Addendum #1

Bid Number 23/24-27

Downey and Warren High School Musco Stadium Lighting Retrofit

The changes made under this Addendum of the Contract Documents, Specifications, Special Provisions, and Plans for the above project Bid Packet are as follows:

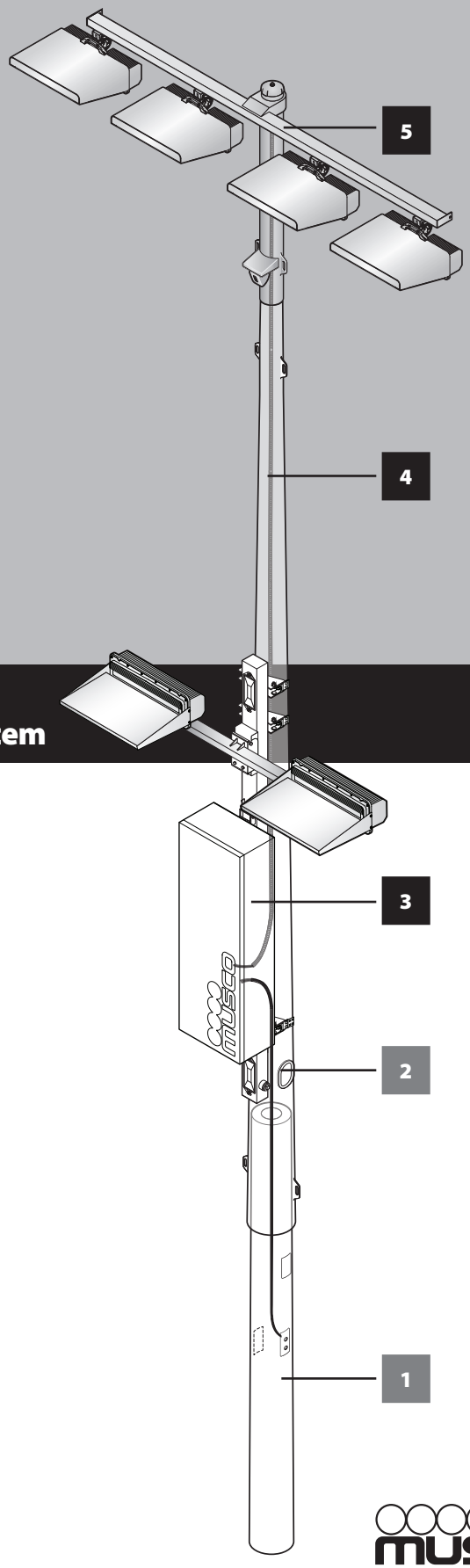
Item 1. Contract Documents

1. Please include attached Downey and Warren High Schools stadium lighting retrofit plans to project manual.
2. Update the Project Manual, Agreement (DOCUMENT 00 45 10-2), item "4. Classification of Contractor's License" to reflect a Type B California contractor's license. Remove Type C-39 and reference to Audio Enhancement and Extron certified and authorized dealer.
3. In the Summary of Work (DOCUMENT 01 11 00-1), please strike 1.02, A, (3) from summary of work for the contractor to have to provide and install one Myers Inverter per site.

Item 2. Pre-Bid RFIs

1. Please provide location of where the inverter shall be installed at both sites. In the electrical room located inside the weight room at both school sites.
2. Confirm if existing inverter feeder shall be reused to feed new inverter, and if exiting inverter breaker shall be reused. The existing breaker is 70A/3P 480V. Inverter has been removed from the summary of work.
3. Will the existing Myers inverters need to be removed? Yes.
4. Please provide structural anchorage detail for new Myers inverter. Inverter has been removed from the summary of work.
5. Please confirm that there are existing emergency circuits to each pole at both sites. Confirmed.
6. Please advise if any breakers will need to be removed and replaced with new? If so, specify what breakers will need to be replaced. No breakers need to be replaced.
7. Is electrical engineering required? The new inverter may require new breaker, feeder, and branch wiring rework based on location. Inverter has been removed from the summary of work.
8. Please provide model # and kVA size of Myers inverter that shall be included. Inverter has been removed from the summary of work.
9. For this bid, I believe it's for installation of Musco lighting that we've already ordered. Is that correct? Correct. This is an owner provided, contractor installed project.

END OF DOCUMENT



Installation Instructions:
Light-Structure System™ Retrofit Lighting System

Upgrade to TLC for LED® with 5 Easy Pieces™ approach to system design

5 **Poletop Luminaire Assembly**

4 **Wire Harness**

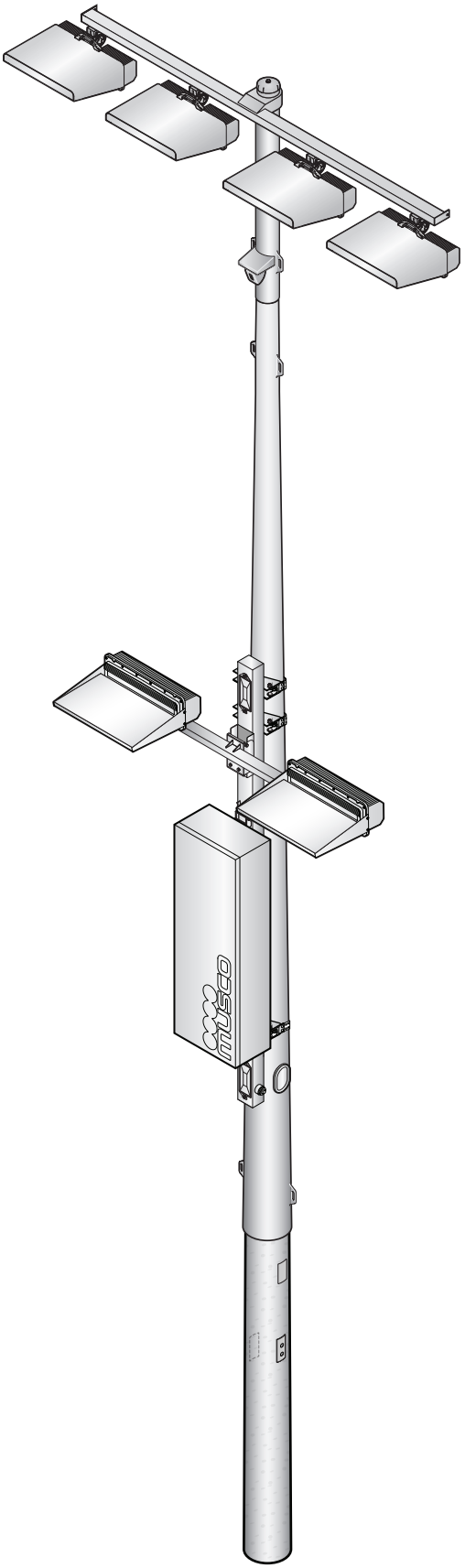
3 **Electrical Components Enclosure**

2 **Existing Galvanized Steel Pole**

1 **Existing Precast Concrete Base**

We Make It Happen.

Table of Contents



Before You Begin

Safety Information

Electrical Safety Guidelines

Use extreme caution near overhead power lines or underground utilities. Observe all safety precautions for high-voltage equipment. Only qualified personnel may perform wiring. Follow all applicable building and electrical codes.

General Safety Guidelines

Follow proper safety procedures and established requirements during installation. Installers must wear the appropriate personal protective equipment including, but not limited to:

- Hard hat
- Steel-toed shoes
- Leather work gloves
- Eye protection
- High-visibility vest

Locate all underground utilities prior to digging.

All tools and equipment supplied by Musco are designed for specific use as described in these instructions. Do not use them in any other manner. Do not alter structural members in any way, such as bend, weld, or drill, without prior authorization from Musco.

Luminaire Mounting Information

Luminaire	Minimum Distance (per IEC/TR 62778)[1]	Projected Area (per IEC 60998-2-5)[2]
TLC-LED-400	29 m (95 ft)	5.3 ft^2 (0.49 m^2)
TLC-LED-550	29 m (95 ft)	3.3 ft^2 (0.30 m^2)
TLC-LED-550NR	29 m (95 ft)	3.7 ft^2 (0.34 m^2)
TLC-BT-575	12 m (40 ft)	3.8 ft^2 (0.35 m^2)
TLC-LED-600	29 m (95 ft)	5.3 ft^2 (0.49 m^2)
TLC-LED-900	29 m (95 ft)	5.3 ft^2 (0.49 m^2)
TLC-LED-900NB	no minimum	4.2 ft^2 (0.39 m^2)
TLC-LED-1200	42 m (138 ft)	5.8 ft^2 (0.54 m^2)
TLC-LED-1400NB	38 m (124 ft)	4.2 ft^2 (0.39 m^2)
TLC-LED-1500	42 m (138 ft)	6.3 ft^2 (0.59 m^2)
TLC-RGB-U	12 m (40 ft)	0.95 ft^2 (0.09 m^2)
TLC-RGBW/TLC-RGBA	15 m (49 ft)	5.3 ft^2 (0.49 m^2)
TLC-BT-1500	42 m (138 ft)	6.3 ft^2 (0.59 m^2)
TLC-RGBW-U/TLC-RGBA-U	15 m (49 ft)	1.9 ft^2 (0.18 m^2)

1. The luminaires should be positioned so prolonged staring into the luminaire at a distance closer than 12 – 42 m (40 – 138 ft) is not expected, per IEC/TR 62778. See table.
2. Represents geometric area only. Your structures have been designed using Effective Projected Area (EPA).

Install luminaires outside arm's reach of unauthorized personnel.

Before You Begin

About These Instructions

These instructions give basic assembly procedures for the Light-Structure System retrofit. They are not a comprehensive guide to all possible situations. Direct any questions to your local Musco representative.

Throughout this manual note these important symbols:

The safety alert symbol alerts you of situations that require care and caution to avoid serious personal injury.

The stop and check symbol signals you to stop and verify conditions before proceeding.

The contact Musco symbol appears in special situations where you may need to contact Musco for further information.

The go-to arrow indicates a branch in a procedure for special situations. In case of optional equipment, the instructions may be in another document.

The tip symbol points out advice that makes installation easier.

The recycle symbol identifies recyclable materials.

Before You Begin

Standard Tools/Supplies Checklist

Refer to supplemental instructions provided for additional tools required.

Contractor/installer supplied tools	Function	Page
Hammer, pry bar, banding cutters	Unloading equipment	8, 10
Ground resistance meter	Verifying existing lightning ground system	9
Angle grinder	Removal of poletop luminaire assembly	10, 13
Dead blow mallet	Removal of poletop luminaire assembly	13
Two 1½ ton chain-type come-alongs	Jacking pole sections together	27, 30
Large Phillips-head screwdriver	Tightening captive screws to seal enclosure to pole hub	12, 14, 16
Standard screwdriver	Tightening distribution lugs, 45 A disconnect switch	36, 37
Torque wrench with ⅜, 7⁄16 and 9⁄16 in sockets	Tightening luminaire retaining cable and spreader bar hardware. Must cover a range of torque from 5 ft•lb to 40 ft•lb (6 N•m to 55 N•m)	22, 26, 33
Torque wrench to cover the following ranges: 60 in•lb (6.8 N•m) to 120 in•lb (13.6 N•m) 12 ft•lb (21.7 N•m) to 40 ft•lb (54.2 N•m)	Proper torquing of fasteners	17 – 37
Electrical fish tape, electrician's tape	Feeding wire harness through pole	17, 35
Spray paint, chalk, or flags	Marking points to sight in aiming	27
10 ft (3 m) stepladder or small line truck	Connecting supply wires to electrical enclosure	14, 36
Musco supplied tools	**Function**	**Page**
9⁄16 in wrench	Tightening poletop set screw, pole cap fastener, enclosure hanger bolt, and spreader bar hardware	11 – 32
1 1⁄16 in socket, extension, breaker bar, and 1 1⁄16 in wrench	Tightening structural fasteners	10, 13, 32
7⁄16 in ratcheting combination wrench	Tightening captive bolts to secure luminaire assembly	24, 26
5⁄32 in hex key	Attaching handhole covers on base and steel pole	34, 35, 37
3⁄16 in hex key	Attaching grounding conductors inside electrical enclosure	36, 37
5⁄16 in hex key	Attaching grounding conductors inside pole at handhole	36, 37
5 mm hex key	Landing primary feed wires on 125 A disconnect switch	36, 37
Dishwashing liquid (original Dawn®, ECOS® Pro, or DIAO™ brand)	Lubricating pole slip-fit connections	27
Machinery needed	**Function**	**Page**
Crane or forklift with nylon strapping and 8 ft (2.5 m) sling (sized to weight of poletop luminaire assembly)	Unloading materials, lifting new assemblies	8, 10 – 13, 21, 28
Manlift or bucket truck	Poletop setting and removal, enclosure setting and removal	14 – 36
Load-rated crane, nylon slings, and shackles	Setting poletops	8, 10 – 12, 21, 28

Documents You Need

- ❑ Musco *Foundation and Pole Assembly Drawing*
- ❑ *Field Aiming Diagram*
- ❑ *Control System Summary*

If you do not have all of these documents, contact your local Musco representative.

Before You Begin

Electrical System Requirements

A qualified electrician must handle the electrical supply installation and hook-up in accordance with national, state, and local codes. Your electrician should review this information before installation begins.

Ensure supply wiring is rated for 90°C. Review the label inside the electrical components enclosure door and *Control System Summary* for voltage and phase requirements.

Luminaires generate up to 2.6 mA per driver on the equipment grounding conductor and are designed to meet leakage current requirements per IEC 61347-1

Basic insulation provided between RS-485 control input and main power supply.

Basic insulation provided between lighting controller (driver control/power and dimming relay) terminals and main power supply.

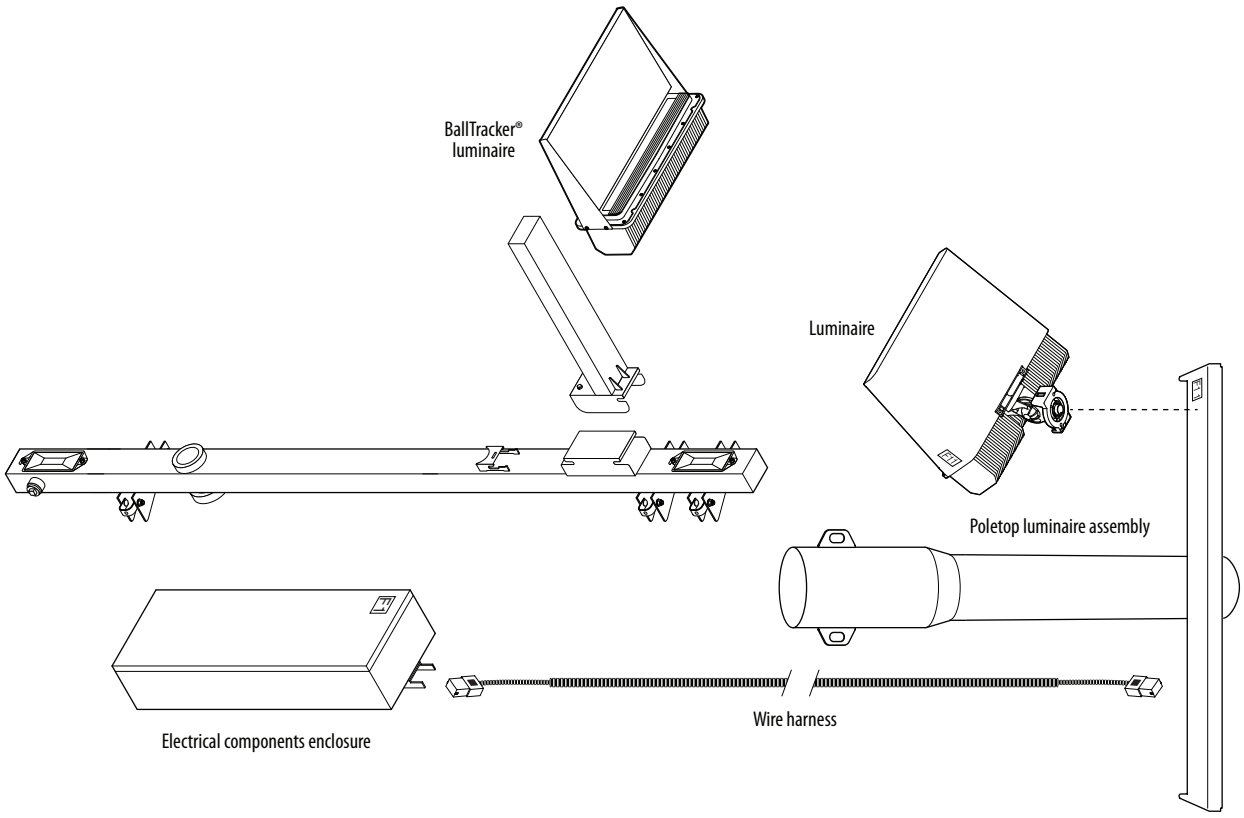
Inspect all wiring for damage prior to installation.

Always dispose of electronic waste in accordance with all applicable laws and regulations.

Components Matching and Labeling

Pole locations are identified by a pole ID (A1, A2, B1, B2, etc.) on the *Field Aiming Diagram*. These IDs are also marked on the individual components:

- Poletop luminaire assemblies, bolt-on crossarms, and luminaire shipping cartons
- Wire harnesses
- Electrical components enclosures



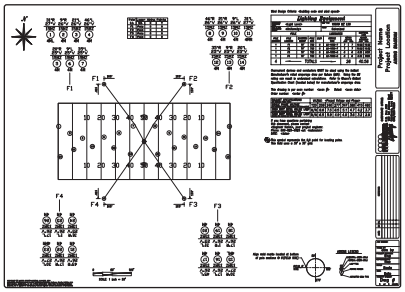
Before You Begin

Documents We Provide

Field Aiming Diagram

The *Field Aiming Diagram* is your map for locating all poles on your project. It gives this information:

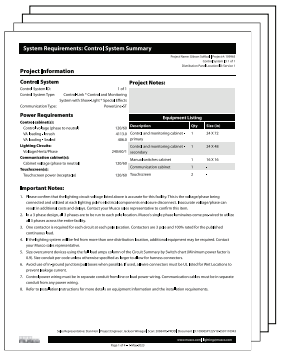
- Pole IDs, locations, and heights
- Luminaire IDs
- Field orgin for coodinate measuring
- Common aiming point for all poles, or individual aiming points for each pole
- Factory-set aimin information for each luminaire
- Full load current for each luminaire



Control System Summary

Projects with a control system include a *Control System Summary*. It gives this information:

- Control system diagram and details
- Contactors and cabinets
- Lighting circuits
- Voltage, phase, and frequency
- Full load current for each circuit

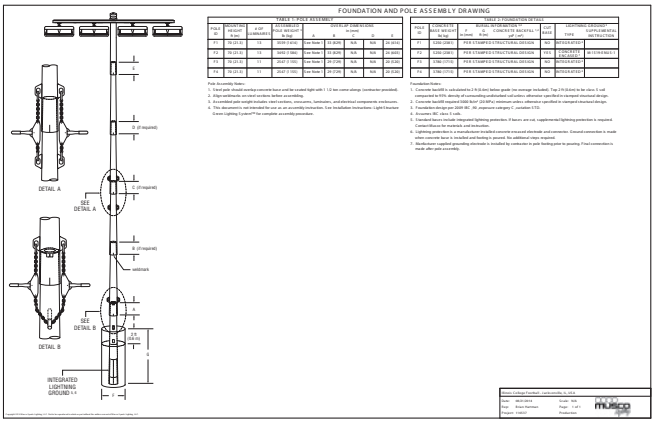


System Requirements: Control System Summary

Musco Foundation and Pole Assembly Drawing

This drawing provides information related to the installation of the poletop luminaire assembly.

- Poletop or crossarm weight
- Poletop luminaire assembly minimum overlaps



FOUNDATION AND POLE ASSEMBLY DRAWING

Before You Begin

Unloading Instructions

A typical shipment includes electrical components enclosures, wire harnesses, and poletop luminaire assemblies with luminaires.

For ease of installation, set all matched components by the proper pole location as noted on the *Field Aiming Diagram*.

Tools/Materials Needed

- ❑ Crane with nylon web sling or forklift (load rated)
- ❑ Hammer
- ❑ Pry bar
- ❑ Banding cutters

Warning
Crushing hazard.

Do not cut shipping bands or remove blocking from equipment until it is supported by unloading equipment.

- Check bill of lading to verify you have all materials.
- Inspect all materials for shipping damage.
- Store electrical components enclosures and luminaires in a dry location or cover with tarp until ready to install.

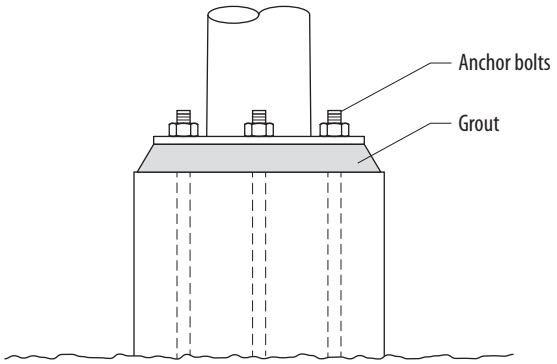
If additional information is needed, contact your local Musco representative.

Please recycle.
Luminaires, wire harnesses, and other components are shipped in recyclable cardboard packaging.

Before You Begin

Inspections

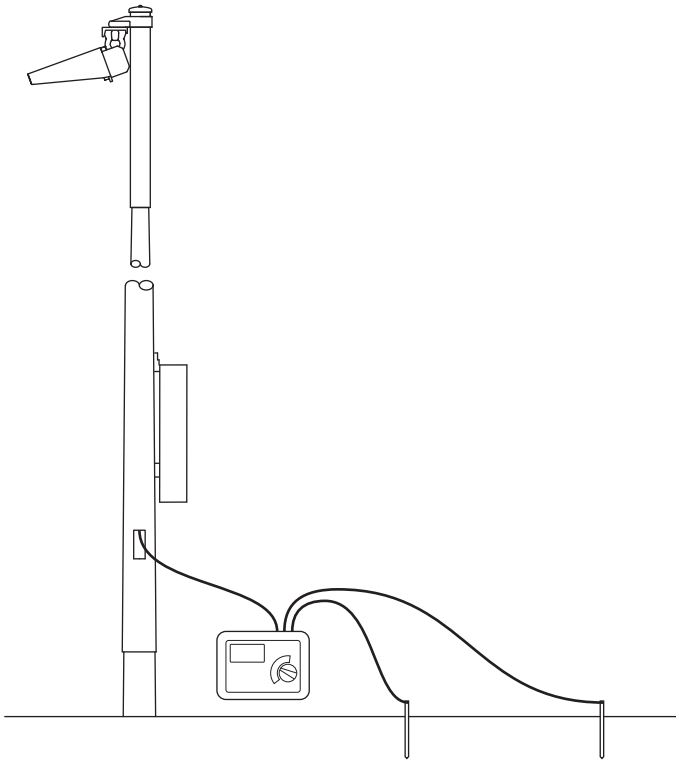
1 A qualified inspector must examine the base and pole sections for damage or prior field modifications.



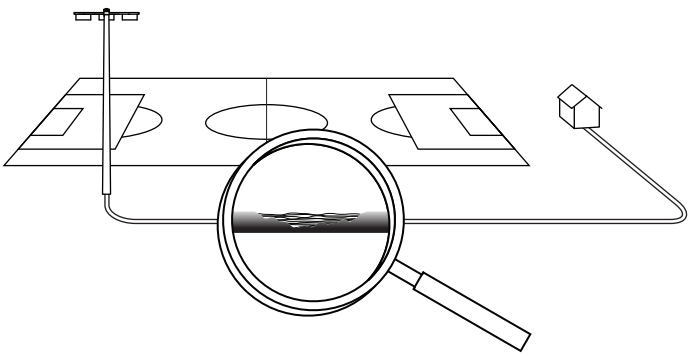
2 Inspect material used to protect exposed bolts. If repair is required, Musco recommends removing damaged material and replacing with wire mesh.

3 If pole is equipped with an external ground rod, test earth ground connection of pole. If greater than 25 ohms, install additional ground rod and retest.

Repeat until < 25 ohms.



4 Conduct insulation test on all conductors. No individual conductor should be less than 100Mohms.



Notify your local Musco representative if concerns are identified with any of these items.

Disassembly

Overview

Remove the existing equipment to be replaced: electrical components enclosures, wire harness, and poletop luminaire assembly (or bolt-on crossarms).

Tools/Materials Needed

Musco Supplied (For bolt-on crossarms.)

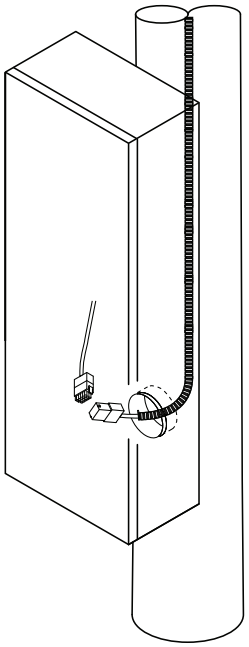
- ❑ 1 1/16 in socket, ¾ in drive
- ❑ Breaker bar, ¾ in drive
- ❑ 4 in extension, ¾ in drive
- ❑ 1 1/16 in wrench

Contractor Supplied

- ❑ 9/16 in wrench, 9/16 in socket and ratchet
- ❑ Angle grinder with metal cutting wheel
- ❑ Crane and slings to support poletop luminaire assembly
- ❑ Dead blow hammer
- ❑ Ratchet, ¾ in drive

Disassembly

1 In electrical components enclosure, disconnect pole harness from enclosure harness. Feed end of pole harness into pole interior. Cut off connector if necessary.

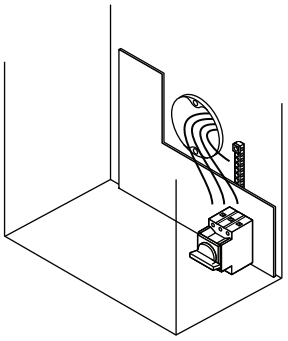


⚠ **Warning**
Risk of electrical shock

Ensure all circuits are disconnected before proceeding.

2 Disconnect electrical supply wiring and equipment grounding conductor.

3 Remove wire harnesses between top, middle, and bottom boxes.



4 Remove wiring between stacks.

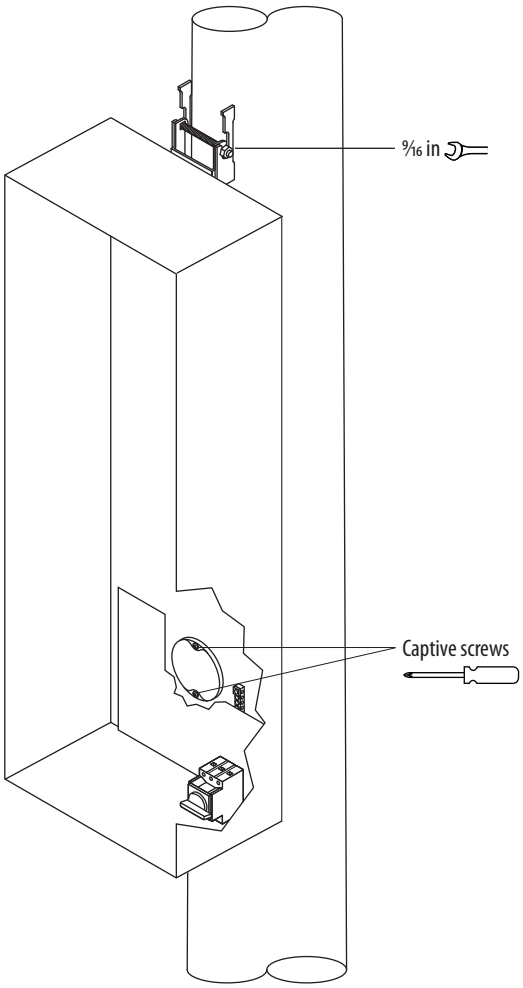
Disassembly

5 Using 9⁄16 in wrench and Phillips screwdriver, loosen enclosure hanger bolts, and captive hub screws.

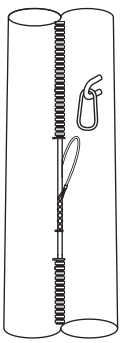
6 Using a crane and sling, remove enclosures from the stack, starting at the top.

Warning
Falling equipment hazard

Enclosures may weigh up to 225 lb (102 kg). Lift with caution.



7 Disconnect middle wire support grip on poles greater than 80 ft (24.5 m).



Leave the pole harness connected to the poletop luminaire assembly. It will pull out as the poletop is removed.

Disassembly

8 Determine if entire poletop luminaire assembly (welded crossarms) or crossarms only (bolted crossarms) will be replaced.

If replacing bolt-on crossarms, skip to Step 13.

9 Using 9⁄16 in wrench, loosen set screw.

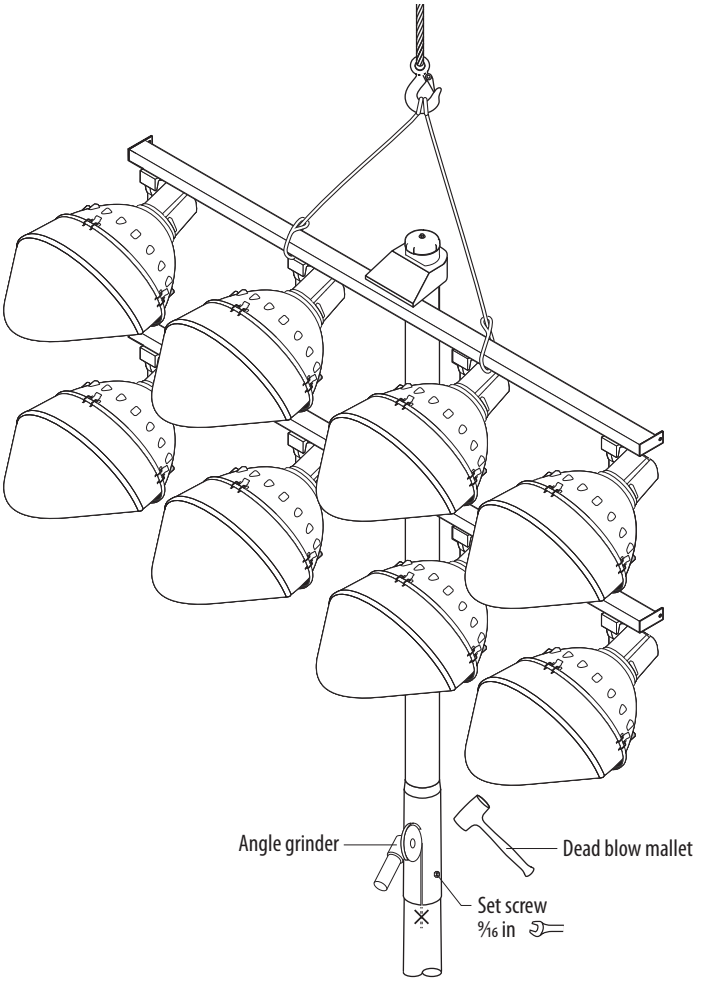
10 Use crane to sling around the top crossarm and provide a slight separating force to the poletop.

