWN	CHK	APP

DWG REFERENCE

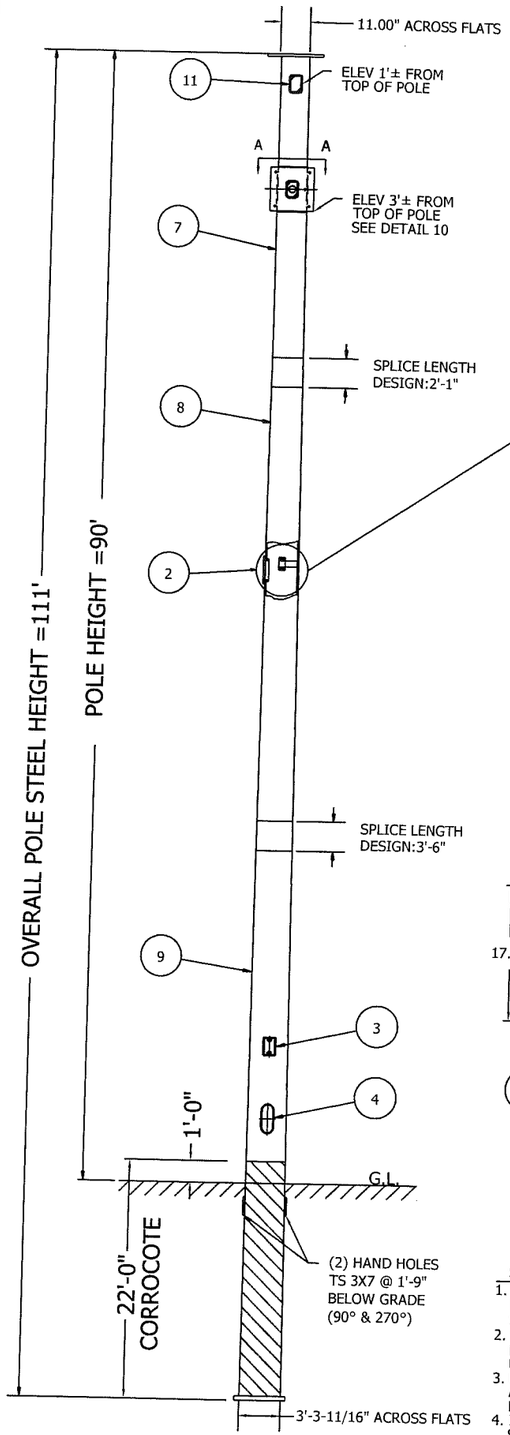
RADIAN
www.radiancorp.com
PEORIA, IL, USA +1 800 727 ROHN
OAKVILLE, ON, CANADA +1 866 4RADIAN
ROHN Products PRODUCTS AND ACCESSORIES

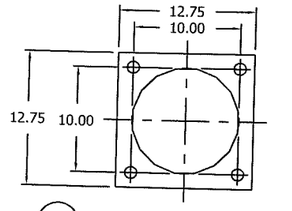
UNIVERSAL SPORTS LIGHTING
WHITE HOUSE FIELD
105' AGL TSP

DWN:	CHK'D:	DATE:
DLJ		FEB/05/2007

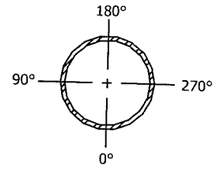
ENG'R:	ENG'R APP'D:

DRAWING NO: PRECHECK
REV: 0

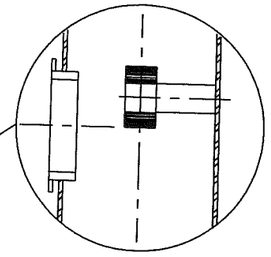




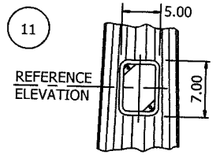
6 TOP VIEW
TOP PLATE MOUNT



TOP VIEW
DETAILS 3, 4, 5 & 11



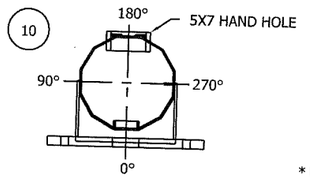
CABLE GUIDE
TYP. AT MID-ELEVATION FOR ALL POLE SECTIONS, EXCEPT BASE SECTION

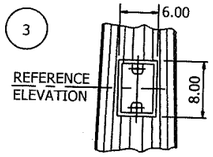


ELECTRICAL ENCLOSURE

HAND HOLE QUANTITY	HAND HOLE ELEVATION
1 PORT {180°}	89'±

* ELEVATIONS ARE MEASURED FROM THE GROUND LEVEL

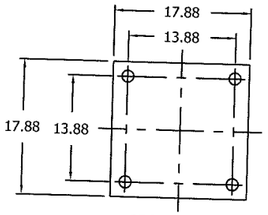




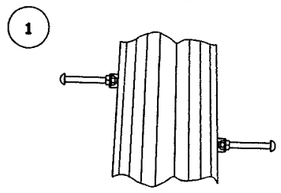
ELECTRICAL ENCLOSURE

HAND HOLE QUANTITY	HAND HOLE ELEVATION
1 PORT {0°}	10'±

* ELEVATIONS ARE MEASURED FROM THE GROUND LEVEL

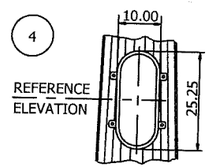


SECTION A-A



STEP BOLT DETAIL

1. STEP BOLTS MUST BE TURNED UNTIL THE FRONT EDGE OF THE BOLT TOUCHES THE SIDE OF THE POLE.
2. STEP BOLTS SUPPLIED FOR CONSTRUCTION PURPOSES AND NOT INTENDED FOR USE BY UNQUALIFIED PERSONNEL.
3. DEVIATION FROM PERFECT ALIGNMENT IS ACCEPTABLE. SOME SPACING INCONSISTENCY MAY EXIST AT SPLICE LOCATIONS.
4. IF STEP BOLTS ARE BELIEVED TO PRESENT SAFETY PROBLEMS TO PERSONNEL, DO NOT INSTALL THE STEP BOLTS.

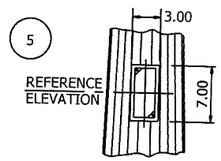


ACCESS PORTS

COVER PLATE P/N: VL5266
SELF TAP SCREW P/N: (4) 210508

ACCESS PORT QUANTITY	ACCESS PORT ELEVATION
1 PORT {0°}	2'-6"±

* ELEVATIONS ARE MEASURED FROM THE GROUND LEVEL



HAND HOLES

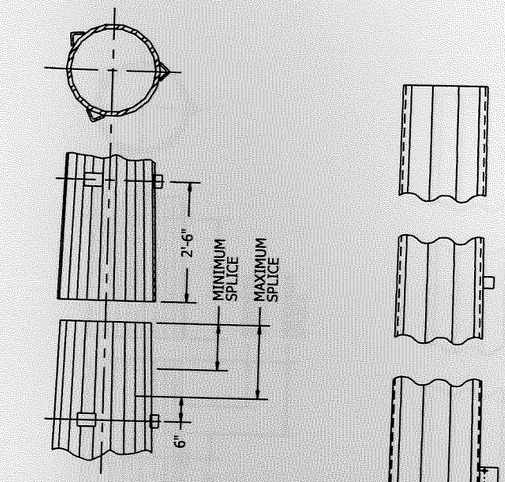
COVER PLATE P/N: VL5279
SELF TAP SCREW P/N: (2) 210508

HAND HOLE QUANTITY	HAND HOLE ELEVATION
1 PORT {90° & 270°}	1'-9"±

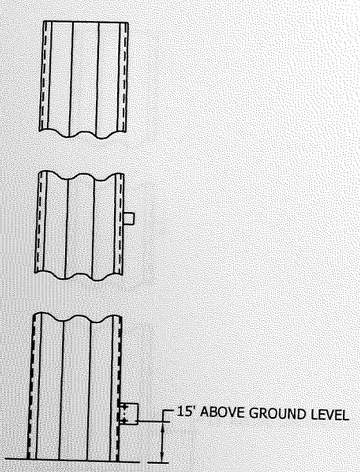
* ELEVATION IS BELOW GROUND LEVEL

1. STEP BOLTS FROM 15' A.G.L. TO TOP OF POLE AT 0°
2. CABLE GUIDE LOCATED INTERNALLY AT MID-ELEVATION IN TOP TWO SECTIONS
3. HANDHOLE FOR ELECTRICAL ENCLOSURE
4. STANDARD ACCESS PORT AT POLE BASE
5. STANDARD HAND HOLE AT MOUNT ELEVATIONS AND CABLE GUIDE
6. 12.75" SQ TOP MOUNTING PLATE FOR USE WITH 11.00" TIP
7. POLE SECTION 20.58', 11.00" TOP O.D., 16.53" BOTTOM O.D.
8. POLE SECTION 48.00', 15.44" TOP O.D., 28.34" BOTTOM O.D.
9. POLE SECTION 48.00', 26.74" TOP O.D., 39.65" BOTTOM O.D.
10. 17.88" SQ CROSSARM MOUNTING PLATE AT 0°
11. STANDARD 5" X 7" HAND HOLE

GALVANIZED POLE WEIGHT = 8121.00 KIPS



SPLICE CONNECTIONS
REFER TO POLE ELEVATION VIEW FOR MINIMUM AND MAXIMUM SPLICE VALUES



SAFETY MOUNTING DETAIL

GENERAL NOTES

1. THE POLE PART NUMBER IS STAMPED AT THE BOTTOM OF EACH POLE SECTION.
2. DESIGN ASSUMES LEVEL GRADE AT POLE SITE.
3. TOLERANCE ON POLE STEEL HEIGHT IS EQUAL TO PLUS 1 % OR MINUS 1/2%.
4. POLE MEMBER DESIGN DOES NOT INCLUDE STRESSES DUE TO ERECTION SINCE ERECTION EQUIPMENT AND CONDITIONS ARE UNKNOWN. DESIGN ASSUMES COMPETENT AND QUALIFIED PERSONNEL WILL ERECT THE POLE.
5. NUMBERS SHOWN IN BALLOONS DENOTE ITEM NUMBERS IN DESCRIPTION TABLE.
6. POLE ORIENTATION TO BE DETERMINED BY OTHERS.
7. MOUNTS TO BE SUPPLIED BY OTHERS.
8. STEP BOLTS WITH SAFETY DEVICE ARE SUPPLIED FOR CLIMBING FROM 15' ± TO THE TOP OF THE POLE.
9. JACKING ANGLES ARE PROVIDED ABOVE AND BELOW EACH SLIP JOINT TO FACILITATE THE USE OF JACKING DEVICES. THE SECTIONS SHOULD OVERLAP BETWEEN THE SPECIFIED MINIMUM AND MAXIMUM LENGTHS WITH THE DESIGN LENGTH AS OPTIMUM. NON-STAINING LUBRICANTS MAY BE APPLIED TO THE SLIP JOINTS. JACKING FORCES SHOULD BE APPLIED UNTIL THE JOINT IS TIGHT WITH NO GAPS GREATER THAN 1/4".
10. IT IS THE RESPONSIBILITY OF THE ERECTOR TO REPAIR ANY DAMAGE TO GALVANIZING, CAUSED BY CADWELD, WITH COLD GALV. IT IS THE CUSTOMER'S REPONSIBILITY TO PERIODICALLY INSPECT THE REPAIRED SURFACE.
11. GROUNDING IS TO BE SUPPLIED BY OTHERS AND MUST MEET ALL APPLICABLE CODES.
12. CORROSION CONTROL COATING IS PROVIDED FROM 12" ABOVE GRADE LINE TO THE BUTT OF THE POLE.

PROJECT: 0604557
LOCATION B1 & B2

FILE NO. 0604557

REVISIONS

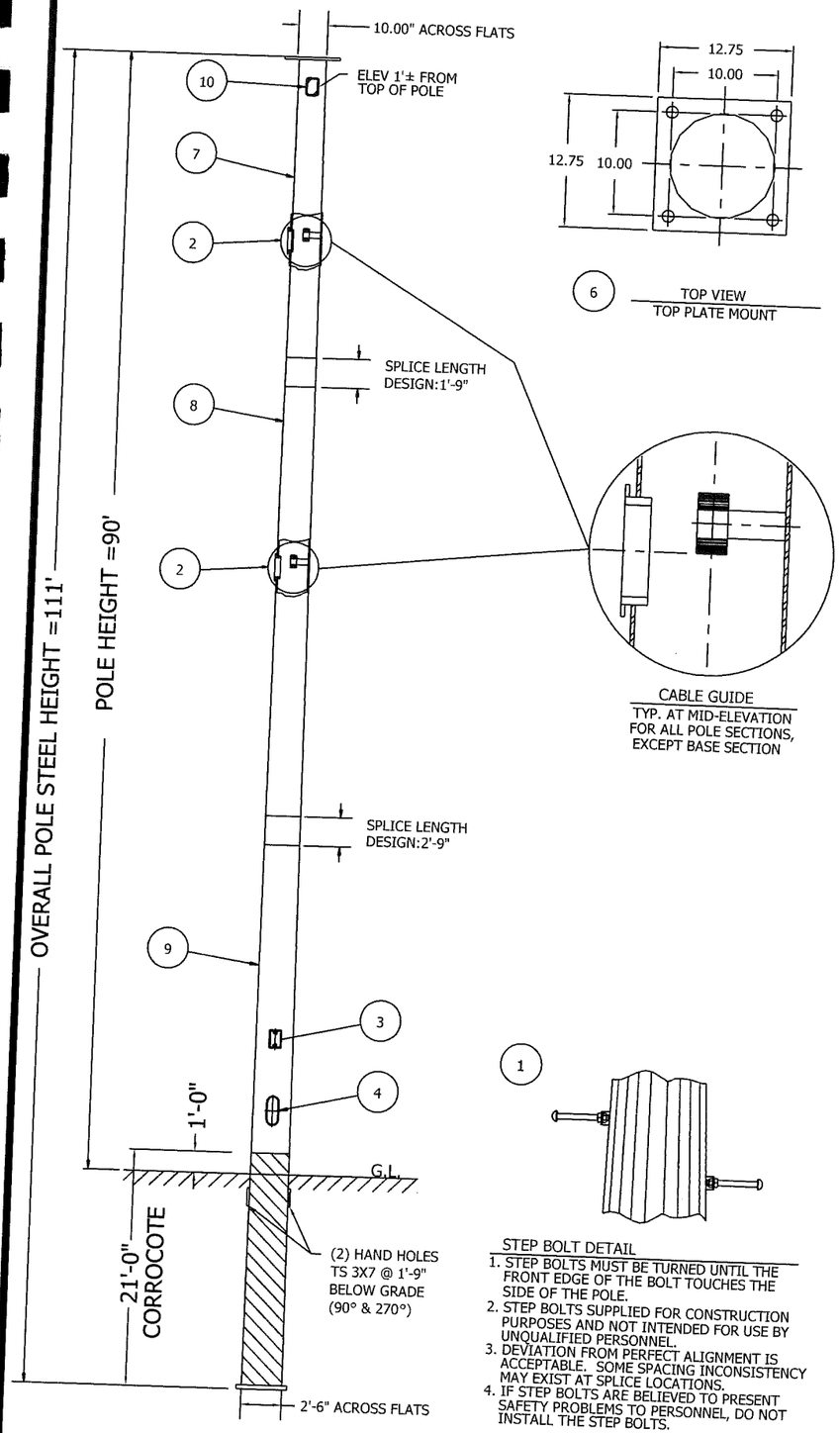
REV.	DESCRIPTION	DWN	CHK	APP

DWG REFERENCE

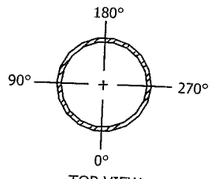
RADIAN
www.radiancorp.com
PEORIA, IL, USA +1 800 727 ROHN
OAKVILLE, ON, CANADA +1 866 4RADIAN
ROHN Products
PRODUCTS AND ACCESSORIES

UNIVERSAL SPORTS LIGHTING
WHITE HOUSE FIELD
90' AGL TSP

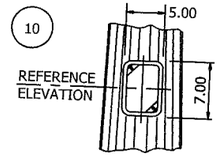
DWN: DLJ	CHK'D:	DATE: FEB/06/2007
ENG'R:	ENG'R APP'D:	
DRAWING NO: PRECHECK		REV: 0



6 TOP VIEW
TOP PLATE MOUNT



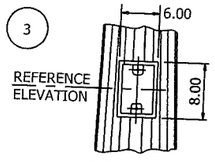
TOP VIEW
DETAILS 3, 4, 5 & 10



ELECTRICAL ENCLOSURE

HAND HOLE QUANTITY	HAND HOLE ELEVATION
1 PORT {180°}	89'±

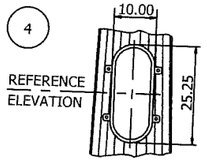
* ELEVATIONS ARE MEASURED FROM THE GROUND LEVEL



HAND HOLES

HAND HOLE QUANTITY	HAND HOLE ELEVATION
1 PORT {0°}	10'±

* ELEVATIONS ARE MEASURED FROM THE GROUND LEVEL

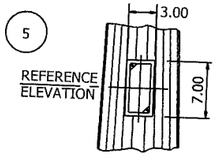


ACCESS PORTS

COVER PLATE P/N: VL5266
SELF TAP SCREW P/N: (4) 210508

ACCESS PORT QUANTITY	ACCESS PORT ELEVATION
1 PORT {0°}	2'-6"±

* ELEVATIONS ARE MEASURED FROM THE GROUND LEVEL



HAND HOLES

COVER PLATE P/N: VL5279
SELF TAP SCREW P/N: (2) 210508

HAND HOLE QUANTITY	HAND HOLE ELEVATION
1 PORT {90° & 270°}	1'-9"±

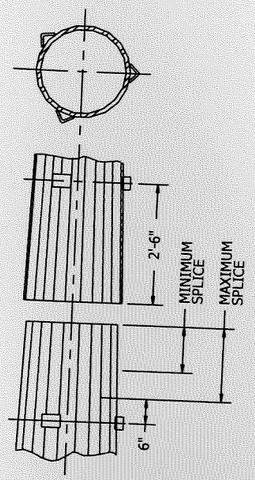
* ELEVATION IS BELOW GROUND LEVEL

STEP BOLT DETAIL

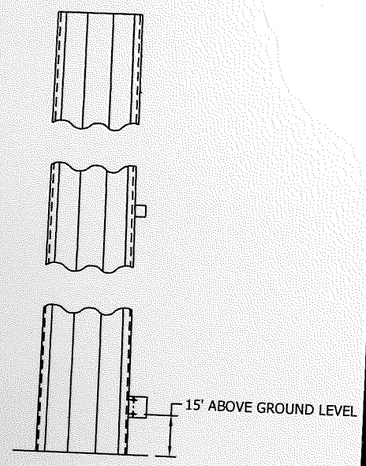
1. STEP BOLTS MUST BE TURNED UNTIL THE FRONT EDGE OF THE BOLT TOUCHES THE SIDE OF THE POLE.
2. STEP BOLTS SUPPLIED FOR CONSTRUCTION PURPOSES AND NOT INTENDED FOR USE BY UNQUALIFIED PERSONNEL.
3. DEVIATION FROM PERFECT ALIGNMENT IS ACCEPTABLE. SOME SPACING INCONSISTENCY MAY EXIST AT SPLICE LOCATIONS.
4. IF STEP BOLTS ARE BELIEVED TO PRESENT SAFETY PROBLEMS TO PERSONNEL, DO NOT INSTALL THE STEP BOLTS.

1. STEP BOLTS FROM 15' A.G.L. TO TOP OF POLE AT 0°
2. CABLE GUIDE LOCATED INTERNALLY AT MID-ELEVATION IN TOP TWO SECTIONS
3. HANDHOLE FOR ELECTRICAL ENCLOSURE
4. STANDARD ACCESS PORT AT POLE BASE
5. STANDARD HAND HOLE AT MOUNT ELEVATIONS AND CABLE GUIDE
6. 12.75" SQ TOP MOUNTING PLATE FOR USE WITH 10.00" TIP
7. POLE SECTION 19.50', 10.00" TOP O.D., 13.73" BOTTOM O.D.
8. POLE SECTION 48.00', 12.86" TOP O.D., 22.03" BOTTOM O.D.
9. POLE SECTION 48.00', 20.84" TOP O.D., 30.01" BOTTOM O.D.
10. STANDARD 5" X 7" HAND HOLE

GALVANIZED POLE WEIGHT = 6327.00 KIPS



SPLICE CONNECTIONS
REFER TO POLE ELEVATION VIEW FOR MINIMUM AND MAXIMUM SPLICE VALUES



SAFETY MOUNTING DETAIL

GENERAL NOTES

1. THE POLE PART NUMBER IS STAMPED AT THE BOTTOM OF EACH POLE SECTION.
2. DESIGN ASSUMES LEVEL GRADE AT POLE SITE.
3. TOLERANCE ON POLE STEEL HEIGHT IS EQUAL TO PLUS 1 % OR MINUS 1/2%.
4. POLE MEMBER DESIGN DOES NOT INCLUDE STRESSES DUE TO ERECTION SINCE ERECTION EQUIPMENT AND CONDITIONS ARE UNKNOWN. DESIGN ASSUMES COMPETENT AND QUALIFIED PERSONNEL WILL ERECT THE POLE.
5. NUMBERS SHOWN IN BALLOONS DENOTE ITEM NUMBERS IN DESCRIPTION TABLE.
6. POLE ORIENTATION TO BE DETERMINED BY OTHERS.
7. MOUNTS TO BE SUPPLIED BY OTHERS.
8. STEP BOLTS WITH SAFETY DEVICE ARE SUPPLIED FOR CLIMBING FROM 15' ± TO THE TOP OF THE POLE.
9. JACKING ANGLES ARE PROVIDED ABOVE AND BELOW EACH SLIP JOINT TO FACILITATE THE USE OF JACKING DEVICES. THE SECTIONS SHOULD OVERLAP BETWEEN THE SPECIFIED MINIMUM AND MAXIMUM LENGTHS WITH THE DESIGN LENGTH AS OPTIMUM. NON-STAINING LUBRICANTS MAY BE APPLIED TO THE SLIP JOINTS. JACKING FORCES SHOULD BE APPLIED UNTIL THE JOINT IS TIGHT WITH NO GAPS GREATER THAN 1/4".
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11. GROUNDING IS TO BE SUPPLIED BY OTHERS AND MUST MEET ALL APPLICABLE CODES.
12. CORROSION CONTROL COATING IS PROVIDED FROM 12" ABOVE GRADE LINE TO THE BUTT OF THE POLE.

PROJECT: 0604556
LOCATION C1 & C2

FILE NO.

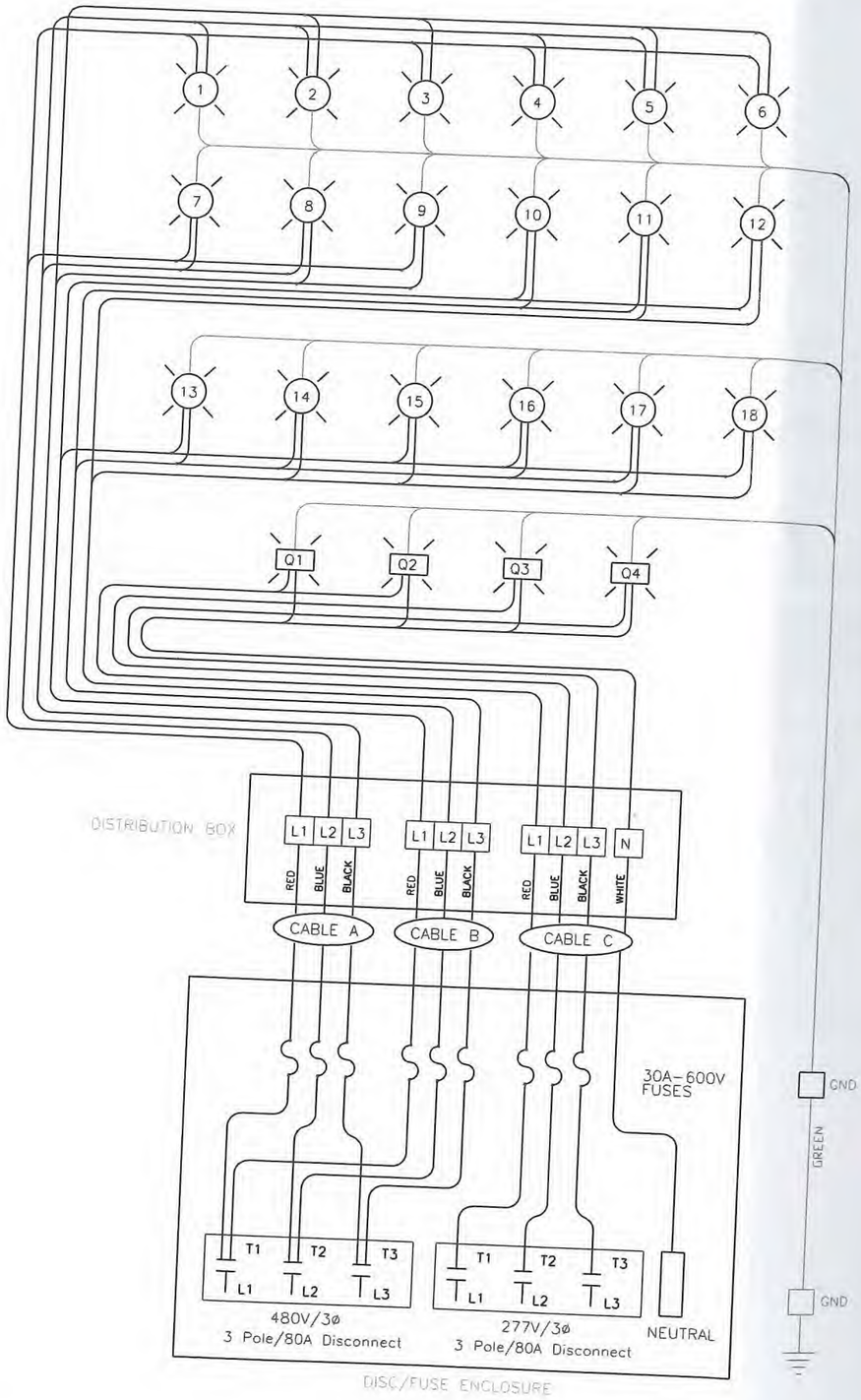
REVISIONS				
REV.	DESCRIPTION	DWN	CHK	APP

DWG REFERENCE

RADIAN
www.radiancorp.com
PEORIA, IL, USA +1 800 727 ROHN
OAKVILLE, ON, CANADA +1 866 4RADIAN
ROHN PRODUCTS AND ACCESSORIES

UNIVERSAL SPORTS LIGHTING
WHITE HOUSE FIELD
90' AGL TSP

DWN:	CHK'D:	DATE:
DLJ		FEB/05/2007
ENG'R:	ENG'R APP'D:	
DRAWING NO:		



UNIVERSAL SPORTS LIGHTING

LIGHTING DESIGN DEPT.
2277 OLD ROUTE 66
P.O. BOX 486
ATLANTA, IL 61723

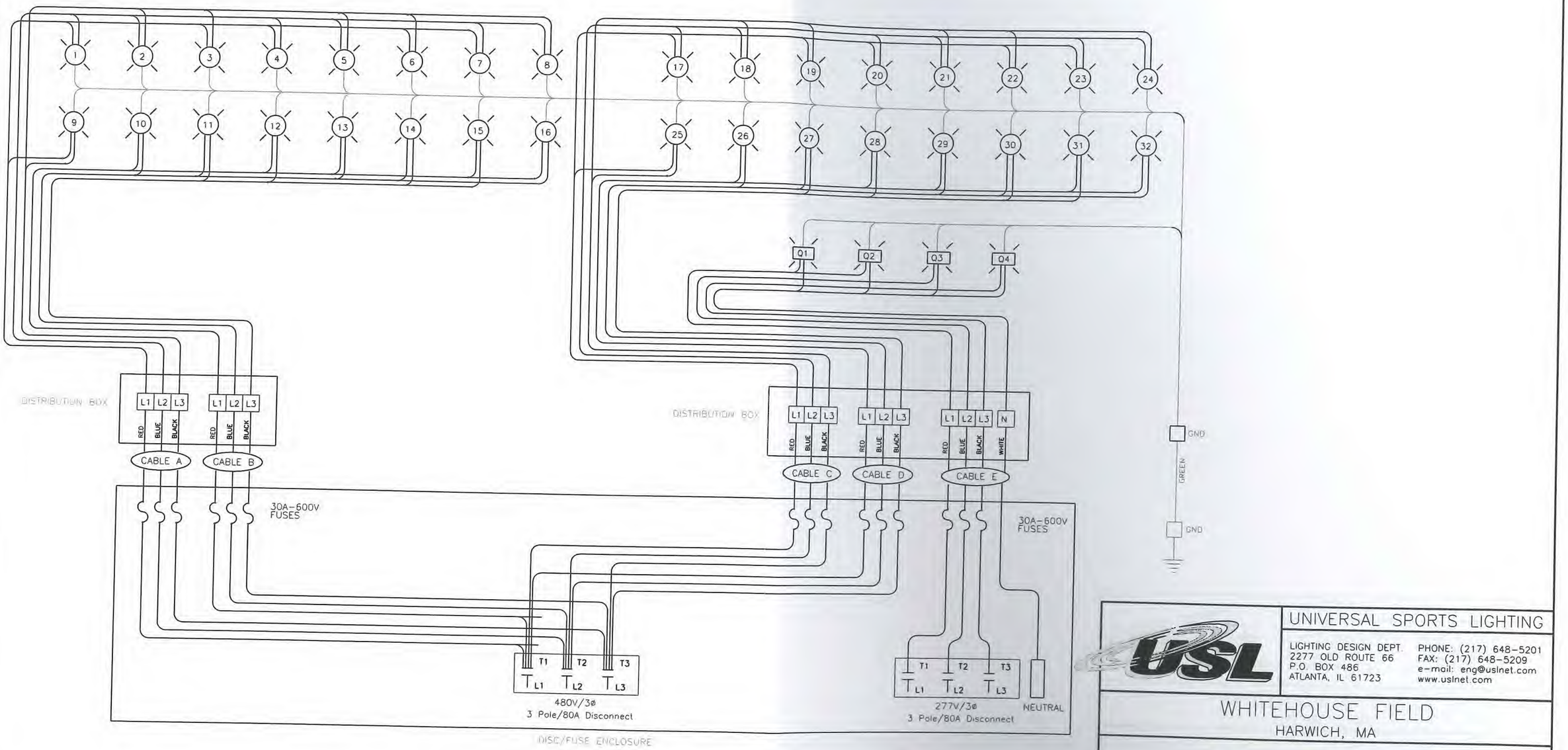
PHONE: (217) 648-5201
FAX: (217) 648-5209
e-mail: eng@uslnet.com
www.uslnet.com

WHITEHOUSE FIELD

HARWICH, MA

ELECTRICAL WIRING SCHEMATICS
277/480/3ø 4 WIRE
POLES A1 & A2
18 SPORTS LIGHTS AND 4 QUARTZ LIGHTS

Sheet No.	Designer:	Date/Time of Design	Drawing Number:	Rev:
N/A	MTR	1/22/08 10:45 A.M.	USL7628-ELC1	00



UNIVERSAL SPORTS LIGHTING

LIGHTING DESIGN DEPT.
2277 OLD ROUTE 66
P.O. BOX 486
ATLANTA, IL 61723

PHONE: (217) 648-5201
FAX: (217) 648-5209
e-mail: eng@uslnet.com
www.uslnet.com

WHITEHOUSE FIELD

HARWICH, MA

ELECTRICAL WIRING SCHEMATICS
277/480/3ø 4 WIRE
POLES B1 & B2
32 SPORTS LIGHTS AND 4 QUARTZ LIGHTS

Sheet No.	Designer:	Date/Time of Design	Drawing Number:	Rev:
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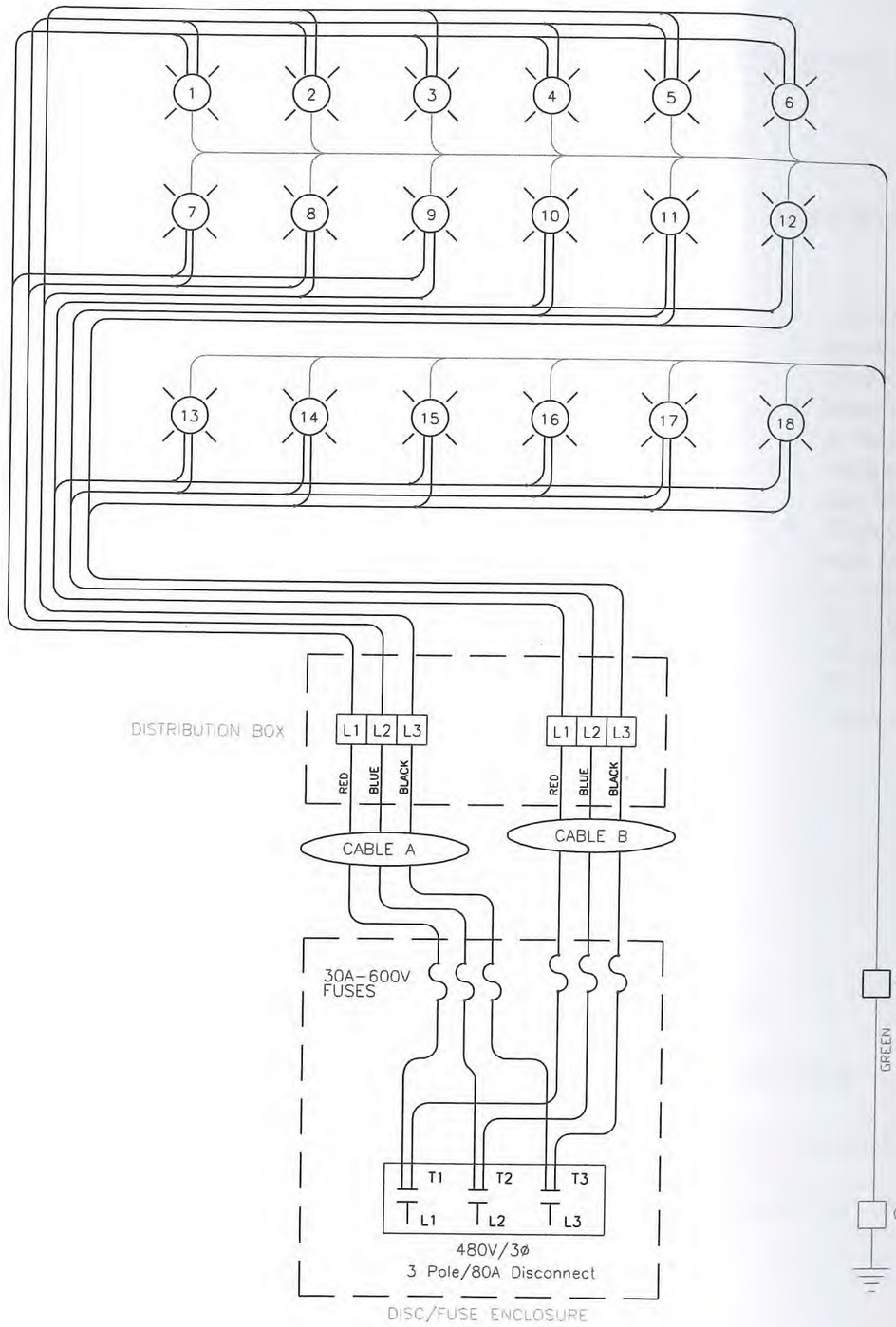

UNIVERSAL SPORTS LIGHTING

LIGHTING DESIGN DEPT
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ATLANTA, IL 61723

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FAX: (217) 648–5209
e–mail: eng@uslnet.com
www.uslnet.com

WHITEHOUSE FIELD

HARWICH, MA

ELECTRICAL WIRING SCHEMATICS
277/480/3ø 4 WIRE
POLES C1 & C2
18 SPORTS LIGHTS

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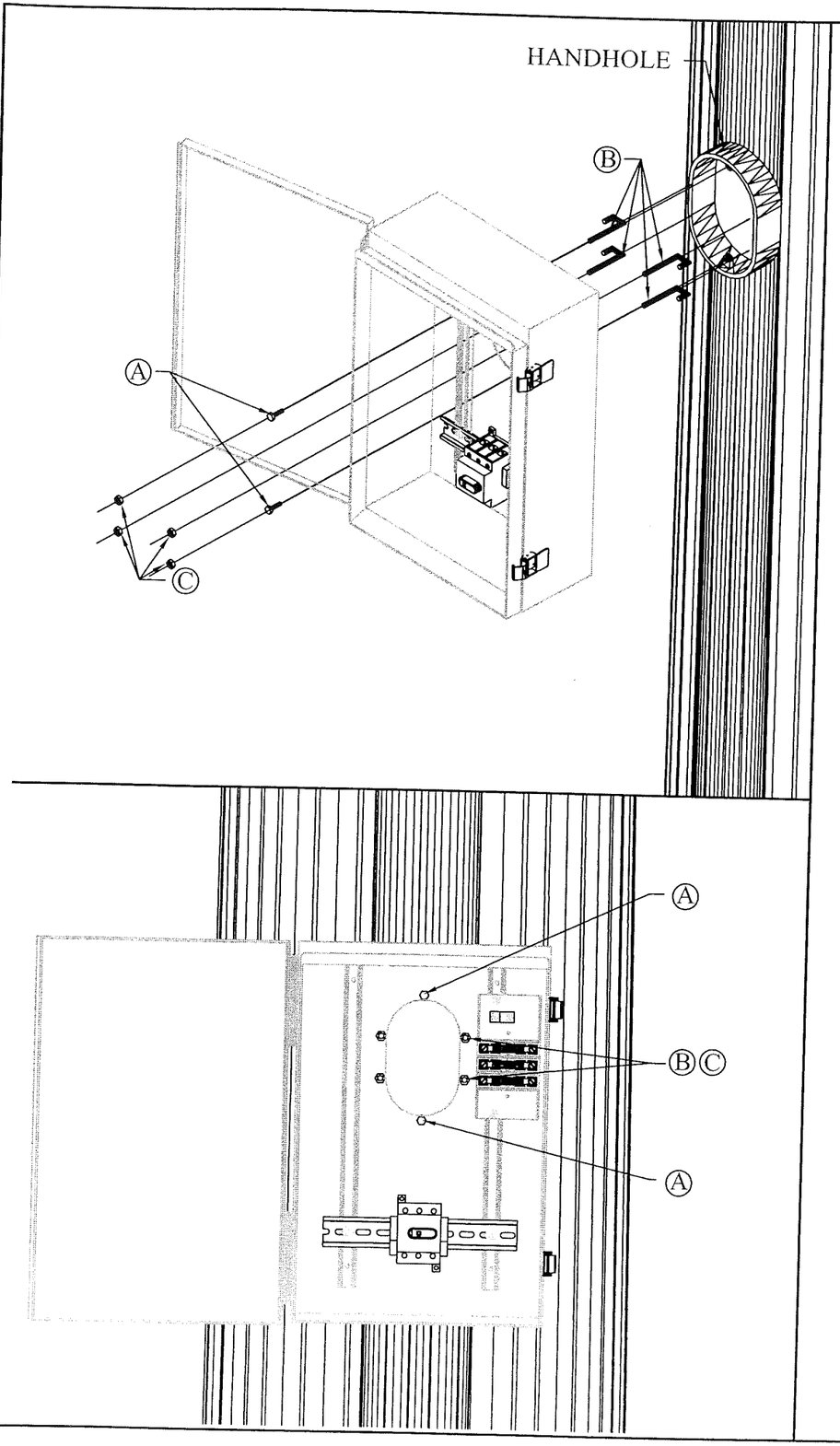

External Disconnect Box Mounting

Installing panel mounting hardware.

1. Align Enclosure to Handhole on Pole.
2. Insert one 1/4" galvanized bolt into the top hole and hand tighten.
3. Insert a hook bolt into one of the four side holes, hooking to the underside of the handhole in the pole. Attach and hand tighten 1/4" nut. Repeat procedure for other 3 side holes.
4. Align the enclosure to the best position and tighten all bolts and nuts, pulling enclosure tight against the handhole on pole.
5. Insert the remaining 1/4" galvanized bolt into the bottom hole and tighten.
   (Note: Step 5 is not applicable on all pole/handhole types.)
6. Nema 3R rated.

Hardware List:

	Description	Quantity
Ⓐ	1/4-20 X 3/4" Galvanized Bolt	2
Ⓑ	Zinc "Hook" Bolt	4
Ⓒ	1/4" Stainless Steel Nut	4

USL
UNIVERSAL SPORTS LIGHTING
LIGHTING DESIGN DEPT.
2277 OLD ROUTE 66
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e-mail: eng@uslnet.com
www.uslnet.com

STEEL POLE MOUNTING INSTRUCTIONS,
EXTERNAL DISCONNECT BOX

Sheet No.	Designer:	Date/Time of Design	Drawing Number:	Rev:
1 of 1	KBZ	10/20/03 9:21 AM	USLLEDBM-SP1	00

COLEMANCABLE

Toll-Free (800) 323-9355 Wiring The World Fax (847) 659-1192

PRODUCT DATASHEET

PART NUMBER: TBD 600419-09-08
DESCRIPTION: 10/4 COMPACT 600 TRAY CABLE SPCC
CONSTRUCTION: This cable consists of four bare copper insulated conductors cabled with a reinforced mylar wrap and an oil and sunlight resistant overall jacket.
APPROVALS: UL Standard 1277, NEC Article 340.
APPLICATION: 600 Volt Power and Control Tray Cable

Construction Parameters:

Conductor	10 AWG Bare Copper
Stranding	104/30
Insulation Material	PVC/Nylon
Insulation Thickness	0.028" Nom.
Insulated Conductor Diameter	0.169" Nom.
Number of Conductors	4
Lay Length	4.00" Nom.
Filler Type	Dry Jute
Separator/Wrap	Reinforced Mylar
Jacket Material	TPE
Jacket Thickness	0.050" Nom.
Overall Cable Diameter	0.524" Nom.
Approximate Cable Weight	232.2 Lbs/1M' Nom.
Flame Rating	UL 1581 Vertical Tray Flame Test

Electrical Properties:

Temperature Rating	-40°C to 90°C
Operating Voltage	600 V RMS Max.
DC Resistance per Conductor @ 20°C	0.99 Ohms/1M' Nom.

Insulation Colors	Red Blue Black Green
Jacket Color	Black
Legend (White Surface Ink Print)	COLEMAN CABLE 10-4 COMPACT 600V THHN/THWN (UL) TYPE TC 90C OIL RES I SUNLIGHT RESISTANT

The customer will accept all factory lengths and +/- 10 percent of total order requested.
The information presented here is, to the best of our knowledge, is true and accurate. However, since conditions of use are beyond our control, all recommendations or suggestions are presented without guarantee or responsibility on our part. We disclaim all liability in connection with the use of information contained herein or otherwise.

Customer Name_____

Customer Approval _____

Specification Issue Date: August 31, 2001

Intertek ETL SEMKO

AUTHORIZATION TO MARK

This authorizes the application of the Certification Marks shown below to the Product Covered (also to the multiple listee model identified on the correlation page of the Listing Report where applicable) when made in accordance with the Description and under the conditions set forth in the Certification Agreement and Listing Report. This document is not valid until signed and dated.

Applicant: UNIVERSAL SPORTS LIGHTING, INC.
2277 Old Route 66, PO Box 486
Atlanta, IL 61723

Contact: Name: Mr. Chuck Lindstrom Phone: (217) 648-5201

Manufacturer: UNIVERSAL SPORTS LIGHTING, INC.
2277 Old Route 66, PO Box 486
Atlanta, IL 61723

Party Authorized To Apply Mark: Same as Manufacturer

Report Issuing Office: Intertek, Des Plaines IL

Report No.: 3045142.001

Product Covered: High Intensity Discharge Luminaires; Models USL 1500 Watt and USL/CE 1500 Watt.

Description: The products covered in this report are pole-mount, permanently connected, metal halide high-intensity discharge lighting fixture assemblies, suitable for use in wet locations.

Standard(s): Standard for Safety for Luminaires (UL 1598 / CSA C22.2 No. 250.0-00, First Edition, 01/31/2000).

Authorized by: William T Starr
William T. Starr, Certification Manager

Date: July 22, 2003

Control Number: 76514 (entered by Lab)

Intertek
165 Main Street, Cortland, NY 13045
Telephone 800-345-3851 or 607-753-6711 Fax 607-756-6699

LISTING REPORT
INTERTEK

200 E. Howard Ave., Suite 296 Des Plaines, IL 60018

Job No. 3045142

Issued: **/**/**

REPORT NO. 3045142.001

INSPECTION, TESTS AND EVALUATION
OF
HIGH INTENSITY DISCHARGE LUMINAIRES

RENDERED TO

UNIVERSAL SPORTS LIGHTING, INC.
ATLANTA, IL

GENERAL: This Report gives the results of the inspection, tests and evaluation of a High Intensity Discharge Luminaires for compliance with applicable requirements of the Standard for Safety for Luminaires (UL 1598 / CSA C22.2 No. 250.0-00, First Edition, 01/31/2000). This investigation was authorized by signed application No. 11873999, dated 06/25/03. The investigation was begun on 07/07/03 and completed on 07/10/03. A prototype sample in good condition was provided by the client on July 07, 2003 and tested at local Intertek, Des Plaines, IL facility.

Standard for Safety for Luminaires
(UL 1598 / CSA C22.2 No. 250.0-00, First Edition, 01/31/2000)

Applicant: UNIVERSAL SPORTS LIGHTING, INC.
2277 Old Route 66, PO Box 486
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Contact: Mr. Chuck Lindstrom
Phone: (217) 648-5201
Fax: (217) 648-5209

Manufacturer: UNIVERSAL SPORTS LIGHTING, INC.
2277 Old Route 66, PO Box 486
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Contact: Mr. Chuck Lindstrom
Phone: (217) 648-5201
Fax: (217) 648-5209

Report Composition:	Numbering
Cover	1
Revisions	2
Main Report	3 – 16
Illustrations	17 – 20
Components Requiring Yearly Testing	21
Total Number of Pages	21

REVISION SUMMARY - The following changes have been made to this Report:

Date/Project #	Project Handler	Reviewer	Page	Item	Description of Change
					NONE

PRODUCT DESCRIPTION

PRODUCT COVERED

High Intensity Discharge Luminaires; Models USL 1500 Watt and USL/CE 1500 Watt.

PRODUCT DESCRIPTION

The products covered in this report are pole-mount, permanently connected, metal halide high-intensity discharge lighting fixture assemblies, suitable for use in wet locations.

MODEL SIMILARITY

Both the models are same except that the Model USL has powder coated enclosure while model USL/CE has hot dipped galvanized enclosure.

ELECTRICAL RATINGS

All models are rated 120/208/240/277/480 VAC, 1500Watt and 60 Hz.

TEST PERFORMANCE

A representative sample of the product was tested in accordance with the Standard for Safety for Luminaires (UL 1598 / CSA C22.2 No. 250.0-00, First Edition, 01/31/2000).

The following tests were performed:

Test Description	Clause
Normal Temperature	11
Rain	13.5.2
Loading	13.15
Dielectric Strength	14.1
Grounding Continuity	14.2

Results of the tests indicate the specimens conform to applicable test criteria.

CONCLUSION

A representative sample of the product covered by this report has been evaluated to the applicable requirements of the Standard for Safety for Luminaires (UL 1598 / CSA C22.2 No. 250.0-00, First Edition, 01/31/2000).

Report prepared by:

Syed Rizvi
Project Engineer

Report reviewed/approved by:

Brett Alsop
Senior Project Engineer

Intertek ETL SEMKO

INTERTEK TEST DATA PAGE

CLIENT: Universal Sports Lighting, Inc.
PRODUCT: Metal Halide (HID) Lamp
MODEL NO: USL and USL/CE 1500 Watt
STANDARD: UL 1598 / CSA 250.0
Condition of Sample:

EDITION: 1st (1/31/00)
☐ PRODUCTION ■PROTOTYPE

ORDER NO: 3045142
PROJECT ENGINEER: Syed Rizvi
TESTED BY: Syed Rizvi
DATE: 07/07/02

TEMPERATURE TEST (SECTION 11) – Tested with Advance ballast model 71A6792.

Method: The unit was operated at a voltage of 120VAC, using 1500W, BT56 (ANSI type M48), Mogul base type lamp. The luminaire was installed and supported to simulate intended use in accordance with manufacturer's instructions. Ambient temperature was measured using thermocouple immersed in 15 ml of mineral oil in a glass container. Metal Halide test lamp was seasoned for 100 hrs before the test. Test was continued until thermal stabilization.

	LOCATION: TIME:>	1:10 PM	1:30 PM	2:30 PM	3:00 PM	3:30 PM	4:30 PM	4:45 PM	LIMIT °C
1	Branch circuit conductor	37	43	46	47	47	47	47	105
2	Ballast winding location 1	63	76	85	90	91	92	92	170
3	Ballast winding location 2	45	65	78	87	92	93	93	170
4	Capacitor	32	37	44	50	53	54	54	90
5	Luminaire Conductor Location 1	35	47	53	58	61	62	62	105
6	Luminaire Conductor Location 2	37	39	56	61	62	63	63	105
7	Gasket on lamp shade	78	114	121	122	122	122	122	160
8	Ambient	25	25	25	25	25	25	25	---

Result – All measured temperatures were within the limits.