Warning
Crushing hazard

Do not attempt to "pop off" the poletop using the crane only as the high separating forces can cause an uncontrolled separation and potential injury.

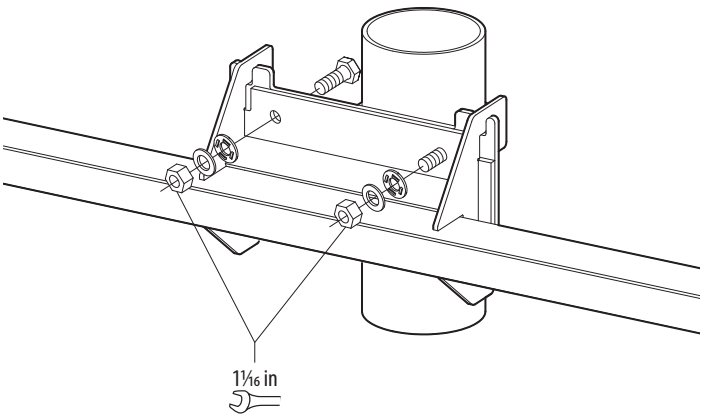
11 Use an angle grinder to make a relief cut in the overlap area of the poletop luminaire assembly. Do not damage the pole section underneath the poletop.

12 Tap on the poletop with a dead blow mallet until it begins to move and separate.



13 Use crane and sling to support crossarm.

14 Use supplied breaker bar, 1 1⁄16 in socket, extension, and wrench to remove crossarm retaining bolts.



Electrical Components Enclosure and BallTracker® Luminaire

Overview

The electrical components enclosure is factory-wired and tested. It contains essential electrical components of the lighting system in an accessible location.

Tools/Materials Needed

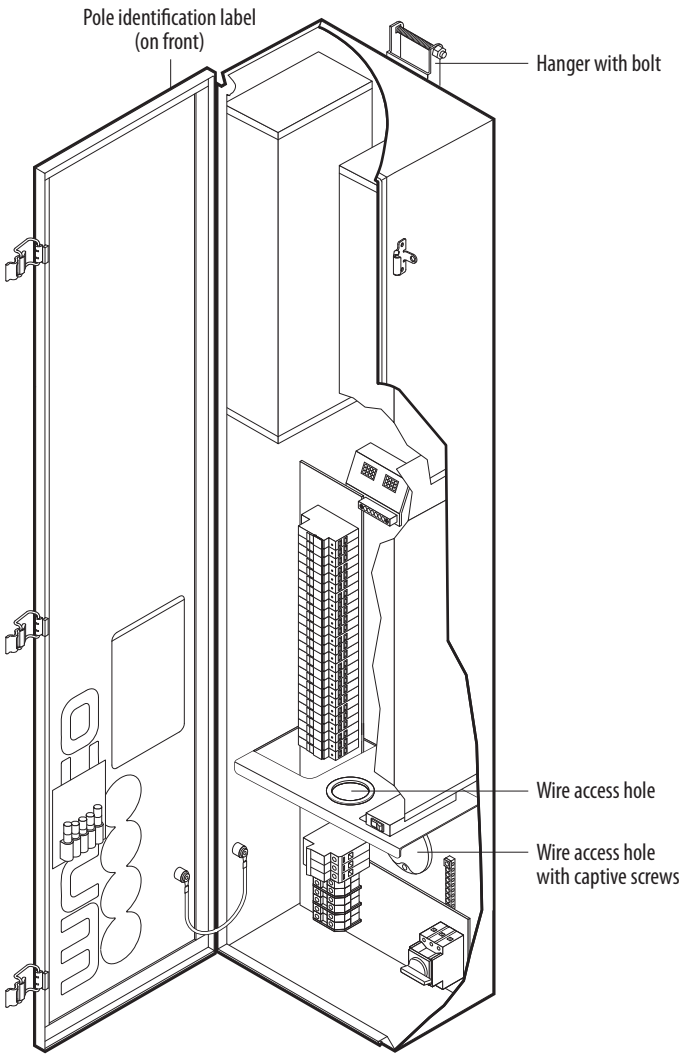
Musco Supplied

- ❑ ½ and 9⁄16 in offset combination wrenches
- ❑ Snips
- ❑ *Field Aiming Diagram*

Contractor Supplied

- ❑ Torque wrench with ½ and 9⁄16 in sockets
- ❑ Large Phillips-head screwdriver
- ❑ Measuring tape
- ❑ Marker
- ❑ 10 ft (3 m) stepladder or small line truck

Consult project documents to determine if your enclosures will mount on existing hangers or if new mounting bracket has been provided.



Electrical Components Enclosure and BallTracker® Luminaire

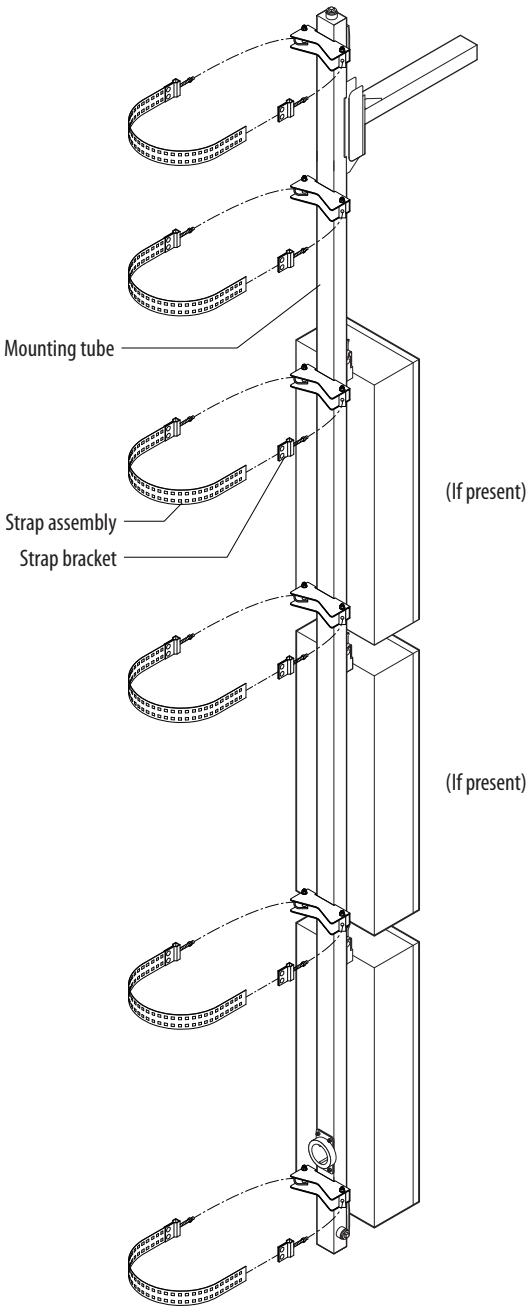
Round Pole Strap Selection

Diameter	Round Pole Strap Length
0 – 17 in (0 – 432 mm)	45 in (1143 mm)
17.01 – 22 in (432 – 559 mm)	60 in (1524 mm)
22.01 – 28 in (559 – 711 mm)	78 in (1981 mm)
28.01 – 34 in (711 – 864 mm)	96 in (2438 mm)
34.01 – 40 in (864 – 1016 mm)	114 in (2896 mm)
40.01 – 46 in (1016 – 1168 mm)	132 in (3353 mm)

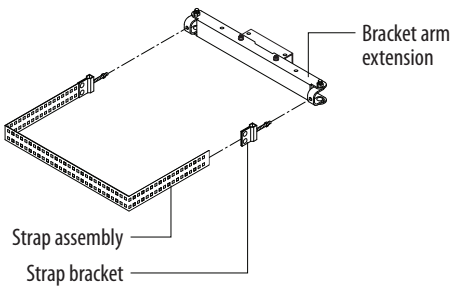
Square Pole Strap and Bracket Selection

Width	Strap Length	Bracket Arm Extension Width
0 – 12 in (0 – 304 mm)	45 in (1143 mm)	14 in (356 mm)
12.01 – 16 in (304 – 406 mm)	60 in (1524 mm)	18.5 in (470 mm)
16.01 – 20 in (406 – 508 mm)	78 in (1981 mm)	22.5 in (572 mm)
20.01 – 24 in (508 – 610 mm)	96 in (2438 mm)	26.5 in (673 mm)
24.01 – 28 in (610 – 711 mm)	114 in (2896 mm)	30.5 in (775 mm)

Mounting tubes are marked with pole ID. One strap assembly and one strap bracket required per mounting arm (as shown).



Round pole option (shown)



Option for square pole

Electrical Components Enclosure and BallTracker® Luminaire

Verify pole ID on electrical components enclosure matches pole location on *Field Aiming Diagram*.

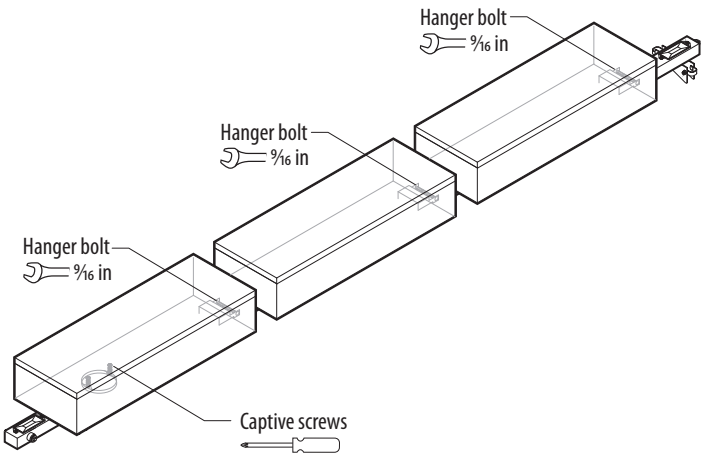
Assembly Procedure

Caution
Electrical components enclosures are heavy

Electrical components enclosure may weigh up to 65 lb (30 kg). Lift carefully with two people to avoid injury.

1 Mount bottom enclosure on tube. Align wire access hole with hub. Tighten captive screw using Phillips-head screwdriver. Tighten hanger bolt with 9⁄16 in wrench.

2 Mount middle and/or top enclosures. Align access hole with hub and slide box onto hanger bracket. Tighten hanger bolt with 9⁄16 in wrench.



Electrical Components Enclosure and BallTracker® Luminaire

3 If pole includes a BallTracker® luminaire, attach bracket using ¾ in socket and torque wrench. Tighten captive bolts to 40 ft•lb (54 N•m).

4 Position crossarm near poletop, and feed crossarm wire harness through hole in center of poletop plate.

Route crossarm wire harness to upper handhole for connection to pole harness.

Ensure crossarm wire harness is not pinched between mating plates.

5 Using 7⁄16 in socket and torque wrench, tighten captive mounting bolts to 20 ft•lb (27 N•m). Orange tag will break loose before all bolts are fully tight.

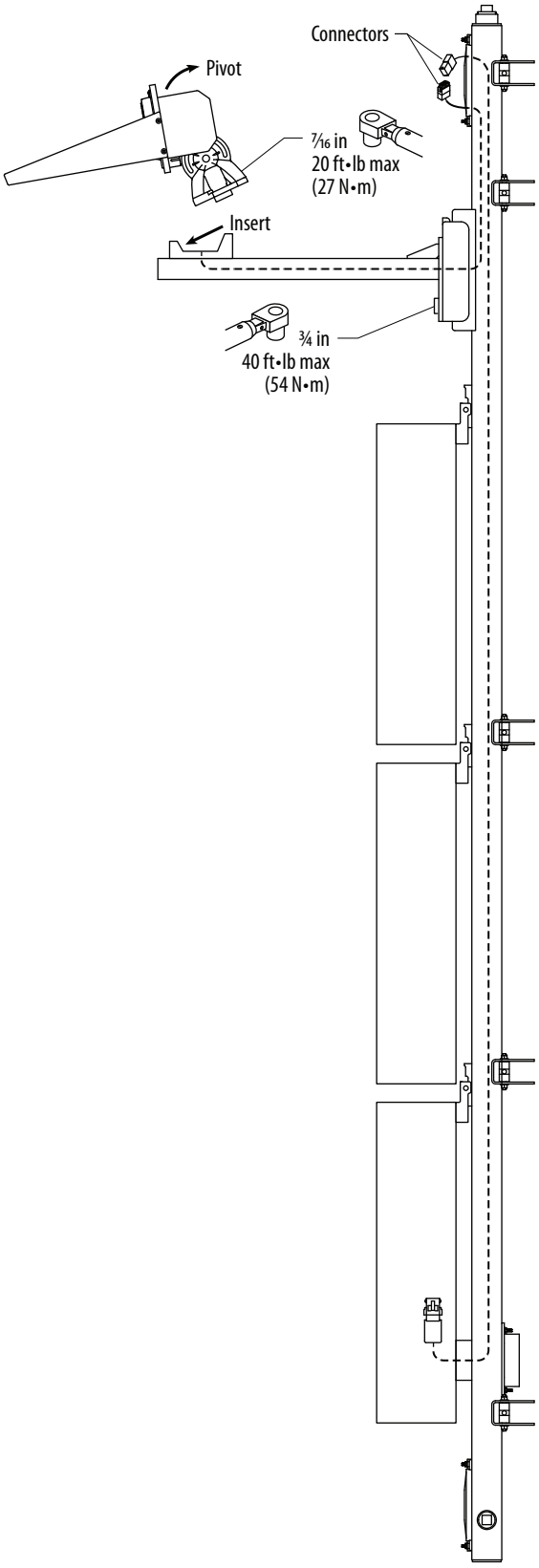
6 Pull BallTracker® wire harness through tube.

Feed bottom of harness into enclosure hub.

7 Fish all pole wire harnesses between poletop and appropriate electrical components enclosure(s). Use handholes to access tube and aid in routing pole harness. Ensure protective sleeve extends through access hub and tuck harnesses behind subpanel.

8 Attach support grips at top handhole.

9 Mate quick-connectors at poletop and inside electrical components enclosure(s). Match driver/luminaire IDs.

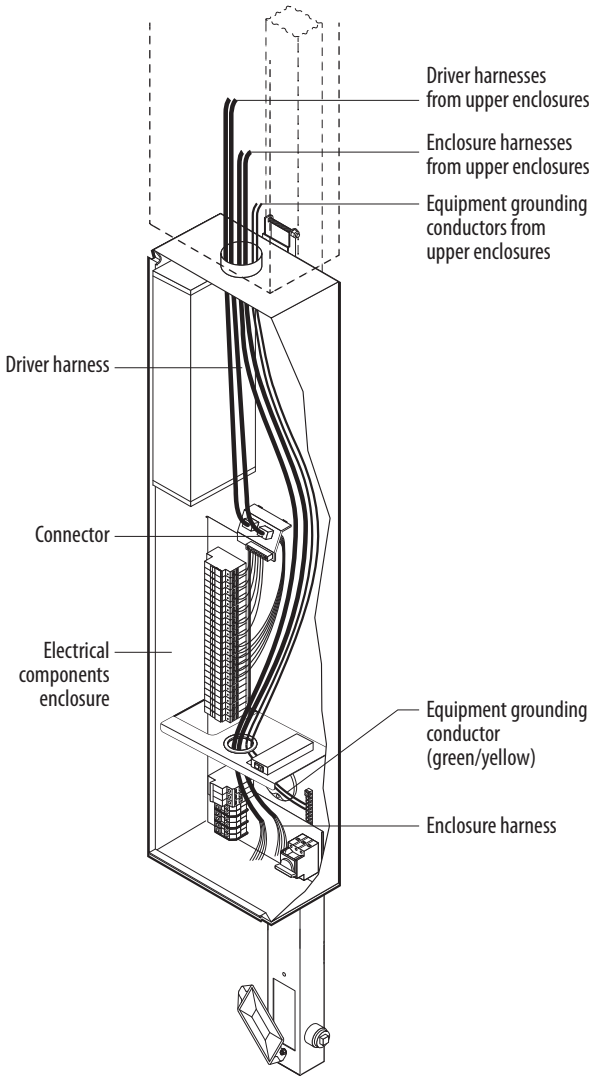


Electrical Components Enclosure and BallTracker® Luminaire

Only qualified personnel may perform wiring. Route wires as shown, but leave final connections for your electrician.

10 Route driver harnesses from top and middle enclosures to bottom enclosure and plug into connector mounted in bracket.

11 Route equipment grounding conductor and enclosure harnesses from top and middle enclosures to bottom enclosure.

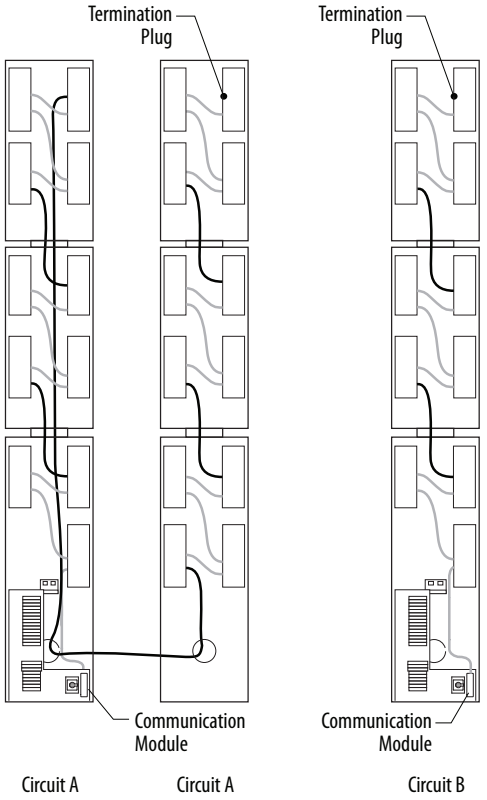


Electrical Components Enclosure and BallTracker® Luminaire

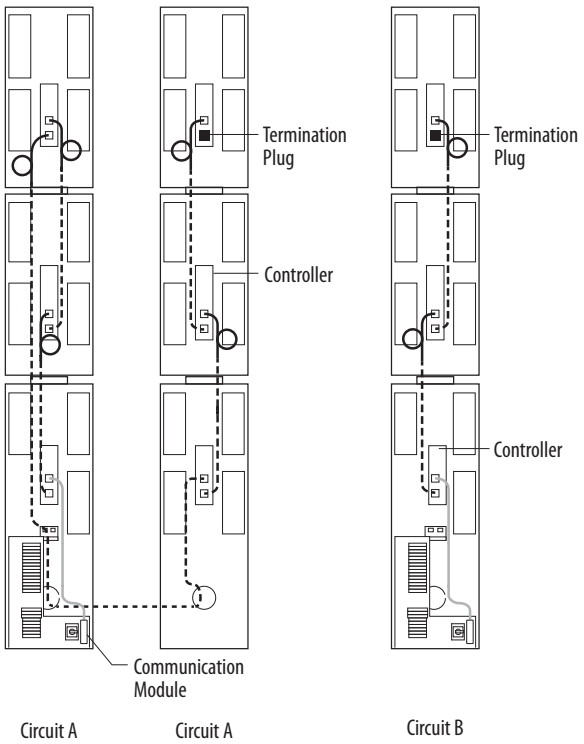
Note: Skip step 12 if drivers or controllers do not include communication.

12 Pull communication cables down from top and middle boxes and plug into driver or controller in enclosure below as shown.

Connecting Drivers



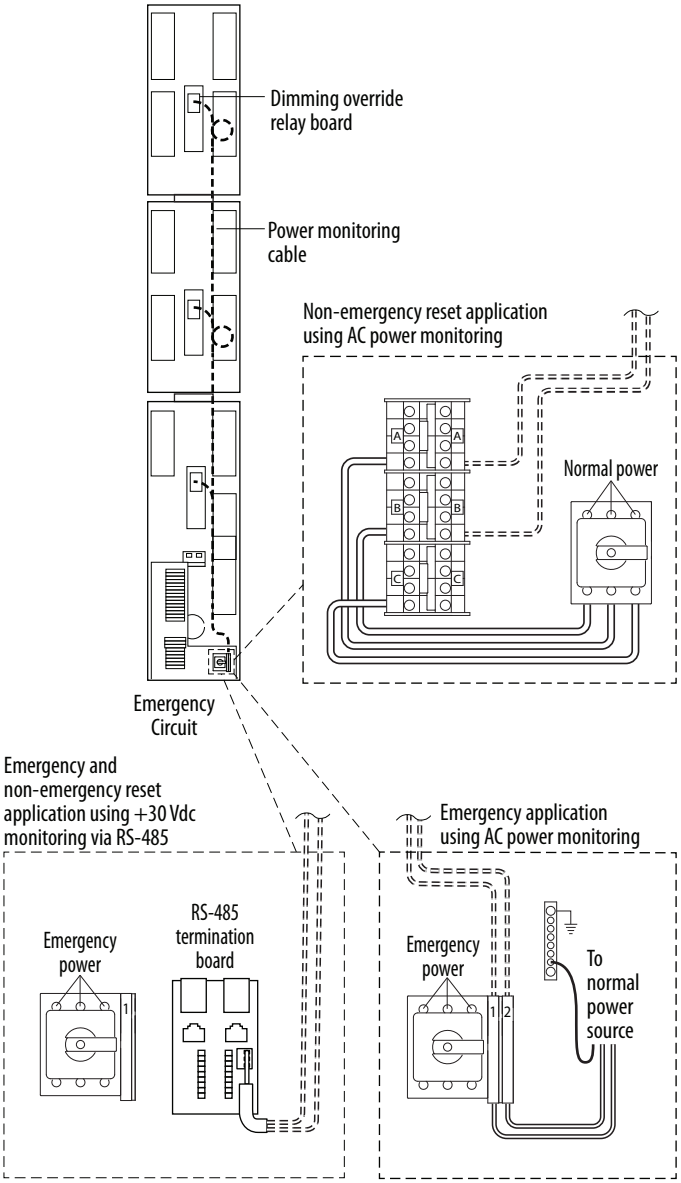
Connecting Controllers



Electrical Components Enclosure and BallTracker® Luminaire

Skip Step 13 if emergency egress lighting dimming override relay board is not present.

13 Pull power monitoring cable from dimming override relay board in top and middle enclosures down to bottom enclosure and land black wire on terminal block M1 and blue/white wire on terminal block M2.



Electrical Components Enclosure and BallTracker® Luminaire

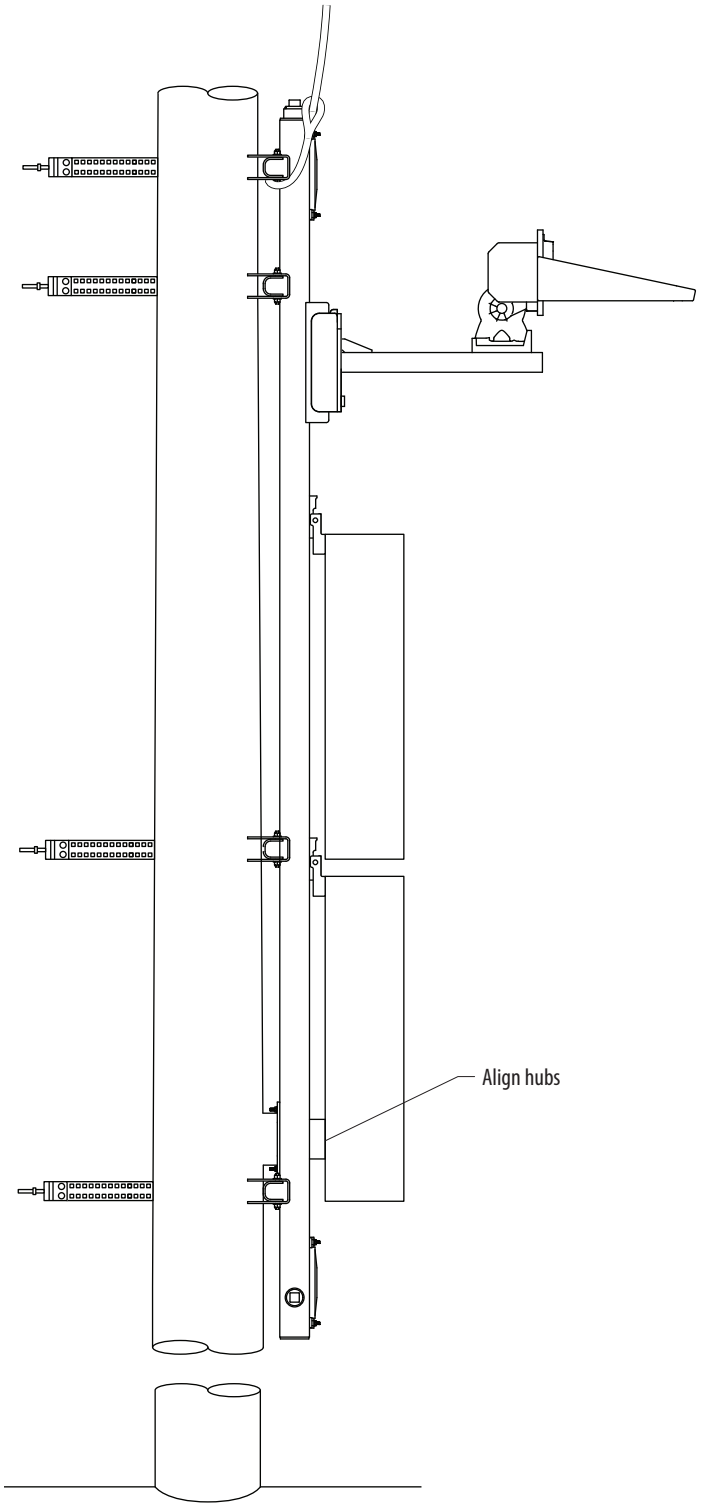
Installation Procedure

- ☑ Verify pole ID on electrical components enclosure matches pole location on *Field Aiming Diagram*.

1. Sling enclosure stack under the welded arm for strapping connections (not under BallTracker luminaire crossarm) and lift enclosure stack.
2. Align hub on tube with pole hub.

- ☑ Enclosure stacks that are not mounted on a pole hub will include cover plates for tube opening. Ensure these plates are installed.

- ☑ BallTracker® luminaires should face the field. If pole hub does not face the field, contact your Project Engineer or local Musco representative.



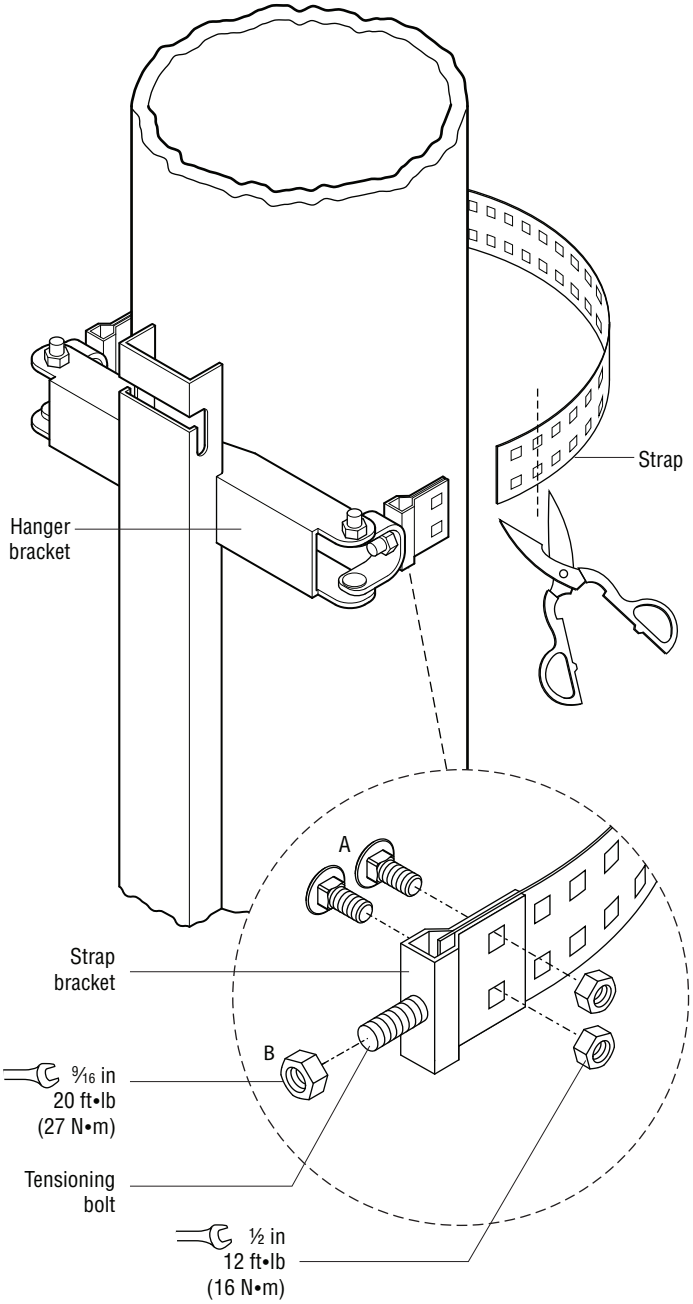
Electrical Components Enclosure and BallTracker® Luminaire

3 Cut straps to required length. Pull tight around pole and trim excess within 1 in (25 mm) of strap bracket. Cut across square holes, not between them.

4 Attach brackets to pole. Torque 5⁄16 in strap bracket hardware A to 12 ft•lb (16 N•m) using ½ in socket and torque wrench. Torque all ⅜ in tensioning nuts B to 20 ft•lb (27 N•m) using 9⁄16 in socket and torque wrench.

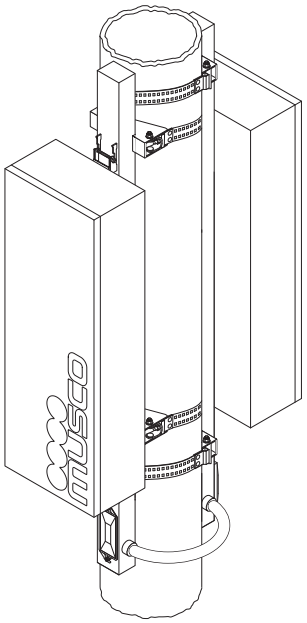
Caution
Falling equipment hazard
Ensure you meet torque values specified on all tensioning hardware.

If tensioning bolt is fully seated and strap is not yet tight, trim strap at next set of holes and repeat step 4.