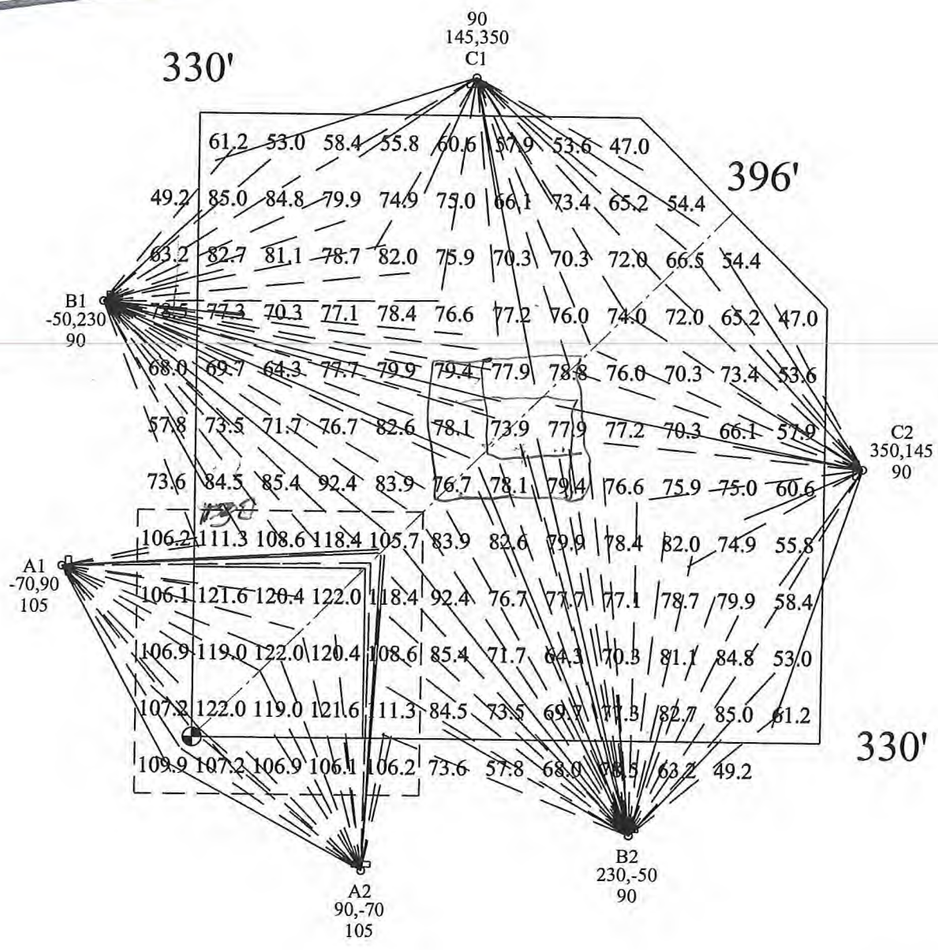
Circle one: PASS / FAIL

Circle equipment used:

Ground Bond Tester	Data Logger	Power Analyzer	Digital Multimeter	Small Clamp-On Current Probe	Large Dielectric Tester	Small Dielectric Tester
Thermometer	Steel Ball	Weight Scale	Rain Tester	Push/Pull Meter	Impact Hammer	Sprinkler Tester

Signature: _____ Date:

August 2008



Pole	x-loc	y-loc	height	CE-NS	CE-MS	CE-WS	Total	kw
A1	-70	90	105ft	3	15		18	29.3
A2	90	-70	105ft	3	15		18	29.3
B1	-50	230	90ft	3	23	6	32	52.2
B2	230	-50	90ft	3	23	6	32	52.2
C1	145	350	90ft	3	10	5	18	29.3
C2	350	145	90ft	3	10	5	18	29.3
Total				18	96	22	136	221.7

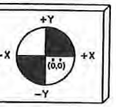
With all readings: They exceeded projections

CE-NS
Narrow w/Internal Glare Louver
Initial Lumens per lamp = 180000
Light Loss Factor = 0.800
Watts per luminaire = 1630
Candela file name: CE-NS.ies
Number luminaires used = 18
kw these luminaires = 29.3

CE-MS
Medium w/Internal Glare Louver
Initial Lumens per lamp = 180000
Light Loss Factor = 0.800
Watts per luminaire = 1630
Candela file name: CE-MS.IES
Number luminaires used = 96
kw these luminaires = 156.5

CE-WS
Wide w/Internal Glare Louver
Initial Lumens per lamp = 180000
Light Loss Factor = 0.800
Watts per luminaire = 1630
Candela file name: CE-WS.ies
Number luminaires used = 22
kw these luminaires = 35.9

NOTE:
ALL POLE LOCATIONS ARE REFERENCED FROM ORIGIN (0,0) AT HOMEPLATE OF BASEBALL FIELD



Baseball
136 points (25 infield, 111 outfield) at z=3, sp 30ft by 30ft
HORIZONTAL FOOTCANDLES

	Outfield	Infield
Average	72.2	113.3
Maximum	92.4	122.0
Minimum	47.0	105.7
Avg:Min	1.54	1.07
Max:Min	1.97	1.15
Coef Var	0.14	0.06
UnifGrad	1.73	1.15

Calculated light levels are based on specific information that has been supplied to us. Any differences in the luminaire installation, lighted area geometry and any obstructions in the lighted area may produce different results from the predicted values. Normal tolerances of voltage, lamp output, and ballast and luminaire manufacture will affect results.
Ref: IES LM-61-1986
Identifying Operating Factors for HID Luminaires

Behind 2nd Base 135
mound 128
135
Home Plate 120
128
1st Base 132
126

Between 1st + 2nd
130
129

Outfield
Center-behind 2nd 130
Shallow Center 118
Center 112
106
Deep Center 94
85
warning track 110

Right Center → Foul Line 90°
scoreboard
82 87 100 105 108 108

UNIVERSAL SPORTS LIGHTING
LIGHTING DESIGN DEPT.
2277 OLD ROUTE 66
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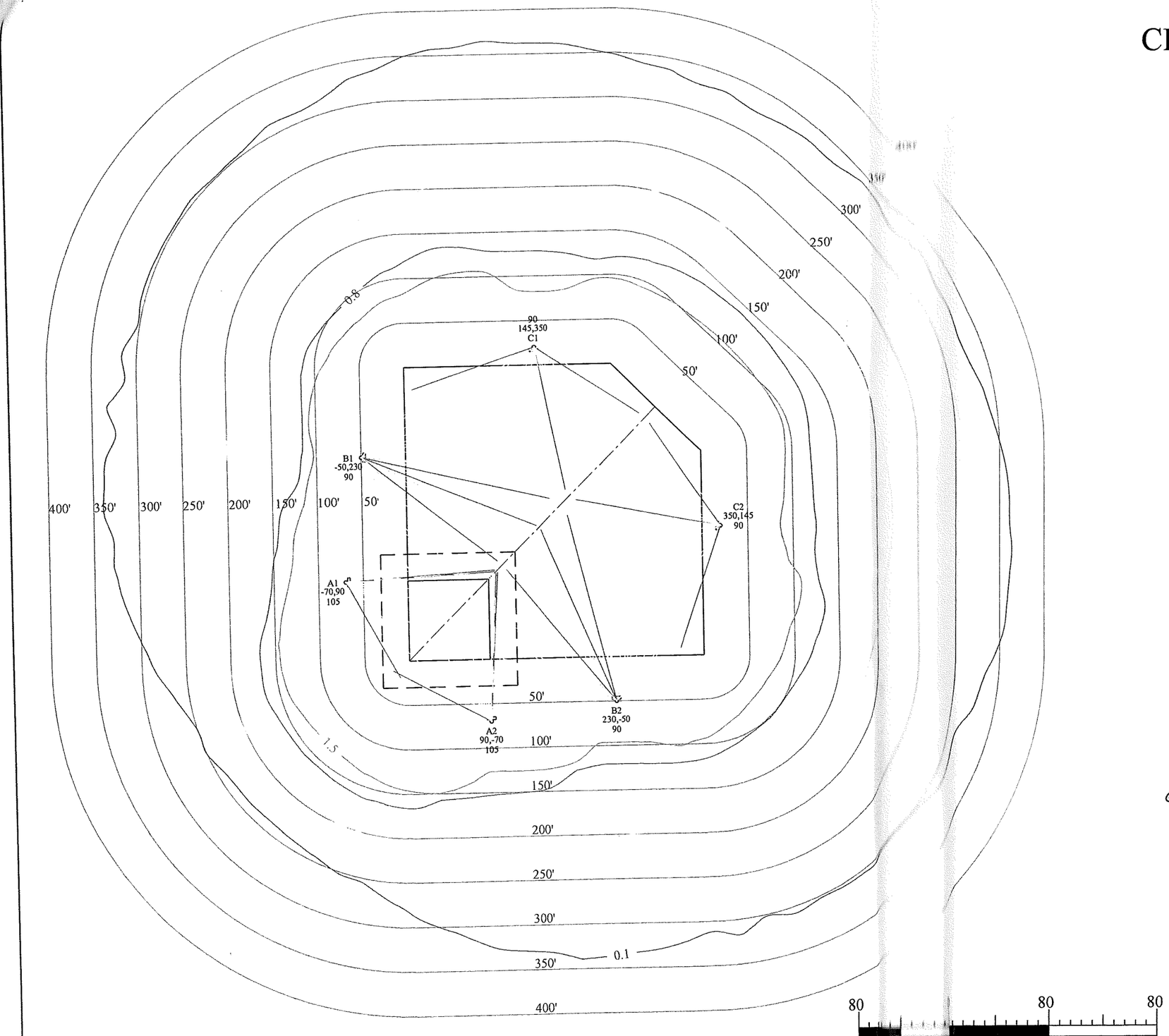
e-mail: eng@uslnet.com
www.uslnet.com

WHITEHOUSE FIELD
HARWICH, MASSACHUSETTS

MAINTAINED HORIZONTAL FOOTCANDLES
6 POLE/136 FIXTURE DESIGN
POLES A1 & A2 - 105' M.H. w/18 FIXTURES EACH
POLES B1 & B2 - 90' M.H. w/32 FIXTURES EACH
POLES C1 & C2 - 90' M.H. w/18 FIXTURES EACH

1500 WATT METAL HALIDE FIXTURES
TOTAL KILOWATT CONSUMPTION = 221.7 KW

Sheet No.	Designer:	Date/Time of Design	Drawing Number:	Rev:
1 of 2	CCL	2/8/08 12:29 P.M.	USL07628-18B	00



CIE's Four Environmental Zones

Zone E1: "Areas with intrinsically dark landscapes."
Examples are national parks, areas of outstanding natural beauty, or residential areas where inhabitants have expressed a strong desire that all light trespass be strictly limited. (This is the most sensitive zone.)
[0.1 FC Max]

Zone E2: "Areas of low ambient brightness."
These may be outer urban and rural residential areas. Roadways may be lighted to typical residential standards.
[0.3 FC Max]

Zone E3: "Areas of medium ambient brightness."
These will generally be urban residential areas. Roadways will normally be lighted to typical traffic route standards.
[0.8 FC Max]

Zone E4: "Areas of high ambient brightness."
Normally these are urban areas having both residential and commercial use and experiencing high levels of night time activity.
[1.5 FC Max]

UNIVERSAL SPORTS LIGHTING

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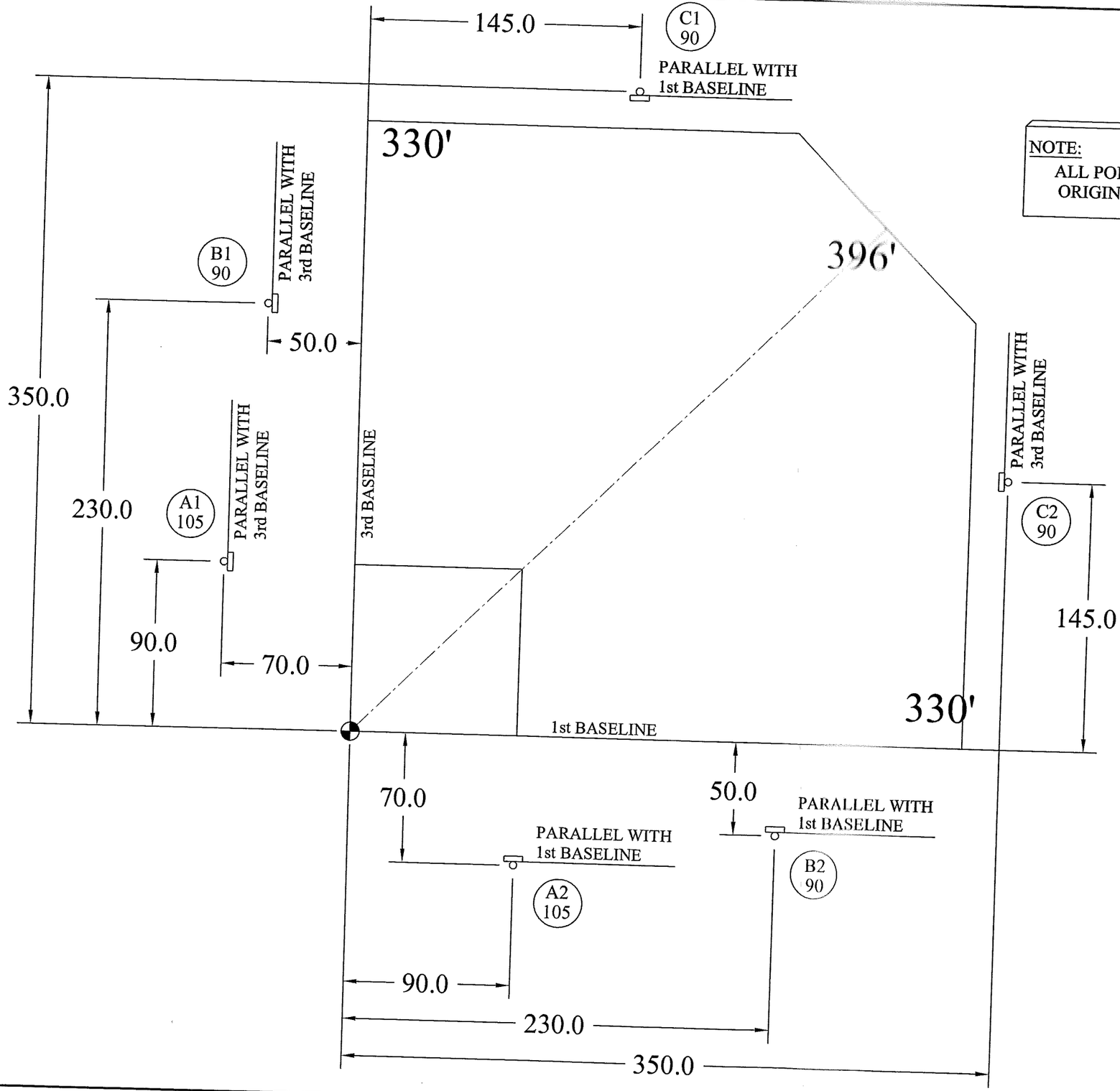
e-mail eng@uslnet.com
www.uslnet.com

WHITEHOUSE FIELD
HARWICH, MASSACHUSETTS

MAINTAINED HORIZONTAL FOOTCANDLES
6 POLE/136 FIXTURE DESIGN
POLES A1 & A2 - 105' M.H. w/18 FIXTURES EACH
POLES B1 & B2 - 90' M.H. w/32 FIXTURES EACH
POLES C1 & C2 - 90' M.H. w/18 FIXTURES EACH
SPILL LIGHT SHOWN
1500 WATT METAL HALIDE FIXTURES
TOTAL KILOWATT CONSUMPTION = 221.7 KW

Sheet No.	Designer:	Date/Time of Design	Drawing Number:	Rev:
2 of 2	CCL	2/8/08 12:29 P.M.	USL07628-18B	00



NOTE:
ALL POLE LOCATIONS ARE REFERENCED FROM ORIGIN (0,0) AT HOMEPLATE OF BASEBALL FIELD

+Y
-X (0,0) +X
-Y

Calculated light levels are based on specific information that has been supplied to us. Any differences in the luminaire installation, lighted area geometry and any obstructions in the lighted area may produce different results from the predicted values. Normal tolerances of voltage, lamp output, and ballast and luminaire manufacture will affect results.
Ref: IES LM-61-1986
Identifying Operating Factors for HID Luminaires

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WHITEHOUSE FIELD
HARWICH, MASSACHUSETTS

POLE LOCATION
&
SERVICE BASKET ORIENTATION

NOTE: ALL POLES MUST BE LOCATED AND ALL SERVICE BASKETS MUST BE ORIENTED AS SHOWN TO ENSURE PROPER PREAIMING OF FIXTURES.

Sheet No.	Designer:	Date/Time of Design	Drawing Number:	Rev:
1 of 1	CCL	2/8/08 12:40 P.M.	USL07628DIM18	00

RADIAN
ROHN Products

Radian Communication Services
6718 West Plank Road
Peoria, IL 61604
Telephone + 1 309 697 4400
Facsimile + 1 309 697 5612
www.radiancorp.com

Poles B1, B2 Revised

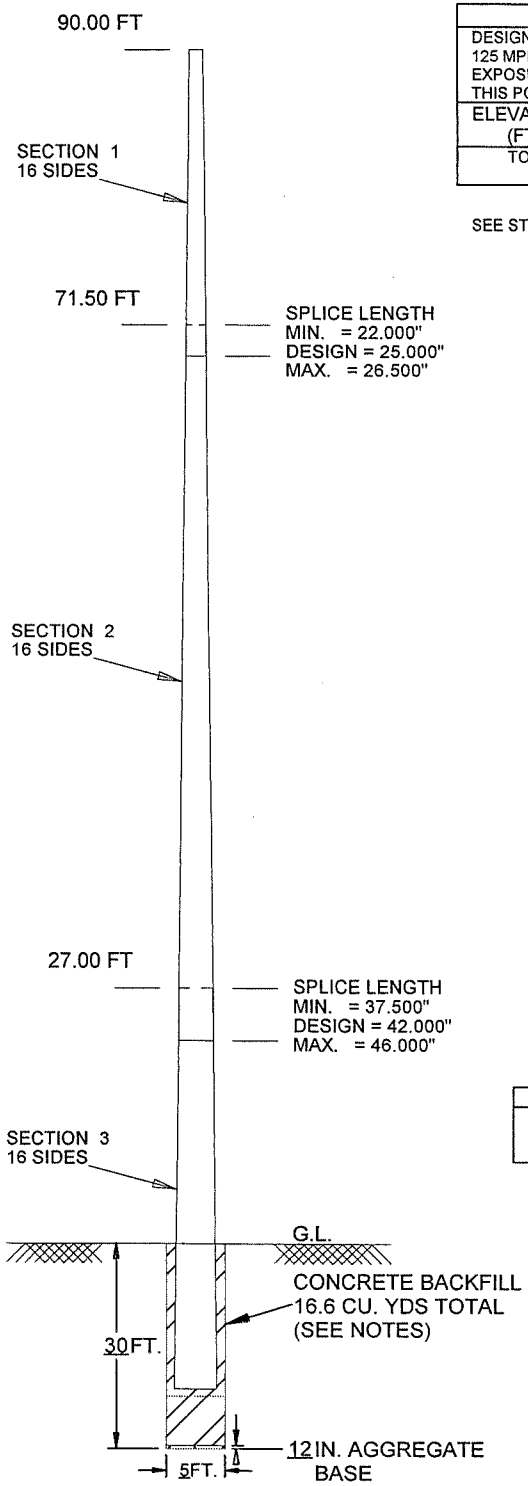
PURCHASER:	UNIVERSAL SPORTS LIGHTING
NAME OF PROJECT:	WHITEHOUSE FIELD, BARNSTABLE COUNTY, MASSACHUSETTS 90 FT. TAPERED STEEL POLE
FILE NUMBER:	0604557, 57431EH
DRAWING NUMBERS:	A080055 AND A080100

I CERTIFY THAT THE ATTACHED DRAWINGS AND CALCULATIONS WERE PREPARED UNDER MY SUPERVISION IN ACCORDANCE WITH THE LOADING SPECIFIED BY THE PURCHASER AND THAT I AM A REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MASSACHUSETTS.

CERTIFIED BY _____

DATE: 2/27/08

COMMONWEALTH OF MASSACHUSETTS
HABIB JIRJI AZOURI
CIVIL
No. 40916
REGISTERED PROFESSIONAL ENGINEER



DESIGN LOADING		
DESIGN WIND LOAD PER AASHTO – 2001 USING THE FOLLOWING DESIGN CRITERIA: 125 MPH 3-SECOND GUST WIND SPEED (NO ICE) EXPOSURE CATEGORY: C - GUST RESPONSE FACTOR: 1.14 THIS POLE IS DESIGNED TO SUPPORT THE FOLLOWING LOADS:		
ELEVATION (FT)	ANTENNA TYPE	LINE SIZE
TOP	132 SQ.FT. EPA LIGHTING FIXTURE LOADING	(2)1 in.

SEE STRESS ANALYSIS FOR A COMPLETE LISTING OF ALL LOADS ON STRUCTURE.

MAXIMUM REACTIONS		
DOWNLOAD =	13.3	KIPS
SHEAR =	11.9	KIPS
O.T.M =	893.5	FT.-KIPS

GENERAL NOTES

1. RADIAN COMMUNICATION POLE DESIGNS CONFORM TO AASHTO – 2001 UNLESS OTHERWISE SPECIFIED UNDER POLE DESIGN LOADING.
2. THE DESIGN LOADING CRITERIA INDICATED HAS BEEN PROVIDED TO RADIAN.THE DESIGN LOADING CRITERIA HAS BEEN ASSUMED TO BE BASED ON SITE-SPECIFIC DATA IN ACCORDANCE WITH AASHTO – 2001 AND MUST BE VERIFIED BY OTHERS PRIOR TO INSTALLATION.
3. FIXTURES, BASKETS, AND LINES LISTED IN POLE DESIGN LOADING TABLE ARE PROVIDED BY OTHERS UNLESS OTHERWISE SPECIFIED.
4. POLE MEMBER DESIGN DOES NOT INCLUDE STRESSES DUE TO ERECTION SINCE ERECTION EQUIPMENT AND CONDITIONS ARE UNKNOWN. DESIGN ASSUMES COMPETENT AND QUALIFIED PERSONNEL WILL ERECT THE POLE.
5. WORK SHALL BE IN ACCORDANCE WITH AASHTO - 2001, "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS".
6. FIELD CONNECTIONS SHALL BE BOLTED. NO FIELD WELDS SHALL BE ALLOWED.
7. STRUCTURAL BOLTS SHALL CONFORM TO ASTM A-325, EXCEPT WHERE NOTED
8. A NUT LOCKING DEVICE SHALL BE PROVIDED FOR ALL STRUCTURAL BOLTS ON THE POLE.
9. STRUCTURAL STEEL AND CONNECTION BOLTS SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION, IN ACCORDANCE WITH AASHTO - 2001.
10. ALL HIGH STRENGTH BOLTS ARE TO BE TIGHTENED TO A "SNUGTIGHT" CONDITION AS DEFINED IN THE JUNE 23, 2000, AISC "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS". NO OTHER MINIMUM BOLT TENSION OR TORQUE VALUES ARE REQUIRED.
11. PURCHASER SHALL VERIFY THE INSTALLATION IS IN CONFORMANCE WITH LOCAL, STATE, AND FEDERAL REQUIREMENTS FOR OBSTRUCTION MARKING AND LIGHTING.
12. TOLERANCE ON POLE STEEL HEIGHT IS EQUAL TO PLUS 1% OR MINUS 1/2%.
13. DESIGN ASSUMES THAT, AS A MINIMUM, MAINTENANCE AND INSPECTION WILL BE PERFORMED OVER THE LIFE OF THE STRUCTURE IN ACCORDANCE WITH AASHTO - 2001.
14. DESIGN ASSUMES LEVEL GRADE AT POLE SITE.
15. FOUNDATION EMBEDMENT SHALL BE DESIGNED TO SUPPORT THE REACTIONS SHOWN FOR THE CONDITIONS EXISTING AT THE SITE.
16. DESIGN ASSUMES ALL LINES ARE ROUTED INTERNALLY.
17. POLE SHAFT CONFORMS TO ASTM A572 GRADE 65, HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH AASHTO - 2001.
18. CONCRETE BACKFILL SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI IN 28 DAYS USING 1-1/2 INCH MAXIMUM COARSE AGGREGATE SIZE AND SHALL CONFORM TO THE APPROPRIATE STATE REQUIREMENTS FOR EXPOSED STRUCTURAL CONCRETE. THE DURABILITY REQUIREMENTS OF ACI 318 CHAPTER 4 SHALL BE SATISFIED BASED ON THE CONDITIONS EXPECTED AT THE SITE. FREE FALL CONCRETE MAY BE USED PROVIDED FALL IS VERTICAL DOWN WITHOUT HITTING SIDES OF EXCAVATION OR POLE AND DOES NOT FALL THROUGH WATER.

SECTION SCHEDULE						
SEC.	HEIGHT (FT)	DIAMETER (IN)		WALL THICK. (IN)	Fy (KSI)	WEIGHT (KIPS)
		BOT.	TOP			
1	20.58	16.534	11.000	0.1875	65.0	0.602
2	48.00	28.342	15.439	0.2500	65.0	2.981
3	27.00	34.000	26.742	0.2500	65.0	4.538

FOR POLYGONAL POLES DIAMETER IS MEASURED ACROSS FLATS.