Electrical Components Enclosure and BallTracker® Luminaire

5 Repeat steps 3 and 4 for back-to-back or multiple stacks.



6 Use 1¼ in hubs provided to run flex conduit between electrical component enclosure stacks.

Luminaire Attachment

Overview

Luminaires are factory built and shipped in individual cartons. They are factory aimed and ready for installation. Do not disassemble knuckle.

Tools/Materials Needed

Musco Supplied

- ❑ 7⁄16 in ratcheting combination wrench

Contractor Supplied:

- ❑ Torque wrench with 7⁄16 in socket

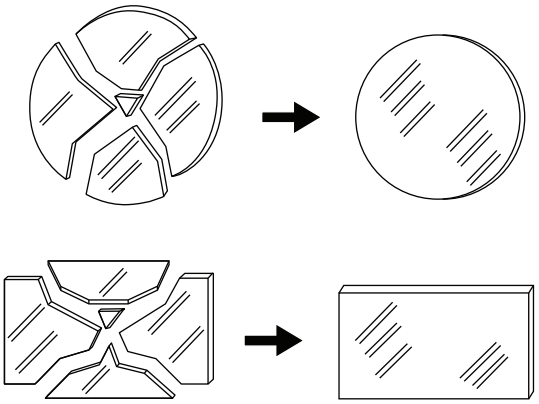
Note: Leave luminaires in box until ready to assemble. Keep protective cover on luminaire until ready to set pole. Do not leave luminaires unassembled from crossarm in wet conditions.

Caution
No User Serviceable Parts

If protective lens glass is cracked or broken, luminaire must be replaced.

Luminaire light source is not replaceable; when light source reaches end of life entire luminaire must be replaced.

Contact your local Musco representative for maintenance or replacement.

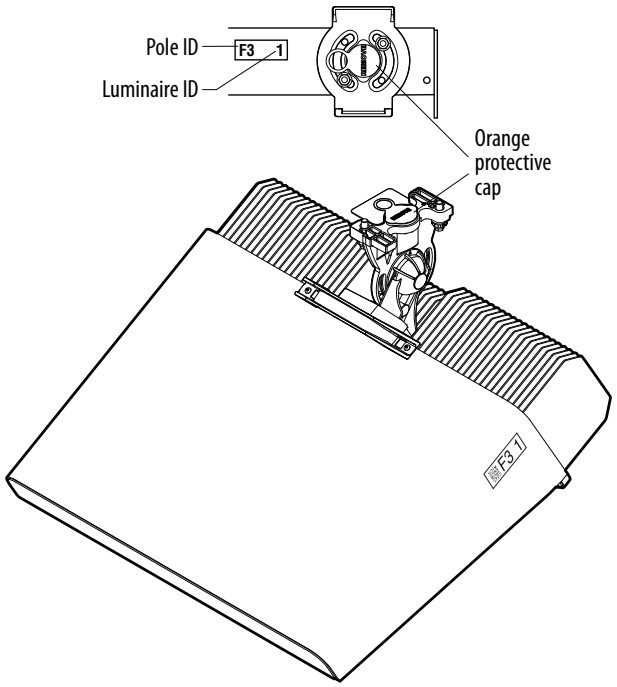


Assembly Procedure

Verify pole ID on luminaire cartons matches pole and location on *Field Aiming Diagram*.

1 Remove and discard orange protective caps from luminaire knuckle and mounting plate that cover electrical connections. Do not remove orange tag around captive bolts.

Note: The luminaire style may vary from what is shown.



Luminaire Attachment

Warning
Risk of injury or property damage

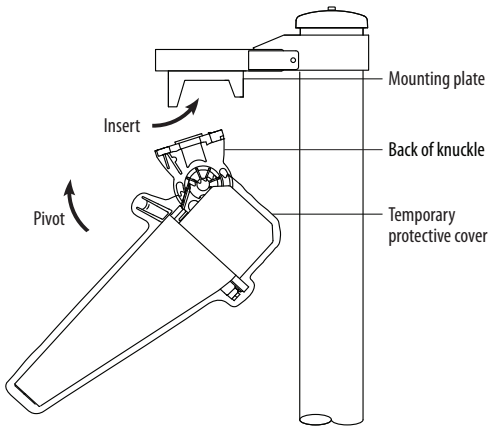
Rotation may be required to assemble all luminaires onto the poletop luminaire assembly. Do not stand under poletop when lifting. Steady with two people holding crossarms. Allow for poletop to safely rotate around when it is high enough for crossarms to clear the ground.

Caution
Risk of injury or property damage

Pole may move without warning. Properly support pole before attaching luminaires.

2 Match luminaire ID to crossarm and install luminaire onto mounting plate. Use handle if present to lift luminaire. Insert back of knuckle into mounting plate and pivot into position.

Note: The luminaire style may vary from what is shown.



Luminaire	Weight
TLC-LED-400	40 lb (18 kg)
TLC-LED-550	25 lb (11 kg)
TLC-LED-550NR	38 lb (17 kg)
TLC-BT-575	34 lb (15 kg)
TLC-LED-600	40 lb (18 kg)
TLC-LED-900	40 lb (18 kg)
TLC-LED-900NB	114 lb (52 kg)
TLC-LED-1200	45 lb (20 kg)
TLC-LED-1400NB	106 lb (48 kg)
TLC-LED-1500	67 lb (30 kg)
TLC-RGB-A	40 lb (18 kg)
TLC-RGB-U	20 lb (9 kg)
TLC-RGBW	40 lb (18 kg)
TLC-TW	40 lb (18 kg)
TLC-BT-1500	67 lb (30 kg)
TLC-RGBW-U/ TLC-RGBA-U	40 lb (18 kg)

Caution
Luminaire May Be Heavy

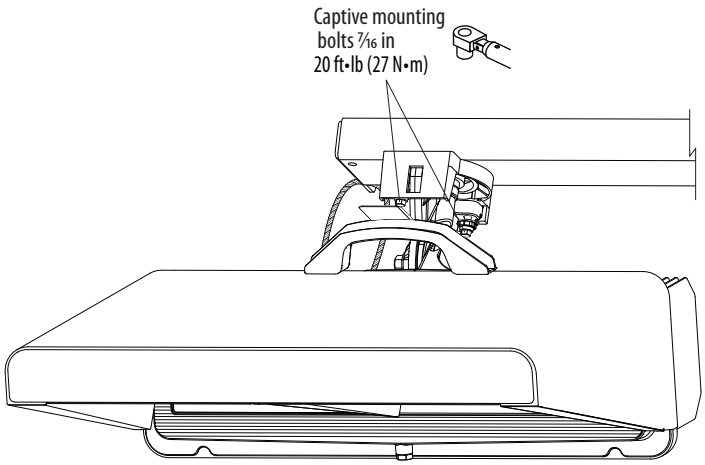
Lift carefully with two people. Do not use visor to lift. Use handle if provided.

Luminaire Attachment

3 Using 7⁄16 in socket and torque wrench, tighten captive mounting bolts to 20 ft•lb (27 N•m). Orange tag will break loose before all bolts are fully tight.

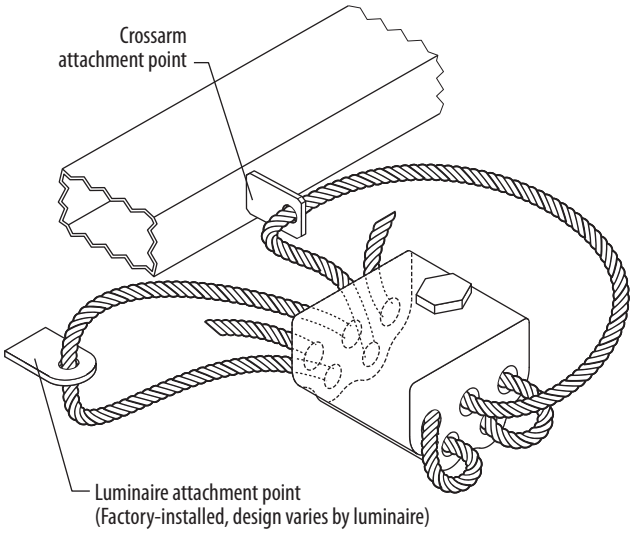
Warning
Luminaire may fall if bolts are not tight.

Do not remove tag before tightening bolts.



4 Attach luminaire retaining cable (if present). Route luminaire cable through crossarm anchor point, through luminaire block, and back through the block under the set screw. Luminaire attachment point will vary per luminaire design.

5 Using 7⁄16 in socket and torque wrench, tighten cable set screw to 60 in•lb (6.8 N•m).



Poletop Luminaire Assembly

Overview

The galvanized steel pole and poletop luminaire assembly are designed to slip-fit together. Jacking ears on pole section and poletop assembly provide attachment points to pull sections together. The Musco *Foundation and Pole Assembly Drawing* gives minimum overlap specifications for each poletop luminaire assembly.

Tools/Materials Needed

Musco Supplied

- ❑ Musco *Foundation and Pole Assembly Drawing*
- ❑ 9/16 in wrench
- ❑ Dishwashing liquid (original Dawn®, ECOS® Pro, or DIAO™ brand)

Contractor Supplied

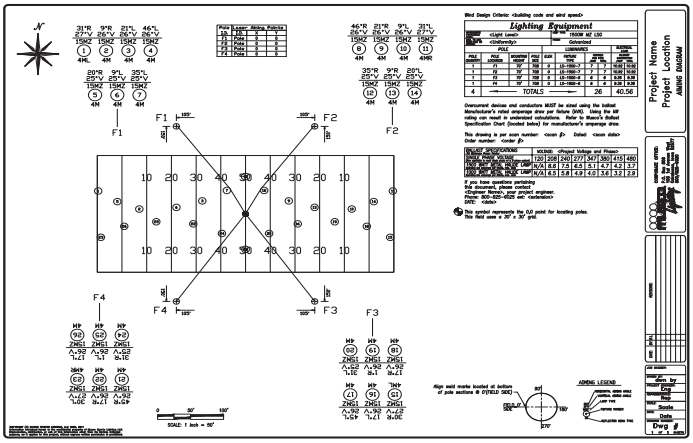
- ❑ Two 1½ ton chain come-alongs

If pole utilizes bolt-on bars, skip to next section. See Musco *Foundation and Pole Assembly Drawing.*

Assembly Procedure

Verify pole ID on each poletop luminaire assembly matches pole location on *Field Aiming Diagram*. Pole ID is labeled on crossarm.

1 Plot and mark aiming point(s) on field. Refer to *Field Aiming Diagram*.



Poletop Luminaire Assembly

Warning
Laser radiation hazard
Pole alignment beam is safe for viewing at a distance of three feet (one meter) or more. Do not look into beam from closer than three feet (one meter).

2 Turn on pole alignment beam.

3 Hook pole harness wire support grip to the poletop luminaire assembly u-hook and bundle the pole harness to the bottom crossarm.

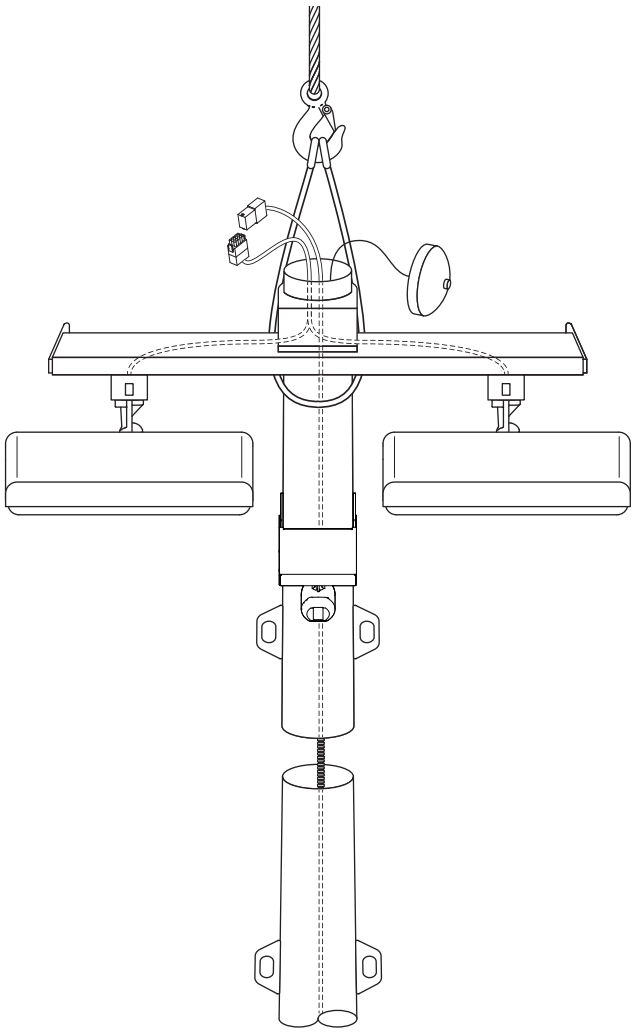
4 Lubricate top of steel pole section with supplied dishwashing liquid.

5 Sling and lift poletop luminaire assembly into place.

6 Carefully lower the pole harness(es) down into the pole. The attached cable support hook will prevent the pole harness from dropping.

Warning
Falling material hazard

If erecting pole with luminaire assembly attached, do not attach rigging to luminaire assembly. Follow pole supplier instructions for lifting.



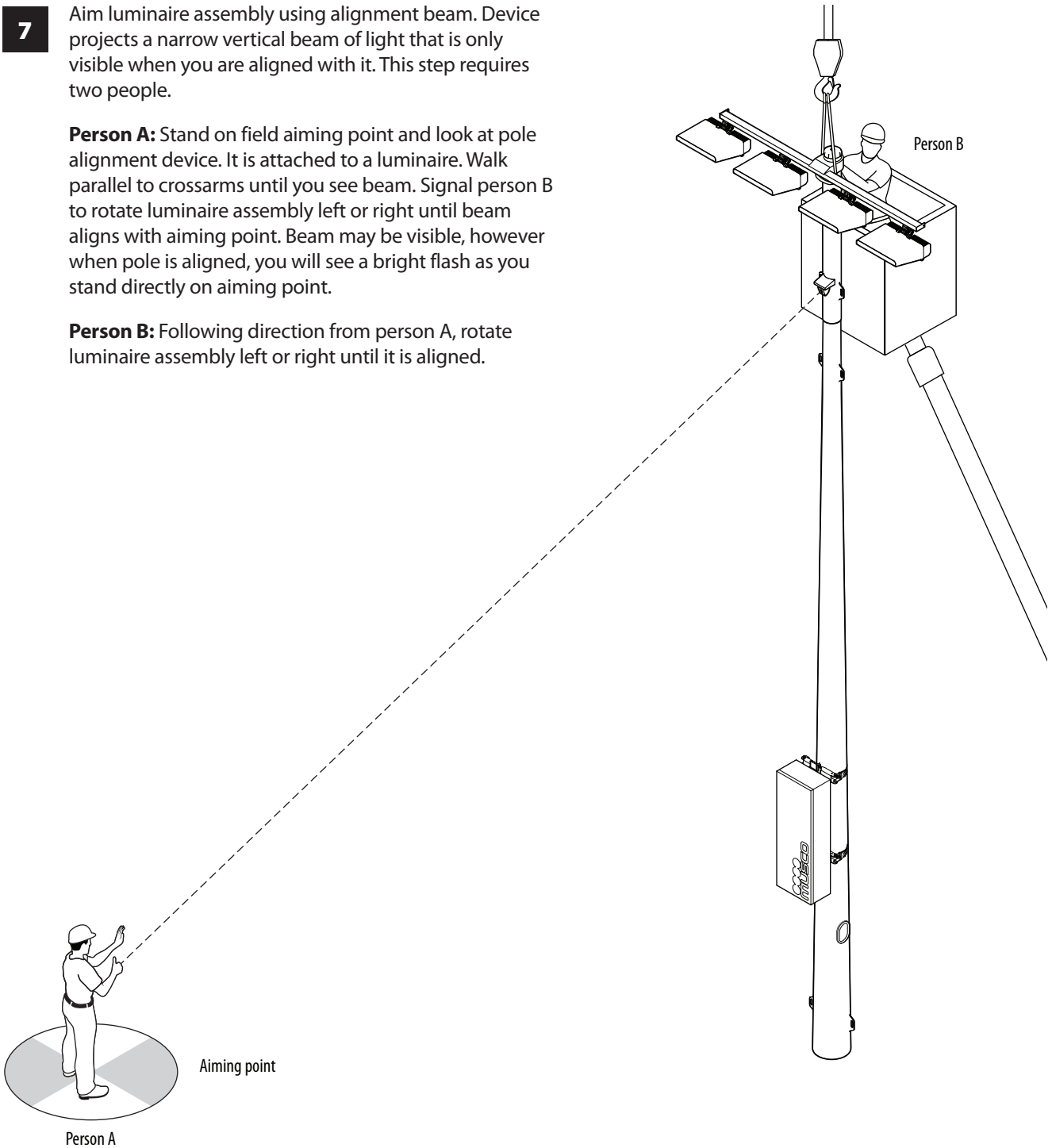
Poletop Luminaire Assembly

7

Aim luminaire assembly using alignment beam. Device projects a narrow vertical beam of light that is only visible when you are aligned with it. This step requires two people.

Person A: Stand on field aiming point and look at pole alignment device. It is attached to a luminaire. Walk parallel to crossarms until you see beam. Signal person B to rotate luminaire assembly left or right until beam aligns with aiming point. Beam may be visible, however when pole is aligned, you will see a bright flash as you stand directly on aiming point.

Person B: Following direction from person A, rotate luminaire assembly left or right until it is aligned.



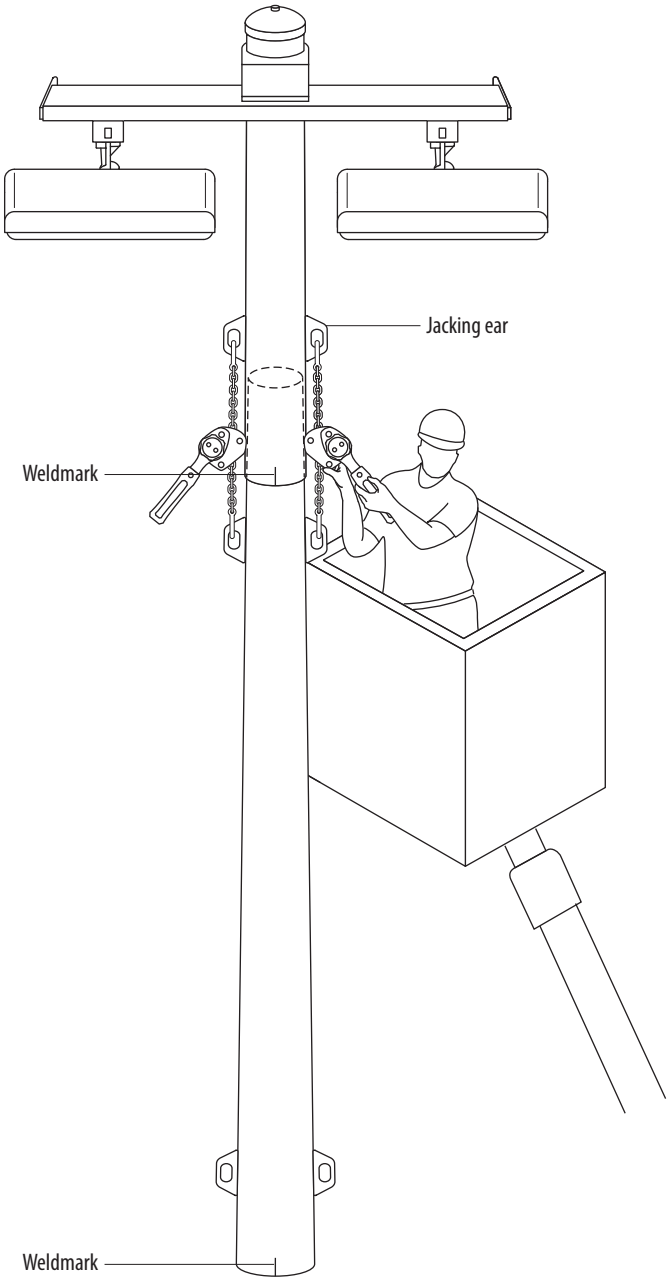
Warning
Laser radiation hazard
Pole alignment beam is safe for viewing at a distance of three feet (one meter) or more. Do not look into beam from closer than three feet (one meter). Do not use binoculars, camera, or telescope to view beam from any distance. Locator beam is a class 2M laser device. Wavelength: 635-660 nm, Laser power for classification: <1 mW continuous, divergence: <1.5 mrad x 1 rad. Using alignment beam in a manner other than as described here may result in hazardous exposure. Do not modify, dismantle, or attempt to repair.

Poletop Luminaire Assembly

8 Using two 1½ ton come-alongs, pull poletop luminaire assembly onto pole evenly until tight. Ensure minimum overlap per Musco *Foundation and Foundation and Pole Assembly Drawing.*

✓ Ensure alignment is maintained while tightening.

9 Tighten set screw using 9⁄16 in wrench.



Bolt-on Crossarms

Overview

Bolt-on bar style may vary from what is shown. Replacement procedure is identical.

Tools/Materials Needed

Musco Supplied:

- ❑ ¾ in drive 1 1/16 in socket
- ❑ ¾ in drive breaker bar
- ❑ ¾ in drive 4 in extension
- ❑ 1 1/16 in wrench
- ❑ Spreader bars
- ❑ ⅜ in fasteners (for spreader bars)
- ❑ ⅝ in structural fasteners
- ❑ 9/16 in wrench

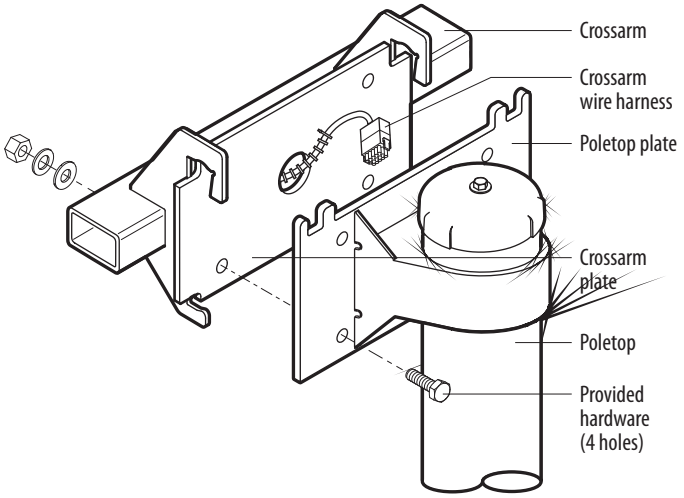
Contractor Supplied:

- ❑ Torque wrench with 9/16 in socket

Assembly Procedure

Verify pole ID on crossarm matches ID of pole.

Note: Each crossarm is factory assembled for a specific position on poletop section to ensure correct aiming. Top side of crossarm is labeled with crossarm's position number. Example: Position 1 is installed on first position from top of poletop section.



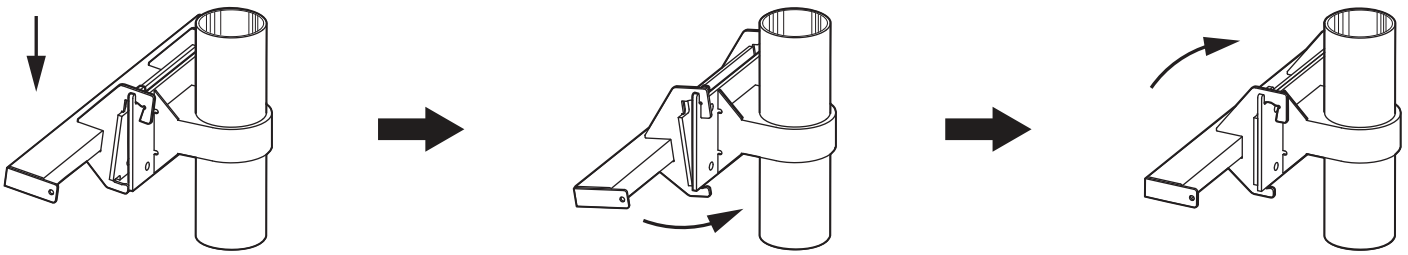
1 Position crossarm near poletop, and feed crossarm wire harness through hole in center of poletop plate.

Route wire harness for crossarms 1–3 to top of pole.

Route wire harness for crossarms 4–7 to handhole below crossarm position 5.

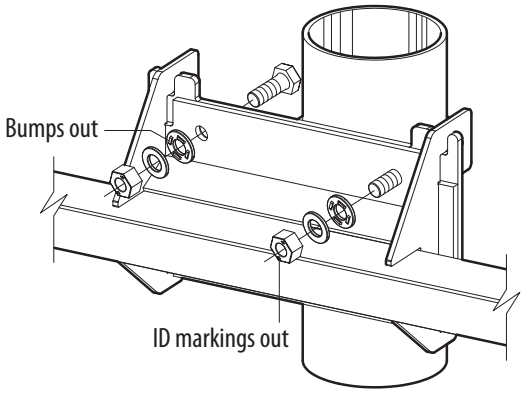
2 Position crossarm as shown below.

Ensure crossarm wire harness is not pinched between mating plates.

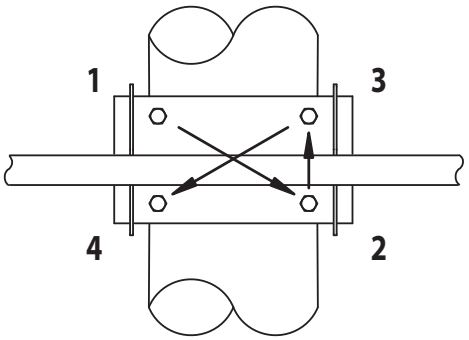


Bolt-on Crossarms

3 Install bolts through plates with threads away from pole. Place direct tension indicating (DTI) washer next, with flat surface (orange material) against plate, and bumps facing out toward nut. Place flat washer next, followed by nut. Small ID markings on nut must face out to allow proper identification of nut.



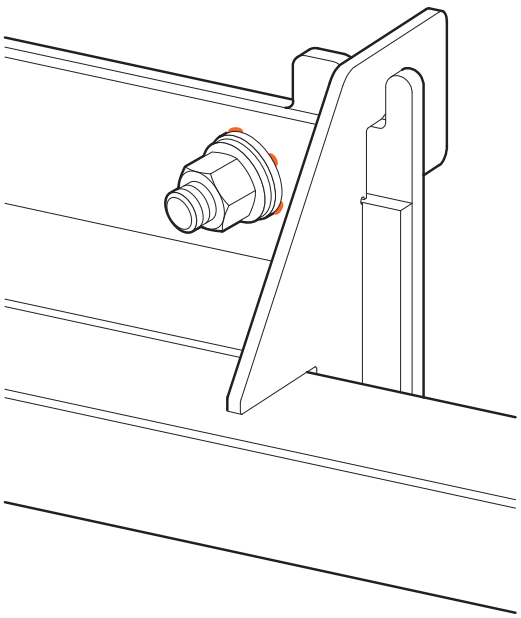
4 Snug all nuts. Using supplied 1 1/16 in wrench, tighten each nut until plates are in firm contact. Follow tightening sequence shown.



5 Using supplied breaker bar, 1 1/16 in socket, extension, and wrench, tighten each nut until orange extrusion appears from at least three bumps.

6 Repeat steps 1–5 for remaining crossarms.

Do not reuse structural fasteners. Discard if removed or loosened after tightening.

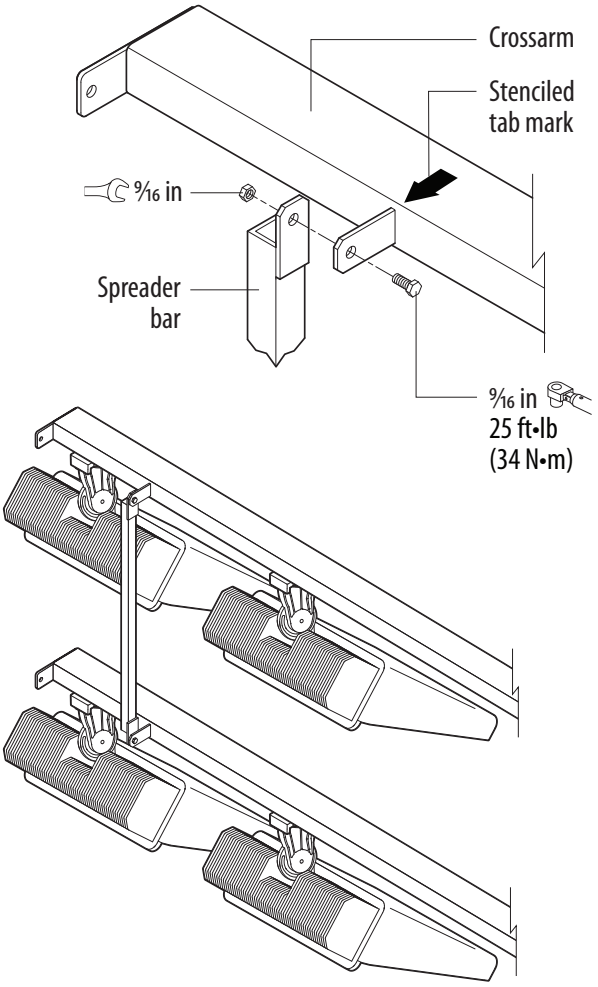


Bolt-on Crossarms

Refer to the Musco *Field Aiming Diagram* to determine if a pole requires spreader bars. If so, spreader bars are bundled together and marked with pole ID. Additionally, the pole crossarms are stenciled indicating which tabs to use. Crossarms are joined in groups of two or three with the greatest grouping on top; do not form other groupings.

7 Install spreader bars with ⅜ in fasteners at locations marked on each crossarm. Torque to 25 ft•lb (34 N•m).

Spreader bars may come in two sizes, 30½ in (775 mm) and 60 in (1524 mm). Always install longer bars to upper three crossarms.