SITE: WHITEHOUSE FIELD
COUNTY: BARNSTABLE, MA

No. ▲ Revision Description	▲ Date	▲ Rev By	▲ Ckd By	▲ Appd By
1 REVISED EMBEDMENT	02/27/2008	DWG	HA	HA

RADIAN

	By	Date
Scale: NONE		
Drawn:	DWG	1/23/2008
Checked:	HA	1/29/2008
App. Eng.:	HA	1/29/2008
Parent File:	58431EH	

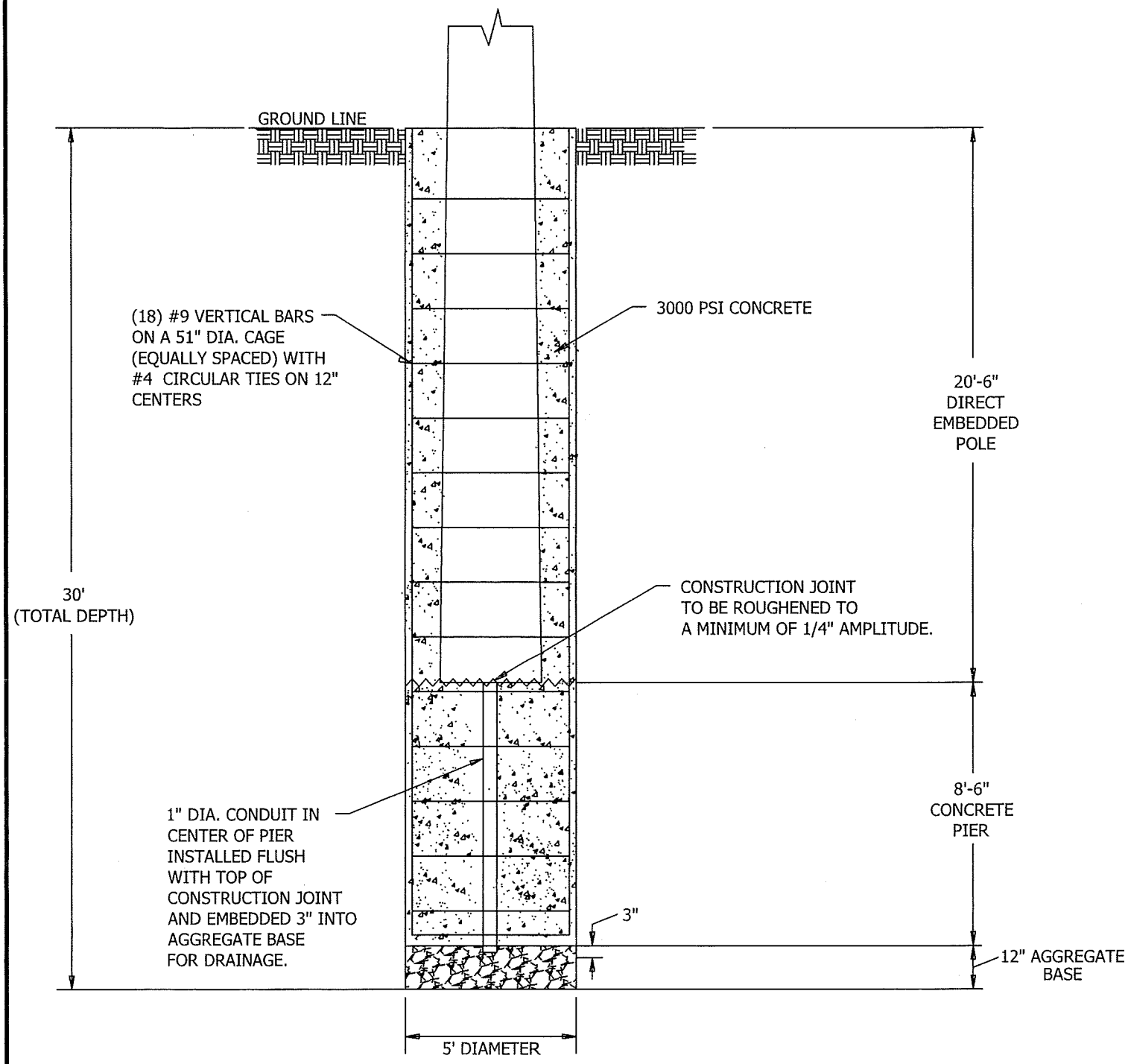
90' TAPERED STEEL POLE DESIGN FOR
Universal Sports Lighting

ENG. FILE: 060-4557

DWG. NO.: A080055

SHEET 1 OF 1

REV. 1



CONCRETE VOLUME

16.6 CU.YDS.

FILE NO. 0604557 REVISIONS REV. DESCRIPTION DWN CHK APP	DWG REFERENCE	RADIAN www.radiancorp.com OAKVILLE, ON, CANADA PEORIA, IL, USA +1 866 4RADIAN +1 800 727 ROHN ROHN PRODUCTS & ACCESSORIES 	UNIVERSAL SPORTS LIGHTING SPECIAL FOUNDATION DETAILS (POLE B2) WHITEHOUSE FIELD, MA DWN: MDF CHK'D: DWG DATE: 2/27/08 ENG'R: HA ENG'R APP'D: HA DRAWING NO: A080100 REV: 0

1/25/08 MAR

RADIAN
ROHN Products

ROHN Products
A Division of Radian Communication Services, Inc.

File: 604557 Site: 1 Cycle: 1 Design: 1 Engineer: don_g
Customer: Universal Sports Lighting
Site: WHITEHOUSE FIELD
Type: POLE-TPR
Pole: Tapered Steel

Page: 1
01/23/2008
2:37 PM

SUMMARY OF ANALYSIS RESULTS

Conditions ..... : 125 mph Basic Wind Speed (0.00" radial ice) 50 mph Operational
Building Code ..... : AASHTO - 2001
Exposure ..... : C
Gust response factor: ..... : 1.14
Allowable Stress Increase .... : 1.33
Natural Frequency ..... : 0.44 cps
Resonant Velocity ..... : 3.76 mph
Pole Height ..... : 90.00 ft
Top Diameter ..... : 11.000 in
Bottom Diameter ..... : 34.000 in
Embedment Depth ..... : 21.00 ft
Pole Shape ..... : 16-sided Polygon
Joint Type ..... : Slip
Shaft Steel Weight ..... : 8.121 kips

"DIRECT EMBED"

POLE SHAFT PROPERTIES:

Seq	Sect. Length (ft)	Wall Thickness [t] (in)	Mat'l Yield [Fy] (ksi)	Top Diameter [Dt] (in)	Bottom Diameter [Db] (in)	Slip Joint Overlap (in)	Taper (in/ft)	Steel Weight (kips)
1	20.580	0.18750	65	11.000	16.530	25.00	0.2687	0.602
2	48.000	0.25000	65	15.440	28.340	42.00	0.2688	2.981
3	48.000	0.25000	65	26.740	39.647		0.2689	4.538

Design Bend Radius = 4.0 * t inches

POLE SHAFT SECTION MAXIMUM FORCES AND MOMENTS:

		At Base of Section					Max. Ratio Actual Allowable
Seq	Load Case	Sect. Elev. (ft.)	Axial Load (kips)	Bending Moment (ft-kips)	Horiz. Shear (kips)	Torsion (ft-Kips)	[Ftot/Fb]
1	Combo005	69.42	5.6519	159.4803	8.1631	0.0000	0.9144
2	Combo005	23.50	7.3341	415.4368	9.5248	0.0000	0.8662
3	Combo005	0.00	12.0884	893.4867	11.8317	0.0000	0.9242
>> MAX REACTIONS:			13.3056	893.4867	11.9050	3.4150 <<	

SECTION PROPERTIES:

Seq	Weight (kips)	Location	Elev (ft)	Diam Across Flats (in)	Wall Thick [t] (in)	[W/t] Ratio	Diam/ Thick [D/t] Ratio	Area (in^2)	J (in^4)	I (in^4)
1	0.602	@Top	90.00	11.000	0.1875	9.68	58.67	6.45	192.5	95.5
		@Splice	71.50	15.970		14.95	85.17	9.42	598.5	297.1
		@Bot	69.42	16.530		15.55	88.16	9.75	664.5	329.8
2	2.981	@Top	71.50	15.440	0.2500	10.30	61.76	12.09	711.5	353.1
		@Splice	27.00	27.400		19.81	109.60	21.60	4062.6	2016.3
		@Bot	23.50	28.340		20.56	113.36	22.35	4499.4	2233.1
3	4.538	@Top	27.00	26.740	0.2500	19.29	106.96	21.08	3773.5	1872.8
		@Bot	0.00	34.000		25.06	136.00	26.85	7804.0	3873.2

Total Shaft Steel Weight = 8.121 kips

File: 604557 Site: 1 Cycle: 1 Design: 1 Engineer: don_g
Customer: Universal Sports Lighting
Site: WHITEHOUSE FIELD
Type: POLE-TPR
Pole: Tapered Steel

PROPERTIES: (@ Max Segment = 5.0 ft)

Node No.	Node Elev. (ft)	Diam. Across Flats (in)	Wall Thick [t] (in)	[W/t] Ratio	Diam/ Thick [D/t] Ratio	Area (in^2)	J (in^4)	I (in^4)
33	90.000	11.00	0.1875	9.68	58.67	6.45	192.5	95.5
32	88.150	11.50	0.1875	10.21	61.32	6.75	220.2	109.3
31	86.300	11.99	0.1875	10.74	63.97	7.05	250.6	124.4
30	84.450	12.49	0.1875	11.26	66.62	7.34	283.6	140.7
29	82.600	12.99	0.1875	11.79	69.27	7.64	319.3	158.5
28	80.750	13.49	0.1875	12.32	71.92	7.94	358.0	177.7
27	78.900	13.98	0.1875	12.84	74.57	8.23	399.7	198.4
26	77.050	14.48	0.1875	13.37	77.22	8.53	444.4	220.6
25	75.200	14.98	0.1875	13.90	79.87	8.82	492.4	244.4
24	73.350	15.47	0.1875	14.43	82.52	9.12	543.8	269.9
23O	71.500	15.97	0.1875	14.95	85.17	9.42	598.6	297.1
23I	71.500	15.44	0.2500	10.30	61.76	12.09	711.5	353.1
22	69.417	16.00	0.2500	10.74	64.00	12.53	793.1	393.6
21	65.175	17.14	0.2500	11.65	68.56	13.44	978.1	485.4
20	60.933	18.28	0.2500	12.56	73.12	14.35	1189.8	590.5
19	56.692	19.42	0.2500	13.46	77.68	15.25	1430.0	709.7
18	52.450	20.56	0.2500	14.37	82.24	16.16	1700.6	844.0
17	48.208	21.70	0.2500	15.28	86.80	17.07	2003.3	994.3
16	43.967	22.84	0.2500	16.18	91.36	17.97	2340.0	1161.4
15	39.725	23.98	0.2500	17.09	95.92	18.88	2712.5	1346.2
14	35.483	25.12	0.2500	18.00	100.48	19.79	3122.5	1549.7
13	31.242	26.26	0.2500	18.90	105.04	20.69	3571.8	1772.7
12O	27.000	27.40	0.2500	19.81	109.60	21.60	4062.3	2016.2
12I	27.000	26.74	0.2500	19.29	106.96	21.08	3773.7	1872.9
11	23.500	27.68	0.2500	20.04	110.72	21.83	4190.1	2079.6
10	21.150	28.31	0.2500	20.54	113.25	22.33	4486.4	2226.6
9	18.800	28.94	0.2500	21.04	115.78	22.83	4796.3	2380.5
8	16.450	29.58	0.2500	21.54	118.31	23.33	5120.2	2541.2
7	14.100	30.21	0.2500	22.05	120.83	23.84	5458.4	2709.0
6	11.750	30.84	0.2500	22.55	123.36	24.34	5811.1	2884.1
5	9.400	31.47	0.2500	23.05	125.89	24.84	6178.7	3066.5
4	7.050	32.10	0.2500	23.55	128.42	25.34	6561.5	3256.5
3	4.700	32.74	0.2500	24.06	130.94	25.85	6959.7	3454.2
2	2.350	33.37	0.2500	24.56	133.47	26.35	7373.8	3659.7
1	0.000	34.00	0.2500	25.06	136.00	26.85	7804.0	3873.2

File: 604557 Site: 1 Cycle: 1 Design: 1 Engineer: don_g
Customer: Universal Sports Lighting
Site: WHITEHOUSE FIELD
Type: POLE-TPR
Pole: Tapered Steel

DISCRETE APPURTENANCE PROPERTIES

Elev. (ft)	Description	Weight W/o Ice (kips)	Weight W/ Ice (kips)	EPA W/o Ice (ft^2)	EPA W/ Ice (ft^2)	Lines
90.00	132 SQ.FT. EPA LOADING	5.00	5.00	132.00	132.00	(2) 1 in.

File: 604557 Site: 1 Cycle: 1 Design: 1 Engineer: don_g
Customer: Universal Sports Lighting
Site: WHITEHOUSE FIELD
Type: POLE-TPR
Pole: Tapered Steel

PRESSURES

Seg.	Elev. (ft)	Kz	W/o Ice Pz	W/o Ice Cd	With Ice Pz	With Ice Cd	Fatigue Pz	Fatigue Cd
1-11	89.075	1.235	30.978	0.550	30.706	0.550	2.870	0.550
1-10	87.225	1.230	30.841	0.550	30.571	0.550	2.870	0.550
1-9	85.375	1.224	30.702	0.550	30.433	0.550	2.870	0.550
1-8	83.525	1.219	30.561	0.550	30.293	0.550	2.870	0.550
1-7	81.675	1.213	30.417	0.550	30.151	0.550	2.870	0.550
1-6	79.825	1.207	30.271	0.550	30.006	0.550	2.870	0.550
1-5	77.975	1.201	30.122	0.550	29.858	0.550	2.870	0.550
1-4	76.125	1.195	29.970	0.550	29.707	0.550	2.870	0.550
1-3	74.275	1.189	29.815	0.550	29.554	0.550	2.870	0.550
1-2	72.425	1.183	29.657	0.550	29.397	0.550	2.870	0.550
1-1	70.458	1.176	29.486	0.550	29.227	0.550	2.870	0.550
2-12	70.458	1.176	29.486	0.550	29.227	0.550	2.870	0.550
2-11	67.296	1.164	29.202	0.550	28.946	0.550	2.870	0.550
2-10	63.054	1.149	28.805	0.550	28.552	0.550	2.870	0.550
2-9	58.813	1.132	28.386	0.550	28.137	0.550	2.870	0.550
2-8	54.571	1.114	27.942	0.550	27.697	0.550	2.870	0.550
2-7	50.329	1.095	27.470	0.550	27.229	0.550	2.870	0.550
2-6	46.088	1.075	26.965	0.550	26.729	0.550	2.870	0.550
2-5	41.846	1.054	26.423	0.550	26.191	0.550	2.870	0.550
2-4	37.604	1.030	25.835	0.550	25.608	0.550	2.870	0.550
2-3	33.363	1.004	25.192	0.550	24.971	0.550	2.870	0.550
2-2	29.121	0.976	24.481	0.550	24.266	0.550	2.870	0.550
2-1	25.250	0.947	23.757	0.550	23.549	0.550	2.870	0.550
3-11	25.250	0.947	23.757	0.550	23.549	0.550	2.870	0.550
3-10	22.325	0.923	23.149	0.550	22.946	0.550	2.870	0.550
3-9	19.975	0.902	22.613	0.550	22.415	0.550	2.870	0.550
3-8	17.625	0.878	22.025	0.550	21.832	0.550	2.870	0.550
3-7	15.275	0.865	21.694	0.550	21.504	0.550	2.870	0.550
3-6	12.925	0.865	21.694	0.550	21.504	0.550	2.870	0.550
3-5	10.575	0.865	21.694	0.550	21.504	0.550	2.870	0.550
3-4	8.225	0.865	21.694	0.550	21.504	0.550	2.870	0.550
3-3	5.875	0.865	21.694	0.550	21.504	0.550	2.870	0.550
3-2	3.525	0.865	21.694	0.550	21.504	0.550	2.870	0.550
3-1	1.175	0.865	21.694	0.550	21.504	0.550	2.870	0.550

File: 604557 Site: 1 Cycle: 1 Design: 1 Engineer: don_g
Customer: Universal Sports Lighting
Site: WHITEHOUSE FIELD
Type: POLE-TPR
Pole: Tapered Steel

MOMENTS, FORCES AND DEFLECTIONS

			Moment			Shear				Operational			
Node	Elev.	Axial (kips)	My (ft-k)	Mz (ft-k)	Mr (kips)	Vy (kips)	Vz (kips)	Vr (kips)	Torsion (ft-k)	Deflect. (in)	Twist (deg)	Sway (deg)	
33	90.000	5.024	0.00	2.29	2.29	7.48	0.00	7.48	0.000	7.491	0.021	0.924	(5)
32	88.150	5.073	0.00	17.55	17.55	7.54	0.00	7.54	0.000	7.135	0.019	0.909	(5)
31	86.300	5.124	0.00	32.92	32.92	7.60	0.00	7.60	0.000	6.787	0.017	0.889	(5)
30	84.450	5.176	0.00	48.39	48.39	7.66	0.00	7.66	0.000	6.446	0.015	0.866	(5)
29	82.600	5.231	0.00	63.96	63.96	7.73	0.00	7.73	0.000	6.116	0.014	0.840	(5)
28	80.750	5.288	0.00	79.63	79.63	7.79	0.00	7.79	0.000	5.795	0.012	0.812	(5)
27	78.900	5.347	0.00	95.40	95.40	7.86	0.00	7.86	0.000	5.486	0.011	0.783	(5)
26	77.050	5.407	0.00	111.27	111.27	7.93	0.00	7.93	0.000	5.188	0.010	0.754	(5)
25	75.200	5.470	0.00	127.24	127.24	8.01	0.00	8.01	0.000	4.901	0.009	0.724	(5)
24	73.350	5.535	0.00	143.31	143.31	8.08	0.00	8.08	0.000	4.626	0.009	0.694	(5)
23	71.500	5.652	0.00	159.48	159.48	8.16	0.00	8.16	0.000	4.363	0.008	0.664	(5)
22	69.417	5.840	0.00	177.84	177.84	8.30	0.00	8.30	0.000	4.077	0.007	0.644	(5)
21	65.175	6.054	0.00	215.73	215.73	8.48	0.00	8.48	0.000	3.529	0.006	0.588	(5)
20	60.933	6.283	0.00	254.26	254.26	8.67	0.00	8.67	0.000	3.030	0.005	0.534	(5)
19	56.692	6.525	0.00	293.47	293.47	8.88	0.00	8.88	0.000	2.578	0.004	0.482	(5)
18	52.450	6.781	0.00	333.38	333.38	9.08	0.00	9.08	0.000	2.171	0.004	0.434	(5)
17	48.208	7.050	0.00	374.02	374.02	9.30	0.00	9.30	0.000	1.805	0.003	0.387	(5)
16	43.967	7.334	0.00	415.44	415.44	9.52	0.00	9.52	0.000	1.480	0.003	0.344	(5)
15	39.725	7.632	0.00	457.64	457.64	9.75	0.00	9.75	0.000	1.193	0.002	0.302	(5)
14	35.483	7.943	0.00	500.66	500.66	9.99	0.00	9.99	0.000	0.941	0.002	0.263	(5)
13	31.242	8.268	0.00	544.50	544.50	10.23	0.00	10.23	0.000	0.724	0.001	0.226	(5)
12	27.000	8.712	0.00	589.19	589.19	10.44	0.00	10.44	0.000	0.538	0.001	0.191	(5)
11	23.500	9.086	0.00	626.74	626.74	10.61	0.00	10.61	0.000	0.405	0.001	0.172	(5)
10	21.150	9.280	0.00	652.29	652.29	10.74	0.00	10.74	0.000	0.325	0.001	0.152	(5)
9	18.800	9.478	0.00	678.09	678.09	10.87	0.00	10.87	0.000	0.255	0.001	0.133	(5)
8	16.450	9.681	0.00	704.13	704.13	11.00	0.00	11.00	0.000	0.193	0.001	0.115	(5)
7	14.100	9.888	0.00	730.42	730.42	11.13	0.00	11.13	0.000	0.141	0.001	0.097	(5)
6	11.750	10.099	0.00	756.95	756.95	11.27	0.00	11.27	0.000	0.097	0.000	0.080	(5)
5	9.400	10.314	0.00	783.73	783.73	11.40	0.00	11.40	0.000	0.062	0.000	0.063	(5)
4	7.050	10.534	0.00	810.77	810.77	11.54	0.00	11.54	0.000	0.035	0.000	0.047	(5)
3	4.700	10.758	0.00	838.07	838.07	11.69	0.00	11.69	0.000	0.015	0.000	0.031	(5)
2	2.350	12.088	0.00	865.64	865.64	11.83	0.00	11.83	0.000	0.004	0.000	0.015	(5)
1	0.000	12.088	0.00	893.49	893.49	11.83	0.00	11.83	0.000	0.000	0.000	0.000	(5)

(xx) indicates the controlling loadcase

File: 604557 Site: 1 Cycle: 1 Design: 1 Engineer: don_g
Customer: Universal Sports Lighting
Site: WHITEHOUSE FIELD
Type: POLE-TPR
Pole: Tapered Steel

ACTUAL AND ALLOWABLE STRESSES

		Actual Stresses					Actual /	Fatigue
Node	Elevation (ft)	Axial [fa] (ksi)	Bending [fb] (ksi)	Shear [fv] (ksi)	Torsion [ft] (ksi)	Combined [Ftot] (ksi)	Allowable [Ftot/Fb] Ratio	Bending Stress (ksi)
33	90.000	0.779	1.583	2.289	0.000	4.615	0.0491	0.000
32	88.150	0.752	11.076	2.206	0.000	12.429	0.2140	0.902
31	86.300	0.727	19.049	2.130	0.000	20.117	0.3526	1.658
30	84.450	0.705	25.769	2.061	0.000	26.713	0.4693	2.296
29	82.600	0.685	31.449	1.997	0.000	32.320	0.5679	2.834
28	80.750	0.666	36.263	1.939	0.000	37.082	0.6514	3.290
27	78.900	0.650	40.349	1.886	0.000	41.129	0.7223	3.678
26	77.050	0.634	43.824	1.837	0.000	44.572	0.7825	4.007
25	75.200	0.620	46.781	1.791	0.000	47.503	0.8337	4.287
24	73.350	0.607	49.298	1.749	0.000	49.997	0.8773	4.527
23O	71.500	0.600	51.441	1.711	0.000	52.126	0.9144	4.730
23I	71.500	0.468	41.838	1.334	0.000	42.369	0.7426	3.847
22	69.417	0.466	43.374	1.307	0.000	43.898	0.7693	3.994
21	65.175	0.451	45.704	1.246	0.000	46.205	0.8096	4.218
20	60.933	0.438	47.227	1.194	0.000	47.710	0.8358	4.364
19	56.692	0.428	48.180	1.149	0.000	48.648	0.8522	4.459
18	52.450	0.420	48.725	1.110	0.000	49.182	0.8614	4.515
17	48.208	0.413	48.978	1.076	0.000	49.426	0.8656	4.544
16	43.967	0.408	49.020	1.046	0.000	49.461	0.8662	4.554
15	39.725	0.404	48.911	1.020	0.000	49.347	0.8641	4.549
14	35.483	0.401	48.692	0.997	0.000	49.124	0.8602	4.536
13	31.242	0.400	48.395	0.976	0.000	48.824	0.8549	4.515
12O	27.000	0.403	48.042	0.955	0.000	48.474	0.8488	4.490
12I	27.000	0.413	50.473	0.978	0.000	50.915	0.8915	4.717
11	23.500	0.416	50.055	0.960	0.000	50.499	0.8842	4.685
10	21.150	0.416	49.766	0.950	0.000	50.209	0.8791	4.663
9	18.800	0.415	49.471	0.940	0.000	49.913	0.8739	4.642
8	16.450	0.415	49.172	0.931	0.000	49.613	0.8687	4.619
7	14.100	0.415	48.870	0.922	0.000	49.311	0.8634	4.597
6	11.750	0.415	48.566	0.914	0.000	49.007	0.8581	4.575
5	9.400	0.415	48.262	0.906	0.000	48.703	0.8527	4.553
4	7.050	0.416	47.958	0.899	0.000	48.399	0.8474	4.530
3	4.700	0.416	47.656	0.893	0.000	48.097	0.8703	4.510
2	2.350	0.459	47.356	0.887	0.000	47.840	0.8967	4.493
1	0.000	0.450	47.060	0.870	0.000	47.534	0.9242	4.467

File: 604557 Site: 1 Cycle: 1 Design: 1 Engineer: don_g
Customer: Universal Sports Lighting
Site: WHITEHOUSE FIELD
Type: POLE-TPR
Pole: Tapered Steel

NOTES

LOAD COMBINATIONS

Load Combo	Description
Combo005	Dead Load + Wind Load no Ice @ 090 deg.

PARAMETER OVERRIDES

Parameter Name	Value
EmbedmentLength	252.00
MinTopDiam	9.00
NumSides	16.00

MISCELLANEOUS NOTES

Critical wind velocity is outside range where vortex shedding lock-in may occur. No further investigation required.

REVISED CALCULATIONS USING 8.5 SOLID ROCK BELOW POLE EMBEDMENT

Designed By: DWG
Checked By: HA
Eng. File: 060-4557

Date: 2/26/2008 9:10:51 AM
Date: 2/26/08

Customer Name: Universal Sports Lighting

Site Name: Whitehouse Field

B2 Pole

REACTIONS

Download = 13.3 kips
OTM = 893.5 ft-kips
Shear = 11.9 kips

LPILE INPUT PARAMETERS

Depth(ft)	Soil Type	K(pci)	γ(pcf)	ϕ(deg)	C(ksf)	ε_{50}(in/in)	N	RQD
0.0-1.0	Sand	5.0	70.0	25.0	0.000	0.000	2	0
1.0-19.0	Sand	25.0	100.0	29.0	0.000	0.000	8	0
19.0-30.0	Sand	20.0	51.0	29.0	0.000	0.000	8	0

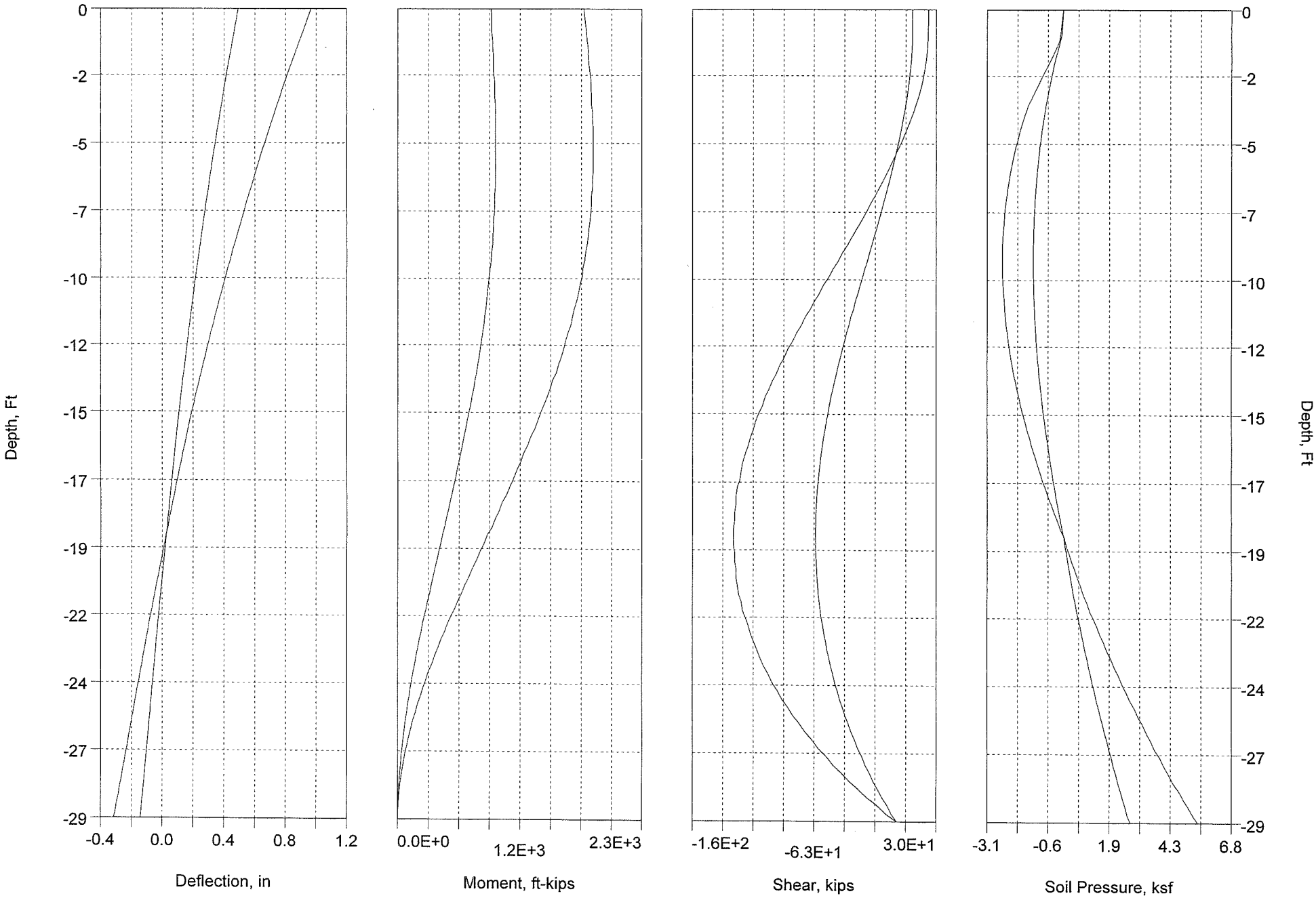
Load Factor = 2.0
Pier Diameter = 5' - 0", Shaft I.D. = 3' - 1", Pier Depth = 29' - 0" and Ground Slope = 0 Deg.

SUMMARY OF LPILE RESULTS

(See Attached Graphs)

Deflection at Top = 0.47 in
Max. Moment = 937.5 ft-kips
Max. Shear = 62.0 kips
Max. Lateral Soil Pressure = 2.712 ksf

060-4557
DWG


Depth, Ft
0
-2
-5
-7
-10
-12
-15
-17
-19
-22
-24
-27
-29
-0.4
0.0
0.4
0.8
1.2
Deflection, in
0.0E+0
1.2E+3
2.3E+3
Moment, ft-kips
-1.6E+2
-6.3E+1
3.0E+1
Shear, kips
-3.1
-0.6
1.9
4.3
6.8
Soil Pressure, ksf
Depth, Ft

SHAFT REINFORCING PROGRAM VER. 91.4

DESIGNED BY: DWG
ENG. FILE NO.: 58431EH
DATE: 02/26/08

CUSTOMER: UNIVERSAL SPORTS LIGHTING

INPUT DATA

C =	13.30 Kips	Vc =	62.00 Kips	Mc =	937.50 Ft-K
T =	1.00 Kips	Vt =	62.00 Kips	Mt =	937.50 Ft-K
Fy =	60.00 Ksi	Fyt =	60.00 Ksi	L.F. =	1.30
H =	60.00 In.	Ds =	51.00 In.	F'c =	3.00 Ksi
U =	1.00	Irs =	1		

*** SHAFT CROSS SECTION IS ROUND ***

SUMMARY OF ANALYSIS

Minimum area of steel req'd. = 15.68 sq.in. (Rhomin = .0055)

Maximum steel area limit = 226.20 sq.in. (Rhomax = .0800)

— USE (18) #9 BARS EQUALLY SPACED ON A 51" DIAMETER CIRCLE WITH #4 TIES AT 12" CENTERS.

CIRCULAR TIE DATA

Vu <.85*Vc/2, shear reinforcement is not required.

Use maximum tie spacing specified in A.C.I. 318-83,
Section 7.10.5 for compression reinforcement.

DEVELOPMENT LENGTH MODIFIERS FOR TENSION AND COMPRESSION BAR DEVELOPMENT

DLMT = MODIFIER FOR TENSION DEVELOPMENT = 1.000

DLMC = MODIFIER FOR COMPRESSION DEVELOPMENT = .536

REQUIRED Ld = MODIFIER * BASIC Ld * ACI 318 MODIFIERS (12 in. min.)

Project Submittal: **Approval Letter**

February 15, 2021

Griffin Ryder
Town of Harwich
732 Main St
Harwich, MA 02645

RE: Whitehouse Baseball Field LED Relight
Project #194150

Dear Griffin Ryder

This serves as approval for submittals provided by Musco Sports Lighting, LLC. Please review the enclosed documents and note changes where appropriate. Upon your approval, we can begin fabrication of the materials for your project. Any changes may result in delay of production, delivery, and additional costs.

Please verify the accuracy of the following items and return a signed copy of this Submittal Approval:

- Voltage to pole requirements:_____
- Phase to enclosure: _____

We shall deliver equipment to the job site 6 - 8 weeks, after submittal approval or release of order.

Please indicate your approval of these submittals in their entirety by signing below.

_____ _____
Authorized Signature Date

_____ _____
Printed Name Company Name

Please return one copy of this form to:
Musco Sports Lighting, LLC
2107 Stewart Road
Muscatine, Iowa 52761

Toll Free: 800-756-1205
Fax: 800-374-6402
Email: heidi.duttlinger@musco.com

MUSCO LIGHTING SUBMITTAL FOR PRODUCTION

PREPARED FOR:

Whitehouse Baseball Field LED Relight

Lighting Project
Harwich, MA
February 15, 2021

Project #194150

Submitted by:
Musco Sports Lighting, LLC

Attn: Heidi Duttlinger
2107 Stewart Road
Muscatine, Iowa 52761

Toll Free: 800-756-1205
Fax: 800-374-6402

TABLE OF CONTENTS

A. BILL OF MATERIALS

Project Submittal: Bill of Materials

Equipment Description	
4	SportsCluster® System Total Light Control™ TLC-LED-900 luminaires
56	SportsCluster® System Total Light Control™ TLC-LED-1500 luminaires
16	SportsCluster® System Total Light Control™ TLC-BT-575 luminaires
✓	Factory wired and assembled pole top luminaire assemblies
✓	Factory wired electrical component enclosures
✓	Factory built wire harnesses with plug-in connections
Controls	
1	24 x 48 Control and monitoring cabinet Show-Light™ entertainment package
4	30-amp contactors
2	60-amp contactors
1	On-Off-Auto (OOA) switches
1	Touchscreen (low temperature rated)
Warranty	
✓	Musco's Constant 10™ product assurance and warranty program that eliminates 100% maintenance costs for 10 years, including labor, materials, monitoring and guaranteed light levels.

B. LIGHTING DESIGN

Whitehouse Baseball Field LED Relight

Harwich, MA

Lighting System

Pole / Fixture Summary

Pole ID	Pole Height	Mtg Height	Fixture Qty	Luminaire Type	Load	Circuit
A1-A2	105'	105'	7	TLC-LED-1500	10.01 kW	A
		16'	2	TLC-BT-575	1.15 kW	A
B1-B2	90'	90'	12	TLC-LED-1500	17.16 kW	A
		90'	1	TLC-LED-900	0.89 kW	A
		16'	3	TLC-BT-575	1.73 kW	A
C1	90'	90'	9	TLC-LED-1500	12.87 kW	A
		90'	1	TLC-LED-900	0.89 kW	A
		16'	3	TLC-BT-575	1.73 kW	A
C2	90'	90'	9	TLC-LED-1500	12.87 kW	A
		90'	1	TLC-LED-900	0.89 kW	A
		30'	3	TLC-BT-575	1.73 kW	A
6			***76***		***92.84 kW***	

Circuit Summary

Circuit	Description	Load	Fixture Qty
A	Baseball	92.84 kW	76

Fixture Type Summary

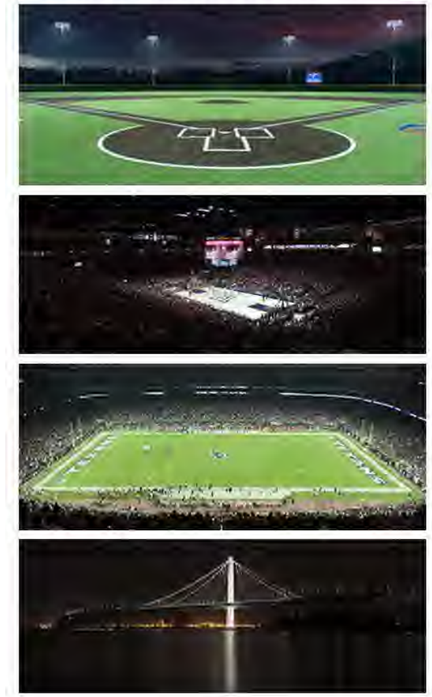
Type	Source	Wattage	Lumens	L90	L80	L70	Quantity
TLC-LED-1500	LED 5700K - 75 CRI	1430W	160,000	>120,000	>120,000	>120,000	56
TLC-BT-575	LED 5700K - 75 CRI	575W	52,000	>120,000	>120,000	>120,000	16
TLC-LED-900	LED 5700K - 75 CRI	890W	89,600	>120,000	>120,000	>120,000	4

Light Level Summary

Calculation Grid Summary

Grid Name	Calculation Metric	Illumination					Circuits	Fixture Qty
		Ave	Min	Max	Max/Min	Ave/Min		
Baseball (Infield)	Horizontal Illuminance	70.9	61	80	1.31	1.16	A	76
Baseball (Outfield)	Horizontal Illuminance	50.9	38	68	1.82	1.34	A	76
Bleachers	Horizontal	27.2	11	44	3.87	2.47	A	76
Spill at 150'	Horizontal Illuminance	0.44	0.05	1.67	36.78	8.83	A	76
Spill at 150'	Max Candela Metric	28271	8866	60341	6.81	3.19	A	76
Spill at 150'	Max Vertical Illuminance Metric	0.92	0.18	3.05	17.37	5.09	A	76

From Hometown to Professional



ENGINEERED DESIGN By: Tanner Lanphier · File #194150C · 13-Oct-20

EQUIPMENT LIST FOR AREAS SHOWN

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
2	A1-A2	105'	-	15.5'	TLC-BT-575	2	2	0
				105'	TLC-LED-1500	7	7	0
2	B1-B2	90'	-	90'	TLC-LED-900	1	1	0
				15.5'	TLC-BT-575	3	3	0
				90'	TLC-LED-1500	12	12	0
1	C1	90'	-	90'	TLC-LED-900	1	1	0
				15.5'	TLC-BT-575	3	3	0
				90'	TLC-LED-1500	9	9	0
1	C2	90'	-	90'	TLC-LED-900	1	1	0
				30'	TLC-BT-575	3	3	0
				90'	TLC-LED-1500	9	9	0
6	TOTALS					76	76	0

SCALE IN FEET 1 : 60

0' 60' 120'

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

ENGINEERED DESIGN By: Tanner Lanphier · File #194150C · 13-Oct-20

Whitehouse Baseball Field LED Relight

Harwich, MA

GRID SUMMARY

Name:	**Baseball**
Size:	Irregular 330' / 399' / 328'
Spacing:	30.0' x 30.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY

MAINTAINED HORIZONTAL FOOTCANDLES

	Infield	Outfield
Guaranteed Average:	**70**	**50**
Scan Average:	70.93	50.93
Maximum:	80	68
Minimum:	61	38
Avg / Min:	1.17	1.35
Guaranteed Max / Min:	**2**	**2.5**
Max / Min:	1.31	1.82
UG (adjacent pts):	1.16	1.31
CU:	0.67	
No. of Points:	25	111

LUMINAIRE INFORMATION

Applied Circuits:	A
No. of Luminaires:	**76**
Total Load:	92.84 kW

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.

EQUIPMENT LIST FOR AREAS SHOWN

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
2	A1-A2	105'	-	15.5'	TLC-BT-575	2	2	0
				105'	TLC-LED-1500	7	7	0
2	B1-B2	90'	-	90'	TLC-LED-900	1	1	0
				15.5'	TLC-BT-575	3	3	0
				90'	TLC-LED-1500	12	12	0
1	C1	90'	-	90'	TLC-LED-900	1	1	0
				15.5'	TLC-BT-575	3	3	0
				90'	TLC-LED-1500	9	9	0
1	C2	90'	-	90'	TLC-LED-900	1	1	0
				30'	TLC-BT-575	3	3	0
				90'	TLC-LED-1500	9	9	0
6	TOTALS					76	76	0

SCALE IN FEET 1 : 30

0' 30' 60'

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

ENGINEERED DESIGN By: Tanner Lanphier · File #194150C · 13-Oct-20

Whitehouse Baseball Field LED Relight
Harwich, MA

GRID SUMMARY

Name:	**Bleachers**
Size:	Irregular 330' / 399' / 328'
Spacing:	10.0' x 10.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY

MAINTAINED HORIZONTAL FOOTCANDLES

	Entire Grid
Scan Average:	**27.20**
Maximum:	44
Minimum:	11
Avg / Min:	2.41
Max / Min:	**3.87**
UG (adjacent pts):	1.47
CU:	0.02
No. of Points:	60

LUMINAIRE INFORMATION

Applied Circuits:	A
No. of Luminaires:	**76**
Total Load:	92.84 kW

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.

EQUIPMENT LIST FOR AREAS SHOWN

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
2	A1-A2	105'	-	15.5'	TLC-BT-575	2	2	0
				105'	TLC-LED-1500	7	7	0
2	B1-B2	90'	-	90'	TLC-LED-900	1	1	0
				15.5'	TLC-BT-575	3	3	0
				90'	TLC-LED-1500	12	12	0
1	C1	90'	-	90'	TLC-LED-900	1	1	0
				15.5'	TLC-BT-575	3	3	0
				90'	TLC-LED-1500	9	9	0
1	C2	90'	-	90'	TLC-LED-900	1	1	0
				30'	TLC-BT-575	3	3	0
				90'	TLC-LED-1500	9	9	0
6	TOTALS					76	76	0

SCALE IN FEET 1 : 100

0' 100' 200'

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

ENGINEERED DESIGN By: Tanner Lanphier · File #194150C · 13-Oct-20

Whitehouse Baseball Field LED Relight
Harwich, MA

GRID SUMMARY

Name:	**Spill at 150'**
Spacing:	30.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY

HORIZONTAL FOOTCANDLES

	Entire Grid
Scan Average:	0.4414
Maximum:	1.67
Minimum:	0.05
No. of Points:	74

LUMINAIRE INFORMATION

Applied Circuits:	A
No. of Luminaires:	**76**
Total Load:	92.84 kW

Guaranteed Performance: The ILLUMINATION described above is guaranteed per your Musco Warranty document.

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.

EQUIPMENT LIST FOR AREAS SHOWN

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
2	A1-A2	105'	-	15.5'	TLC-BT-575	2	2	0
				105'	TLC-LED-1500	7	7	0
2	B1-B2	90'	-	90'	TLC-LED-900	1	1	0
				15.5'	TLC-BT-575	3	3	0
				90'	TLC-LED-1500	12	12	0
1	C1	90'	-	90'	TLC-LED-900	1	1	0
				15.5'	TLC-BT-575	3	3	0
				90'	TLC-LED-1500	9	9	0
1	C2	90'	-	90'	TLC-LED-900	1	1	0
				30'	TLC-BT-575	3	3	0
				90'	TLC-LED-1500	9	9	0
6	TOTALS					76	76	0

SCALE IN FEET 1 : 100

0' 100' 200'

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

ENGINEERED DESIGN By: Tanner Lanphier · File #194150C · 13-Oct-20

Whitehouse Baseball Field LED Relight
Harwich, MA

GRID SUMMARY

Name:	**Spill at 150'**
Spacing:	30.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY

MAX VERTICAL FOOTCANDLES

	Entire Grid
Scan Average:	0.9162
Maximum:	3.05
Minimum:	0.18
No. of Points:	74

LUMINAIRE INFORMATION

Applied Circuits:	A
No. of Luminaires:	**76**
Total Load:	92.84 kW

Guaranteed Performance: The ILLUMINATION described above is guaranteed per your Musco Warranty document.

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.

EQUIPMENT LIST FOR AREAS SHOWN

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
2	A1-A2	105'	-	15.5'	TLC-BT-575	2	2	0
				105'	TLC-LED-1500	7	7	0
2	B1-B2	90'	-	90'	TLC-LED-900	1	1	0
				15.5'	TLC-BT-575	3	3	0
				90'	TLC-LED-1500	12	12	0
1	C1	90'	-	90'	TLC-LED-900	1	1	0
				15.5'	TLC-BT-575	3	3	0
				90'	TLC-LED-1500	9	9	0
1	C2	90'	-	90'	TLC-LED-900	1	1	0
				30'	TLC-BT-575	3	3	0
				90'	TLC-LED-1500	9	9	0
6	TOTALS					76	76	0

SCALE IN FEET 1 : 100

0' 100' 200'

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

ENGINEERED DESIGN By: Tanner Lanphier · File #194150C · 13-Oct-20

Whitehouse Baseball Field LED Relight
Harwich, MA

GRID SUMMARY

Name:	**Spill at 150'**
Spacing:	30.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY

CANDELA (PER FIXTURE)

	Entire Grid
Scan Average:	28271.4922
Maximum:	60340.66
Minimum:	8865.90
No. of Points:	74

LUMINAIRE INFORMATION

Applied Circuits:	A
No. of Luminaires:	**76**
Total Load:	92.84 kW

Guaranteed Performance: The ILLUMINATION described above is guaranteed per your Musco Warranty document.

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.

SCALE IN FEET 1 : 80

0' 80' 160'

ENGINEERED DESIGN By: Tanner Lanphier · File #194150C · 13-Oct-20

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

Whitehouse Baseball Field LED Relight
Harwich, MA

EQUIPMENT LAYOUT

INCLUDES:
· Baseball

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

Pole				Luminaires		
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE
2	A1-A2	105'	-	15.5' 105'	TLC-BT-575 TLC-LED-1500	2 7
2	B1-B2	90'	-	90' 15.5' 90'	TLC-LED-900 TLC-BT-575 TLC-LED-1500	1 3 12
1	C1	90'	-	90' 15.5' 90'	TLC-LED-900 TLC-BT-575 TLC-LED-1500	1 3 9
1	C2	90'	-	90' 30' 90'	TLC-LED-900 TLC-BT-575 TLC-LED-1500	1 3 9
6	TOTALS					76

SINGLE LUMINAIRE AMPERAGE DRAW CHART

Ballast Specifications (.90 min power factor)	Line Amperage Per Luminaire (max draw)						
Single Phase Voltage	208 (60)	220 (60)	240 (60)	277 (60)	347 (60)	380 (60)	480 (60)
TLC-LED-1500	8.5	8.1	7.4	6.4	5.1	4.7	3.7
TLC-BT-575	3.4	3.2	2.9	2.5	2.0	1.8	1.5
TLC-LED-900	5.3	5.0	4.6	4.0	3.2	2.9	2.3

C. CONTROLS AND MONITORING

<UTF-8>

Control System Summary

Project Specific Notes:

Project Information

Project #:	194150
Project Name:	Whitehouse Baseball Field LED Relight
Date:	10/13/20
Project Engineer:	Tanner Lanphier
Sales Representative:	Mike Berry
Control System Type:	Control-Link™ Control and Monitoring System with Show-Light™ Entertainment Package
Communication Type:	PowerLine-ST
Scan:	194150C
Document ID:	194150P1V2-1013100256
Distribution Panel Location or ID:	Service 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 48

	QTY	SIZE (AMPS)
Total Contactors	4	30 AMP
Total Contactors	2	60 AMP
Total Off/On/Auto Switches:	1	

Materials Checklist

Contractor/Customer Supplied:

- ❑ A dedicated 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
  - __ HID rated or D-curve circuit breaker sized per full load amps on Circuit Summary by Zone Chart
- ❑ Wiring
  - __ See chart on page 2 for wiring requirements
  - __ Equipment grounding conductor and splices must be insulated (per circuit)
  - __ Lightning ground protection (per pole), if not Musco supplied
- ❑ 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
- ❑ Breaker lock-on device to prevent unauthorized power interruption to control power and powerline connection (if present)
- ❑ 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.

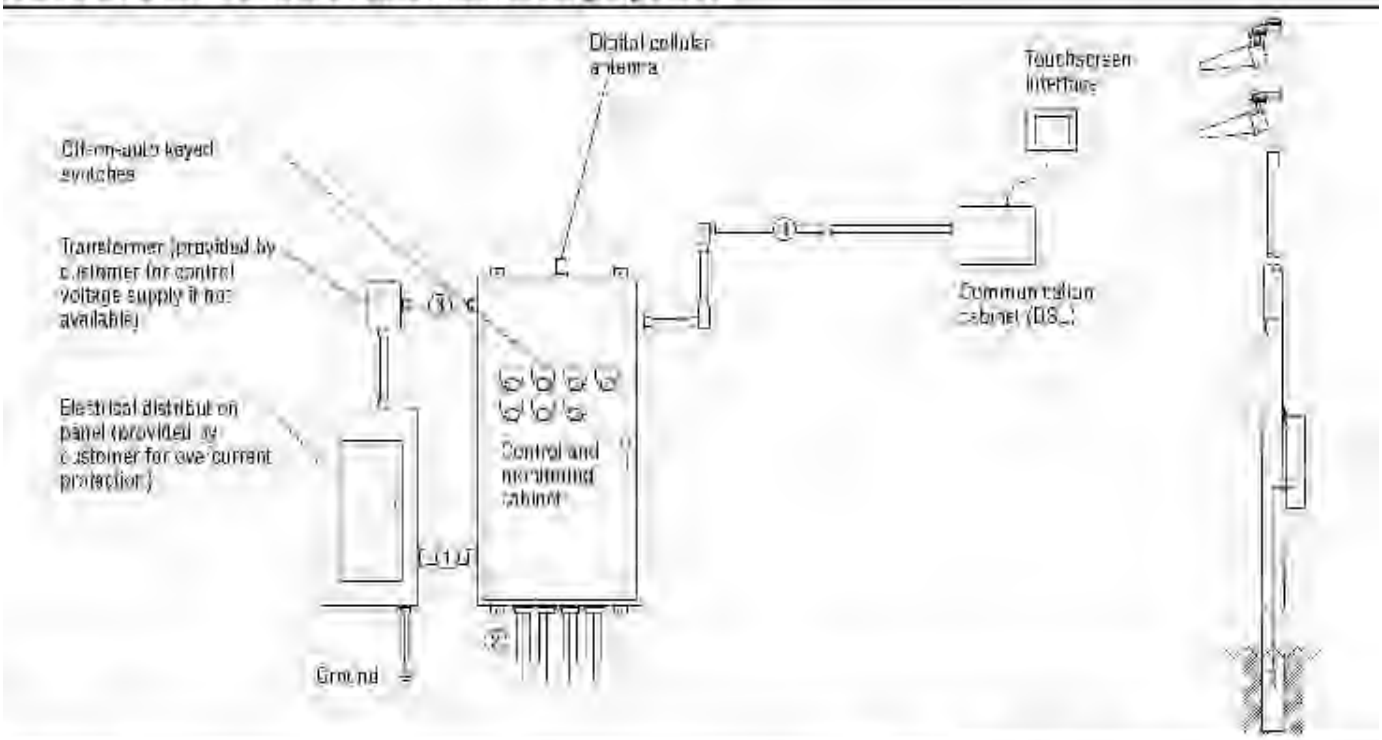
Note: Activation may take up to 1 1/2 hours.