Wire Harness

Overview

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

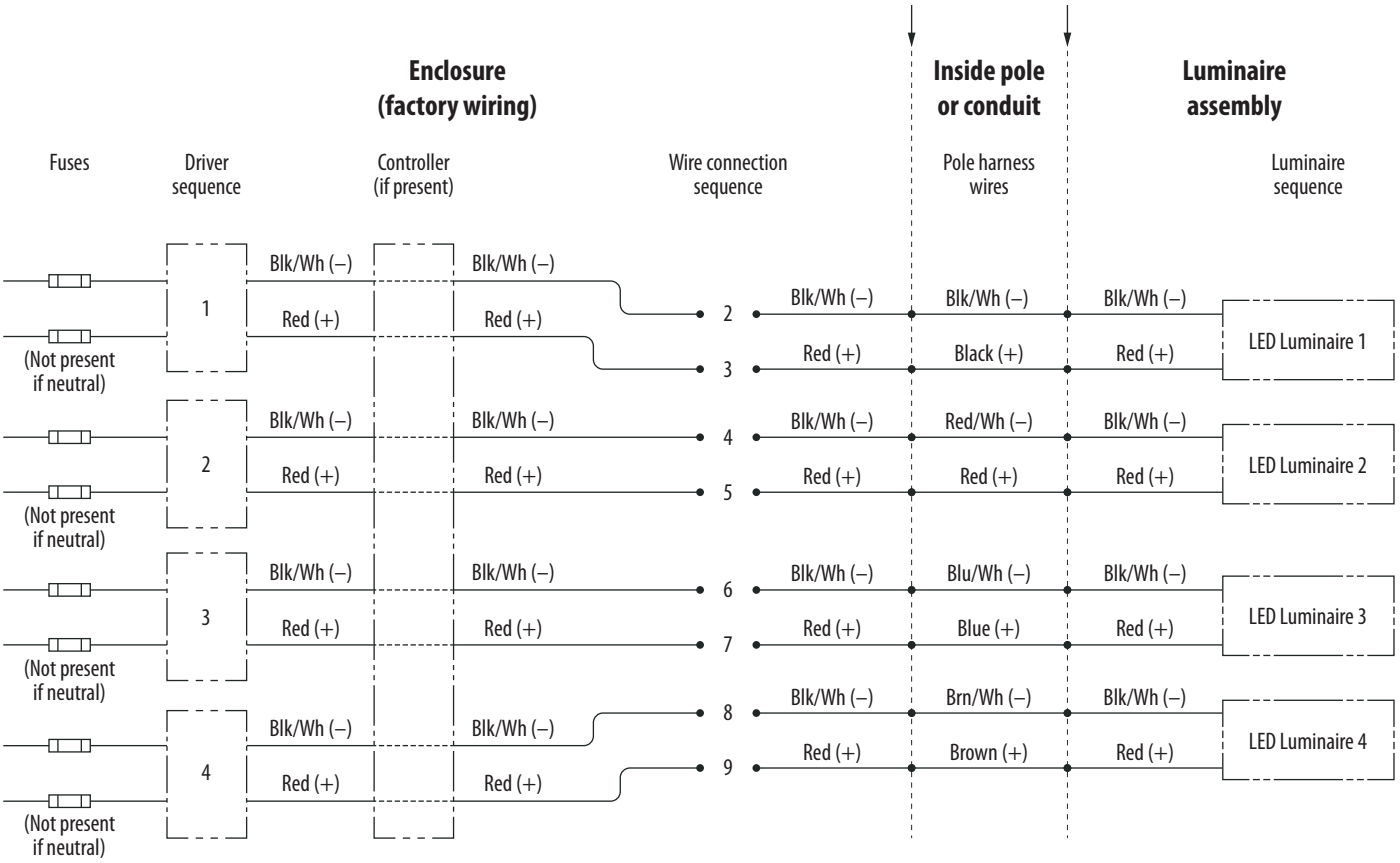
Tools/Materials Needed

Musco Supplied

- ❑ 5⁄32 in hex key
- ❑ 9⁄16 in wrench

Contractor Supplied

- ❑ Fish tape
- ❑ Electrician's tape



Notes:

1. Pole harness wire color indicated if provided by Musco.
2. Enclosure factory wiring may be different than shown above. One pair of wires per luminaire is required in pole harness.

Wire Harness

Assembly Procedure

Verify pole ID on wire harness matches pole location on *Field Aiming Diagram*.

1 Remove handhole covers using 5⁄32 in hex key. Remove polecap using 9⁄16 in wrench.

2 Fish all pole wire harnesses between poletop and appropriate electrical components enclosure(s). Use lower handhole to access enclosure hubs. Ensure protective sleeve extends through access hub and tuck harnesses behind subpanel.

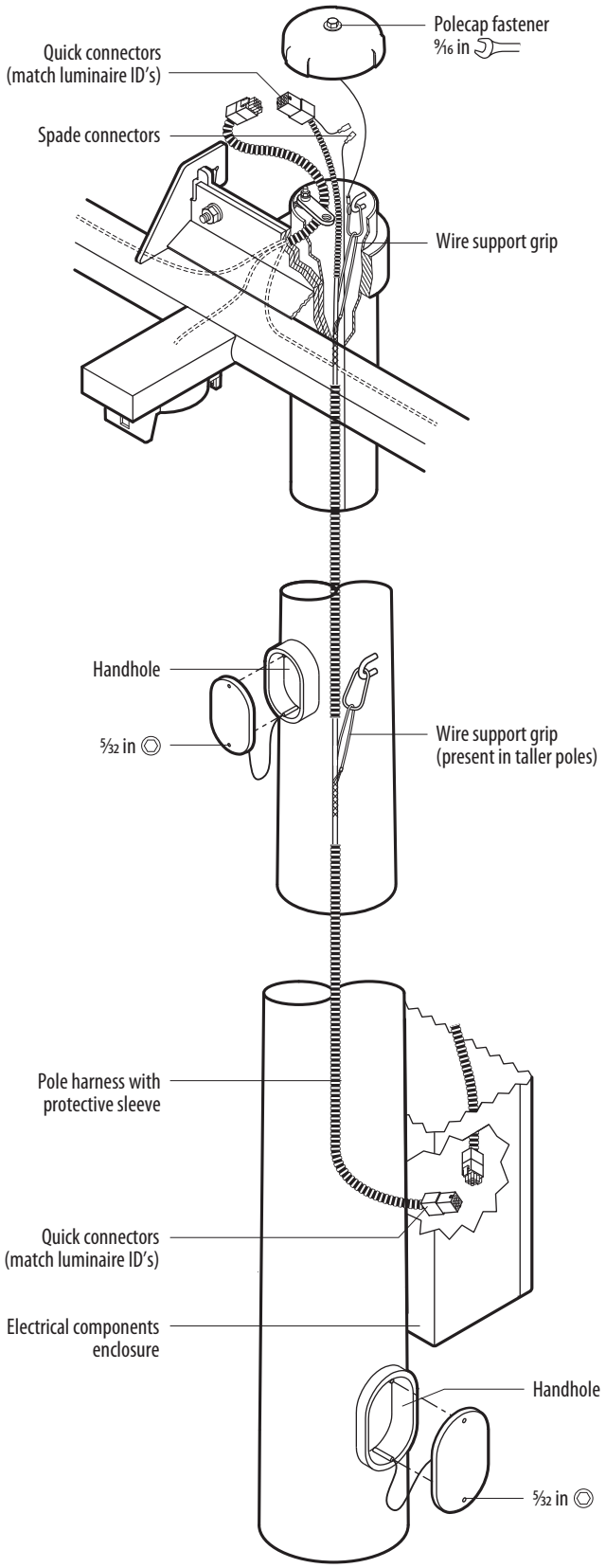
3 Attach support grips at midpole (if present).

4 Mate quick connectors at poletop and inside first stack of electrical components enclosures. Match driver/luminaire IDs.

For additional stacks of enclosures, connect pole harnesses using Musco-provided LEVER-NUTS wire connectors. Match luminaire ID and wire polarity per each wire label.

Use electrical tape to ensure LEVER-NUTS® levers stay secure and don't snag on surrounding wires.

5 Replace handhole covers and polecap.



Connecting to Supply Wiring

Overview

The final step of installation is connecting supply wiring at the subpanel. Terminals for phase wires and neutral (if used), disconnect switch with lockout, and equipment ground bar are provided on the subpanel in the electrical components enclosure. If there are multiple circuits on the pole, a disconnect is provided for each circuit. This may be on a separate subpanel in another enclosure. Depending on foundation design and/or soil conditions, a supplemental grounding electrode may be required.

Tools/Materials Needed

Musco Supplied

- ❑ 3⁄16 in hex key (ground bar)
- ❑ 5⁄16 in hex key (bonding terminal inside handhole)
- ❑ 5⁄32 in hex key (handhole covers)
- ❑ 5 mm hex key (125 A disconnect terminals)
- ❑ Equipment bonding jumper

Contractor Supplied

- ❑ Standard screwdriver
- ❑ 3 m (10 ft) stepladder or small line truck

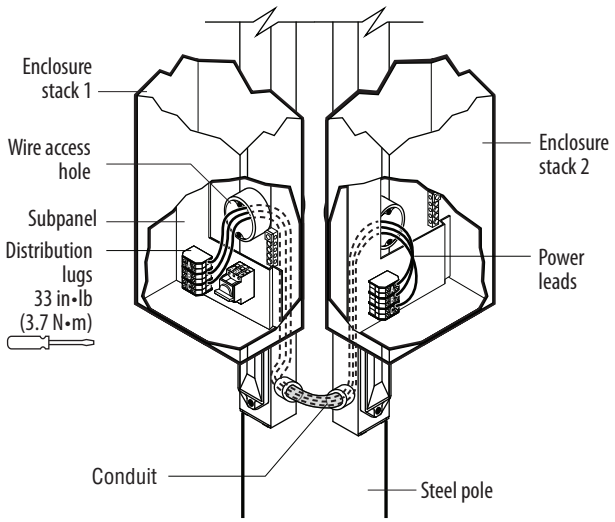
Installation Procedure

Musco *Control System Summary* or *Field Aiming Diagram* provides electrical loading information needed to size wire and switchgear.

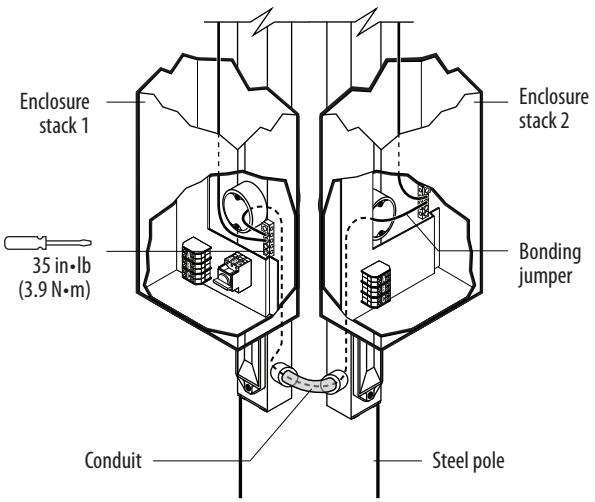
Musco provides instructions for installing Control-Link™ control system or lighting contactor cabinet when these items are part of your project.

1 If pole has multiple stacks on the same electrical circuit then route lower loads from second stack to distribution lugs on main subpanel.

Route all power leads for lighting equipment to appropriate subpanel locations.



2 Connect equipment grounding conductors (green/yellow) from each upper enclosure to equipment ground bar in bottom enclosure. If pole has multiple stacks, connect bonding jumper from stack one. Tighten lugs using 3⁄16 in hex key.



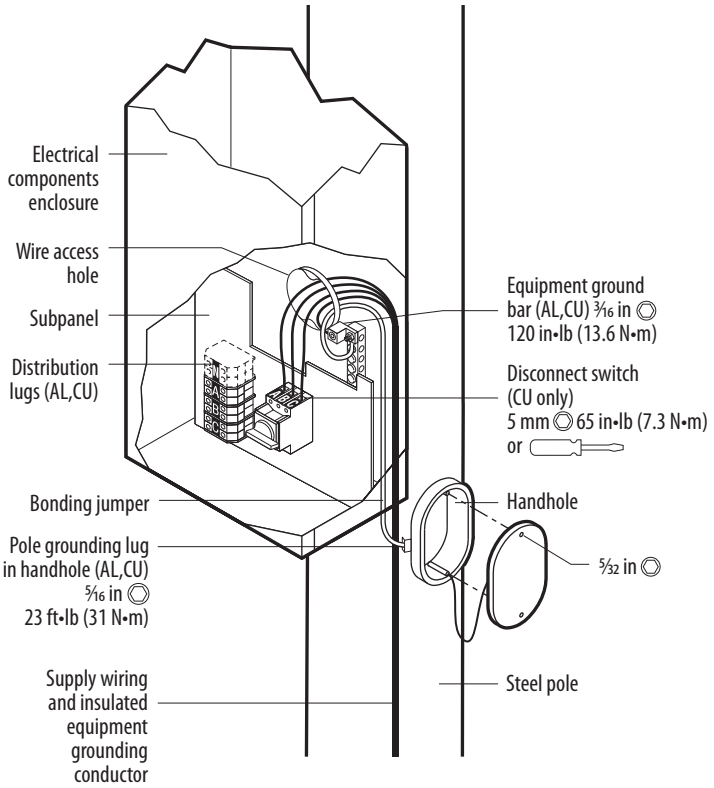
Connecting to Supply Wiring

3 Remove handhole cover using 5⁄32 in hex key. Route supply wiring through access hub into electrical components enclosure.

4 Connect insulated equipment grounding conductor (supply) to ground bar. Tighten lug using 3⁄16 in hex key.

Disconnect is rated for copper wire only. Contact Musco for adaptor or use UL Listed adaptor for aluminum supply wire.

5 Connect phase wires (supply) to disconnect switch. Tighten lugs using standard screwdriver (45 A disconnect) or 5 mm hex key (125 A disconnect). Connect neutral wire (if used) to distribution lug. Tighten lug using standard screwdriver.



Disconnect Wiring Information

Disconnect Rating	Terminal	Wire Size Range	Strip Length	Torque
45 A	L	12 – 3 AWG (4 – 25 mm²)*	0.63 in (16 mm)	25 in•lb (2.8 N•m)
	N	16 – 4 AWG (1.5 – 25 mm²)*	0.56 in (14 mm)	27 in•lb (3.1 N•m)
	G	14 – 2/0 AWG (2.5 – 50 mm²)**	NA	120 in•lb (13.6 N•m)
125 A	L	10 – 2 AWG (6 – 35 mm²)*	0.63 in (16 mm)	50 in•lb (5.6 N•m)
		1 – 2/0 AWG (40 – 50 mm²)*	0.63 in (16 mm)	65 in•lb (7.3 N•m)
	N	16 – 1/0 AWG (1.5 – 50 mm²)*	0.71 in (18 mm)	33 in•lb (3.7 N•m)
	G	14 – 2/0 AWG (2.5 – 50 mm²)**	NA	120 in•lb (13.6 N•m)

*Stranded cable, single conductor, copper only

**Stranded cable, single conductor, copper or aluminum

Connecting to Supply Wiring

6 Route provided equipment bonding jumper (green/yellow) through access hub to pole grounding lug inside handhole. Tighten lug using 5/16 in hex key.

7 Ensure all handhole covers are installed and electrical components enclosure is closed and latched.

If your project includes a supplemental grounding electrode kit, follow instructions in kit for installing electrode.

Warning
Risk of electric shock

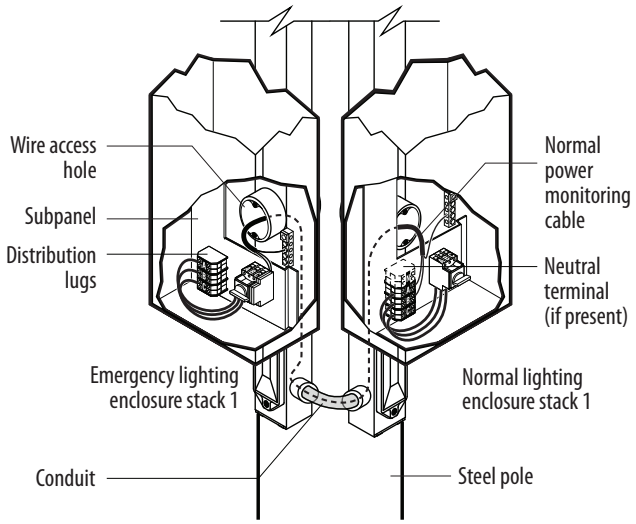
Terminate equipment grounding conductor at equipment ground bar in electrical components enclosure.

Warning
Lightning hazard

For poles located near metal fences, metal bleachers, or other metal structures, bond structures to pole ground to maintain equal electrical potential.

Skip step 8 if no emergency egress lighting is present.

8 Route cable for normal power to adjacent enclosure stack. Connect black wire and blue/white wire to any two active terminals A, B, C, or neutral, if present, and green wire to ground bar.

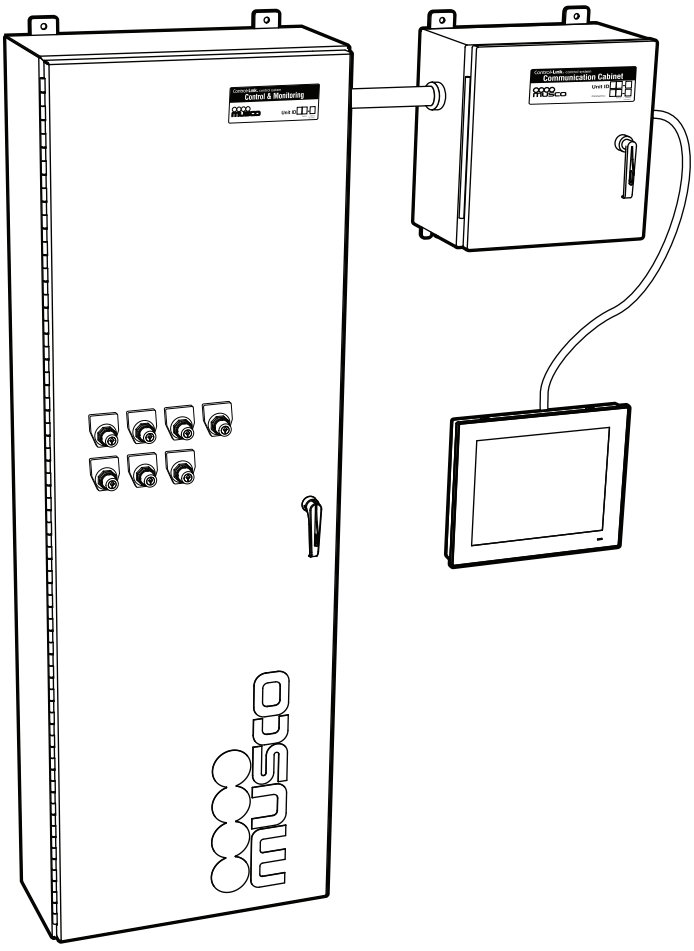


Notes

www.musco.com

Musco Light-Structure System™ product referenced or shown may be protected by one or more of the patents listed here: https://www.musco.com/patents/lss-retro_m-2768.pdf

Installation Instructions: **Control·Link® System with Show-Light® Special Effects**



We Make It Happen®

Rev. 1 - Per Addendum 1

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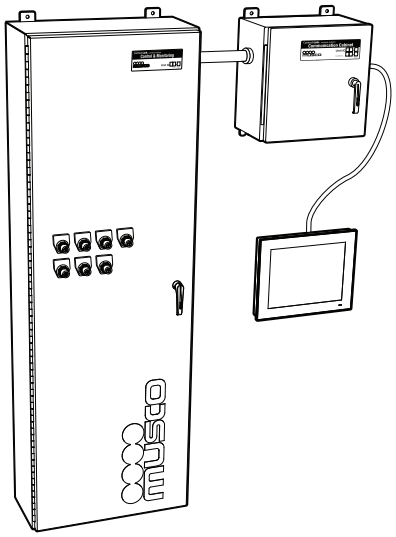


Before You Begin

Safety Information

Electrical Safety Guidelines

Use extreme caution near overhead power lines or underground utilities. Observe all safety precautions for high-voltage equipment. Only qualified personnel may perform wiring. Follow all applicable building and electrical codes.

General Safety Guidelines

Follow proper safety procedures during installation. Installers must wear appropriate personal protective equipment, including eye protection.

Locate all underground utilities before digging.

All tools and equipment Musco supplies are designed for a specific use as described in these instructions. Do not use them in any other manner. Do not alter structural members in any way, such as bending, welding, or drilling, without prior authorization from Musco.

About These Instructions

These instructions detail basic installation procedures for the Control-Link® control and monitoring system with Show-Light® special effects package. They are not a comprehensive guide to all possible situations. Direct any questions to Musco at +1-800-825-6020 or +1-641-676-2309 or call your local representative.

Throughout this manual, note these important symbols:

The safety alert symbol alerts you of situations that require care and caution to avoid serious personal injury.

The stop and check symbol signals you to stop and verify conditions before proceeding.

The contact Musco symbol appears in special situations where you may need to call Musco for further information.

The go-to arrow tells you where to find further instructions for special situations or optional features.

The tip symbol points out advice that makes installation easier.

The recycle symbol identifies recyclable materials.

Call Musco Control-Link Central™ service center at +1-877-347-3319 or +1-641-676-2309 two weeks prior to anticipated project completion to schedule commissioning time.

Before You Begin

Electrical System Requirements

Only a qualified electrician may perform electrical work. Follow all applicable code requirements. Ensure your electrician reviews the following information before beginning installation.

- Ensure supply wiring is rated for 90 °C.
- Size circuit breakers for full load amperage draw of each circuit. Refer to cabinet interior door label for short circuit current rating information.
- A transformer may be required to supply control power. See *Control Power Consumption* table in *Control System Summary*.
- The control system requires power at all times for manual lighting control, scheduling, monitoring, and communication with Musco's Control-Link Central™ service center. Only switch off power for maintenance. Supply a breaker lock-on device.

Control System Summary

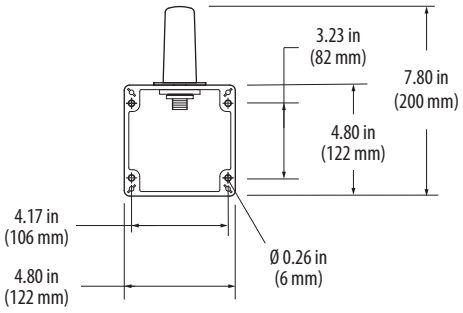
Musco supplies a *Control System Summary* for every project. This document is necessary for system design and pre-installation planning. It contains project-specific details you need for installation. Here are the contents:

- Project information
  - Project details
  - Contact information
  - References to documents such as lighting design scan
  - Voltage, frequency, and phase
  - Control voltage
- Equipment listing
  - Cabinets
  - Contactors and sizes
  - Switches
  - Touchscreens
- Important installation notes
- Control system diagram
  - Cabinet layout
  - Wire runs and conduit details
- Switching schedule
  - Fields and lighting zones

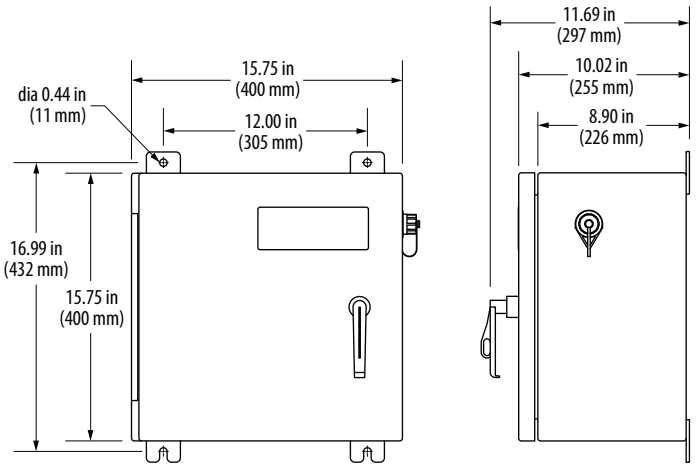
- Control power consumption
  - Control voltage and phase requirements
  - Volt-amp loading of control system
- Driver specifications
  - Luminaire current by voltage
  - Driver power factor
- Circuit summary by switch
  - Switching zone details (pole, number of luminaires, field, contactor ID, zone)
  - Full load current draw for each circuit

Before You Begin

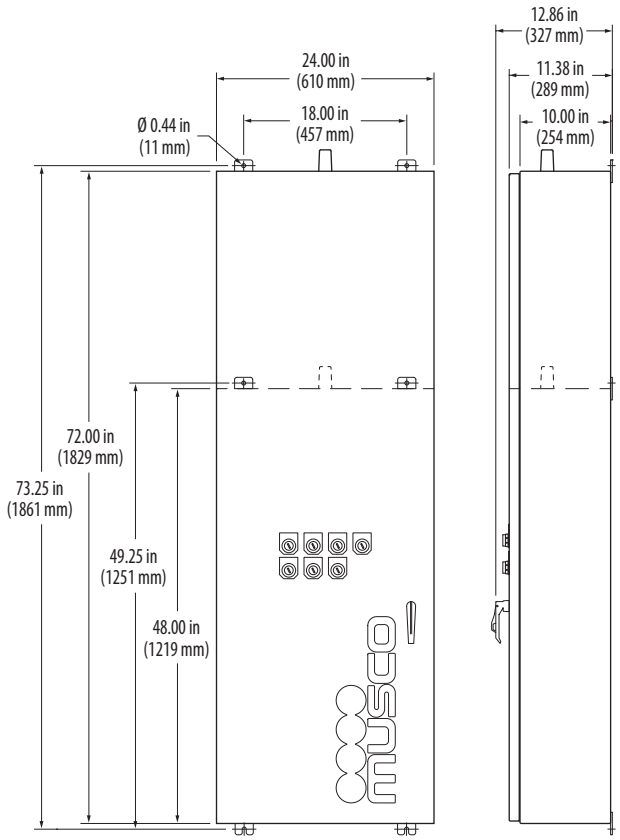
Cabinet Dimensions



Remote wireless antenna cabinet



Communication cabinet

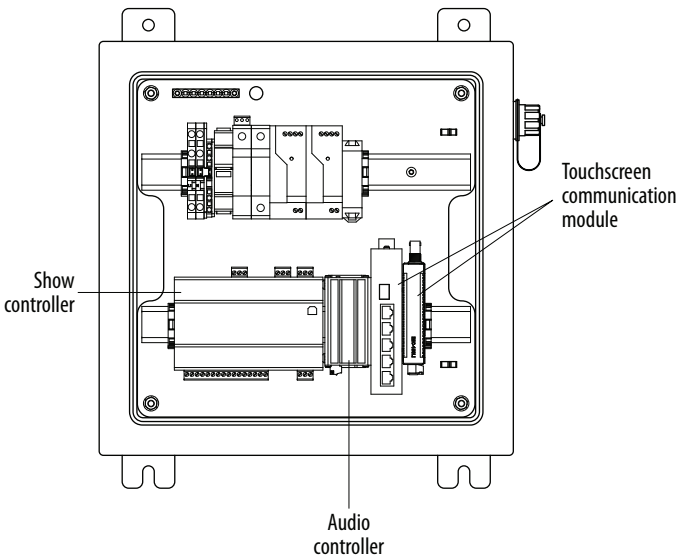


Control cabinet
48 in (1219 mm) or 72 in (1829 mm)

Component Matching and Labeling

Musco labels all equipment to make installation easy. Components, cabinets, wiring, and connectors are all clearly marked with location, function, or any information needed for proper installation.

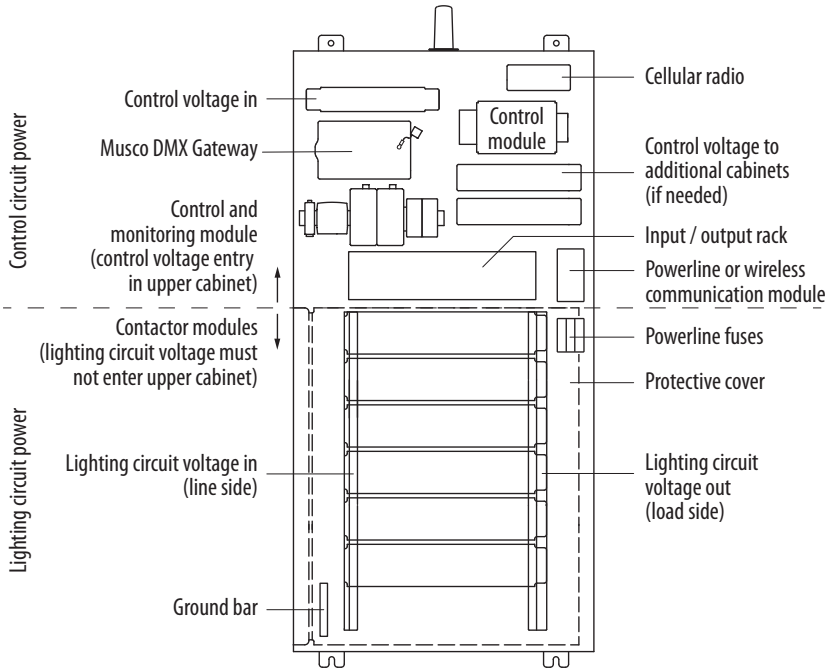
Electrical Components Labeling



Communication cabinet

Before You Begin

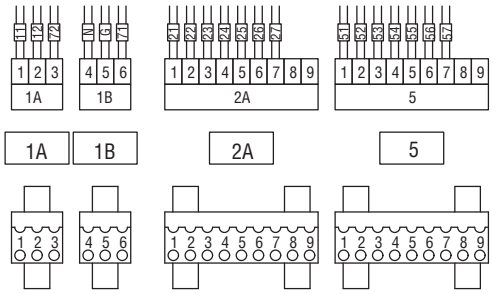
Electrical Components Labeling (continued)



Control and monitoring cabinet (48 inch shown)

Wire and Connector Labeling

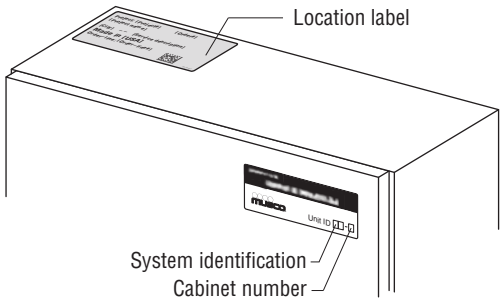
All cabinets are factory wired. Musco provides plug-in connectors to run harnesses between cabinets. The connectors are clearly labeled for easy installation.



Cabinet Labeling

Each enclosure is custom fabricated for a specific location in your facility. To ensure installation at the correct location, the top of each cabinet is labeled with the facility name and electrical service.

A label in the upper right corner of the door identifies each cabinet. This label gives the control module ID and cabinet sequence. For example: 01-1 (first control module, first cabinet), 01-2 (first control module, second cabinet). See *Control System Summary* for a complete list of all supplied equipment.



Installation Procedure

Warning
Shock hazard

Disconnect power from distribution panel before opening. Take measures to ensure power remains disconnected until all installation steps are completed.

Installation steps vary by control system configuration. Consult your *Control System Summary* to determine your configuration before continuing.

Refer to *Control System Summary* for maximum allowable wire or cable length by cabinet type. Ensure cabinet mounting locations do not exceed allowable length.

1 Mount cabinets in desired locations.

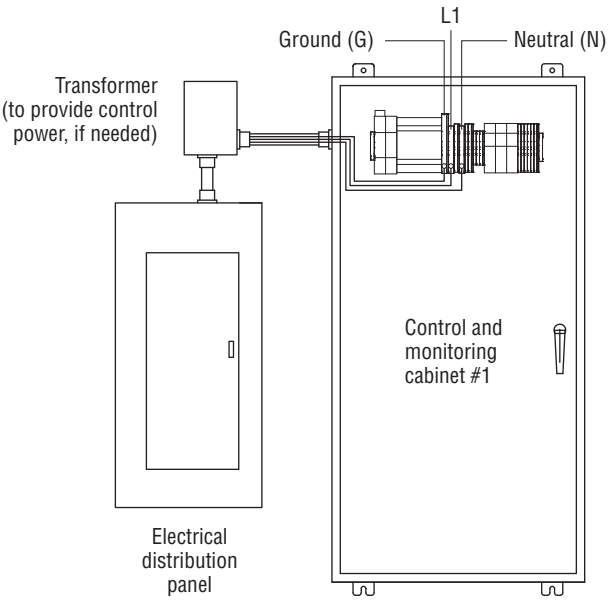
Refer to *Control System Summary* to for specific conduit runs and wire sizing needed in your project. Communication cables and power conductors must be routed in separate conduits.

2 Cut entryways. Run conduit and wireway as needed for all cabinets and lighting circuits. Open protective cover over contactors using 8 mm hex key.

3 Install dedicated 20 amp circuit breaker in distribution panel to supply control circuit power. Install transformer if needed. See *Control System Summary* for information on breaker and transformer sizing.

4 Install lock-on device to control power circuit breaker. Apply provided label *Leave Breaker On Unless Performing Maintenance* to panel beside breaker.

5 Run control circuit power wires to control and monitoring cabinet. Land on terminals provided (L1, N, G).



Installation Procedure

6 Connect factory-supplied control harnesses as needed between cabinets. Route wires through conduit and plug connectors into matching sockets as labeled.

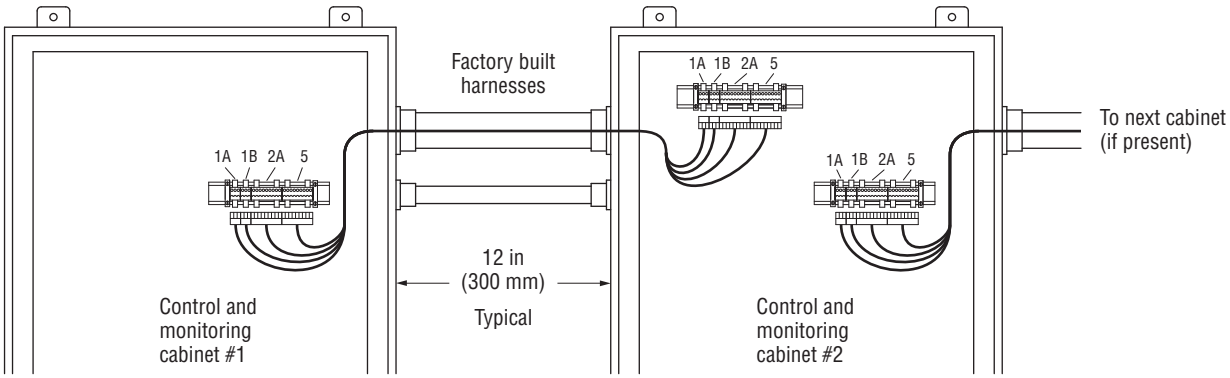
Note: Musco supplies control harnesses in standard lengths of 8 ft (2.4 m). If needed, disconnect and rebuild with longer wire: 12 AWG (4 mm²). The table gives wire and connector identification for reference.

Important: If combined length of all harnesses exceeds 30 ft (9 m), then subsequent cabinets need additional surge protection. Contact Musco for assistance.

Example: Cabinet 1 to 2 is 20 ft (6 m), cabinet 2 to 3 is 20 ft (6 m), total harness length is 40 ft (12 m). Cabinet 3 needs additional surge protection device.

Control Harnesses

Harness series	Wire #	Wire color	Function	Cabinet to cabinet
1A	11	Black	Control power to switches 1 – 4	Connector 1A, pos. 1
1A	12	Red	Control power to switches 5 – 8	Connector 1A, pos. 2
1A	72	Brown	Filtered control power	Connector 1A, pos. 3
1B	N	White	Neutral	Connector 1B, pos. 4
1B	G	Green	Ground	Connector 1B, pos. 5
1B	71	Blue/white	Filtered neutral	Connector 1B, pos. 6
2A	21-24 25-27	Black Red	Switched power to contactor coil	Connector 2A, pos. 1-7
5	51-57	Orange	Contactor status feedback	Connector 5, pos. 1-7



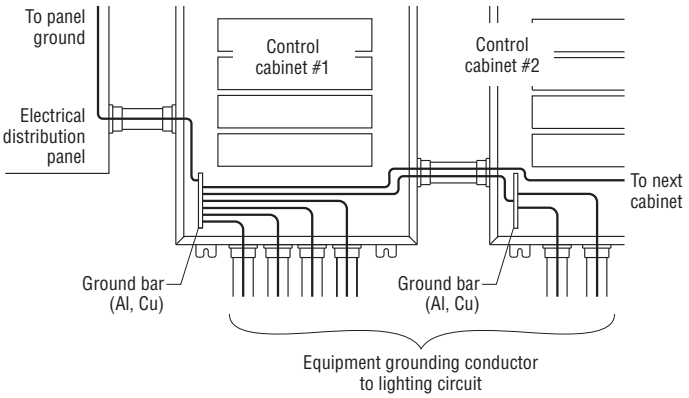
7 For best powerline communication signal, connect lighting circuit equipment grounding conductors in the following configuration:

Connect lighting circuit equipment grounding conductors to ground bar in associated control cabinet.

Connect secondary cabinet ground bars to primary cabinet ground bar using 4 AWG (25 mm²) insulated copper ground wires.

Connect primary cabinet (with powerline communication module) ground bar to service ground bar using a 4 AWG (25 mm²) insulated copper ground wire.

See table *Ground Bar Wire Range and Torque* for torque requirements.



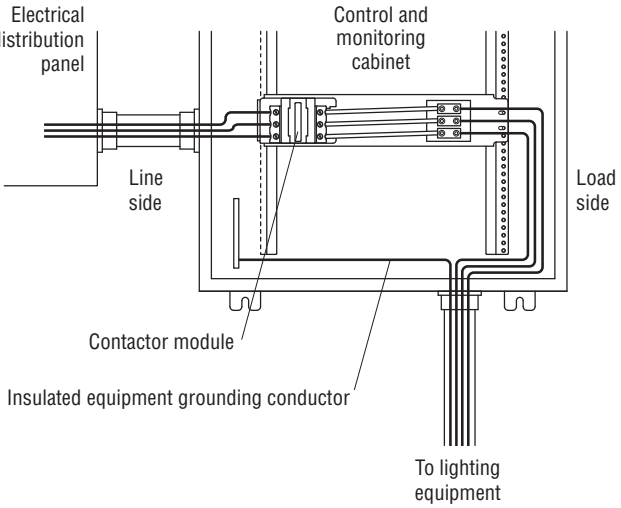
Ground Bar Wire Range and Torque

Wire range	Torque
6 – 4 AWG (16 – 25 mm²)	35 in·lb (4.0 N·m)
14 – 10 AWG (2.5 – 10 mm²) 2 wire	25 in·lb (2.8 N·m)
14 – 10 AWG (2.5 – 10 mm²) 1 wire	20 in·lb (2.3 N·m)

Installation Procedure

8 Connect lighting circuits to load side of contactor modules. See table *Contactor Module Wire Range and Torque* for torque requirements.

9 Connect power from electrical distribution panel to lighting contactor modules. See table *Contactor Module Wire Range and Torque* for torque requirements. Close and secure protective cover.



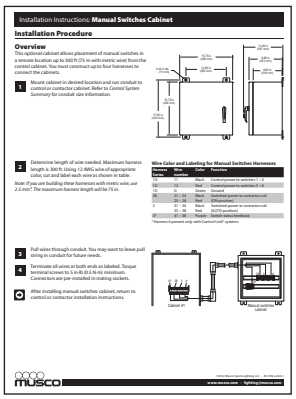
Contactor Module Wire Range and Torque

Contactor rating	Line side		Load side	
	Wire size range* (Cu only)	Torque	Wire size range** (Al, Cu)	Torque
30 amp [LC1D40]	10 – 3 AWG (6 – 25 mm^2)	45 in·lb (5 N·m)	14 – 10 AWG (2.5 – 6 mm^2)	35 in·lb (4 N·m)
			8 AWG (10 mm^2)	40 in·lb (4.5 N·m)
			6 – 2/0 AWG (16 – 50 mm^2)	120 in·lb (13.5 N·m)
60 amp [LC1D80]	10 – 2 AWG (6 – 25 mm^2)	100 in·lb (11 N·m)	14 – 10 AWG (2.5 – 6 mm^2)	35 in·lb (4 N·m)
			8 AWG (10 mm^2)	40 in·lb (4.5 N·m)
			6 – 2/0 AWG (16 – 50 mm^2)	120 in·lb (13.5 N·m)
100 amp [LC1D115]	14 – 2/0 AWG (2.5 – 50 mm^2)	100 in·lb (11 N·m)	6 AWG – 350 MCM (16 – 150 mm^2)	275 in·lb (31 N·m)
			6 AWG – 350 MCM (16 – 150 mm^2) Neutral block only	375 in·lb (42 N·m)

* Stranded cable, single conductor, copper only.

** Stranded cable, single conductor, copper or aluminum.

If your project includes optional manual switches cabinet, follow provided instructions for installation, then proceed to step 10.


Installation Instructions: **Manual Switches Cabinet**

Installation Procedure

Overview

This optional cabinet allows placement of manual switches in a remote location up to 300 ft (75 m with metric wire) from the control cabinet. You must construct up to four harnesses to connect the cabinets.

1 Mount cabinet in desired location and run conduit to control or contactor cabinet. Refer to Control System Summary for conduit size information.

2 Determine length of wire needed. Maximum harness length is 300 ft. Using 12 AWG wire of appropriate color, cut and label each wire as shown in table.

Note: If you are building these harnesses with metric wire, use 2.5 mm². The maximum harness length will be 75 m.

Wire Color and Labeling for Manual Switches Harnesses

Harness No./No.	Wire number	Color	Function
1	1	Red	Control power to manual switches 1 – 8
1	12	Red	Control power to switches 5 – 8
1	G	Green	Ground
2A	21 – 24	Black	Switched power to contactor coil
2	25 – 28	Black	Switched power to contactor coil
3	31 – 34	Black	Switched power to contactor coil
	35 – 38	Red	24 VDC provided
#1	41 – 44	Purple	Switch status feedback

* Harness 4 present only with Control Link® systems.

3 Pull wires through conduit. You may want to leave pull string in conduit for future needs.

4 Terminate all wires at both ends as labeled. Torque terminal screws to 5 in·lb (0.5 N·m) minimum. Connectors are pre-installed in mating sockets.

After installing manual switches cabinet, return to control or contactor installation instructions.

Cabinet #1

Manual switches cabinet

musco

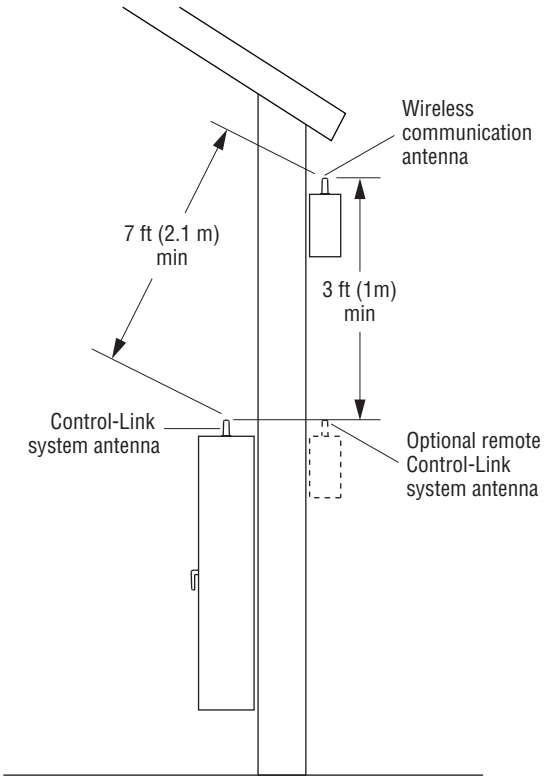
www.musco.com lighting@musco.com

If your project utilizes powerline communication, skip to step 13.

Installation Procedure

10 Mount wireless communication antenna cabinet in desired location. Antenna must have line-of-sight to antenna mounted on light poles. To avoid interference, antenna must be at least 3 ft (0.91 m) above control and monitoring cabinet and a minimum of 7 ft (2.1 m) away, total distance.

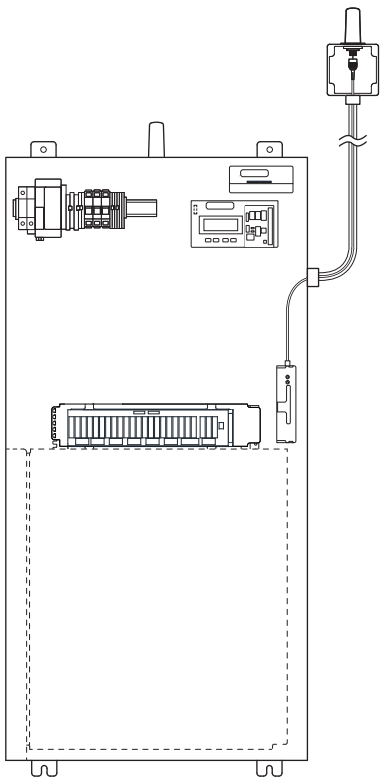
If Control-Link® system antenna is remote mounted, adjust wireless communication antenna location to maintain minimum distances.



11 Cut entryways. Run conduit and wireway as needed.

12 Pull and install supplied coaxial cable from remote antenna to wireless radio in control and monitoring cabinet.

Do not coil excess coax cable inside cabinet as this can cause signal interference.



Installation Procedure

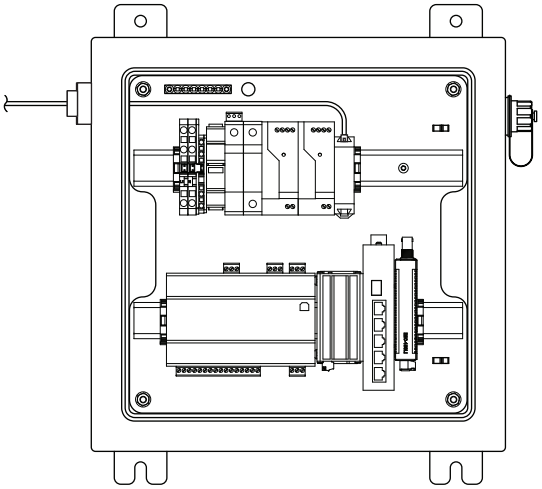
13 Mount communication cabinet in desired location. Cut entryways. Run conduit and wireway as needed.

Communication cables and power conductors must be routed in separate conduits.

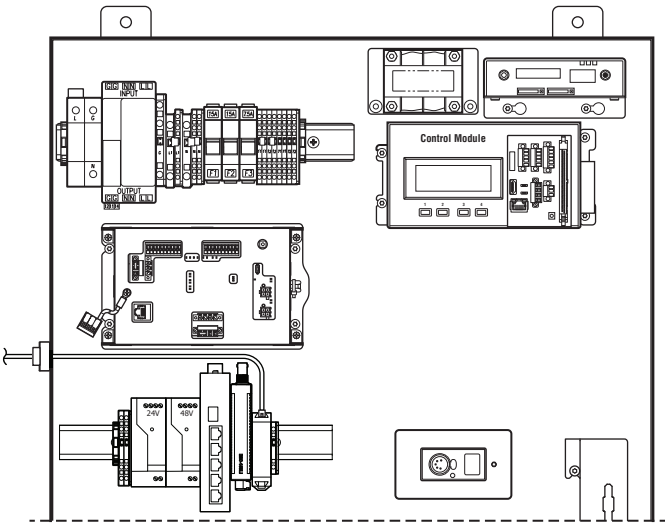
14 Pull Belden 7937A cable from communication cabinet to control and monitoring cabinet. Terminate cable at control and monitoring cabinet with shielded RJ45 connector. Terminate at communication cabinet with non-shielded connector.

Important: Connector pinout must follow T568B standard.

15 Connect unshielded RJ45 connector to surge protector in communication cabinet.



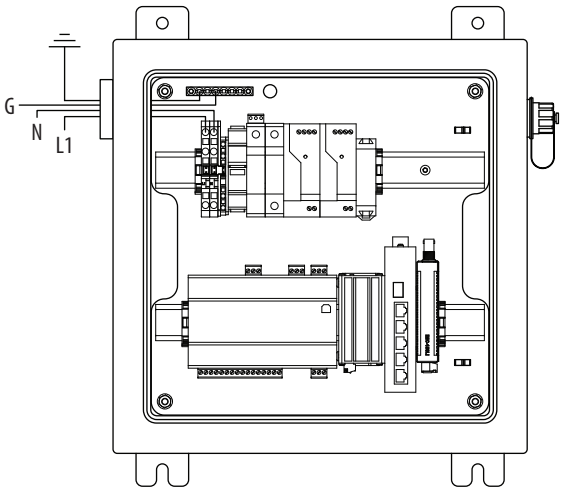
16 Connect shielded RJ45 connector to surge protector in control and monitoring cabinet.



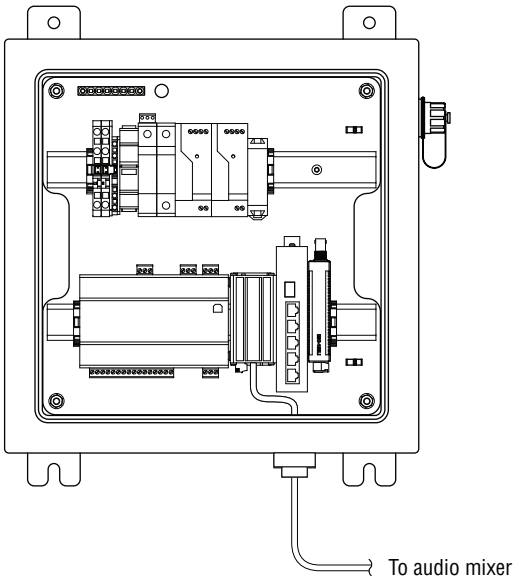
Installation Procedure

17 Run control circuit power wires to communication cabinet. Land ground on ground bar. Land remaining conductors on terminal block connectors provided (L, N)

18 Connect ground lug in communication cabinet to earth ground, for proper surge protection function.

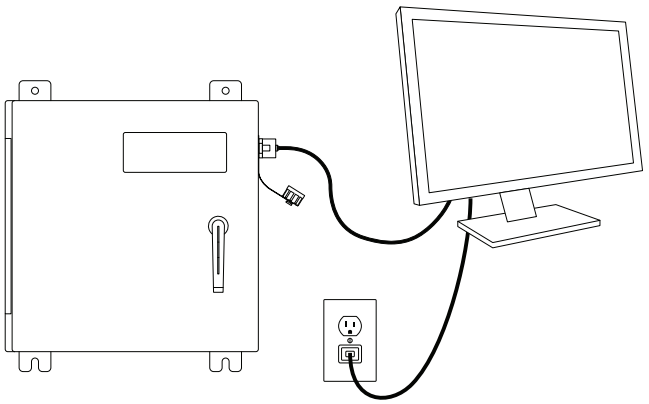


19 Using ⅛ in (3.5 mm) audio cable (customer-supplied), connect audio controller in communication cabinet to audio mixer.



Installation Procedure

20 Plug provided 10-ft (3 m) long ethernet cable into port on side of communication cabinet and bottom of touchscreen.



21 Touchscreen requires 120 V (60 Hz) or 240 V (50 Hz) outlet.

22 With all circuits complete, test entire lighting system.

- Turn off all manual switches.
- Turn on control system power.
- Turn on manual switches to test each circuit.
- Verify contactor pulls in and lights illuminate.

Call Musco Control-Link Central™ service center at +1-877-347-3319 or +1-641-676-2309 two weeks prior to anticipated project completion to schedule commissioning time.

23 Commission the lighting system. Set all manual switches to auto position and call Musco Control-Link Central™ service center at the scheduled date and time.

Commissioning is the process required to bring the remote control system on-line. It takes approximately one to two hours. The electrical installer must be present for assistance and trouble-shooting. During this process, the service center operator:

- Establishes communication
- Remotely switches each circuit and checks status
- Verifies with you each circuit is operating as expected
- Operates all circuits and luminaires approximately three minutes to establish baseline readings for system monitoring
- Verifies each luminaire is addressed correctly

Notes

Notes

We Make It Happen.

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System Requirements: Control System Summary

Project Name: Downey High School Football LED Retrofit | Project #: 215340
Control System ID: 1 of 1
Distribution Panel Location/ID: Service #1

Egress information provided is based on a 480v/1ph inverter, installing contractor is providing the inverter

Project Information

Control System

Control System ID: 1 of 1
Control System Type: Control-Link ® Control and Monitoring System with Show-Light ® Special Effects
Communication Type: PowerLine-ST

Power Requirements

Control cabinet(s):
- Control voltage (phase to neutral): 120/60
- VA loading - Inrush: 2153.0
- VA loading - Sealed: 198.0

Lighting Circuits:
- Voltage/Hertz/Phase: 480/60/3

Auxiliary lighting interface cabinet:
- Control voltage (phase to neutral): 120/60
- VA loading - Inrush: 980.0
- VA loading - Sealed: 111.0

Communication cabinet(s):
- Cabinet voltage (phase to neutral): 120/60

Touchscreen(s):
- Touchscreen power (receptacle): 120/60

Project Notes:

The contactors for the egress fixtures will be housed in a Musco ALIC. The FLA for the egress fixtures on poles F1-F4 is 1.83A/Pole.

Field Voltage:480V/3P
Egress Voltage:480V/1P

Equipment Listing

Description	Qty	Size (in)
Auxiliary lighting interface cabinet	1	16 X 20
Control and monitoring cabinet - primary	1	24 X 48
Communication cabinet	1	-
Touchscreen	1	-
Contactors, 30 amperes	4	-
Off/On/Auto switches	2	-

Musco provided equipment

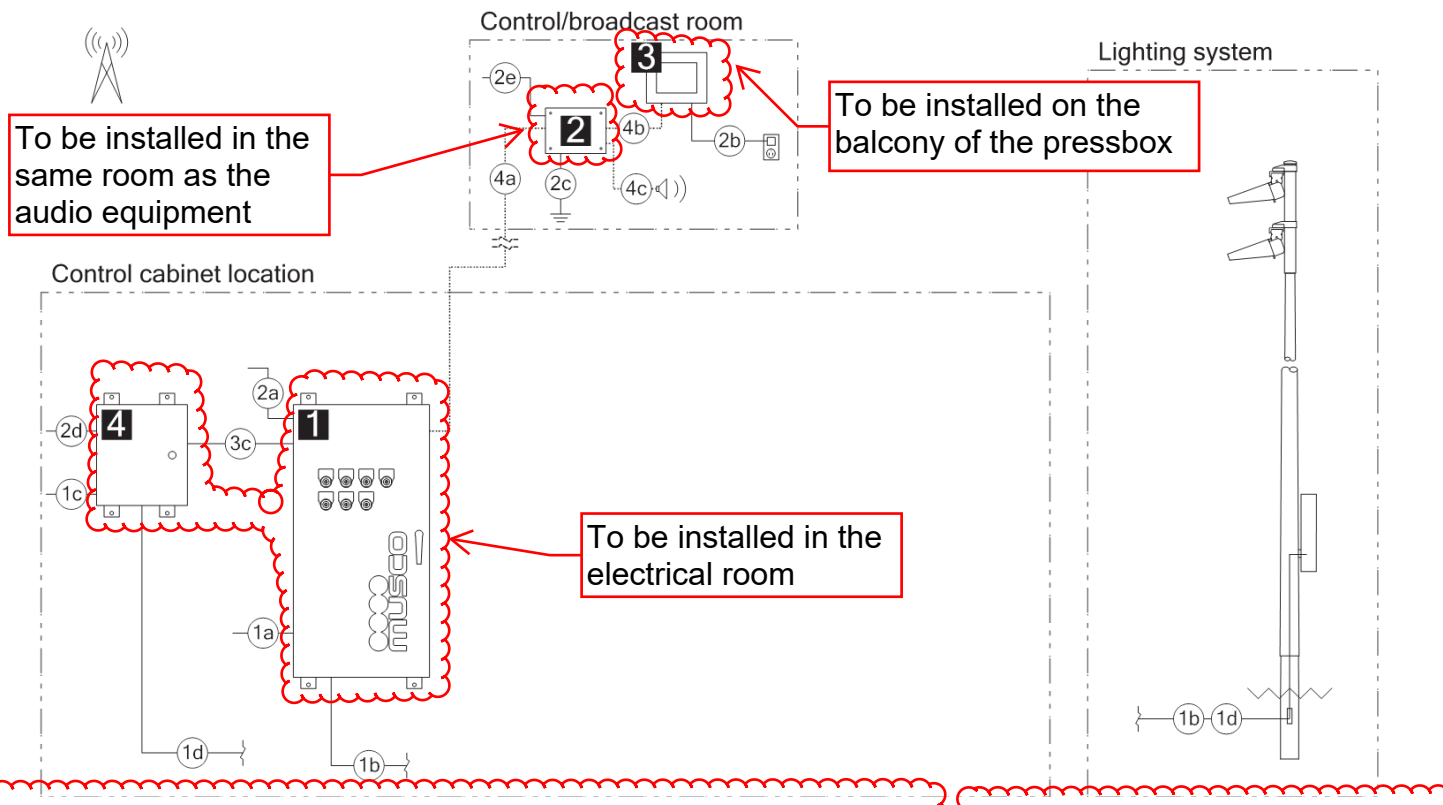
Important Notes:

1. Please confirm that the lighting circuit voltage listed above is accurate for this facility. This is the voltage/phase being connected and utilized at each lighting pole's electrical components enclosure disconnect. Inaccurate 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 location. Musco's single phase luminaires come pre-wired to utilize all 3 phases across the entire facility.
3. One contactor is required for each circuit at each pole location. Contactors are 3 pole and 100% rated for the published continuous load.
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. Size overcurrent devices using the full load amps column of the Circuit Summary by Switch chart (Minimum power factor is 0.9). Size conduit per code unless otherwise specified as larger to allow for harness connectors.
6. Avoid use of in-ground junction/pull boxes when possible. If used, all wire connectors must be UL listed for Wet Locations to prevent leakage current.
7. Control power wiring must be in separate conduit from line or load power wiring. Communication cables must be in separate conduit from any power wiring.
8. Refer to Installation Instructions for more details on equipment information and the installation requirements.

System Requirements: Control System Summary

Project Name: Downey High School Football LED Retrofit | Project #: 215340
Control System ID: 1 of 1
Distribution Panel Location/ID: Service #1

Equipment Layout and Connection Details



Connection Details

ID	Description
1a	Line power to contactors, and equipment grounding conductor. Requires one circuit per contactor, size wiring per load and voltage drop.
1b	Load power from contactors, and equipment grounding conductor. Requires one circuit per contactor, size wiring per load and voltage drop.
1c	Emergency circuit - Line power to contactors, and equipment grounding conductor. Requires one circuit per contactor, size wiring per load and voltage drop.
1d	Emergency circuit - Load power from contactors, and equipment grounding conductor. Requires one circuit per contactor, size wiring per load and voltage drop.
2a	Control power with equipment ground to control cabinet. Requires dedicated 20 A circuit. Provide transformer if control voltage not present.
2b	Power cord for touchscreen. Requires standard receptacle.
2c	Earth ground connection at communication cabinet location. Requires installation of ground electrode if existing earth gound not present.

Equipment

ID	Description
1	Control and monitoring cabinet - primary
2	Communication cabinet
3	Touchscreen
4	Auxiliary lighting interface cabinet

Musco provided equipment

Contractor provided

Sales Representative: Mike Marchetti | Project Engineer: Vashon Alexander | Scan: 215340C_R1 | Document ID: 215340P1V4C17-0226084404

Equipment Layout and Connection Details

Connection Details - Cont'd	
ID	**Description**
2d	Emergency circuit - Control power with equipment ground. Requires dedicated 20 A circuit. Provide transformer if control voltage not present.
2e	Control power with equipment ground.
3c	Control harness - Emergency cabinet to primary control cabinet. Use 14 AWG copper conductor for up to 50 feet between cabinets or 12 AWG up to 300 feet. Requires 4 conductors.
4a	Communication cable - Communication cabinet to primary control cabinet. Requires Cat5e cable (Belden 7937A or equal), maximum of 1500 feet.
4b	Communication cable - Communication cabinet to touchscreen. ~~10-foot ethernet cable provided by Musco.~~ Ethernet cable provided by contractor if longer length is needed. Maximum cable length is 300 feet.
4c	Audio cable - Communication cabinet to audio system, provided by contractor. Requires audio cable with 3.5 mm audio plug.