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 electrical components 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 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



Conduit ID	Description	# of Wires	Wire (AWG)	Conduit (in)	Max. Wire Length (ft)	MUSCO Supplied	Notes
1	Line power to each pole and equipment grounding conductor	[illegible]	[illegible]	[illegible]	N/A	No	A-E
2	Load power to lighting circuits and equipment grounding conductor	[illegible]	[illegible]	[illegible]	N/A	No	A-E
3	Control power (dedicated 20A)	[illegible]	[illegible]	[illegible]	N/A	No	[illegible]
4	Communication cable in each luminaire	[illegible]	[illegible]	[illegible]	1500	Yes	C,E,F

* Notes:
A. See voltage and phasing per the notes on cover page.
B. Circuits per load and voltage drop.
C. All conduit runs are sized per code, unless otherwise specified to allow for conductor size.
D. Equipment grounding conductor and any splices must be insulated.
E. Refer to control and monitoring system installation instructions for more details on equipment location and the installation requirements.
F. Cable model (Belden 7987A or equal) is required. DSL modem (inside cabinet) supplies power over DSL cable. Communication cable at modem connection to earth ground. Standard wall outlet is required to power [illegible] equipment. Luminaire communication cable with Ethernet cable (≤300 ft.).

IMPORTANT: Control wires (5) and communication wire (4) must be in separate conduit from line and load power wires (1, 2).

Control System Summary

SWITCHING SCHEDULE

Field/Zone Description	Zones
Baseball	**1**

CONTROL POWER CONSUMPTION	
120V Single Phase	
VA loading of Musco Supplied Equipment	INRUSH: 2043.0
	SEALED: 231.8

CIRCUIT SUMMARY BY ZONE

POLE	CIRCUIT DESCRIPTION	# OF FIXTURES	# OF DRIVERS	*FULL LOAD AMPS	CONTACTOR SIZE (AMPS)	CONTACTOR ID	ZONE
A1	Baseball	9	9	**17.3**	30	C1	1
A2	Baseball	9	9	**17.3**	30	C2	1
B1	Baseball	16	16	**31.4**	60	C3	1
B2	Baseball	16	16	**31.4**	60	C4	1
C1	Baseball	13	13	**24.9**	30	C5	1
C2	Baseball	13	13	**24.9**	30	C6	1

*Full Load Amps based on amps per driver.

Control System Summary

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 A1	17.28		
1	1	C2	Pole A2	17.28		
1	1	C3	Pole B1	31.35		
1	1	C4	Pole B2	31.35		
1	1	C5	Pole C1	24.94		
1	1	C6	Pole C2	24.94		

ZONE SCHEDULE

			CIRCUIT DESCRIPTION	
ZONE	SELECTOR SWITCH	ZONE DESCRIPTION	POLE ID	CONTACTOR ID
Zone 1	1	Baseball	A1	C1
			A2	C2
			B1	C3
			B2	C4
			C1	C5
			C2	C6

D. WARRANTY

Musco Constant 10™

10-Year Product Assurance & Warranty Program

Project name: Whitehouse Baseball Field LED Relight **Project number:** 194150

Owner: Town of Harwich **City:** Harwich **State:** MA

Covered product(s): SportsCluster ™ System with TLC for LED™ technology

Date issued: Date of Shipment **Expiration:** Date of Shipment + 10 years

Musco Sports Lighting, LLC will provide all materials and labor to maintain operation of your lighting system to original design criteria for 10 years. Musco products and services are guaranteed to perform on your project as detailed in this document.

Light Performance

Specified illumination levels will be maintained and are marked as guaranteed in the Musco Illumination Summary.

Individual luminaire outages that occur during the warranty and maintenance period are repaired when the usage of any field is materially impacted.

Spill Light Control

If specified, spill light levels at identified locations are guaranteed to be controlled to the maximum values provided in the Musco Illumination Summary.

Energy Consumption

Total average kW consumption for your lighting system is guaranteed to be not more than the total load shown in the Musco Illumination Summary.

Monitoring, Maintenance, and Control Services

Musco shall monitor the performance of your lighting system, including on/off status, hours of usage, and luminaire outages. If outages that affect playability are detected, Musco will contact you and proactively dispatch technicians.

On-off control of your lighting system is provided via an easy-to-use web site scheduling system, smartphone app, phone, email, or fax. Our trained Control-Link Central™ service center staff is available toll-free 24/7. Regular usage reports are always available on Control-Link Central's web site.

Structural Integrity

Your project has been designed to IBC, 2015, 130mph, Exposure C .
Structural integrity of equipment manufactured by Musco is guaranteed.

Musco has a team to ensure fulfillment of our product and services warranty and maintains financial reserves dedicated to support our fulfillment of this warranty. Please keep this document as your signed contract guaranteeing comprehensive service for the 10 year period.

Musco Constant 10™

10-Year Product Assurance & Warranty Program

Terms and Conditions

Service under this Contract is provided by Musco Sports Lighting, LLC ("Musco") or an authorized servicer approved by Musco. Services performed under this Contract shall consist of furnishing labor and parts necessary to restore the operation of the Covered Product(s) to original design criteria provided such service is necessitated by failure of the Covered Product(s) during normal usage. This Contract covers Product(s) consisting of Musco's Total Light Control – TLC for LED® with Control-Link® and any additional Musco manufactured product as listed on page 1.

"We", "us," and "our" mean Musco. "You" and "your" mean the purchaser of the Covered Product(s). No one has the authority to change this Contract without the prior written approval of Musco. Musco shall not assume responsibility for their agents or assignees other than as described below. If there is a conflict between the terms of this Contract and information communicated either orally or in writing by one or more of our employees or agents, this Contract shall control.

Additional Provisions

1. **Availability of Service:** Control-Link Central™ operators shall be available 24/7 via web site, phone, fax, or email. Maintenance service specialists shall be available 8AM to 5PM Central Time, and services shall be rendered during these same hours in your local time zone, Monday through Friday (with the exception of national holidays). Hours of operation are subject to change without notice to you. Musco will exercise all reasonable efforts to perform service under this Contract, but will not be responsible for delays or failure in performing such services caused by adverse weather conditions, acts of any government, failure of transportation, accidents, riots, war, labor actions or strikes or other causes beyond its control.

2. **Determination of Repairs:** Musco will utilize the field monitoring system and any information provided by the customer to determine when the usage of the field is materially impacted. From this information, Musco will determine needed repair and/or replacement of Covered Product(s) and parts. Repair will be with Product(s) of like kind and quality.

3. **Your Requirements Under this Contract:** You must meet all electrical and installation requirements as specified by the manufacturer. In addition, you promise and assure: full cooperation with Musco, Musco's technicians and authorized servicers during telephone diagnosis and repair of the Covered Product(s); reasonable accessibility of the Covered Product(s); a nonthreatening and safe environment for service.

   You agree to check fuses and to replace fuses as needed. Musco provides spare fuses in the lowest alpha-numeric numbered enclosure. Musco will replenish spare fuses used.

   You agree to keep your control system online. This means keeping the required control voltage to the control system at all times. Any deviation from this practice must be discussed with Musco's Warranty Department.

4. **Service Limitations — This Contract does not cover:** Maintenance, repair, or replacement necessitated by loss or damage resulting from any external causes such as, but not limited to, theft, environmental conditions, negligence, misuse, abuse, improper electrical/power supply, unauthorized repairs by third parties, attachments, damage to cabinetry, equipment modifications, vandalism, animal or insect infestation, physical damage to Covered Product(s) parts or components, failure of existing structures, supporting electrical systems or any non-Musco equipment, or acts of nature (including, but not limited to: earthquake, flood, tornadoes, typhoons, hurricanes, or lightning).

5. **Contract Limitations:**

   a. EXCLUSIONS FROM COVERAGE: IN NO EVENT WILL MUSCO BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES WHICH INCLUDE, BUT ARE NOT LIMITED TO, ANY DELAY IN RENDERING SERVICE OR LOSS OF USE DURING THE REPAIR PERIOD OF THE COVERED PRODUCT(S) OR WHILE OTHERWISE AWAITING PARTS.

   b. LIMITATION OF LIABILITY: To the extent permitted by applicable law, the liability of Musco, if any, for any allegedly defective Covered Product(s) or components shall be limited to repair or replacement of the Covered Product(s) or components at Musco's option. THIS CONTRACT IS YOUR SOLE EXPRESS WARRANTY WITH RESPECT TO THE COVERED PRODUCT(S). ALL IMPLIED WARRANTIES WITH RESPECT TO THE COVERED PRODUCT(S) INCLUDING, BUT NOT LIMITED TO, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE HEREBY EXPRESSLY EXCLUDED.

   c. For the purposes of and by your acceptance of this Contract you acknowledge and agree that if a surety bond ("Bond") is provided the warranty and/or maintenance guarantee provided for in this Contract and any corresponding liability on behalf of the issuing surety under the Bond is limited to the first twelve (12) months of said warranty and/or maintenance guarantee coverage period. Any warranty and/or guarantee coverage period in excess of said initial 12 month period does not fall within the scope of the Bond and shall be the sole responsibility of Musco.

   d. Musco requires reasonable access for a crane or man lift equipment to service the lighting system. Musco will not be responsible for damage from operating the vehicle on the property when the equipment is operated in the prescribed manner over the designated access route.

   e. Obsolescence or Environmental Restrictions: If during any maintenance or other work performed under this Warranty, any of the parts of the Covered Product(s) are found to be either obsolete, no longer available, or prohibited by any state of federal agency, Musco shall replace said parts with comparable parts and materials with equal operating characteristics solely at Musco's discretion. The cost of replacement of any obsolete cellular related technology shall be borne by you. Prior to completing any such work, Musco shall notify you of the cost (if any) you will incur in the replacement of such parts under this section.

6. **Transfer and Assignment:** Except to owners, you shall not have the right to assign or otherwise transfer your rights and obligations under this Contract except with the prior written consent of Musco; however, a successor in interest by merger, operation of law, assignment or purchase or otherwise of your entire business shall acquire all of your interests under this Contract.

7. **Governing Law:** The Contract shall be interpreted and enforced according to the laws of the project location.

8. **Subrogation:** In the event Musco repairs or replaces any Covered Product(s), parts or components due to any defect for which the manufacturer or its agents or suppliers may be legally responsible, you agree to assign your rights of recovery to Musco. You will be reimbursed for any reasonable costs and expenses you may incur in connection with the assignment of your rights. You will be made whole before Musco retains any amounts it may recover.

Signature: _____

Vice President of Sales

E. PRODUCT INFORMATION

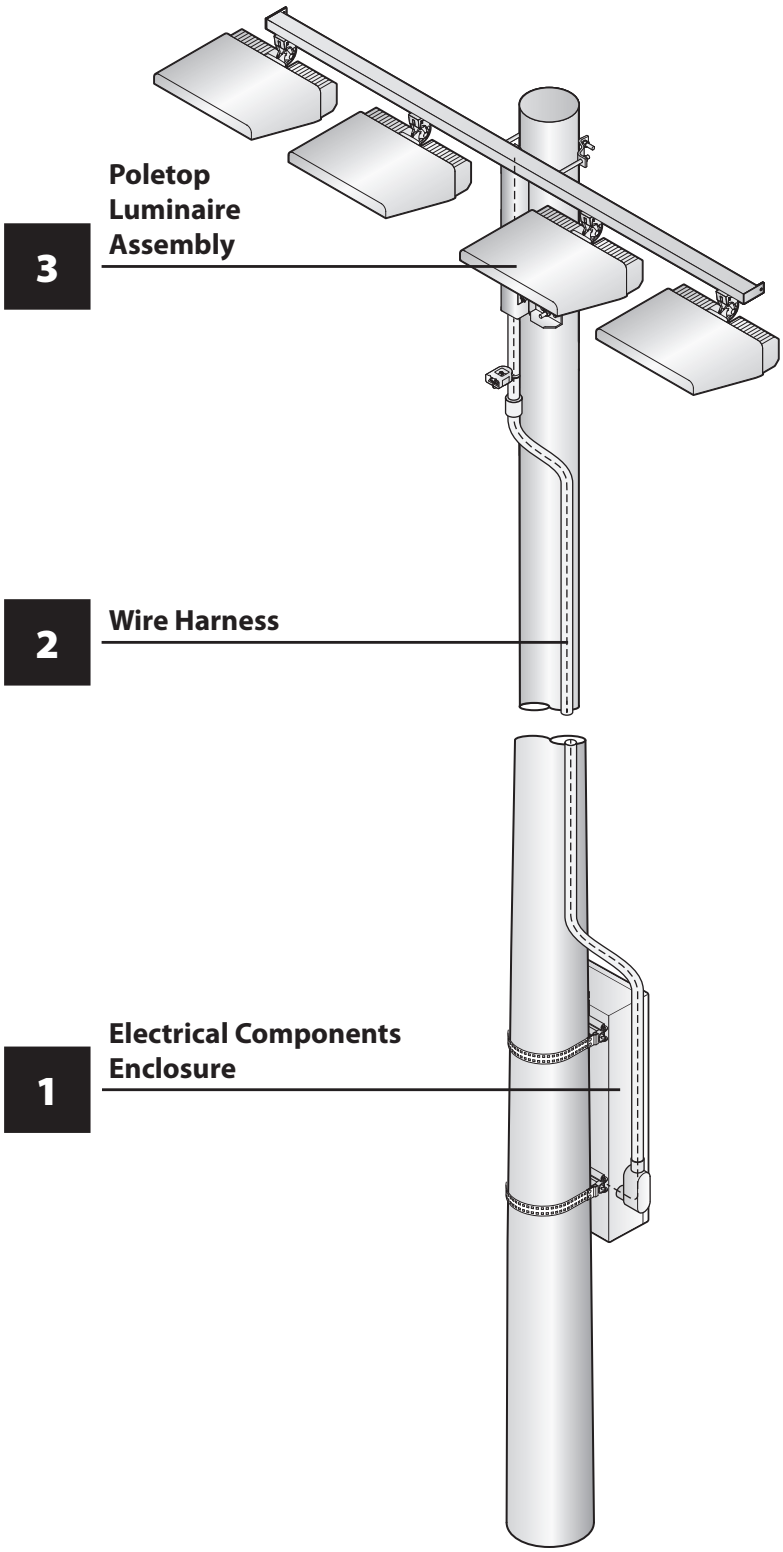
Lighting System for Mounting to Existing Structures

Factory wired, aimed, and tested

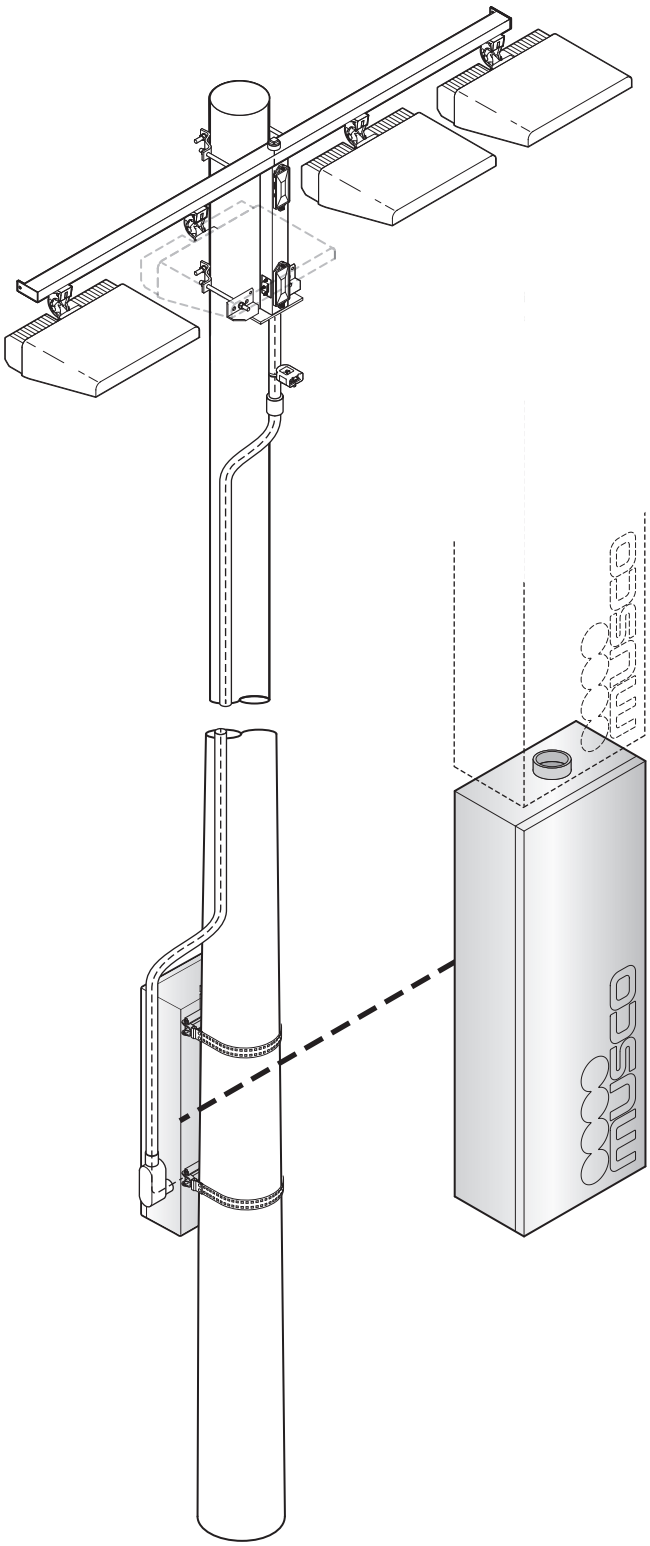
Easy installation to existing structures

Comprehensive corrosion package

Grounding connection for bonding to pole or down conductor



TLC for LED® Electrical Components Enclosure



Overview

The electrical components enclosure contains all necessary equipment to operate luminaires.

Features

- Factory-built and tested as a unit
- Mounted 10 ft (3 m) above grade for servicing with ladder
- Labeled with pole identification and electrical information
- Drivers individually fused and spare fuses supplied
- Disconnect per circuit
- Brackets and straps to mount to pole

Technical Specifications

For amperage draws and circuitry refer to project specific document.

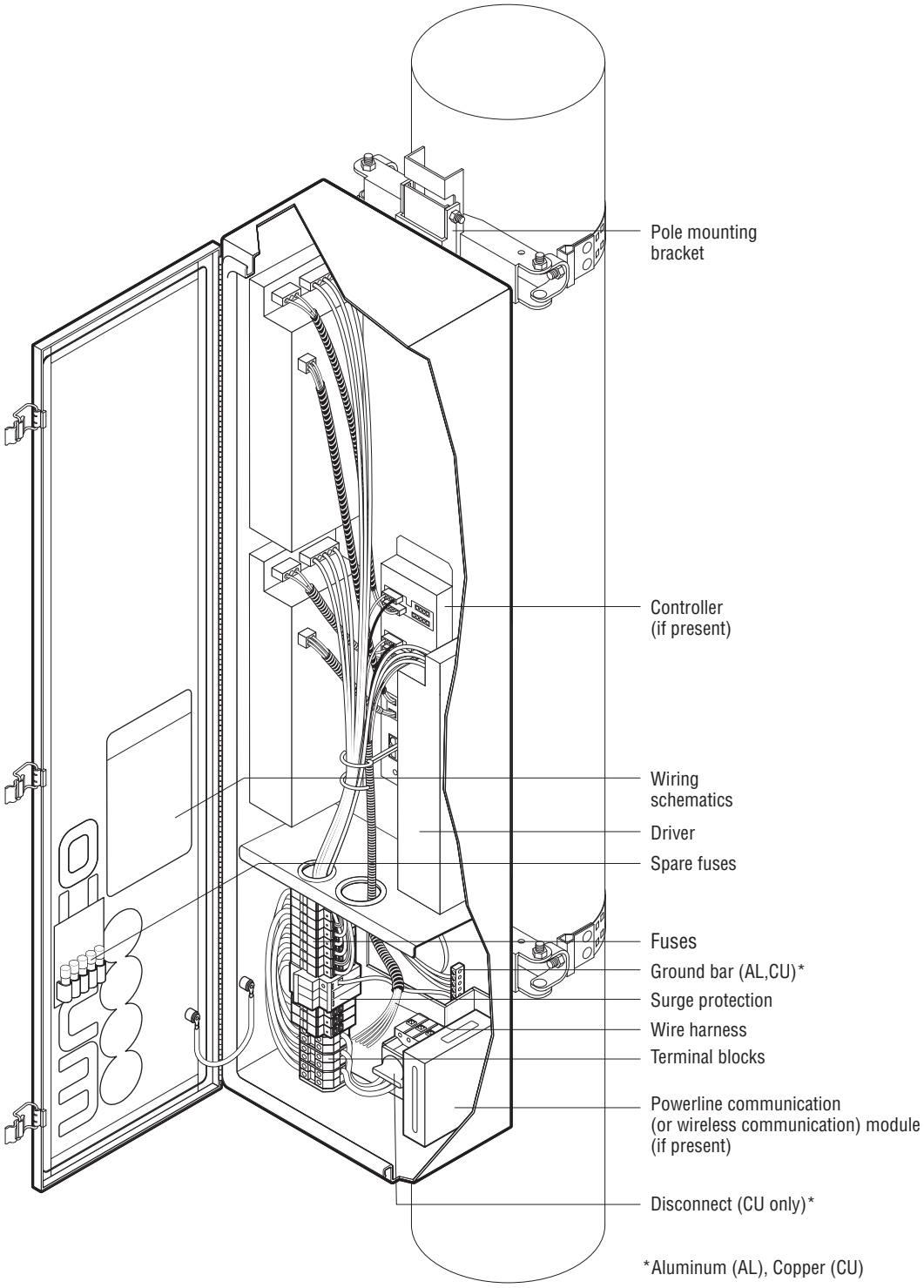
Construction

- 0.08 in (2 mm) thick, powder-coated aluminum
- Enclosure ratings: NEMA 3R, IP54
- Designed to operate in up to 50˚ C (122˚ F) ambient temperature
- Full length stainless steel hinge
- All stainless steel fasteners passivated and coated
- Meets touchsafe standards
- Up to four drivers per enclosure
- Approximate weight 65 lb (29 kg)
- Lower enclosure size 14.25 in (362 mm) wide x 8 in (203 mm) deep x 52.5 in (1334 mm) high
- Upper enclosure size 14.25 in (362 mm) wide x 8 in (203 mm) deep x 40.5 in (1029 mm) high

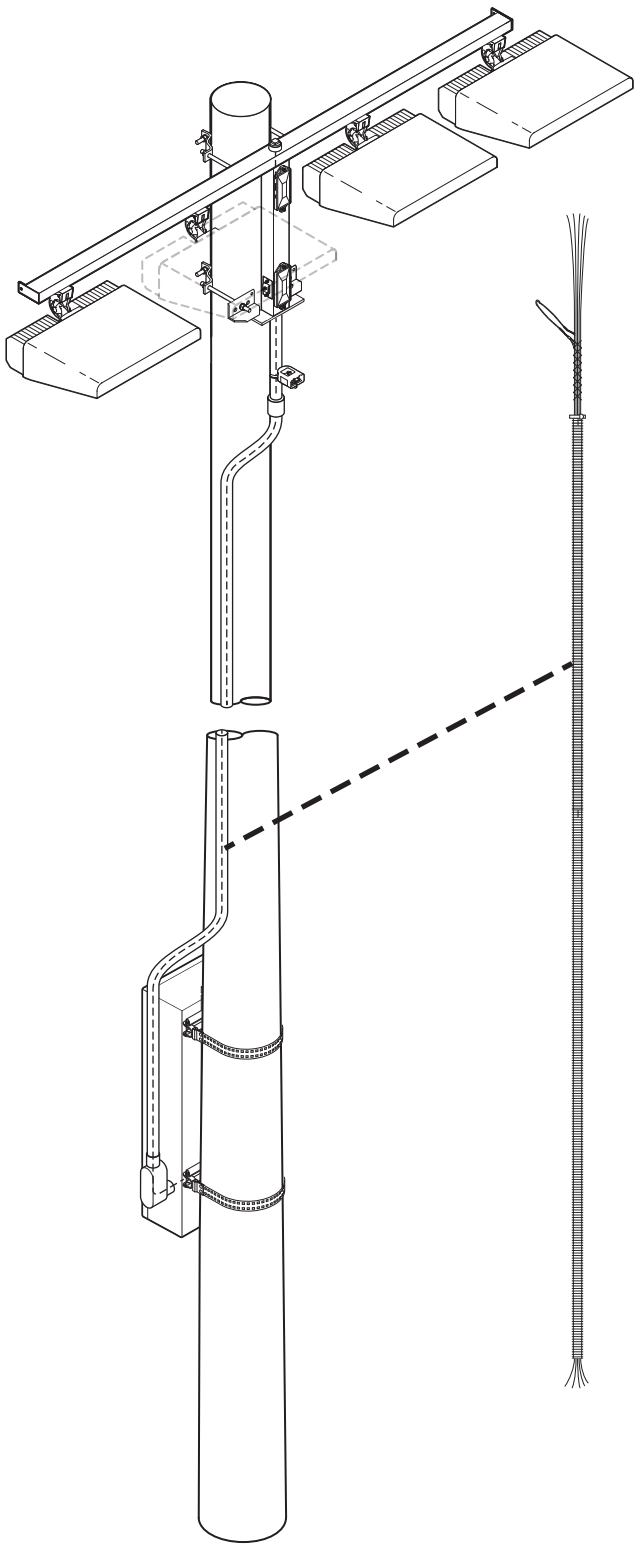
Quality Assurance Tests

- Grounding continuity
- High potential dielectric withstand
- Full functionality test

TLC for LED® Electrical Components Enclosure



TLC for LED® Wire Harness



Overview

The factory-built wire harness connects the electrical components enclosure to the poletop luminaire assembly.