Equipment - Cont'd	
ID	**Description**

Contractor provided

System Requirements: Control System Summary

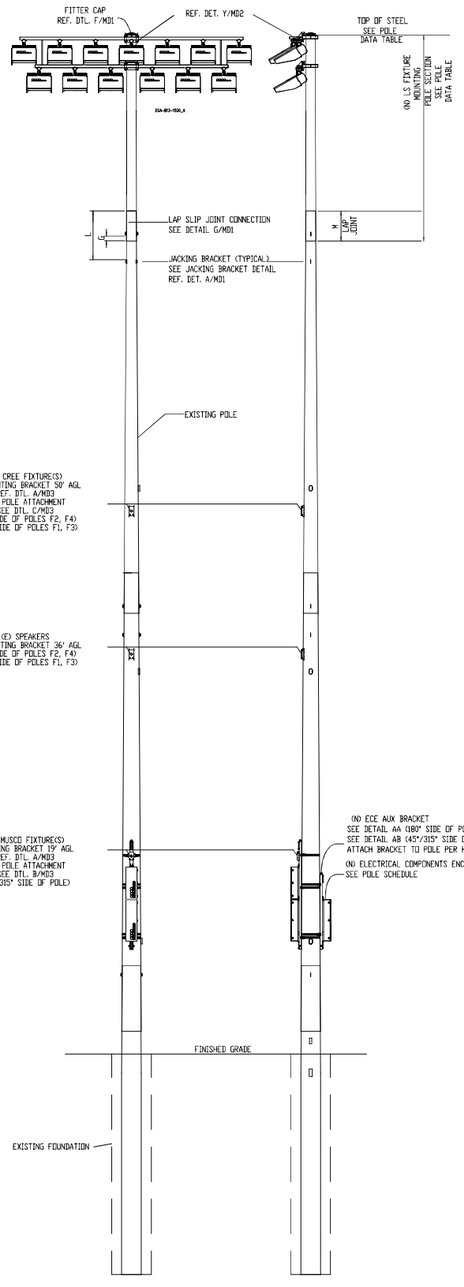
Circuit Summary

Switching Schedule	
Field/Switch Description	**Switches**
Football	1
Egress	2

Control Module ID: 1

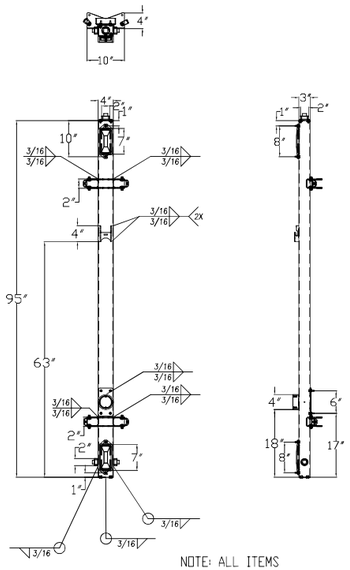
Lighting Circuit Voltage: 480/60/3

Circuit Summary by Switch							
Switch	**Zone Description**	**Pole ID**	**Qty of Fixtures**	**Full load amperes**	**Contactor Size (Amps)**	**Cabinet #**	**Contactor ID**
1	Football	F1	14	25.22	30	1	C1
	Football	F2	14	26.47	30	1	C2
	Football	F3	14	25.22	30	1	C3
	Football	F4	14	26.47	30	1	C4
2	Egress	F1	3	1.83	--	1	--
	Egress	F2	3	1.83	--	1	--
	Egress	F3	3	1.83	--	1	--
	Egress	F4	3	1.83	--	1	--



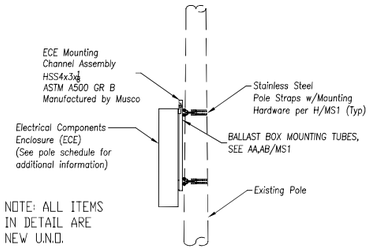
(E) LSS90B POLE FRONT VIEW
N.T.S.

(E) LSS90B POLE SIDE VIEW
N.T.S. DSA-90BBASE_A



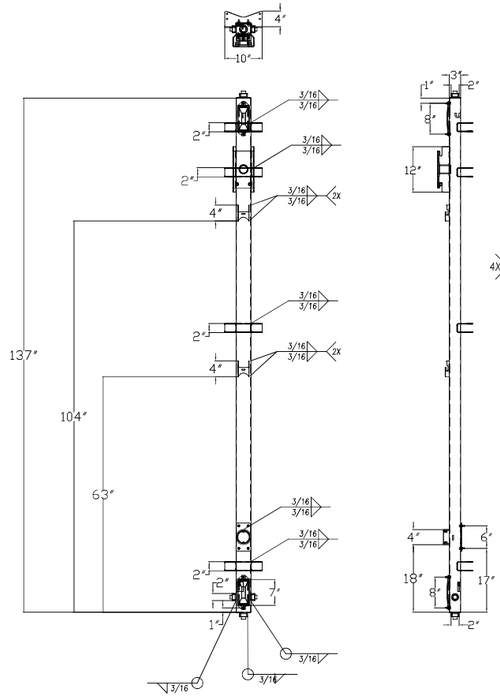
NOTE: ALL ITEMS
IN DETAIL ARE
NEW U.N.O.

AA 6P W/O BTF ECE AUX NON-HUB
N.T.S.



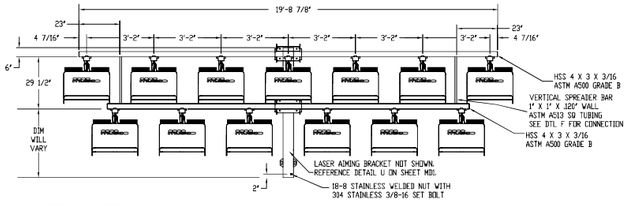
NOTE: ALL ITEMS
IN DETAIL ARE
NEW U.N.O.

J BALLAST BOX CONNECTION DETAIL
N.T.S.



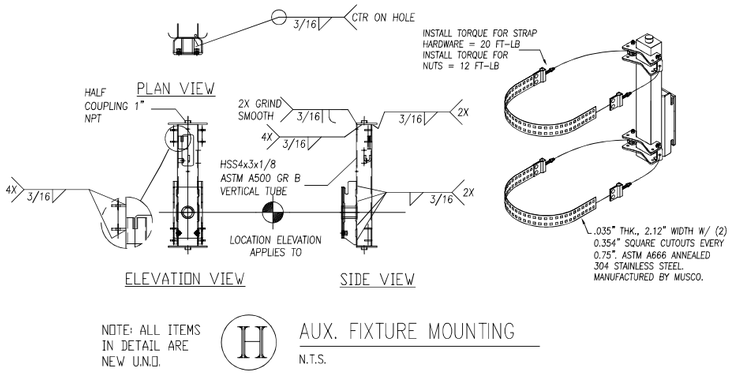
NOTE: ALL ITEMS
IN DETAIL ARE
NEW U.N.O.

AB N.T.S. 6P,6PX-LP W/ BTF ECE AUX NON-HUB



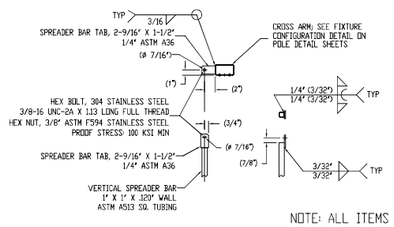
NOTE: ALL ITEMS
IN DETAIL ARE
NEW U.N.O.

B 13 FIXTURE CONFIGURATION
N.T.S. DSA-B13C-1500_A



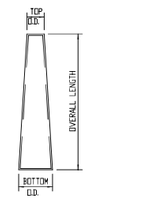
NOTE: ALL ITEMS
IN DETAIL ARE
NEW U.N.O.

H AUX. FIXTURE MOUNTING
N.T.S.



NOTE: ALL ITEMS
IN DETAIL ARE
NEW U.N.O.

F BOLT ON SPREADER BAR DETAIL
SCALE: N.T.S. DSA-SpreaderBarBoltOn-LED_A



(N) FIXTURE MOUNTING SECTION
PER POLE DATA TABLE

G (N) FIXT. MOUNTING POLE SECT.

1. CONTAINS COMBINED EPA OF LIGHT FIXTURES, CROSS ARM AND MISCELLANEOUS FIXTURE MOUNTING APPARATUS.

FIXTURE WEIGHT 99 LBS. THIS INCLUDES THE WEIGHT OF FIXTURE, CROSS ARM & MISC. MOUNTING APPARATUS. ELECTRICAL BALLAST BOX WEIGHT 20 LBS PER FIXTURE SERVICED

POLE SCHEDULE

SITE LOCATION	POLE MARK	REFERENCE LOCATION	POLE TYPE	(N)FIXTURE CONFIGURATION	TOTAL EPA[1]	(N)BALLAST BOX REQUIREMENTS
SEE SITE PLAN (BY OTHERS)	F1-F4	SEE POLE ORIENTATION PLAN	(E)LSS90B	13 - SEE DETAIL B/MS1	4.57	SEE DETAIL SL,SL_D,/M01

DSA-POLESCHE_C

NOTATION	DIMENSION LSS90B
G	1'-6"
L	5'-6 1/2" NOM.
M	3'-3 1/4" NOM. 2'-3" MIN.

POLE DATA TABLE

POLE TYPE	PIECE MARK	MAX NUMBER OF X-Arms	POLE SECTION	TOP O.D. (INCHES)	BTM. O.D. (INCHES)	OVERALL LENGTH	STRAIGHT LENGTH	TAPER LENGTH	THICKNESS (INCHES)	TOP OF STEEL NOMINAL	ASTM REFERENCE
(E)LSS90B	MP-1BTT-1	2	(N)FIXTURE MOUNTING	9.462"	12.000"	18'-1 1/2"	-----	18'-1 1/2"	.179	87'-5 7/8"	A595A (Fy=55 ksi) or A572, Gr 55 or 65

DSA-90BDT_A

REV. 1 - Per Addendum 1

DSA-96_A

Warren HS Football LED Retrofit
FIELD LIGHTING
Downey, CA

REGISTERED PROFESSIONAL ENGINEER * STRUCTURAL * STATE OF CALIFORNIA
No. 4506
Exp. 6-30-25

CONSULTANT
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KNA JOB NO.: 463.366

musco Lighting
CORPORATE OFFICE:
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100 1st Avenue West
Oskaloosa, Iowa 52577
800/825-6020

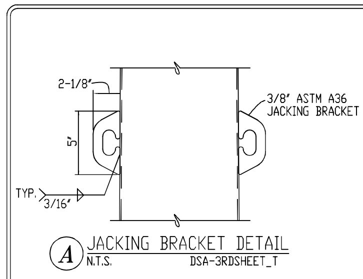
DRAWING TITLE: POLE DETAIL
SCALE: SEE PLAN
REVISIONS:
REFERENCE:

PROJECT NO. 215339

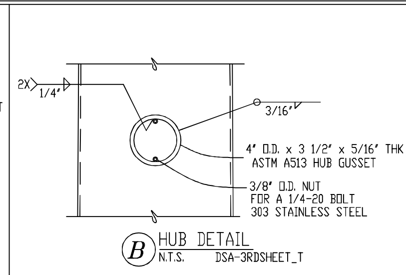
DATE: 11/30/2023

DRAWN BY: V.Alexander

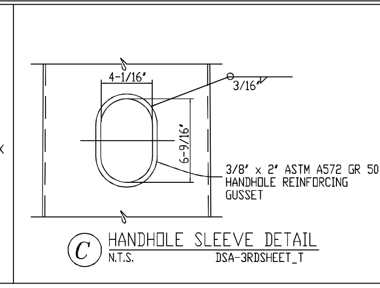
DRAWING NO. 3 OF 6 MS1



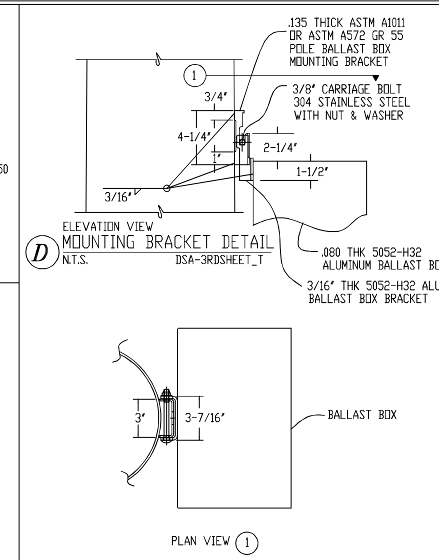
A JACKING BRACKET DETAIL
N.T.S. DSA-3RDSHEET_T



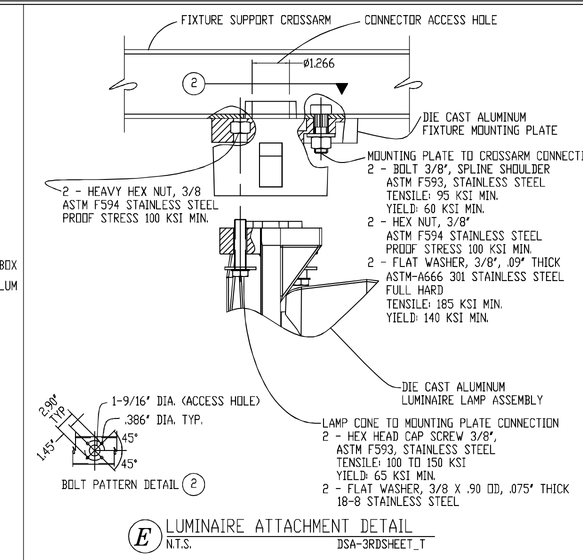
B HUB DETAIL
N.T.S. DSA-3RDSHEET_T



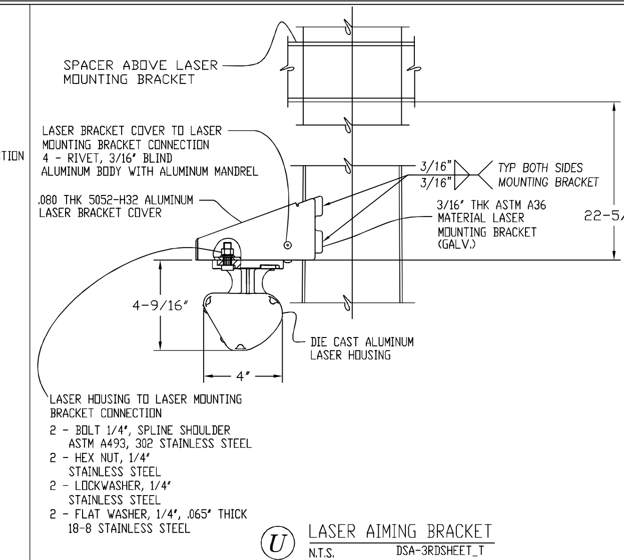
C HANDHOLE SLEEVE DETAIL
N.T.S. DSA-3RDSHEET_T



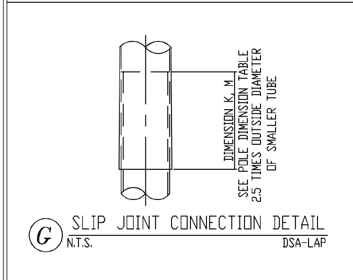
D MOUNTING BRACKET DETAIL
N.T.S. DSA-3RDSHEET_T



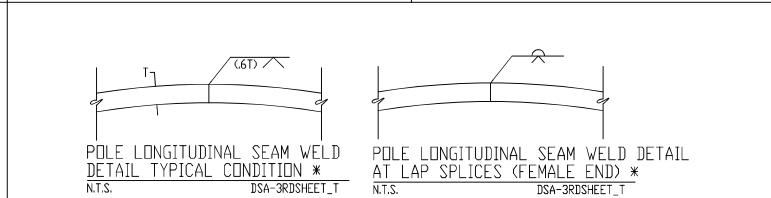
E LUMINAIRE ATTACHMENT DETAIL
N.T.S. DSA-3RDSHEET_T



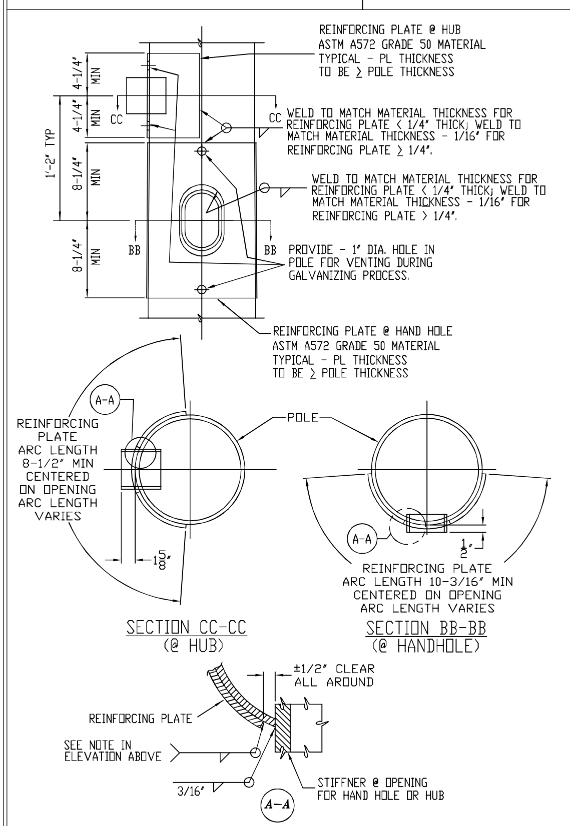
U LASER AIMING BRACKET
N.T.S. DSA-3RDSHEET_T



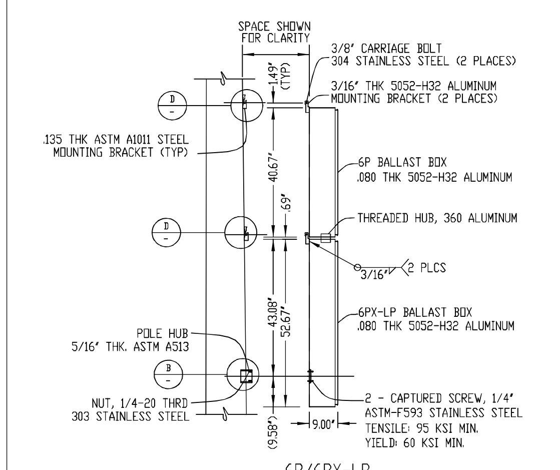
G SLIP JOINT CONNECTION DETAIL
N.T.S. DSA-LAP



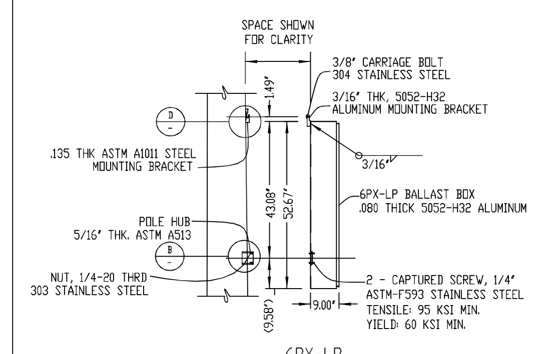
* NOTE- 100% PENETRATION SEAM WELDS MAY BE PROVIDED FULL LENGTH OF POLE SHAFTS PROVIDED WPS'S ARE QUALIFIED BY TEST.



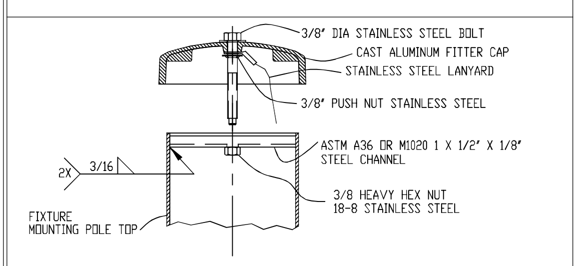
H HANDHOLE/HUB REINFORCING GUSSET
N.T.S.



SL BALLAST BOX CONNECTION DETAIL
N.T.S. STRU-6P6PXLP_E



O BALLAST BOX CONNECTION DETAIL
N.T.S. STRU-6PXLP_E



F FITTER CAP DETAIL
N.T.S. DSA-3RDSHEET_T

Warren HS Football LED Retrofit
FIELD LIGHTING
Downey, CA

REGISTERED PROFESSIONAL ENGINEER · STRUCTURAL · STATE OF CALIFORNIA · Exp. 6-30-25

CONSULTANT
KNA STRUCTURAL ENGINEERS

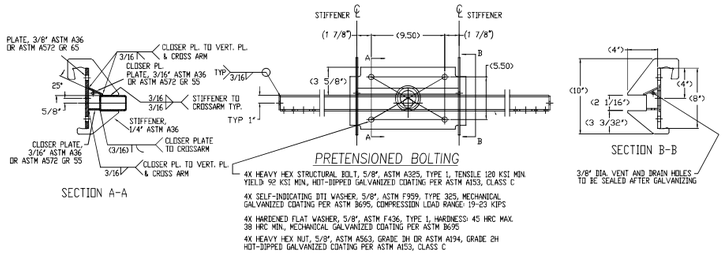
MUSCO Lighting
CORPORATE OFFICE:
P.O. Box 808
100 1st Avenue West
Oskaloosa, Iowa 52577
800/825-6020

DRAWING TITLE: ATTACHMENT DETAILS
SCALE: SEE PLAN
REVISIONS:
REFERENCE:

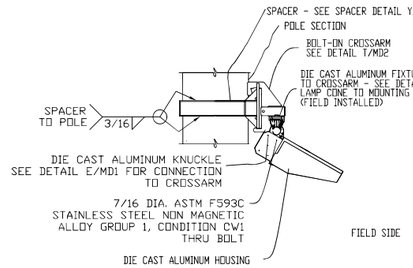
PROJECT NO. 215339
DATE: 11/30/2023
DRAWN BY: V.Alexander
DRAWING NO. 4 OF 6 MD1

STRU-MD1

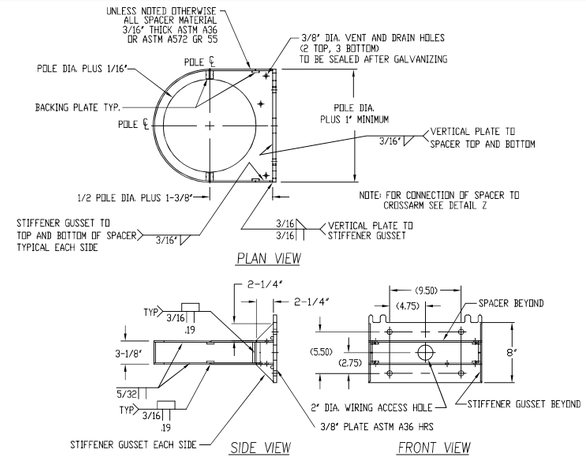
REV. 1 - Per Addendum 1



T BOLT ON CROSSARM DETAIL
SCALE: N.T.S. DSA-BOLTonBAR-LED_A_1



Z LIGHT FIXTURE (TYPICAL)
SCALE: N.T.S. DSA-1500-BOLTON_A



Y SPACER DETAIL
SCALE: N.T.S. DSA-BOLTON_L

Warren HS Football LED Retrofit
FIELD LIGHTING
Downey, CA

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KNA JOB NO.: 463-386

musco Lighting
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100 1st Avenue West
Oskaloosa, Iowa 52577
800/825-6020

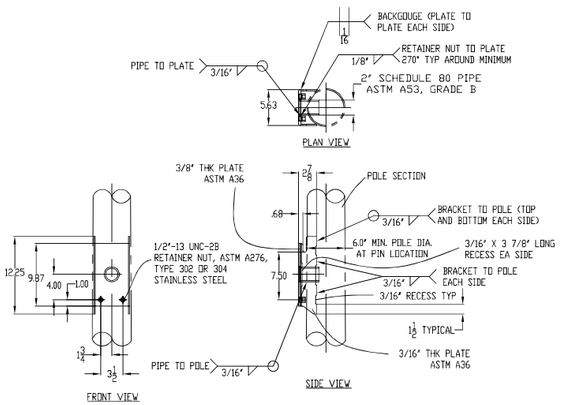
DRAWING TITLE: ATTACHMENT DETAILS
SCALE: SEE PLAN
REVISIONS
REFERENCE

PROJECT NO. 215339

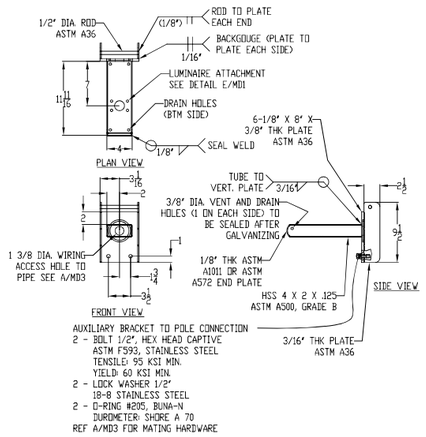
DATE: 11/30/2023

DRAWN BY: V.Alexander

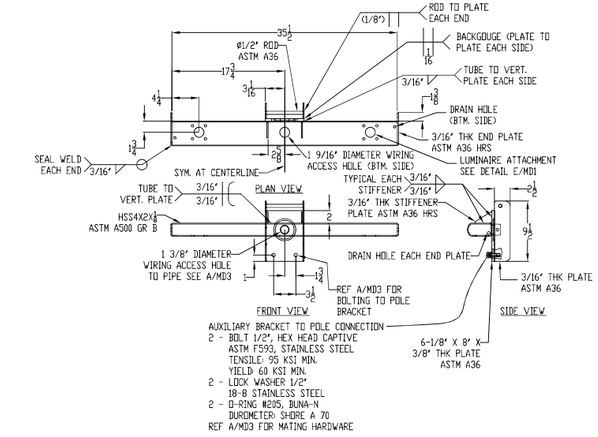
DRAWING NO. MD2
5 OF 6



A BRACKET DETAIL
N.T.S. DSA-Brk-Dtl-L_A



B 1P AUXILIARY MOUNTING BRACKET
N.T.S. DSA-1P FIXTURE MOUNT_E



C 2P AUXILIARY MOUNTING BRACKET
N.T.S. DSA-2P FIXTURE MOUNT_E

Warren HS Football LED Retrofit
FIELD LIGHTING
Downey, CA

PROFESSIONAL ENGINEER * VINOD KUMAR * No. 45506 Exp. 6-30-25 * REGISTERED * STRUCTURAL * STATE OF CALIFORNIA

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email@knastructural.com
KNA JOB NO. - 463-386

MUSCO Lighting
CORPORATE OFFICE:
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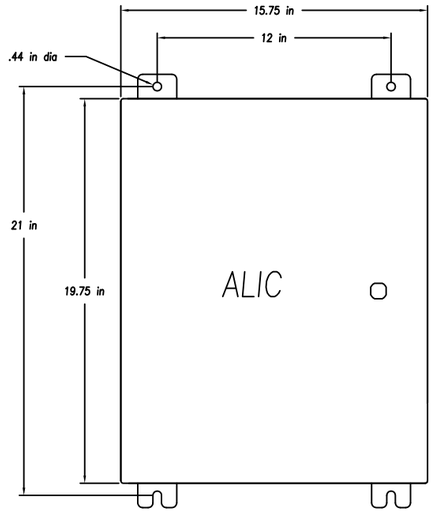
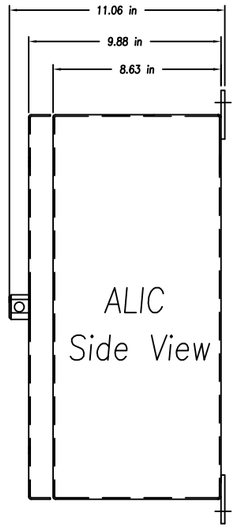
Oskaloosa, Iowa 52577
800/825-6020

DRAWING TITLE: ATTACHMENT DETAILS
SCALE: SEE PLAN
REVISIONS
REFERENCE

PROJECT NO. 215339
DATE: 11/30/2023
DRAWN BY: V.Alexander
DRAWING NO. MD3
6 OF 6

STRU-MDS



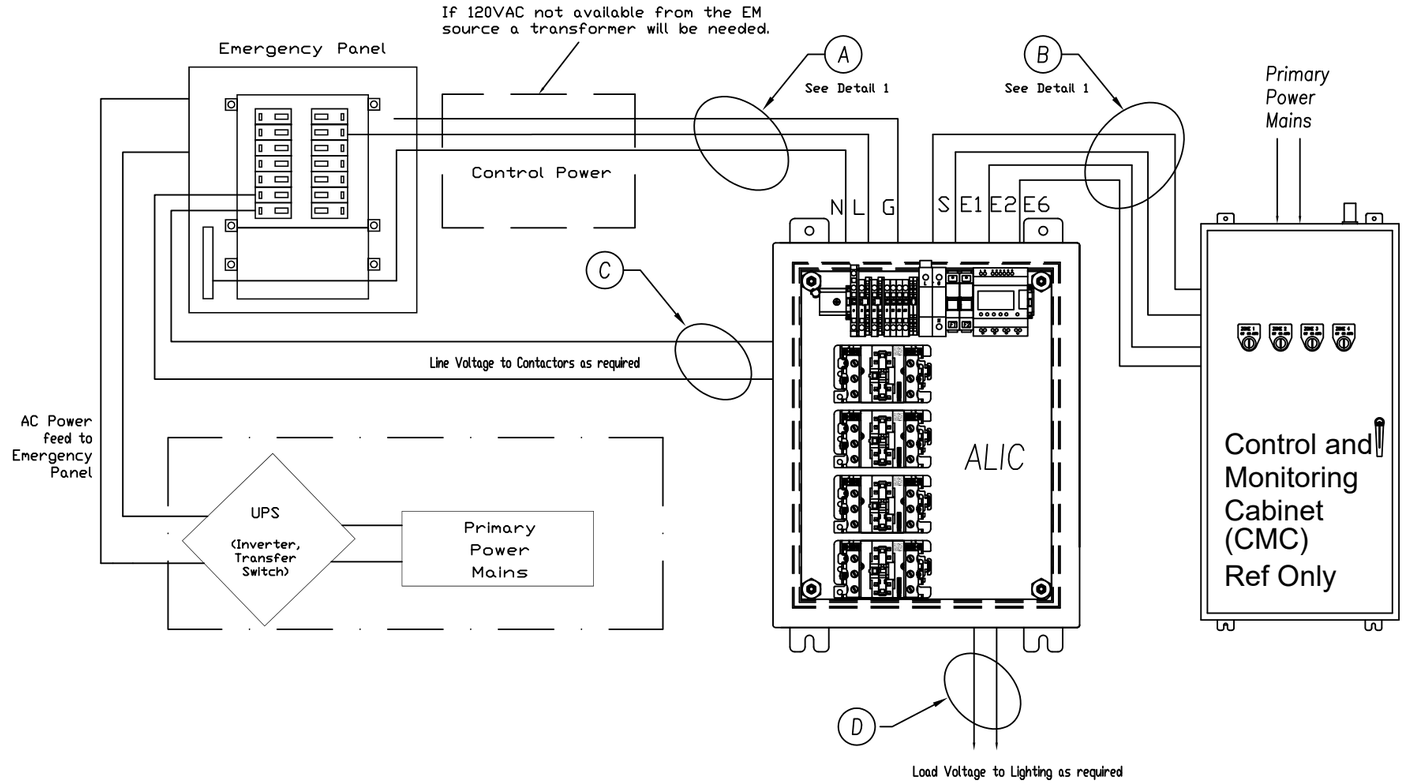


Auxiliary Lighting Interface Cabinet (ALIC)
Standard Operation and Functionality

Functionality
The ALIC (UL924) provides monitoring of Controls and Monitoring Cabinet zones and primary 120V power. For the ALIC to work correctly, it and the emergency lighting fixtures will need to be powered from an Emergency Distribution Panel. This Emergency Distribution Panel is assumed to be powered from a UPS or automatic transfer switch, whose operation is to control the power source, either the generator or the mains.

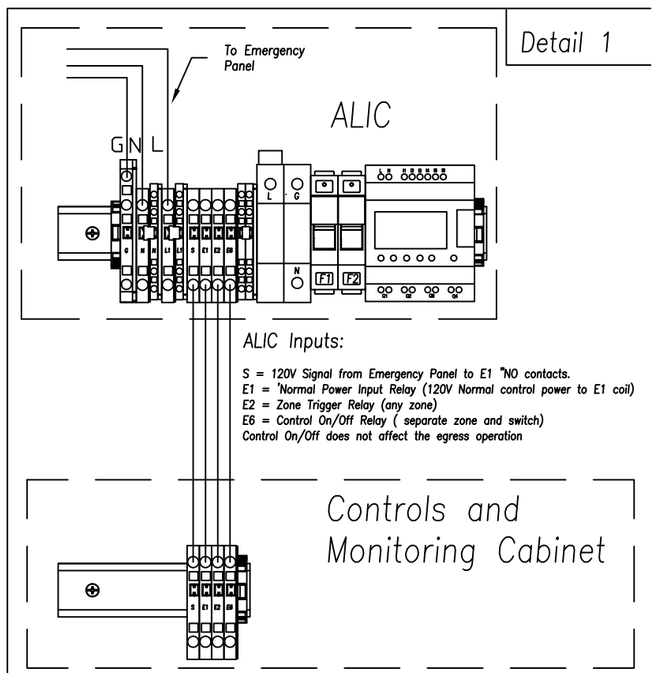
IMPORTANT: The 120 volt power (wire E1) from the Controls Monitoring Cabinet is being monitored as the mains or 'normal power.' For best operation, the Controls and Monitoring Cabinet should be powered from the field lighting distribution panel or what is to be considered the 'main'distribution panel.

Standard sequence of egress operation
1) The ALIC sends 120V over the S wire to the normally open (N.O.) contacts of the E1, E2 and E6 (if present) relays in the CMC.
   a) E1 is connected to the control circuit of the CMC to monitor Normal Power.
   b) E2 is connected to the monitored zone(s) to monitor when the zone(s) is on
   c) E6 is connected to the override zone if present. This zone can manually turn on or schedule the egress fixture. The manually override does not affect the egress operation
2) Normal power (the mains) has an interruption, either sustained or momentary.
3) E1 opens it's contacts cutting the monitored normal power input from the ALIC.
4) The ALIC checks the monitored zone input from E2.
   a) If the input was present the ALIC will output for egress. The ALIC will continue to output as long as the backup system provides power. Once normal power is restored and the ALIC receives an input from E1 the ALIC will delay off the egress output for 20min.
   b) If the input was not present the ALIC will not output for egress



Contractor Notes:

Contractor is responsible for providing (A,B,C,D) cables and installation of cables from emergency panel to ALIC and from ALIC to Controls and Monitoring Cabinet.



REV. 1 - Per Addendum 1

B

ALIC PRESALE DOC

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P.O. Box 808
100 1st Avenue West
Oskaloosa, Iowa 52577
+1-800-825-6020
+1-641-673-0411

Musco Lighting

REVISIONS:

DATE:	BY:	R.L.

JC

DRAWN BY: BH
CHECK BY:
REPRESENTATIVE: MH
SCALE: NTS
DATE: 17 MAY 2018

Downey High School Football LED Retrofit

Downey,CA

Lighting System

Pole/Fixture Summary

Pole ID	Pole Height	Mtg Height	Fixture Qty	Luminaire Type	Load	Circuit
F1-F4	90'	90'	1	TLC-LED-550	0.54 kW	B
		90'	3	TLC-LED-900	2.64 kW	A
		90'	9	TLC-LED-1500	12.69 kW	A
		50'	2	Cree OSQ	0.21 kW	B
		19'	2	TLC-BT-575	1.15 kW	A
4			**68**		**68.91 kW**	

Circuit Summary

Circuit	Description	Load	Fixture Qty
A	Football	65.92 kW	56
B	Security	2.99 kW	12

Egress kW Consumption

Fixture Type Summary

Type	Source	Wattage	Lumens	L90	L80	L70	Quantity
Cree OSQ	LED 5700K - 70 CRI	104W	15,939	--	--	--	8
TLC-BT-575	LED 5700K - 75 CRI	575W	52,000	>120,000	>120,000	>120,000	8
TLC-LED-1500	LED 5700K - 75 CRI	1410W	181,000	>120,000	>120,000	>120,000	36
TLC-LED-550	LED 5700K - 75 CRI	540W	67,000	>120,000	>120,000	>120,000	4
TLC-LED-900	LED 5700K - 75 CRI	880W	104,000	>120,000	>120,000	>120,000	12

Single Luminaire Amperage Draw Chart

Driver 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)
CREE OSQ	-	-	-	-	0.3	-	0.2
TLC-BT-575	3.3	3.2	2.9	2.5	2.0	1.8	1.5
TLC-LED-1500	8.4	7.9	7.3	6.3	5.0	4.6	3.6
TLC-LED-550	3.2	3.0	2.8	2.4	1.9	1.8	1.4
TLC-LED-900	5.2	4.9	4.5	3.9	3.1	2.9	2.3

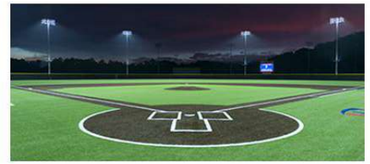
Light Level Summary

Calculation Grid Summary

Grid Name	Calculation Metric	Illumination					Circuits	Fixture Qty
		Ave	Min	Max	Max/Min	Ave/Min		
D Zone	Horizontal	36.8	22	49	2.23	1.67	A	56
Football	Horizontal Illuminance	52.6	44	62	1.39	1.20	A	56
Home ADA Ramps - Security	Horizontal	2.61	2	3	1.41	1.30	B	12
Home Bleacher - Security	Horizontal	5.56	1	8	5.72	5.56	B	12
Property Line Spill	Horizontal	0.93	0	7	0.00		A,B	68
Property Line Spill	Max Candela (by Fixture)	3536	187	22492	120.13	18.91	A,B	68
Property Line Spill	Max Vertical Illuminance Metric	1.10	0	8	9001.19		A,B	68
Shot Put	Horizontal	23	15	33	2.24	1.53	A	56
Soccer	Horizontal Illuminance	52.6	45	60	1.34	1.17	A	56
Track	Horizontal Illuminance	33.5	15	49	3.36	2.23	A	56
Visitor ADA Ramps - Security	Horizontal	2.39	2	3	1.50	1.20	B	12
Visitor Bleacher - Security	Horizontal	5.21	2	7	3.44	2.61	B	12

These light fixtures at approx. 50' above grade will be replaced with (2) new Cree OSQ light fixtures and a new crossarm. New crossarm will mount to the existing mounting bracket on the pole. Musco will provide new crossarm and new Cree OSQ fixtures. Existing speakers to be protected in place.

From Hometown to Professional



DOWNEY HIGH SCHOOL FOOTBALL LED RETROFIT
11040 BROOKSHIRE AVENUE, DOWNEY, CA 90241
A#03-123922

DOWNEY UNIFIED SCHOOL DISTRICT
11627 BROOKSHIRE AVENUE, DOWNEY, CA 90241

PROJECT DIRECTORY

OWNER:

DOWNEY UNIFIED SCHOOL DISTRICT
11627 BROOKSHIRE AVE., DOWNEY, CA 93065
CONTACT: VINCE MADSEN
(652) 469-6703 OFFICE

STRUCTURAL ENGINEER:

RTM ENGINEERING CONSULTANTS
9931 MUIRLANDS BLVD.
IRVINE, CA 92618
CONTACT: JOSH RANDALL
(949) 462-3200 OFFICE
(949) 462-3201 FAX

PROJECT DESCRIPTION

REMOVE ALL EXISTING LIGHT FIXTURES & TOP POLE SECTIONS FROM (4) EXISTING POLES AND REPLACE WITH NEW TOP POLE SECTION, NEW LIGHT FIXTURES & NEW CROSS-ARM SUPPORTS. ADD NEW BALLAST BOXES AT BOTTOM OF POLES.

DSA NOTES

1. CHANGES TO THE DSA APPROVED DRAWINGS AND/OR SPECIFICATIONS SHALL BE MADE BY AN ADDENDUM OR CONSTRUCTION CHANGE DOCUMENT FOR THE STRUCTURAL, ACCESSIBILTY OR FIRE-LIFE SAFETY PORTIONS OF THE PROJECT. CHANGES SHALL BE SUBMITTED TO AND APPROVED BY DSA PRIOR TO COMMENCEMENT OF THE WORK SHOWN THEREON, (CAC 4-338(c)).
2. AN INSPECTOR, EMPLOYED BY THE DISTRICT AND APPROVED IN WRITING BY THE DIVISION OF THE STATE ARCHITECT, SHALL BE REQUIRED FOR CONTINUOUS INSPECTION OF THIS WORK IN ACCORDANCE WITH THE DUTIES DEFINED BY THE CALIFORNIA CODE OF REGULATIONS, TITLE 24, PART 1, SECTION 4-342. THE INSPECTOR SHALL BE QUALIFIED AS A CLASS 2 INSPECTOR FOR THIS PROJECT.
3. TESTING, IF ANY, SHALL BE DONE BY A QUALIFIED TESTING LAB AND PAID FOR BY THE OWNER IN ACCORDANCE WITH THE CALIFORNIA CODE OF REGULATIONS, TITLE 24, PART 1, SECTION 4-335.
4. THERE ARE NO DEFERRED APPROVALS FOR THIS PROJECT.
5. FIRE SAFETY DURING DEMOLITION AND CONSTRUCTION SHALL COMPLY WITH CFC CHAPTER 33.
6. THE INTENT OF THESE DRAWINGS AND SPECIFICATIONS IS THAT THE WORK OF THE ALTERATION, REHABILITATION OR RECONSTRUCTION IS TO BE IN ACCORDANCE WITH TITLE 24, CALIFORNIA CODE OF REGULATIONS. SHOULD ANY EXISTING CONDITIONS SUCH AS DETERIORATION OR NONCOMPLYING CONSTRUCTION BE DISCOVERED WHICH IS NOT COVERED BY THE CONTRACT DOCUMENTS WHEREIN THE FINISHED WORK WILL NOT COMPLY WITH TITLE 24, CALIFORNIA CODE OF REGULATIONS, A CHANGE ORDER, OR A SEPARATE SET OF PLANS AND SPECIFICATIONS, DETAILING AND SPECIFYING THE REQUIRED REPAIR WORK SHALL BE SUBMITTED TO AND APPROVED BY DSA BEFORE PROCEEDING WITH THE REPAIR WORK (CAC, 2103, 4-317(c)).
7. ALL WORK SHALL CONFORM TO TITLE 24, CALIFORNIA CODE OF REGULATIONS (CCR).

GENERAL NOTES

1. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO THE START OF WORK AND IT SHALL BE THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ANY DISCREPANCIES, WHICH MAY EXIST BETWEEN WHAT IS SHOWN ON THESE DRAWINGS AND THE ACTUAL FIELD CONDITIONS.
2. THE CONTRACTOR SHALL THOROUGHLY INVESTIGATE, VERIFY, AND BEAR FULL RESPONSIBILITY FOR DIMENSIONS AND EXISTING CONDITIONS THAT AFFECT CONSTRUCTION AS SHOWN ON THESE DRAWINGS. THE CONTRACTOR SHALL NOTIFY THE STRUCTURAL ENGINEER OF ANY CONDITIONS REQUIRING MODIFICATION OR CHANGE PRIOR TO STARTING WORK.
3. ANY DAMAGE TO EXISTING CONSTRUCTION OR EQUIPMENT CAUSED BY OPERATIONS UNDER THIS CONTRACT SHALL BE REPAIRED OR REPLACED TO THE SATISFACTION OF THE SCHOOL DISTRICT AT THE CONTRACTOR'S EXPENSE.
4. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LOCATE AND PROTECT ALL UTILITIES AND SUBSTRUCTURES WITHIN THE LIMITS OF NEW WORK WHETHER SHOWN ON THE DRAWINGS OR NOT, AND TO PROTECT THEM FROM DAMAGE. THE CONTRACTOR WILL BE HELD RESPONSIBLE AND SHALL BEAR THE TOTAL EXPENSE OF REPAIR OR REPLACEMENT OF SAID UTILITIES AND SUBSTRUCTURES DAMAGED BY HIS OPERATION IN CONNECTION WITH THE EXECUTION OF THIS WORK. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR ALL DAMAGE ARISING FROM AND/OR CONNECTED WITH DAMAGE TO SAID UTILITIES AND SUBSTRUCTURES AS OUTLINED ABOVE.
5. DURING THE ENTIRE CONSTRUCTION PERIOD, IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN CONDITIONS AT THE PROJECT SITE TO MEET THE REQUIREMENTS OF THE FEDERAL OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) AND CALIFORNIA OCCUPATIONAL REGULATIONS. THIS PROVISION SHALL COVER THE CONTRACTOR'S EMPLOYEES AND ALL OTHER PERSONS WORKING UPON OR VISITING THE SITE. THE CONTRACTOR SHALL BECOME FULLY INFORMED OF ALL APPLICABLE STANDARDS AND REGULATIONS AND INFORM ALL PERSONS AND REPRESENTATIVES RESPONSIBLE FOR WORK UNDER THIS CONTRACT.
6. PROVIDE BARRICADES AND PROTECTIVE DEVICES SEPARATING CONSTRUCTION AREAS. PROVIDE TEMPORARY PASSAGES AS REQUIRED. PRIOR TO DELIVERY OF MATERIALS TO CONSTRUCTION ZONE AND REMOVAL OF WASTE FROM SITE, CHECK WITH THE OWNER FOR ACCEPTABLE ACCESS ROUTE AND TIME. UNDER NO CIRCUMSTANCES USE AREA OUTSIDE THE CONSTRUCTION ZONE WITHOUT PRIOR CLEARANCE FROM THE OWNER.
7. TAKE ALL MEASURES TO ACCOMPLISH THE WORK WITH THE MINIMUM OF INTERRUPTION TO NORMAL BUILDING PROCEDURES. NOTIFY OWNER IN ADVANCE OF HVAC, ELECTRICAL OR OTHER BUILDING SYSTEM SHUT-OFFS. MINIMIZE NOISE AND DUST GENERATION TO MAXIMUM EXTENT POSSIBLE.

CODE INFORMATION

ALL CONSTRUCTION SHALL BE DONE IN ACCORDANCE WITH:

2022 CALIFORNIA ADMINISTRATIVE CODE, PART 1, TITLE 24 C.C.R

2022 CALIFORNIA BUILDING CODE (CBC), PART 2, TITLE 24 C.C.R.
(2021 INTERNATIONAL BUILDING CODE VOLUMES 1-2 & 2022 CALIFORNIA AMENDMENTS)

2022 CALIFORNIA ELECTRICAL CODE (CEC), PART 3, TITLE 24 C.C.R
(2020 NATIONAL ELECTRICAL CODE & 2022 CALIFORNIA AMENDMENTS)

2022 CALIFORNIA MECHANICAL CODE (CMC) PART 4, TITLE 24 C.C.R
(2021 UNIFORM MECHANICAL CODE & 2022 CALIFORNIA AMENDMENTS)

2022 CALIFORNIA PLUMBING CODE (CPC), PART 5, TITLE 24 C.C.R
(2021 UNIFORM PLUMBING CODE & 2022 CALIFORNIA AMENDMENTS)

2022 CALIFORNIA ENERGY CODE (CEC), PART 6, TITLE 24 C.C.R.

2022 CALIFORNIA FIRE CODE, PART 9, TITLE 24 C.C.R
(2021 INTERNATIONAL FIRE CODE & 2022 CALIFORNIA AMENDMENTS)

2022 CALIFORNIA GREEN BUILDING STANDARDS CODE, PART 11, TITLE 24 C.C.R.

2022 CALIFORNIA REFERENCED STANDARDS, PART 12, TITLE 24 C.C.R

TITLE 19 C.C.R., PUBLIC SAFETY, STATE FIRE MARSHAL REGULATIONS

SHEET INDEX (TOTAL SHEETS = 6)

VICINITY MAP

Downey HS Football LED Retrofit
FIELD LIGHTING
DOWNEY, CA 90241

For Review
01/17/2024 11:16:39 AM

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DRAWING TITLE: TITLE SHEET/CODE/INDEX
SCALE: SEE PLAN
REVISIONS:
REFERENCE:

PROJECT NO. 215340

DATE: 12/15/2023

DRAWN BY: J.Donahue

DRAWING NO. T1
1 OF 6

GENERAL NOTES:

GENERAL NOTES:

SCOPE OF WORK

Removal of existing pole top fitter sections. Installation of new pole top fitter sections with new lights and new crossarms. Removal and replacement of existing ballast boxes. Installation of new auxiliary fixtures.

APPLICABLE BUILDING CODE

All construction and workmanship shall conform to the 2019 California Building Code, California Code of Regulations – Title 24, Parts 1 & 2.

This pole and foundation standard has been designed for lateral loads on the completed structure as follows:

Wind Design Data:
- Vult = 95 MPH (Exposure C); Vasd = 74 MPH (Exposure C)
- Risk Category = II

Seismic Design Data:
- I_e = 1.0
- Risk Category = II (Self Supporting Poles)
- S_S = 1.704
- S_1 = 0.611
- Site Class = D–DEFAULT
- S_{DS} = 1.363
- S_{D1} = 0.692
- Seismic Design Category = D
- Basic Seismic–Force–Resisting System = Non–Building Structure, not similar to buildings
- Cs = 0.326 (STRENGTH LEVEL)
- R = 1.5
- Ω = 1.5
- Analysis Procedure = Equivalent Lateral Force Procedure
- See Pole Foundation Schedule for maximum pole seismic forces.

GENERAL CONSTRUCTION

These notes shall be used in conjunction with the plans and any discrepancies shall be brought to the attention of the Engineer.

Contractor must check all dimensions, clearances and job conditions before starting work. Engineer shall be notified immediately of any discrepancies or possible deficiencies.

The drawings and specifications represent the finished structure. All bracing, temporary supports, shoring, etc., is the sole responsibility of the Contractor. Observation visits to the job site by the Engineer do not include inspection of construction procedures. The Contractor is solely responsible for all construction methods and for safety conditions at the worksite. These visits shall not be construed as continuous and detailed inspections.

Design, material, equipment, and products other than those described below or indicated on the drawings may be considered for use, provided prior approval is obtained from the School District, Engineer, and the Division of the State Architect.

All changes In approved plans shall be made by means of construction change documents (CCD) approved by the Division of State Architect, as required by Section 4–338, Part 1, Title 24, CCR. All CCD documents shall be signed by the Architect and Owner. Addenda shall be signed by the design professional in general responsible charge.

Substitutions shall be considered as a CCD and shall be approved by DSA prior to fabrication or use.

A Class 1 or Class 2 Project Inspector employed by the District (Owner) and approved by the Division of State Architect shall provide continuous inspection of the work, the duties of the Inspector are defined In Section 4–342, Part 1, Title 24, CCR.

All Tests And Inspections shall be performed by an Independent lab employed by the School District and approved by DSA.

Reference pole location drawings provided by the Architect, Structural Engineer, or Electrical Engineer for actual pole placement and site location.

STEEL POLE

All miscellaneous structural steel items conform to AISC 360–16.

All weldment conforms with AWS D1.1 specification for GMAW fillet utilizing E70S–X filler metal or SAW fillet utilizing F7XX–EXXX or F8XX–EXXX filler metal.
GMAW procedure conforms to AWS A5.18.
SAW procedure conforms to AWS A5.23.

All field welding shall be in compliance with AWS D1.1 specification.

All welding shall be continously inspected by an AWS CWI certified inspector approved by DSA.

All exposed steel shall be hot dipped galvanized to ASTM A123 latest standards.

TESTING AND INSPECTION

Testing and inspection in accordance with Title 24, Part 1 & Part 2 & project DSA 103 form.

STEEL MATERIALS:
Structural steel – 2202A.1 & 2205A.1
Cold formed steel – 2210A.1
Identification – 2202A.1

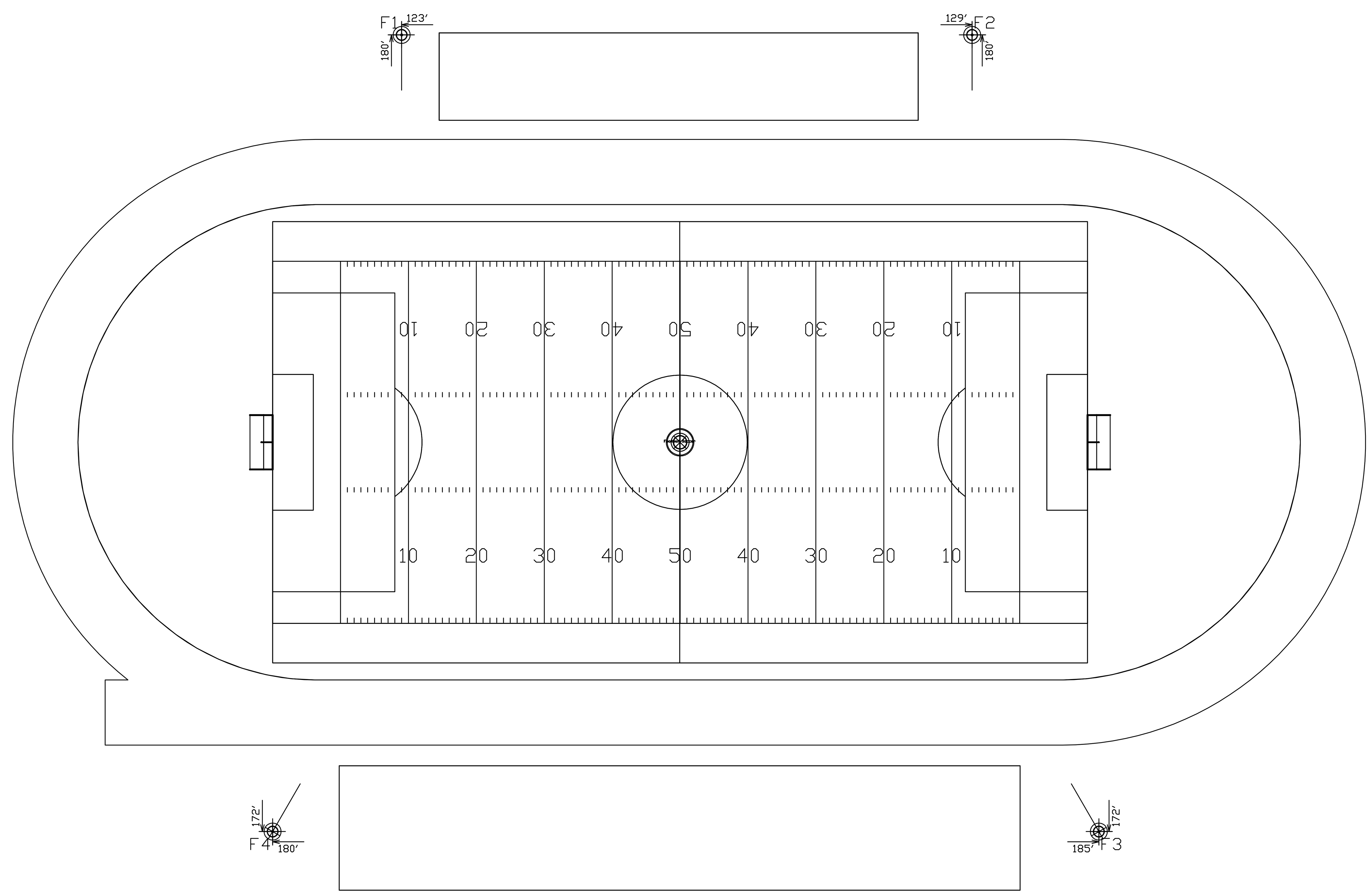
STEEL QUALITY:
Tests of structural steel & cold formed steel – 2202A.1

STRUCTURAL STEEL INSPECTIONS: Table 1705A.2.1
Shop fabrication inspection – 1704A2.5
Welding – 1705A.2.5, DSA IR 17–3 and AWS D1.1.

NOTE: Field verify existing pole conditions & repair any defects, if found. Repair procedures and details to be reviewed and approved by Structural Engineer of Record and DSA.

These plans are for construction approval. An application number and approval of these drawings by the Division of The State Architect of California must be secured to build from these plans.

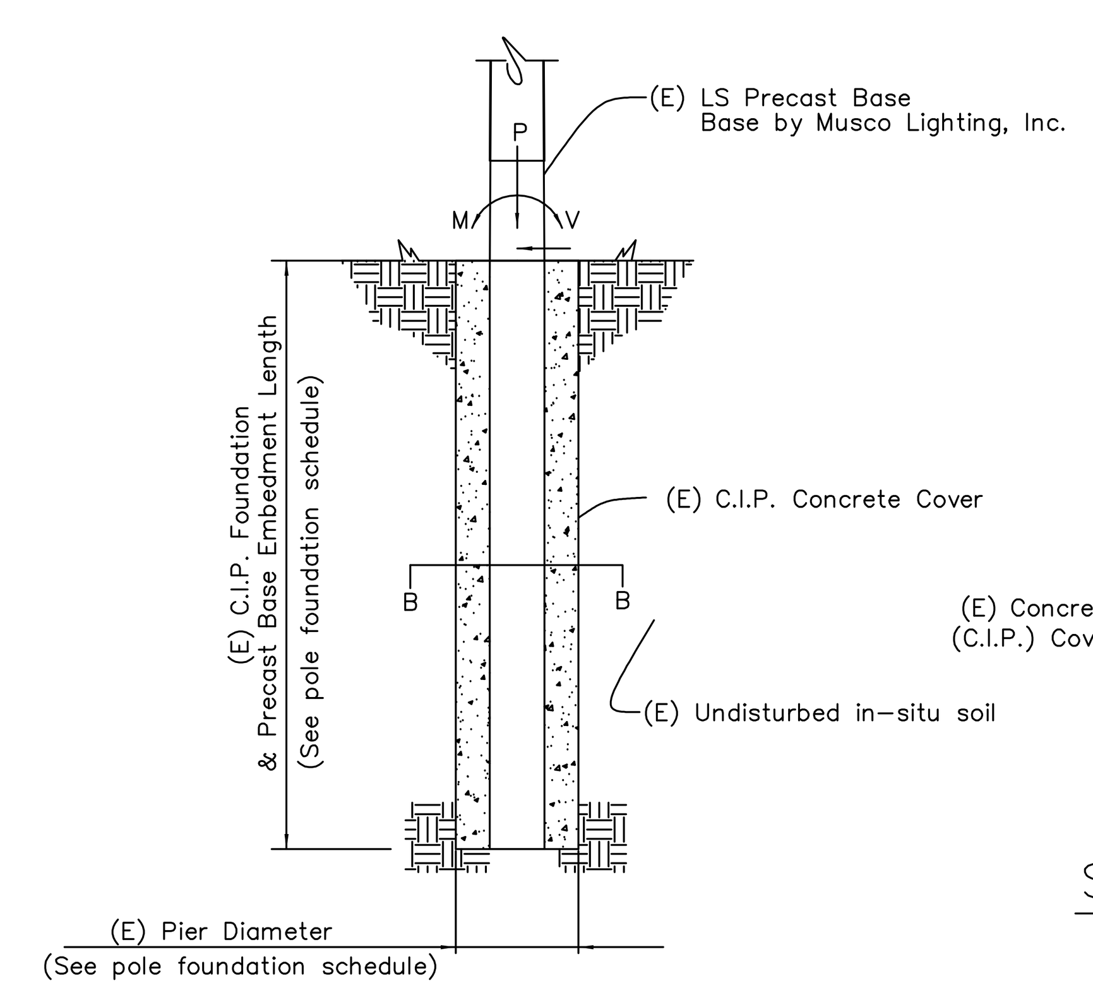
INDEX OF SHEETS

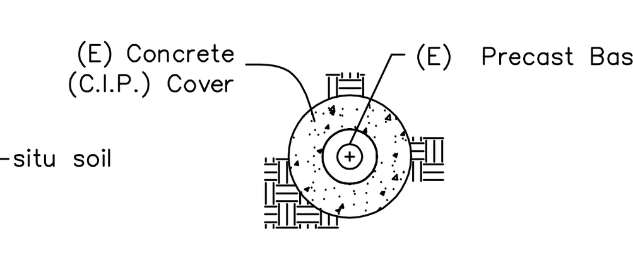


POLE ORIENTATION PLAN

N.T.S.

NOTE: THIS PLAN IS A PICTORAL REPRESENTATION OF THE SITE LAYOUT. REFERENCE APPROPRIATE ARCHITECTURAL SITE PLAN FOR ALL NECESSARY INFORMATION.





SECTION B

(A) (E) FOUNDATION DETAIL

N.T.S.

(E) POLE FOUNDATION SCHEDULE								
POLE TYPE–# OF FIXTURES (MAX) (LSS=LIGHT STRUCTURE)	MARK (SEE POLE ORIENTATION PLAN)	WIND OR SEISMIC (SEISMIC FORCE INCLUDES OVERSTRENGTH FACTOR=1.5)	ASD LEVEL FORCES (MAX)			(E) C.I.P. DEEP FOUNDATION		(E) PRECAST BASE
			MOMENT (M) FT–LBS*	SHEAR (V) LBS	VERTICAL (P) LBS**	DIAMETER INCHES	EMBEDMENT FEET	EMBEDMENT LENGTH
(E) LSS90B–13	F1, F2, F3, F4	SEISMIC	146,000	2,375	6,940	36"	18'–0"	18'–0"
		WIND	165,800	2,710	4,816			

*Moment (M) computed below grade at Shear (V) = 0.
**Vertical (P) load includes steel pole, light fixtures, and attachments. Vertical (P) load for wind is the dressed pole weight for erection purposes. Vertical (P) load for seismic also includes weight of precast base above groundline.

Downey HS Football LED Retrofit
FIELD LIGHTING
Downey, CA

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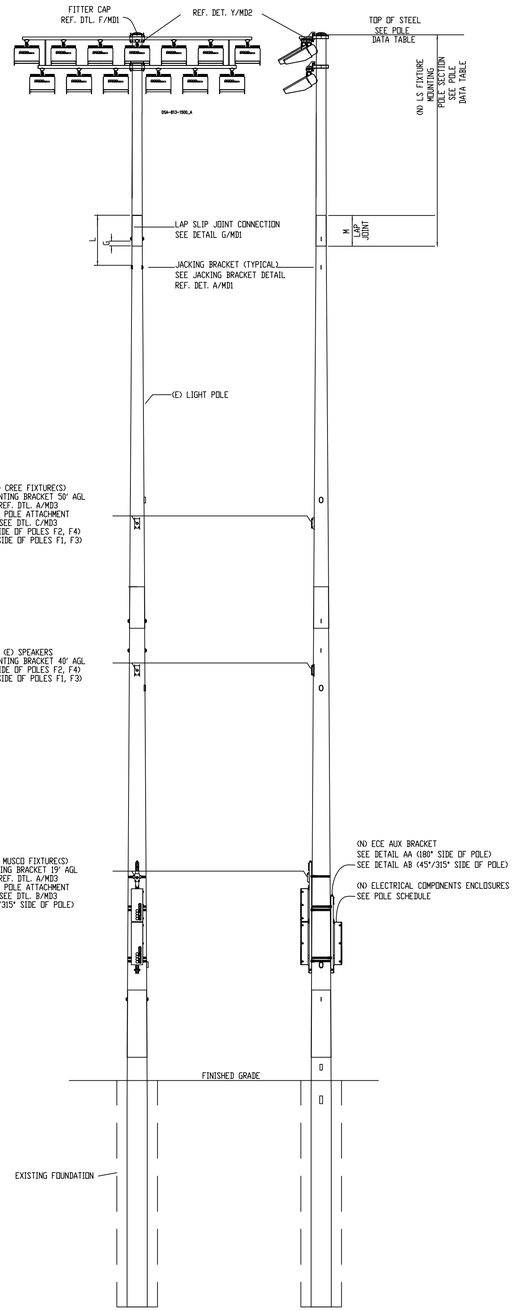
DRAWING TITLE: NOTES, FOUNDATION DETAIL
SCALE: SEE PLAN
REVISIONS:
REFERENCE:

PROJECT NO. 215340
DATE: 11/27/2023
DRAWN BY: V.Alexander
DRAWING NO. MT1

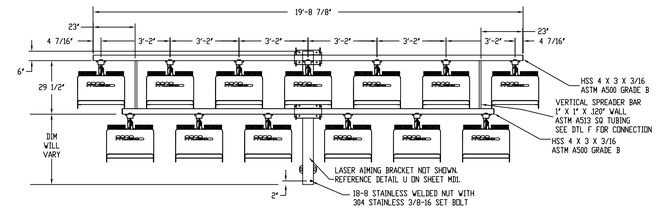
REV 1. - Per Addendum 1

DSA–TITLE1_E



LSS90B POLE FRONT VIEW
N.T.S.