Features

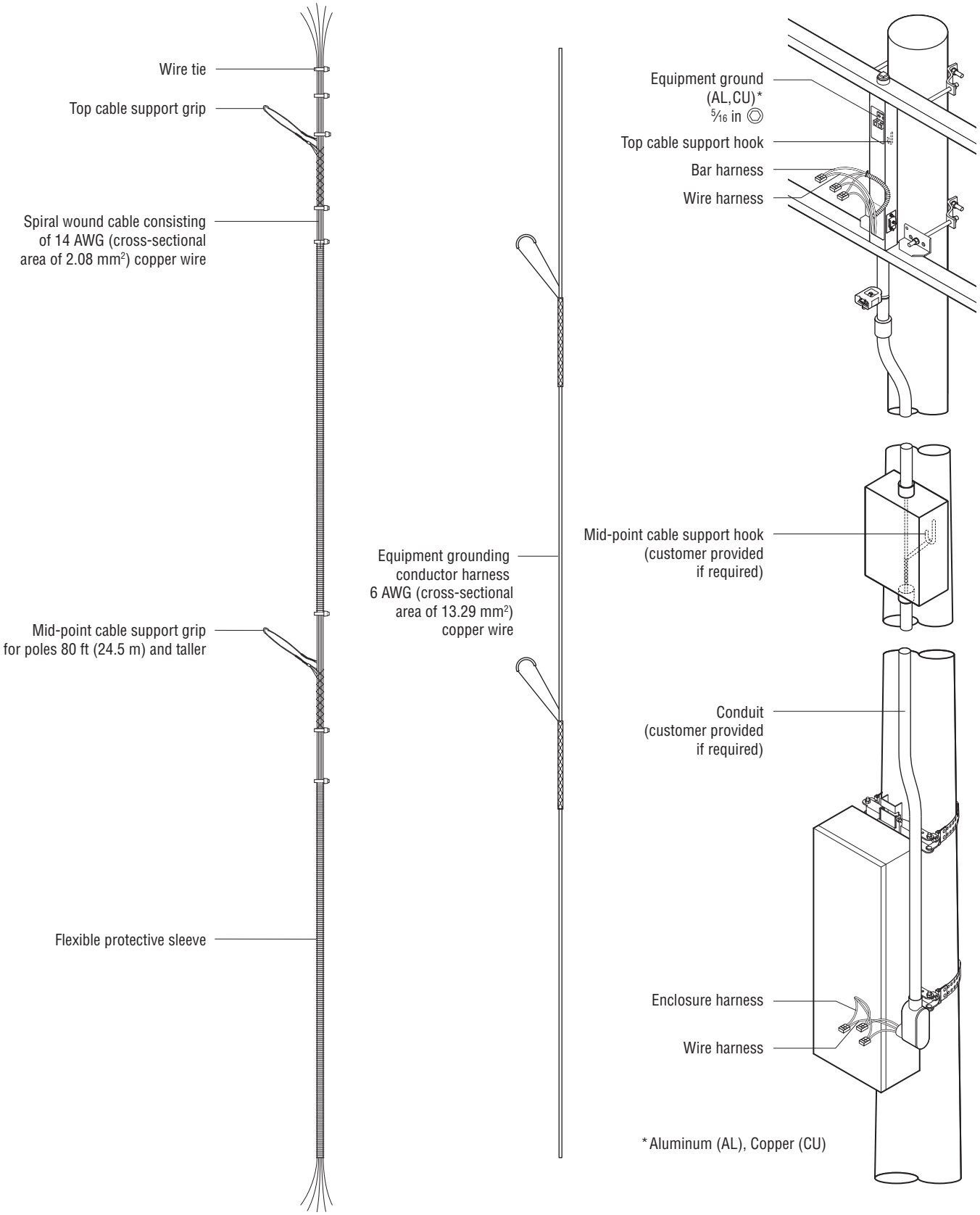
- Harness custom made to fit application, (including strain relief, protective sleeves, and wire length)
- Factory-assembled cable support grip alleviates strain on connections
- Spiral wound cable eliminates slippage
- Protective sleeve prevents wire damage
- All internal wiring, no exposed wires
- Labels identify luminaire wire pairs

Technical Specifications

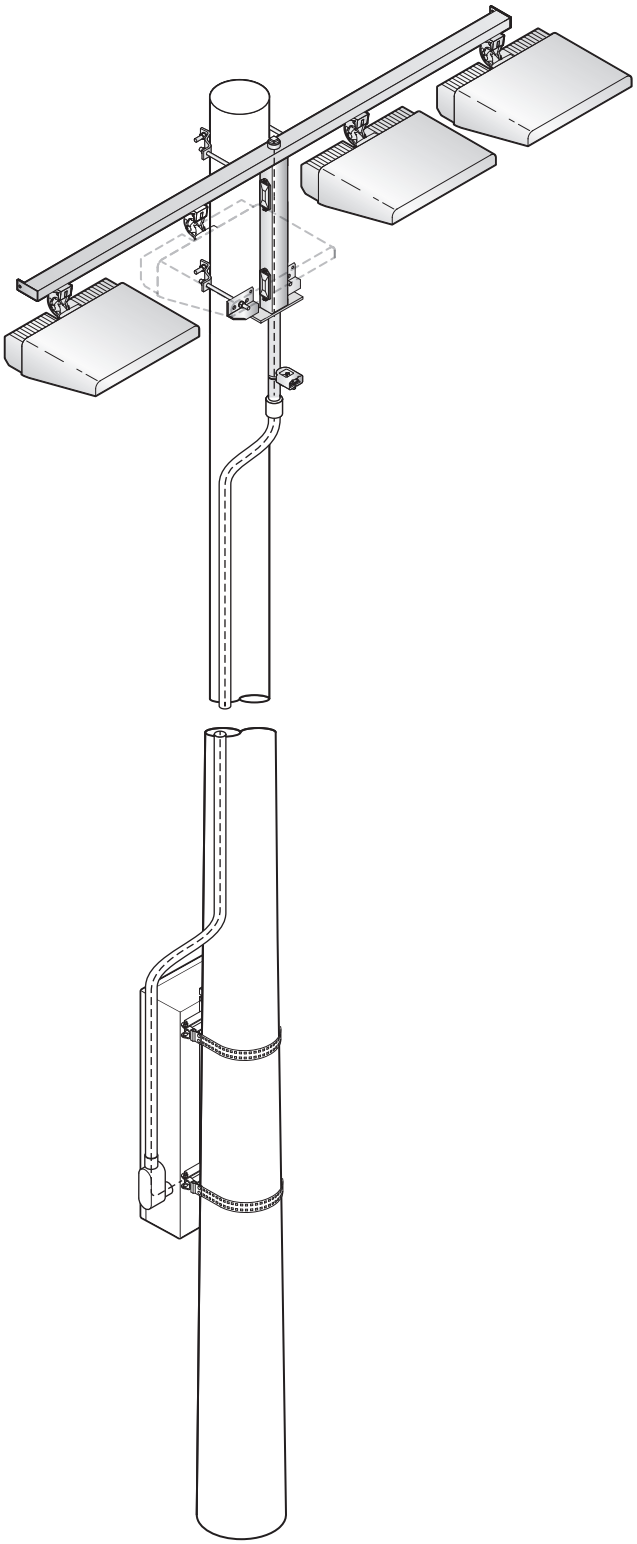
Construction

- Spiral wound, wrapped cable, 14 AWG (cross-sectional area of 2.08 mm^2) copper wire
- Integral cable support grip
- Two wires per driver
- Each harness supports up to four drivers
- Equipment grounding conductor harness, 6 AWG (cross-sectional area of 13.29 mm^2) copper wire. One provided per pole.

TLC for LED® Wire Harness



TLC for LED® Poletop Luminaire Assembly



Overview

The factory-aimed poletop luminaire assembly is clamped to the upper pole section.

Features

- Each luminaire is factory-built, tested, and ships as a unit
- Luminaires are factory-aimed to within 0.20 degree of accuracy
- Luminaire mounts to crossarm and connects electrically in a single step
- Labels identify pole location and luminaire location
- No exposed wiring
- Pole clamp brackets and hardware specific to pole size

Technical Specifications

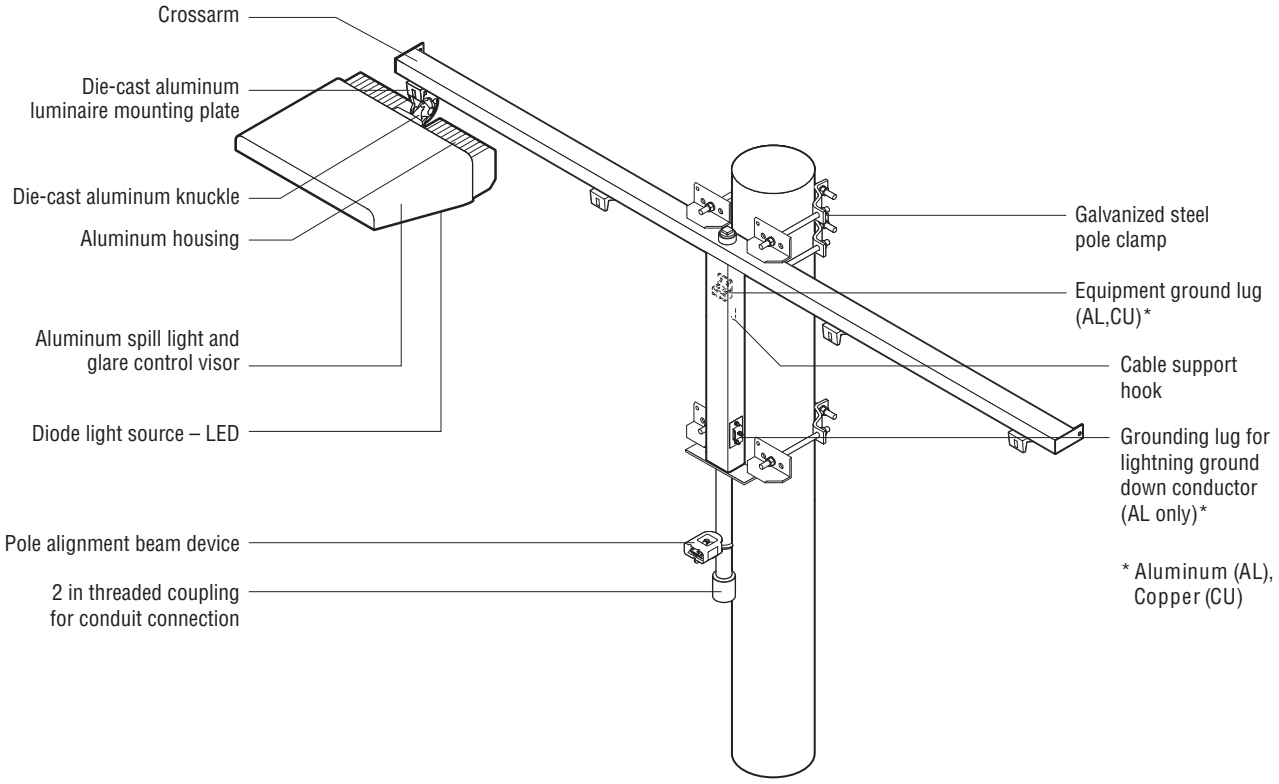
Construction

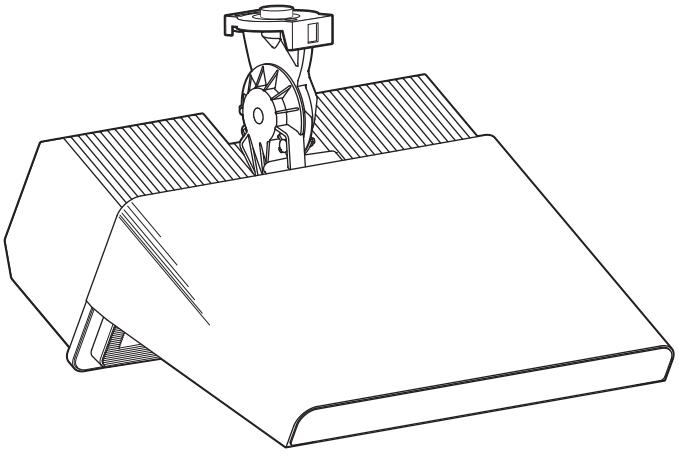
- Crossarms and pole clamp brackets hot-dip galvanizing inside and outside after fabrication meets ASTM-A123 and EN 1461 standards
- Crossarms are constructed of rectangular steel tubing
- All aluminum components are powder-coated or anodized to mil-A-8625F and BS 5599
- All stainless steel fasteners are passivated and coated

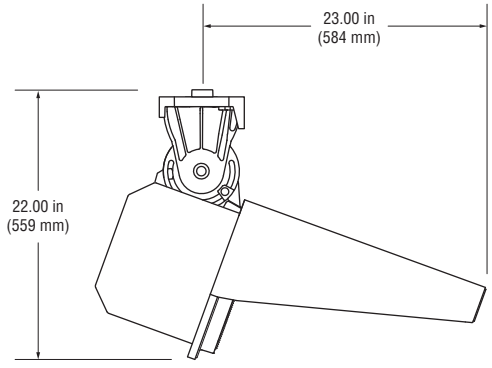
Quality Assurance Tests

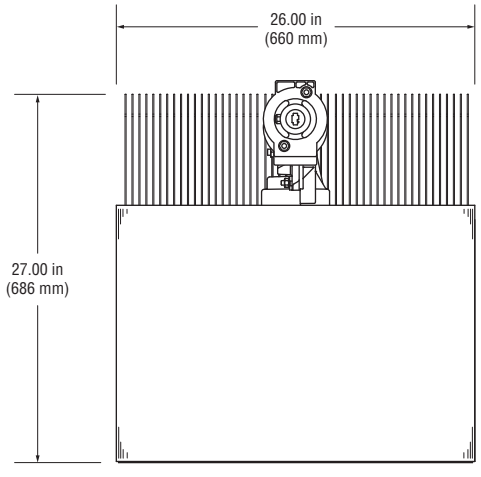
- Galvanizing thickness
- High potential dielectric withstand
- Electrical continuity

TLC for LED® Poletop Luminaire Assembly









Luminaire Data

Weight (luminaire)	67 lb (30 kg)
UL listing number	E338094
UL listed for USA / Canada	UL1598 CSA-C22.2 No.250.0
CE Declaration	LVD, EMC, RoHS
Ingress protection, luminaire	IP65
Impact rating	IK07
Material and finish	Aluminum, powder-coat painted
Wind speed rating (aiming only)	150 mi/h (67 m/s)
UL, IEC ambient temperature rating, luminaire	50°C (122°F)

Photometric Characteristics

Projected lumen maintenance per IES TM-21-11	
L90 (20k)	>120,000 h
L80 (20k)	>120,000 h
L70 (20k)	>120,000 h
Lumens[1]	160,000
CIE correlated color temperature	5700 K
Color rendering index (CRI)	75 typ, 70 min
LED binning tolerance	7-step MacAdam Ellipse

Footnotes:

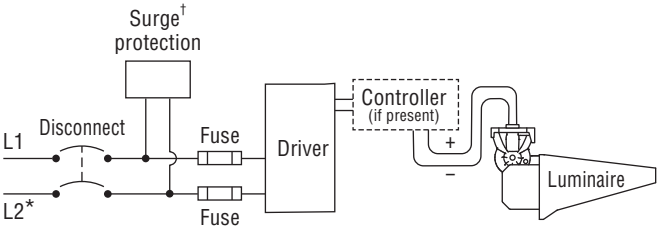
1) Incorporates appropriate dirt depreciation factor for life of luminaire.

Driver Data

Electrical Data

Rated wattage[1]	
Per driver	1430 W
Per luminaire	1430 W
Number of luminaires per driver	1
Starting (inrush) current	<40 A, 256 µs
Fuse rating	15 A
UL, IEC ambient temperature rating, electrical components enclosure	50°C (122°F)
Ingress protection, electrical components enclosure	IP54
Efficiency	95%
Dimming mode	optional
Range, energy consumption	12 – 100%
Range, light output	17 – 100%
Flicker	<2%
Total harmonic distortion (THD) at full output	<20%

Typical Wiring



* If L2 (com) is neutral then not switched or fused.
† Not present if indoor installation.

	200 Vac 50/60 Hz	208 Vac 60 Hz	220 Vac 50/60 Hz	230 Vac 50 Hz	240 Vac 50/60 Hz	277 Vac 60 Hz	347 Vac 60 Hz	380 Vac 50/60 Hz	400 Vac 50 Hz	415 Vac 50 Hz	480 Vac 60 Hz
Max operating current per luminaire[2]	8.86 A	8.52 A	8.06 A	7.71 A	7.39 A	6.40 A	5.11 A	4.67 A	4.43 A	4.27 A	3.70 A

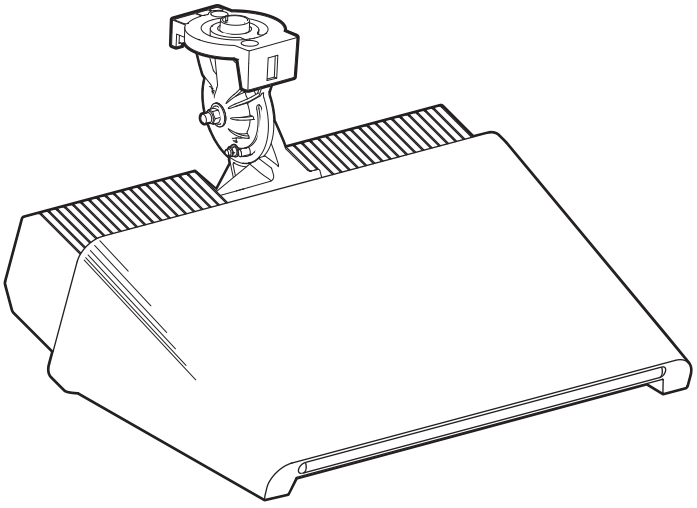
Footnotes:

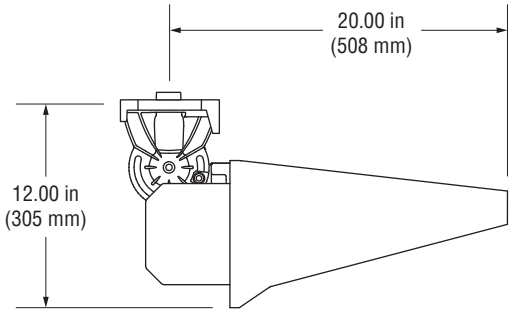
1) Rated wattage is the power consumption, including driver efficiency losses, at stabilized operation in 25°C ambient temperature environment.

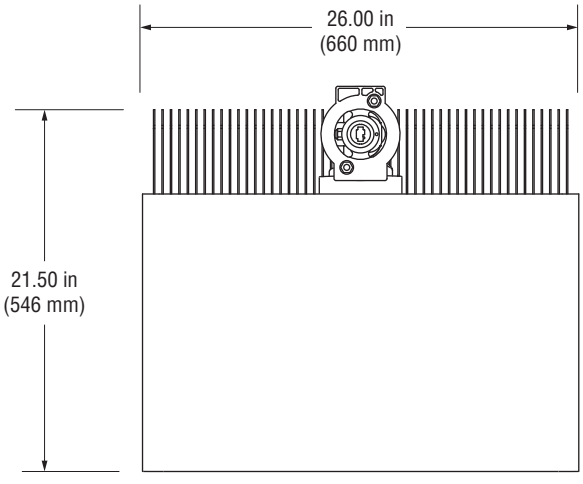
2) Operating current includes allowance for 0.90 minimum power factor, operating temperature, and LED light source manufacturing tolerances.

Notes

1. Use thermal magnetic HID-rated or D-curve circuit breakers.
2. See *Musco Control System Summary* for circuit information.







Luminaire Data

Weight (luminaire)	40 lb (18 kg)
UL listing number	E338094
UL listed for USA / Canada	UL1598 CSA-C22.2 No.250.0
CE Declaration	LVD, EMC, RoHS
Ingress protection, luminaire	IP65
Impact rating	IK07
Material and finish	Aluminum, powder-coat painted
Wind speed rating (aiming only)	150 mi/h (67 m/s)
UL, IEC ambient temperature rating, luminaire	50°C (122°F)

Photometric Characteristics

Projected lumen maintenance per IES TM-21-11	
L90 (20k)	>120,000 h
L80 (20k)	>120,000 h
L70 (20k)	>120,000 h
Lumens[1]	89,600
CIE correlated color temperature	5700 K
Color rendering index (CRI)	75 typ, 70 min
LED binning tolerance	7-step MacAdam Ellipse

Footnotes:

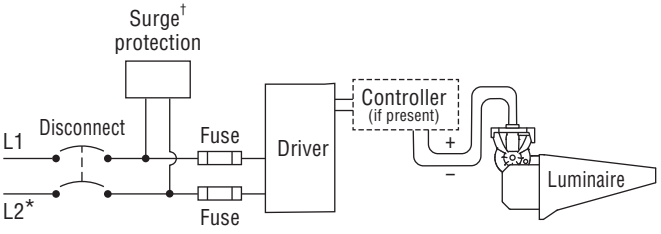
1) Incorporates appropriate dirt depreciation factor for life of luminaire.

Driver Data

Electrical Data

Rated wattage[1]	
Per driver	890 W
Per luminaire	890 W
Number of luminaires per driver	1
Starting (inrush) current	<40 A, 256 µs
Fuse rating	15 A
UL, IEC ambient temperature rating, electrical components enclosure	50°C (122°F)
Ingress protection, electrical components enclosure	IP54
Efficiency	95%
Dimming mode	optional
Range, energy consumption	25 – 100%
Range, light output	30 – 100%
Flicker	<2%
Total harmonic distortion (THD) at full output	<20%

Typical Wiring



* If L2 (com) is neutral then not switched or fused.
† Not present if indoor installation.

	200 Vac 50/60 Hz	208 Vac 60 Hz	220 Vac 50/60 Hz	230 Vac 50 Hz	240 Vac 50/60 Hz	277 Vac 60 Hz	347 Vac 60 Hz	380 Vac 50/60 Hz	400 Vac 50 Hz	415 Vac 50 Hz	480 Vac 60 Hz
Max operating current per luminaire[2]	5.50 A	5.29 A	5.00 A	4.78 A	4.58 A	3.97 A	3.17 A	2.90 A	2.75 A	2.65 A	2.29 A

Footnotes:

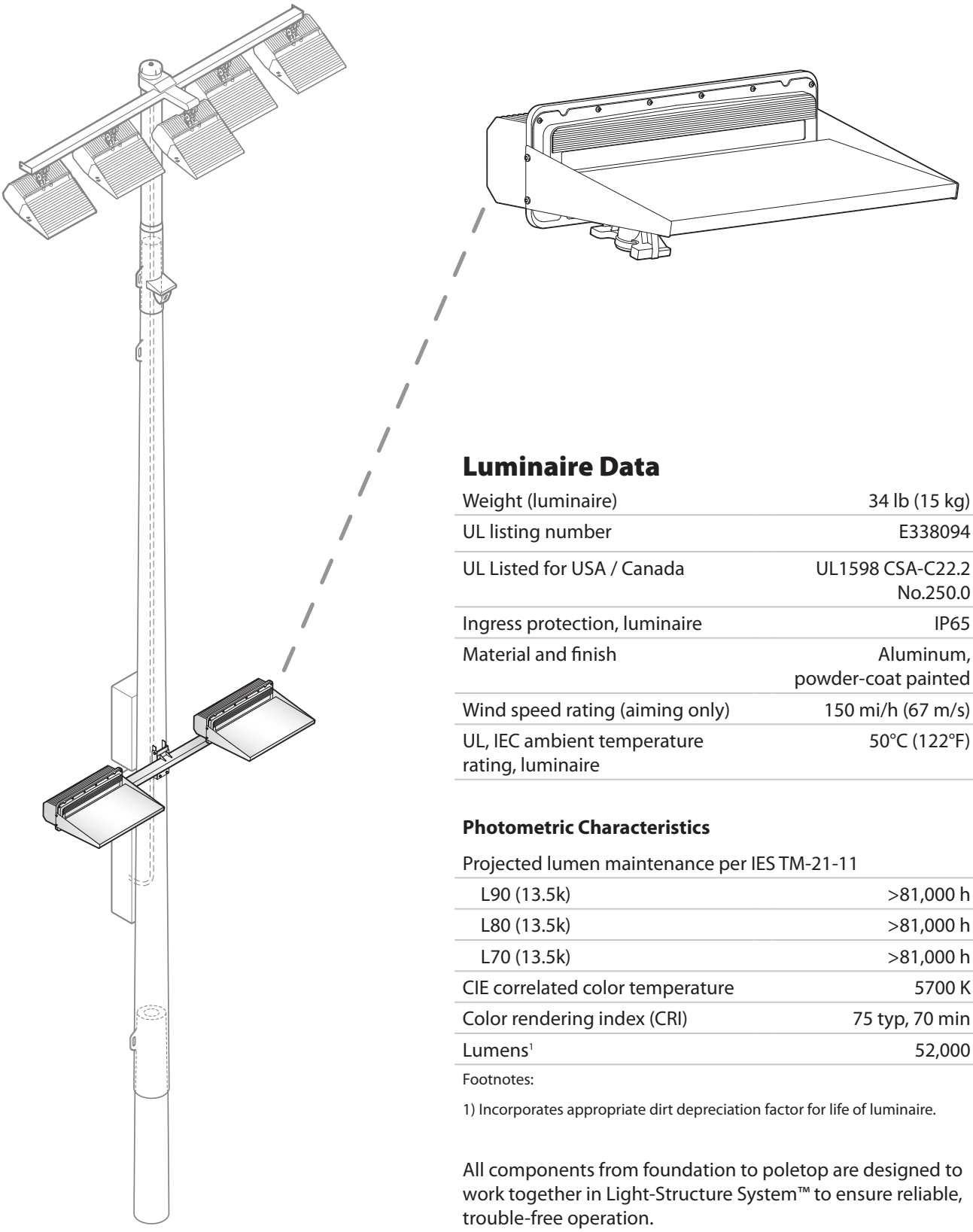
1) Rated wattage is the power consumption, including driver efficiency losses, at stabilized operation in 25°C ambient temperature environment.

2) Operating current includes allowance for 0.90 minimum power factor, operating temperature, and LED light source manufacturing tolerances.

Notes

1. Use thermal magnetic HID-rated or D-curve circuit breakers.
2. See *Musco Control System Summary* for circuit information.

Luminaire and Driver Components – TLC-BT-575



Luminaire Data

Weight (luminaire)	34 lb (15 kg)
UL listing number	E338094
UL Listed for USA / Canada	UL1598 CSA-C22.2 No.250.0
Ingress protection, luminaire	IP65
Material and finish	Aluminum, powder-coat painted
Wind speed rating (aiming only)	150 mi/h (67 m/s)
UL, IEC ambient temperature rating, luminaire	50°C (122°F)

Photometric Characteristics

Projected lumen maintenance per IES TM-21-11	
L90 (13.5k)	>81,000 h
L80 (13.5k)	>81,000 h
L70 (13.5k)	>81,000 h
CIE correlated color temperature	5700 K
Color rendering index (CRI)	75 typ, 70 min
Lumens[1]	52,000

Footnotes:

1) Incorporates appropriate dirt depreciation factor for life of luminaire.

All components from foundation to poletop are designed to work together in Light-Structure System™ to ensure reliable, trouble-free operation.

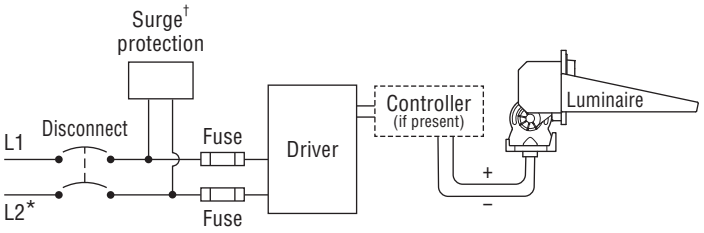
Luminaire and Driver Components – TLC-BT-575

Driver Data

Electrical Data

Rated wattage[1]	
Per driver	575 W
Per luminaire	575 W
Number of luminaires per driver	1
Starting (inrush) current	<40 A, 256 µs
Fuse rating	15 A
UL, IEC ambient temperature rating, electrical components enclosure	50°C (122°F)
Ingress protection, electrical components enclosure	IP54
Efficiency	95%

Typical Wiring



* If L2 (com) is neutral then not switched or fused.
† Not present if indoor installation.

	200 Vac 50/60 Hz	208 Vac 60 Hz	220 Vac 50/60 Hz	230 Vac 50 Hz	240 Vac 50/60 Hz	277 Vac 60 Hz	347 Vac 60 Hz	380 Vac 50/60 Hz	400 Vac 50 Hz	415 Vac 50 Hz	480 Vac 60 Hz
Max operating current[2] per luminaire	3.48 A	3.35 A	3.16 A	3.03 A	2.90 A	2.51 A	2.01 A	1.83 A	1.74 A	1.68 A	1.45 A

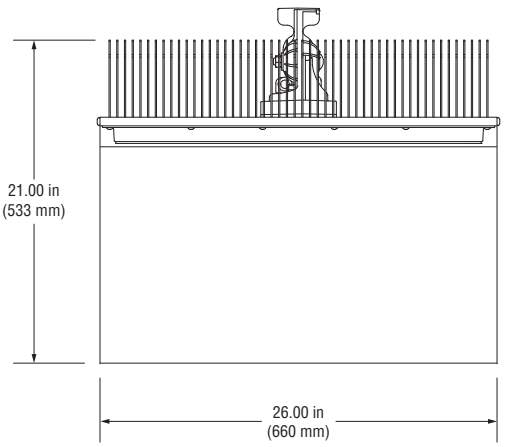
Footnotes:

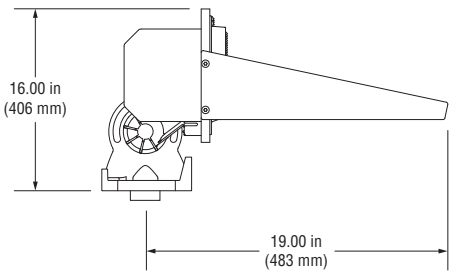
1) Rated wattage is the power consumption, including driver efficiency losses, at stabilized operation in 25˚C ambient temperature environment.

2) Operating current includes allowance for 0.90 minimum power factor, operating temperature, and LED light source manufacturing tolerances.

Notes

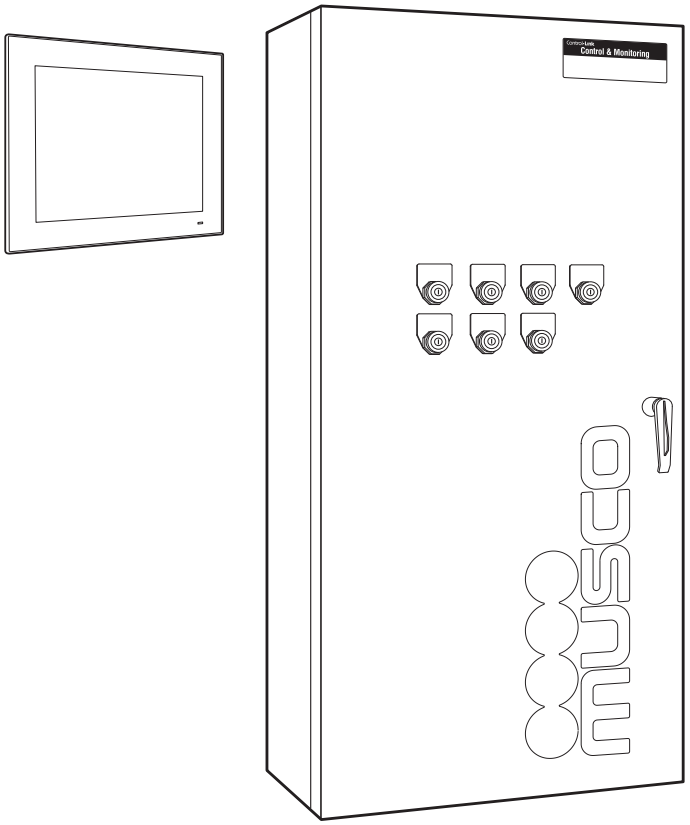
1. Use thermal magnetic HID-rated or D-curve circuit breakers.
2. See Musco *Control System Summary* for circuit information.





Datasheet: **Control-Link® Control and Monitoring System**

Show-Light™ Entertainment Package



Overview

Control-Link® Control and Monitoring System with Show-Light™ entertainment package provides remote on/off control, dimming, color changing, pre-programmed and custom light shows, system monitoring, and management of your lighting system.

Features

Control Features

- Controls: Lighting system and auxiliary equipment
- Control options: Control-Link website, smartphone app, onsite touchscreen, phone call, email, or fax up to 10 years in advance
- Multi-level user security settings
- Door-mounted or remote-mounted on/off/auto switches allow manual override of automated control
- Seven controllable lighting zones
- Four customizable dimming levels (factory defaults: 100%, 50%, 20% and blackout)

Show-Light Entertainment Package Features

- Six preprogrammed light shows included, up to three of them can be custom
- Preprogrammed light shows include: pole chase, luminaire chase, score, wave, pulse, marquee, and random
- Customize the color of Musco TLC-RGBW luminaires if present

Monitoring

- Detects luminaire outages and other issues that affect light quality

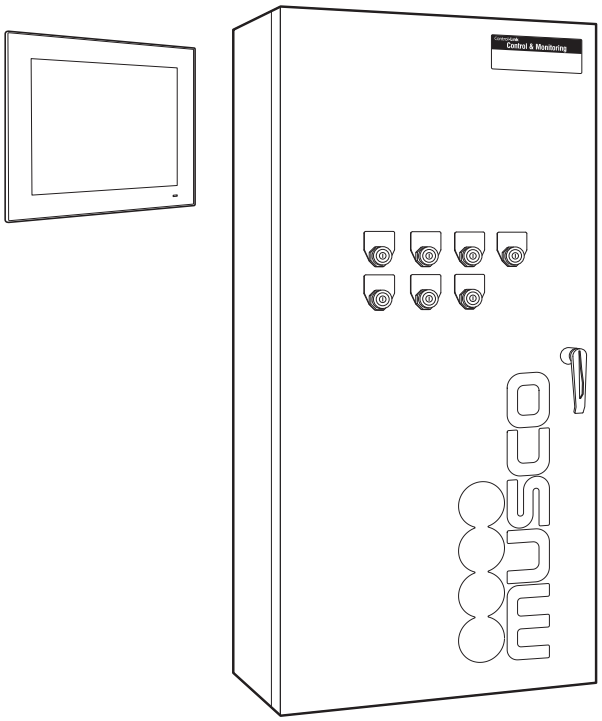
Management and Support

- 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

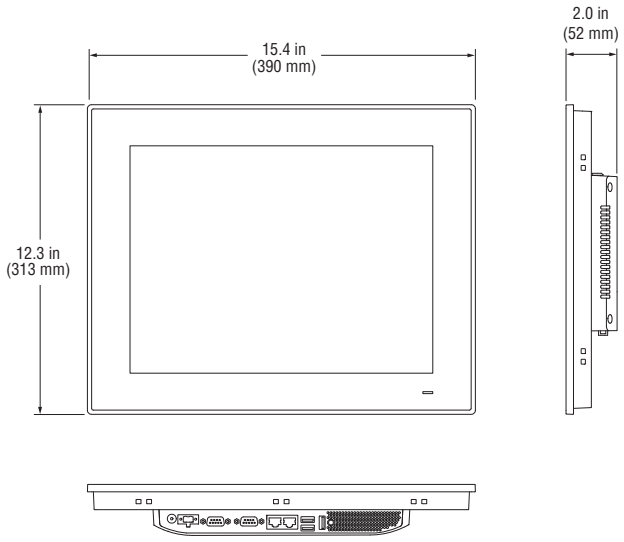
Control and Monitoring Cabinet

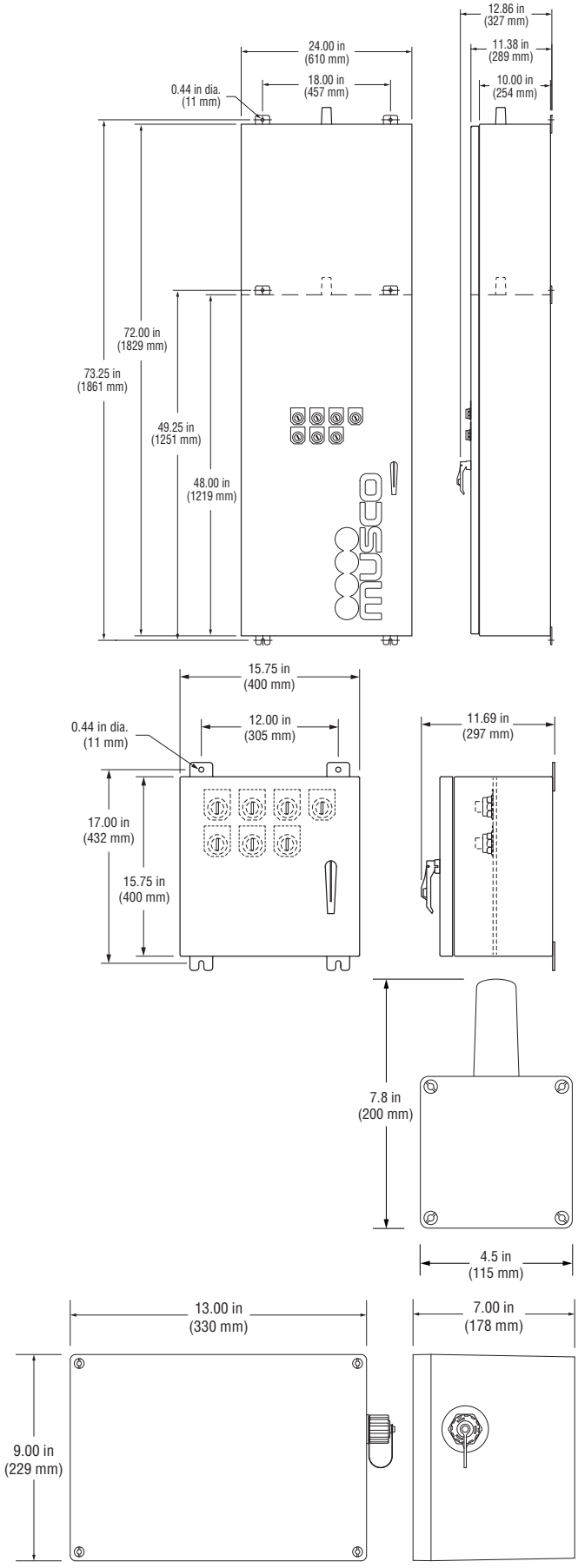
UL 508A Listed E204954
CE declaration . . . . . LVD, EMC, RoHS
IEC 60439-1 compliant . . . . . UL test report 05NK26317
IEC Emissions/Immunity . . . . . Class A compliant
Operating temperature . . . . . -4˚F to 140˚F (-20˚C to 60˚C)
FCC Part 15 . . . . . Class A compliant
Weight for 72 inch (1829 mm) cabinet . . . . . 180 lb (82 kg)
Weight for 48 inch (1219 mm) cabinet . . . . . 140 lb (64 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.



Touchscreen System Interface

Approvals . . . . . UL, CB, CCC, BSMI
CE declaration . . . . . LVD, EMC, RoHS
FCC Part 15 . . . . . Class B Compliant
Operating temperature . . . . . 32˚F to 122˚F (0˚C to 50˚C)
Storage temperature . . . . . -40˚F to 140˚F (-40˚C to 60˚C)
Backlight life . . . . . 50,000 h
Input voltage . . . . . 120 Vac 60 Hz, 240 Vac 50 Hz (Vdc power supply provided)
Mounting options . . . . . Wall or desk mounts
Environment . . . . . Indoor use only





Technical Specifications - Construction

Control and Monitoring Cabinets

- NEMA Type 4 (IP65) cabinet
- Powder-coated aluminum 5052 H32 cabinet and panel
- Lockable, 3-point latch
- Supports lighting system voltage up to 480 V
- Requires 120 V or 230 V phase-to-neutral control voltage
- Protective cover isolates high voltage

On/Off/Auto Manual Switches Cabinet (optional equipment)

- NEMA type 4 (IP65) cabinet
- Powder-coated aluminum 5052 H32 cabinet and panel
- Lockable door
- Hinged interior panel for switch mounting

Remote Wireless Antenna Cabinet (if wireless communication)

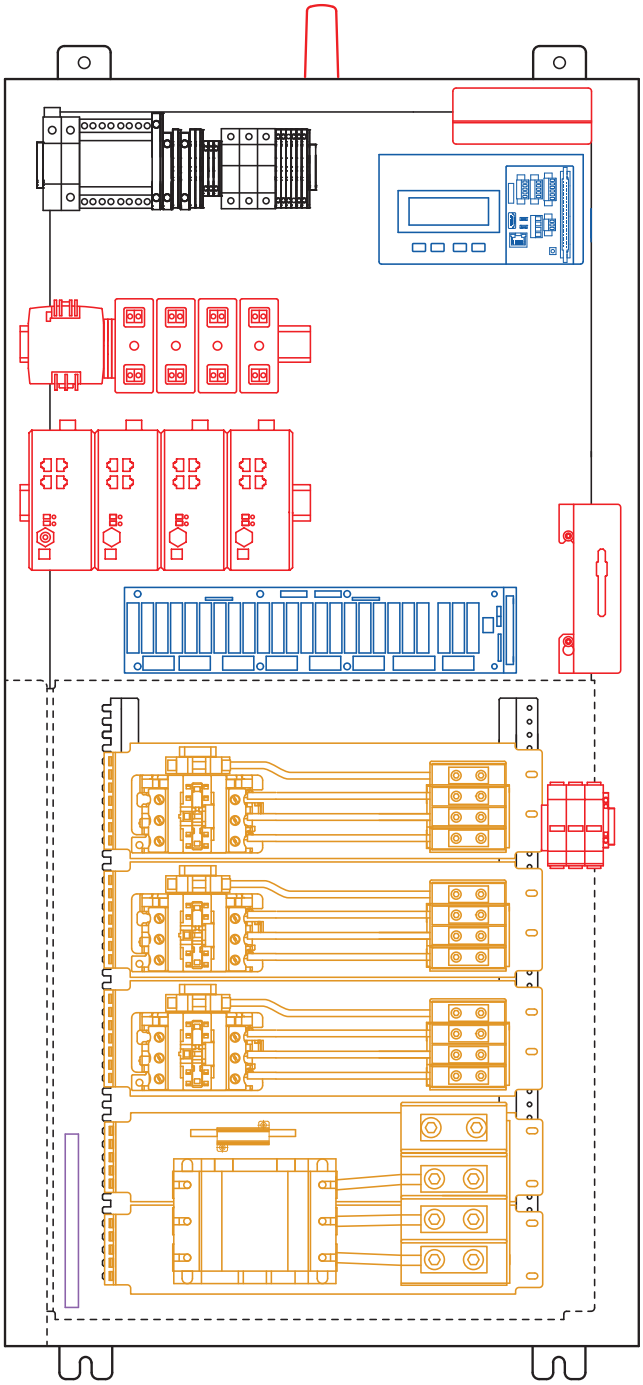
- Cast aluminum with texture gray paint finish
- Omnidirectional antenna
- Operating temperature: -40˚F (-40˚C) to 185˚F to (85˚C)
- Frequency: 900 MHz or 2.4 GHz

Touchscreen Communication Cabinet

- NEMA type 4 (IP65) cabinet
- Powder-coated aluminum 5052 H32 cabinet
- VDSL communication

Internal Details

- Factory wired, programmed, and tested
- Internally fused
- Control power terminal blocks provided
- 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 are carried out.

- Executes light show commands and scheduled on/off or dimming events.
- Stores schedules for up to 7 days
- Automatic recovery mode to current lighting schedule in the event of power interruption or loss.
- 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 Modules

Communication with Control-Link Central is done via an integrated, high speed, cellular connection with no additional monthly charges during the warranty period.

Communication with luminaire controllers is done via powerline or wireless communication.

- Powerline communication requires a dedicated 20A circuit (distribution panel)
- Wireless communication requires a dedicated antenna to be mounted 3 ft above the cellular antenna, and 7 ft total distance away, and line of sight to remote antennas at light pole locations.
- VDSL communication with touchscreen user interface requires Cat5e cable (Belden 7937A)

Contactor Modules

Switches equipment based on control module schedules.

- Compliant with IEC 60947-4-1 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.

PPC-STAND

Stand Kit For All PPC Models

Features

- Includes VESA standards:75 x 75 mm and/or 100 x 100 mm hole pattern bracket
- Texture of material aluminum
- Modern appearance
- Max. Load-bearing: 10 kg

Introduction

The PPC-STAND fits all 6"~21.5" PPC products, and is designed using aluminium alloy and plastic materials. After many thousands of torque tests, this stand ensure that PPCs products won't change their position.

Specifications

- **Net weight** 7.5 KG
- **Dimensions** 259 x 190 x 354/283 mm
- **Max. Load-bearing** 10kg

Ordering Information

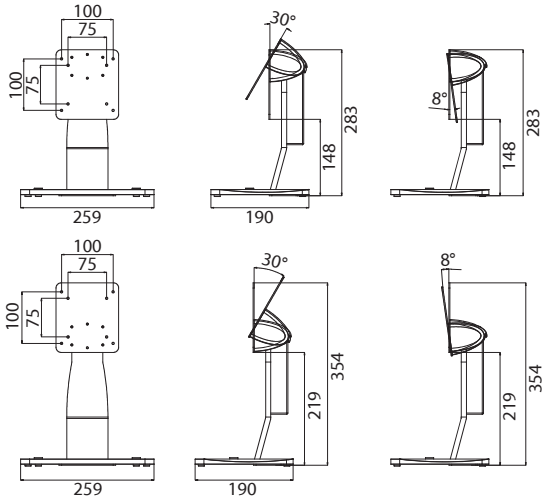
- **PPC-STAND-A1E** Stand Kit for all PPC Models

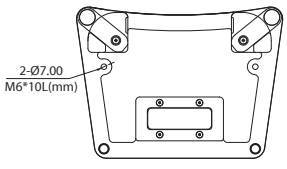
Front

Rear

Dimensions

Unit: mm





Base Plate

Safety: **UL Product Certification**

UL Product Certification for:

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

UL Category	Covers	UL Number
High-Intensity Discharge Surface-Mounted Luminaires	• Green Generation™ luminaires and remote ballast assemblies • SportsCluster® 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 indoor luminaires with Multi-Watt™ control system • 1000 W Show-Light™ and Show-Light Green™ luminaires 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
Industrial Control Panels	Control panels and enclosures for: • Control-Link® control and monitoring system • Control-Link retrofit control system • Lighting contactor cabinets • Multi-Watt™ control systems	E204954
Emergency Lighting and Power Equipment	• Auxiliary Lighting Interface Cabinet (ALIC)	E311491
Luminaire Fittings	Galvanized steel poles 12 ft (3.7 m) or less for: • Poles for Mirtran™ luminaire mounting • Rooftop poles • Special applications	E132445
Luminaire Pole in Excess of 12 ft (3.7 m)	Galvanized steel poles greater than 12 ft (3.7 m) for: • Light-Structure System™ luminaire mounting • Sportspole™ structure or mounting system and special applications	E325078

Safety: **UL Product Certification**

UL Category	Covers	UL Number
Devices, Scaffolding	Service platforms for: • Light-Structure System™ luminaires and remote ballast assemblies • SportsCluster® System luminaires and remote ballast assemblies	SA7004
Lightning Conductors, Air Terminals, and Fittings	• Light-Structure System™ pole structure concrete base	E337467
Light-Emitting-Diode Surface-Mounted Luminaires	• LED luminaires and driver assemblies • LED auxiliary luminaires	E338094

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

Manufacturer's Certification of Corrosion Protection for Light-Structure System™ and SportsCluster® Lighting Systems

The following standard corrosion protection is provided on your equipment:

- All exposed components are constructed of corrosion-resistant material and/or coated to protect against corrosion.
- All exposed carbon steel is hot-dip galvanized, meeting ASTM A123 and ISO/EN 1461.
- All exposed aluminum is powder-coated with high-performance polyester or anodized. All exterior reflective inserts are anodized, coated with a clear, high-gloss, durable fluorocarbon, and protected from direct environmental exposure to prevent reflective degradation or corrosion.
- All exposed hardware and fasteners are stainless steel, passivated, and coated with an aluminum based thermosetting epoxy resin for protection against corrosion and stress corrosion cracking. Alternately, for hardware in non-stressed applications, an electroless nickel coating meeting ASTM B733 may be used. Pole strapping used to mount certain equipment to light poles is annealed grade 304 stainless steel and passivated.
- Certain structural fasteners are carbon steel, galvanized meeting ASTM A153 and ISO/EN 1461 (for hot-dip galvanizing), or ASTM B695 (for mechanical galvanizing).

This corrosion protection package only applies to equipment manufactured by Musco.

Musco Sports Lighting, LLC

Greg Kubbe
Director of Product Performance