LSS90B POLE SIDE VIEW
N.T.S. DSA-90BBASE_A



B 13 FIXTURE CONFIGURATION
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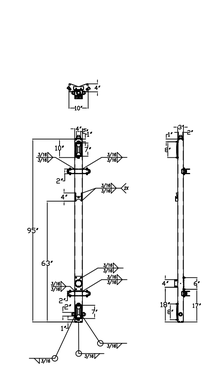
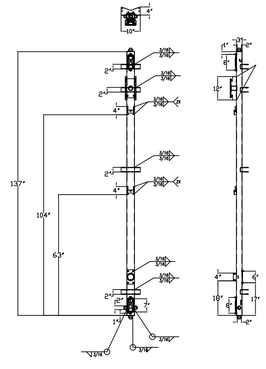
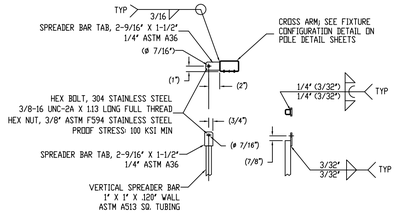


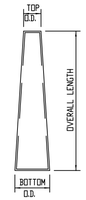
AA 6P W/O BTF ECE AUX NON-HUB
N.T.S.



AB 6P,6PX-LP W/ BTF ECE AUX NON-HUB
N.T.S.



F BOLT ON SPREADER BAR DETAIL
SCALE: N.T.S. DSA-SpreaderBarBoltOn-LED_A



TOP/MIDDLE/BOTTOM
POLE SECTION

1. CONTAINS COMBINED EPA OF LIGHT FIXTURES, CROSS ARM AND MISCELLANEOUS FIXTURE MOUNTING APPARATUS.

FIXTURE WEIGHT 90 LBS. THIS INCLUDES THE WEIGHT OF FIXTURE, CROSS ARM & MISC. MOUNTING APPARATUS. ELECTRICAL BALLAST BOX WEIGHT 20 LBS PER FIXTURE SERVICED

POLE SCHEDULE

SITE LOCATION	POLE MARK	REFERENCE LOCATION	POLE TYPE	FIXTURE CONFIGURATION	TOTAL EPA[1]	BALLAST BOX REQUIREMENTS
SEE SITE PLAN (BY OTHERS)	F1-F4	SEE POLE ORIENTATION PLAN	LSS90B	13 - SEE DETAIL B/MS1	45.63	SEE DETAIL SL,SL,D/MD1

DSA-POLESCHE_C

NOTATION	DIMENSION
	LSS90B
G	1'-6"
L	5'-6 1/2" NOM.
M	3'-3 1/4" NOM. 2'-3" MIN.

POLE DATA TABLE

POLE TYPE	PIECE MARK	MAX NUMBER of X-Arms	POLE SECTION	TOP O.D. (INCHES)	BTM. O.D. (INCHES)	OVERALL LENGTH	STRAIGHT LENGTH	TAPER LENGTH	THICKNESS (INCHES)	TOP OF STEEL NOMINAL	ASTM REFERENCE
LSS90B	MP-1BTT-1	2	FIXTURE MOUNTING	9.462"	12.000"	18'-1 1/2"	-----	18'-1 1/2"	.179	87'-5 7/8"	A595A (Fy=55 ksi) or A572, Gr 55 or 65

DSA-90BDT_A

REV 1 - Per Addendum 1

DSA-90_A

Downey HS Football LED Retrofit
FIELD LIGHTING
Downey, CA

PROFESSIONAL ENGINEER
KARIM T.
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01/17/2024 11:16:51 AM
STATE OF

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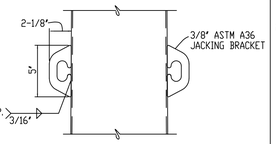
DRAWING TITLE: POLE DETAIL
SCALE: SEE PLAN
REVISIONS:
REFERENCE:

PROJECT NO. 215340

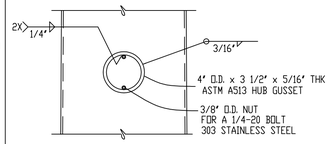
DATE: 11/27/2023

DRAWN BY: V.Alexander

DRAWING NO. MS1
3 OF 6



A JACKING BRACKET DETAIL
N.T.S. DSA-3RDSHEET_T



B HUB DETAIL
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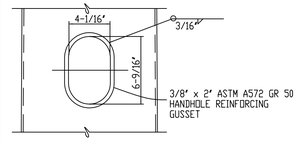

C HANDHOLE SLEEVE DETAIL
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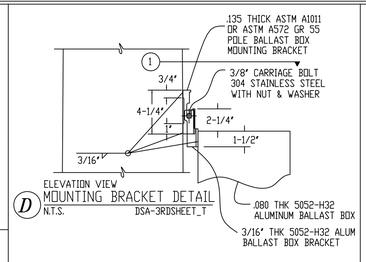

D MOUNTING BRACKET DETAIL
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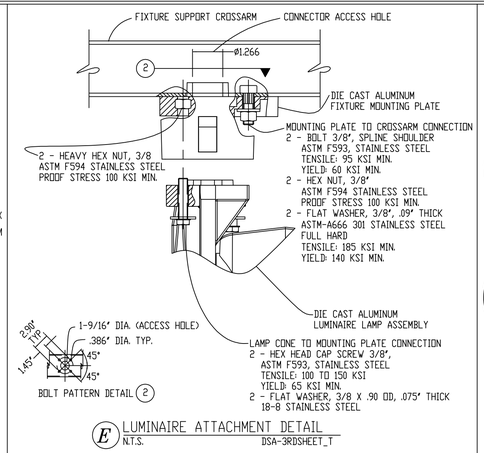

E LUMINAIRE ATTACHMENT DETAIL
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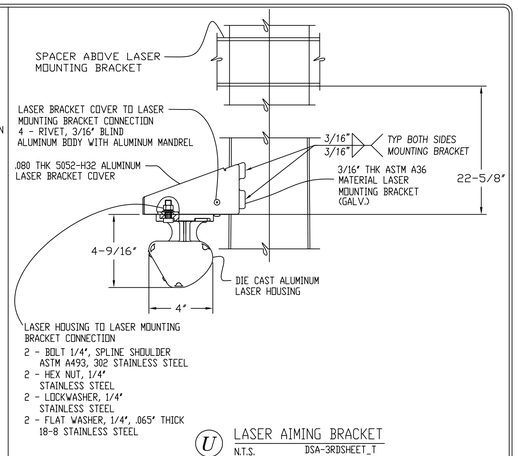

U LASER AIMING BRACKET
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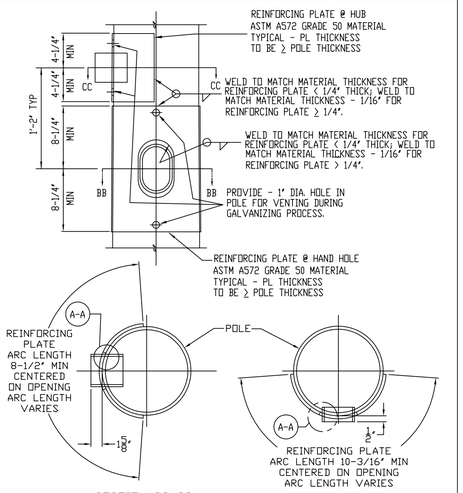
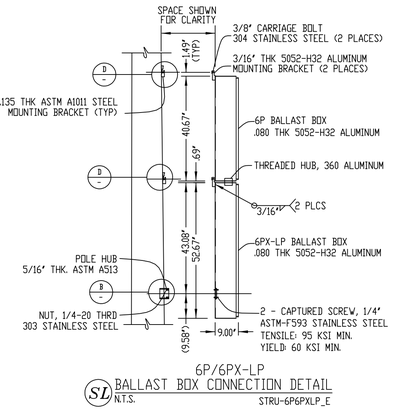
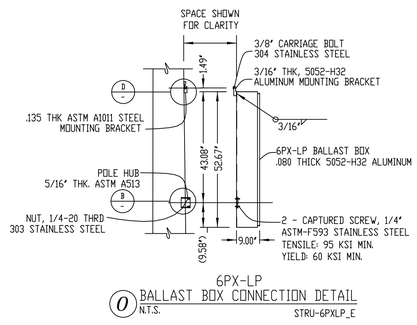


H HANDHOLE/HUB REINFORCING GUSSET
N.T.S.

F FITTER CAP DETAIL
N.T.S. DSA-3RDSHEET_T



SL BALLAST BOX CONNECTION DETAIL
N.T.S. STRU-6P6PXLP_E



O BALLAST BOX CONNECTION DETAIL
N.T.S. STRU-6PXLP_E

Downey HS Football LED Retrofit
FIELD LIGHTING
Downey, CA

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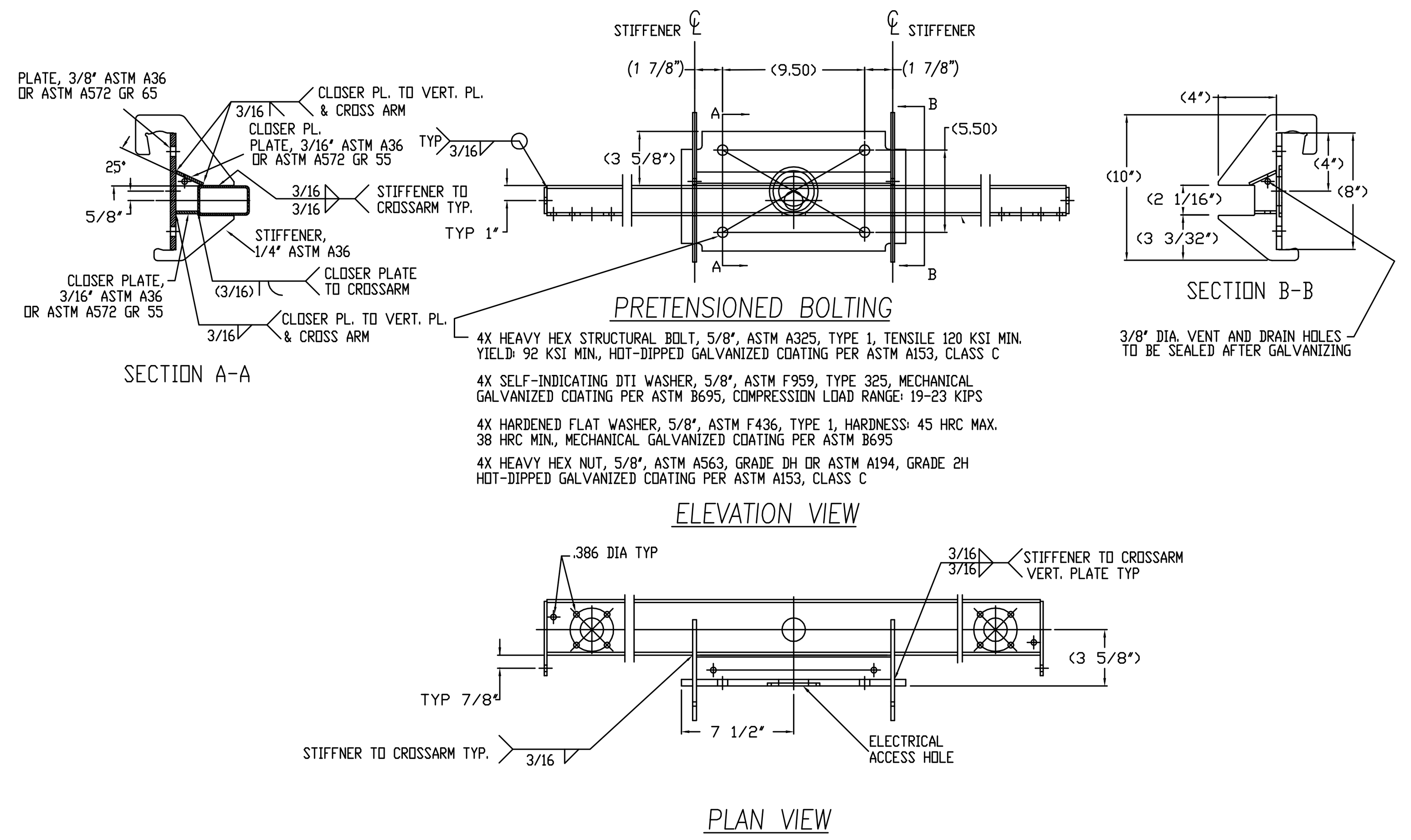
DRAWING TITLE: ATTACHMENT DETAILS
SCALE: SEE PLAN
REVISIONS
REFERENCES

PROJECT NO. 215340
DATE: 11/27/2023
DRAWN BY: V.Alexander
DRAWING NO. MD1
4 OF 6

STRU-MD1

REV 1. - Per Addendum 1



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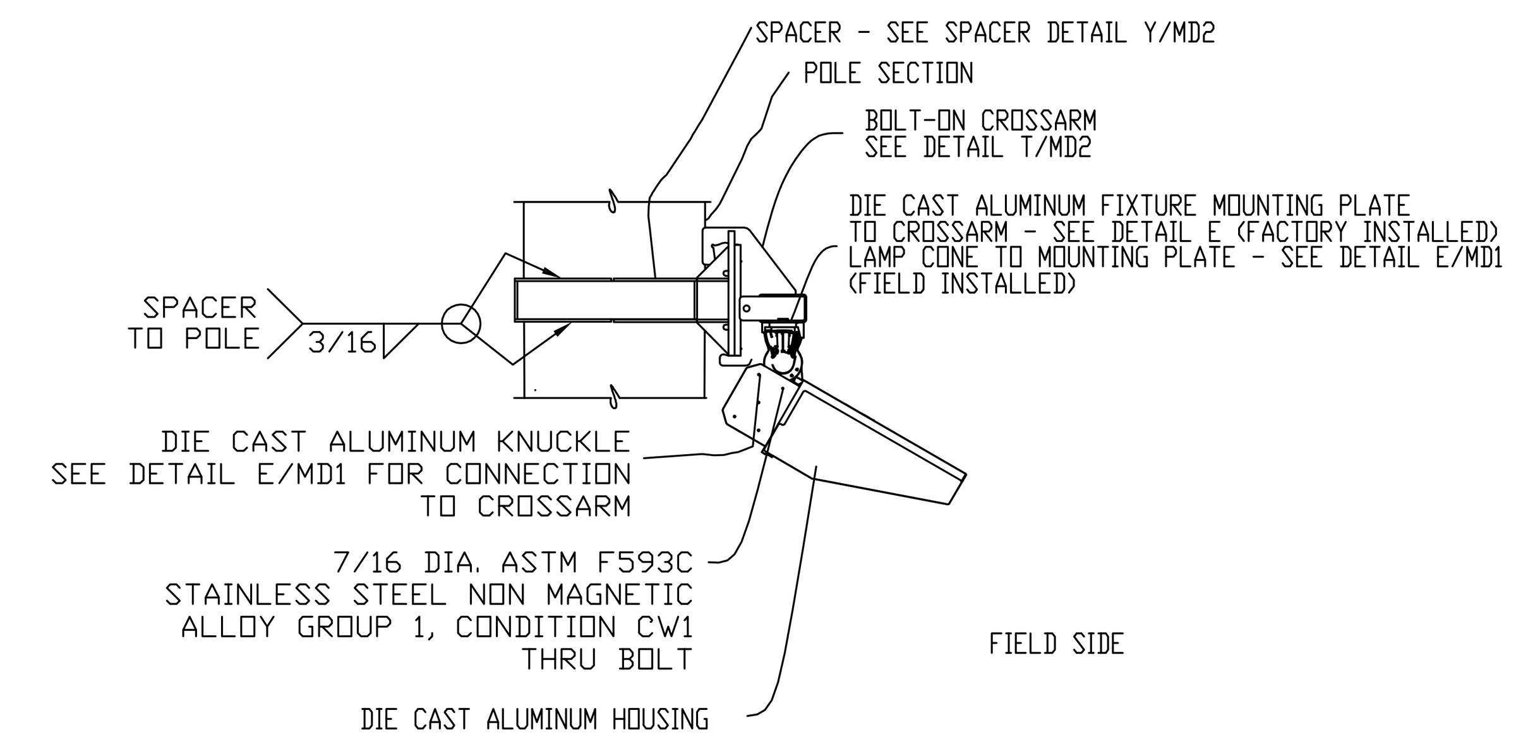
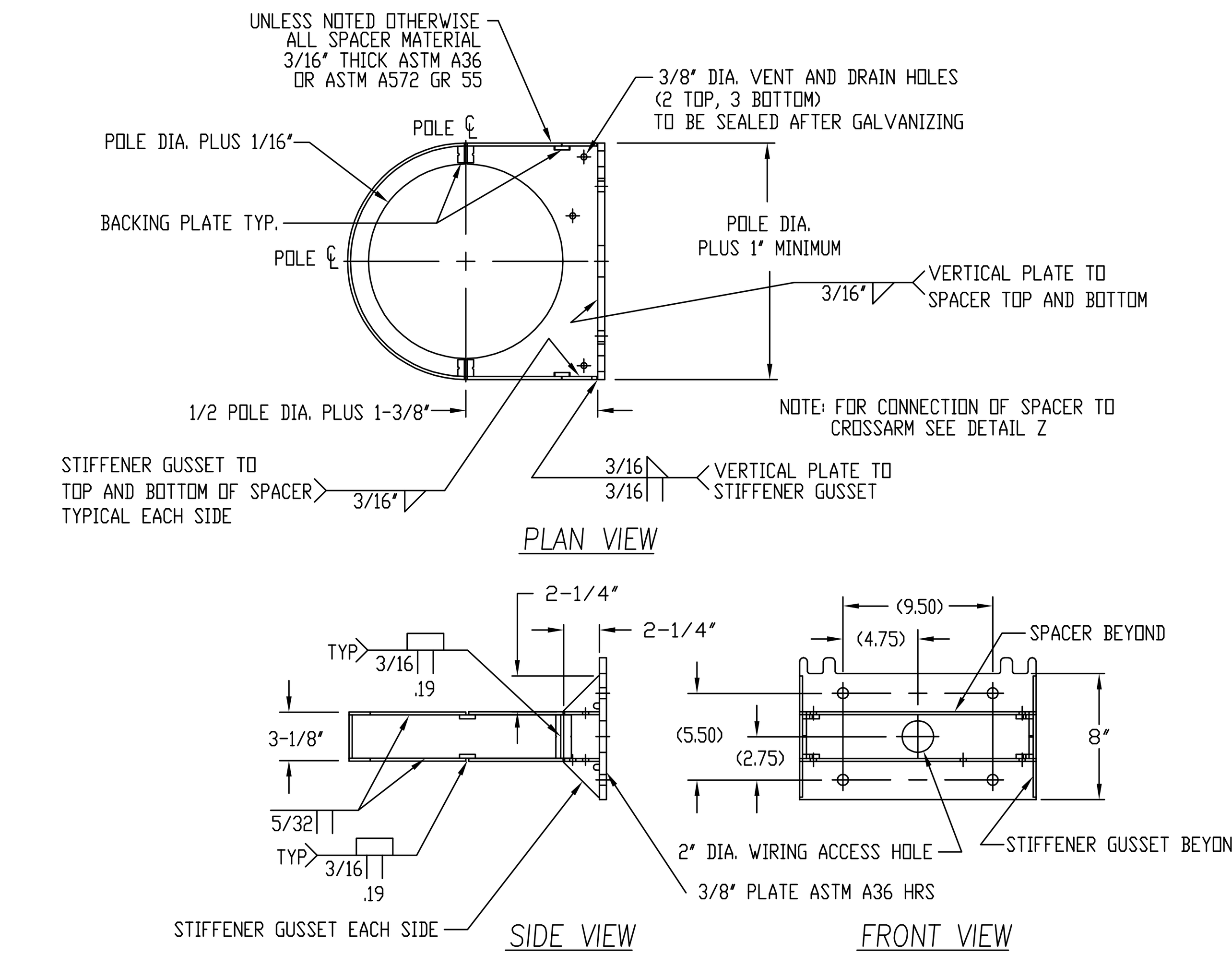


Z LIGHT FIXTURE (TYPICAL)
SCALE: N.T.S.
DSA-1500-BOLTON_A



Y SPACER DETAIL
SCALE: N.T.S. DSA-BOLTON_L

Downey HS Football LED Retrofit
FIELD LIGHTING
Downey, CA

For Review 01/17/2024 11:17:02 AM

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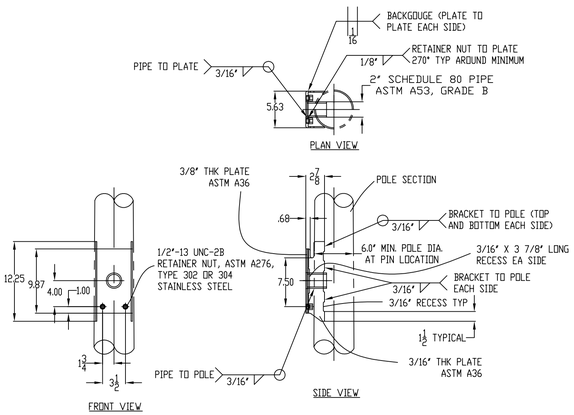
DRAWING TITLE: ATTACHMENT DETAILS
SCALE: SEE PLAN
REVISIONS:
REFERENCE:

PROJECT NO. 215340
DATE: 11/27/2023
DRAWN BY: V.Alexander
DRAWING NO. MD2
5 OF 6

STRU-MD2

REV 1. - Per Addendum 1



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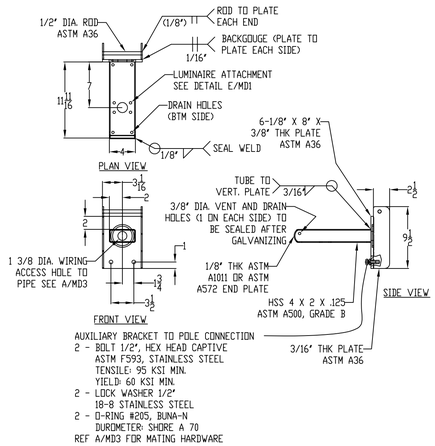
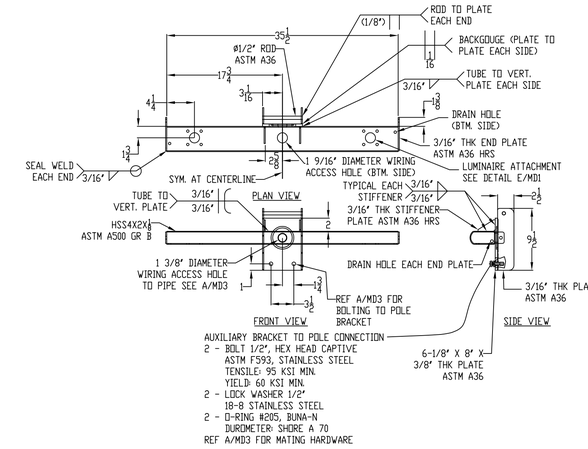


B 1P AUXILIARY MOUNTING BRACKET
N.T.S. DSA-1P FIXTURE MOUNT_E



C 2P AUXILIARY MOUNTING BRACKET
N.T.S. DSA-2P FIXTURE MOUNT_E

Downey HS Football LED Retrofit
FIELD LIGHTING
Downey, CA

PROFESSIONAL ENGINEER
For Review
01/17/2024 11:17:08 AM
STATE OF CALIFORNIA

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DRAWING TITLE: ATTACHMENT DETAILS
SEALS: SEE PLAN
REVISIONS
REFERENCE:

PROJECT NO. 215340
DATE: 11/27/2023
DRAWN BY: V.Alexander
DRAWING NO. MD3
6 OF 6

STRU-MD1

WARREN HIGH SCHOOL FOOTBALL LED RETROFIT
8141 DE PALMA STREET, DOWNEY, CA 90241
A#03-123923

DOWNEY UNIFIED SCHOOL DISTRICT
11627 BROOKSHIRE AVENUE, DOWNEY, CA 90241

PROJECT DIRECTORY

OWNER:

DOWNEY UNIFIED SCHOOL DISTRICT
11627 BROOKSHIRE AVE., DOWNEY, CA 93065
CONTACT: VINCE MADSEN
(652) 469-6703 OFFICE

STRUCTURAL ENGINEER:

RTM ENGINEERING CONSULTANTS
9931 MUIRLANDS BLVD.
IRVINE, CA 92618
CONTACT: JOSH RANDALL
(949) 462-3200 OFFICE
(949) 462-3201 FAX

PROJECT DESCRIPTION

REMOVE ALL EXISTING LIGHT FIXTURES & TOP POLE SECTIONS FROM (4) EXISTING POLES AND REPLACE WITH NEW TOP POLE SECTION, NEW LIGHT FIXTURES & NEW CROSS-ARM SUPPORTS. ADD NEW BALLAST BOXES AT BOTTOM OF POLES.

DSA NOTES

1. CHANGES TO THE DSA APPROVED DRAWINGS AND/OR SPECIFICATIONS SHALL BE MADE BY AN ADDENDUM OR CONSTRUCTION CHANGE DOCUMENT FOR THE STRUCTURAL, ACCESSIBILTY OR FIRE-LIFE SAFETY PORTIONS OF THE PROJECT. CHANGES SHALL BE SUBMITTED TO AND APPROVED BY DSA PRIOR TO COMMENCEMENT OF THE WORK SHOWN THEREON, (CAC 4-338(c)).
2. AN INSPECTOR, EMPLOYED BY THE DISTRICT AND APPROVED IN WRITING BY THE DIVISION OF THE STATE ARCHITECT, SHALL BE REQUIRED FOR CONTINUOUS INSPECTION OF THIS WORK IN ACCORDANCE WITH THE DUTIES DEFINED BY THE CALIFORNIA CODE OF REGULATIONS, TITLE 24, PART 1, SECTION 4-342. THE INSPECTOR SHALL BE QUALIFIED AS A CLASS 2 INSPECTOR FOR THIS PROJECT.
3. TESTING, IF ANY, SHALL BE DONE BY A QUALIFIED TESTING LAB AND PAID FOR BY THE OWNER IN ACCORDANCE WITH THE CALIFORNIA CODE OF REGULATIONS, TITLE 24, PART 1, SECTION 4-335.
4. THERE ARE NO DEFERRED APPROVALS FOR THIS PROJECT.
5. FIRE SAFETY DURING DEMOLITION AND CONSTRUCTION SHALL COMPLY WITH CFC CHAPTER 33.
6. THE INTENT OF THESE DRAWINGS AND SPECIFICATIONS IS THAT THE WORK OF THE ALTERATION, REHABILITATION OR RECONSTRUCTION IS TO BE IN ACCORDANCE WITH TITLE 24, CALIFORNIA CODE OF REGULATIONS. SHOULD ANY EXISTING CONDITIONS SUCH AS DETERIORATION OR NONCOMPLYING CONSTRUCTION BE DISCOVERED WHICH IS NOT COVERED BY THE CONTRACT DOCUMENTS WHEREIN THE FINISHED WORK WILL NOT COMPLY WITH TITLE 24, CALIFORNIA CODE OF REGULATIONS, A CHANGE ORDER, OR A SEPARATE SET OF PLANS AND SPECIFICATIONS, DETAILING AND SPECIFYING THE REQUIRED REPAIR WORK SHALL BE SUBMITTED TO AND APPROVED BY DSA BEFORE PROCEEDING WITH THE REPAIR WORK (CAC, 2103, 4-317(c)).
7. ALL WORK SHALL CONFORM TO TITLE 24, CALIFORNIA CODE OF REGULATIONS (CCR).

GENERAL NOTES

1. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO THE START OF WORK AND IT SHALL BE THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ANY DISCREPANCIES, WHICH MAY EXIST BETWEEN WHAT IS SHOWN ON THESE DRAWINGS AND THE ACTUAL FIELD CONDITIONS.
2. THE CONTRACTOR SHALL THOROUGHLY INVESTIGATE, VERIFY, AND BEAR FULL RESPONSIBILITY FOR DIMENSIONS AND EXISTING CONDITIONS THAT AFFECT CONSTRUCTION AS SHOWN ON THESE DRAWINGS. THE CONTRACTOR SHALL NOTIFY THE STRUCTURAL ENGINEER OF ANY CONDITIONS REQUIRING MODIFICATION OR CHANGE PRIOR TO STARTING WORK.
3. ANY DAMAGE TO EXISTING CONSTRUCTION OR EQUIPMENT CAUSED BY OPERATIONS UNDER THIS CONTRACT SHALL BE REPAIRED OR REPLACED TO THE SATISFACTION OF THE SCHOOL DISTRICT AT THE CONTRACTOR'S EXPENSE.
4. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LOCATE AND PROTECT ALL UTILITIES AND SUBSTRUCTURES WITHIN THE LIMITS OF NEW WORK WHETHER SHOWN ON THE DRAWINGS OR NOT, AND TO PROTECT THEM FROM DAMAGE. THE CONTRACTOR WILL BE HELD RESPONSIBLE AND SHALL BEAR THE TOTAL EXPENSE OF REPAIR OR REPLACEMENT OF SAID UTILITIES AND SUBSTRUCTURES DAMAGED BY HIS OPERATION IN CONNECTION WITH THE EXECUTION OF THIS WORK. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR ALL DAMAGE ARISING FROM AND/OR CONNECTED WITH DAMAGE TO SAID UTILITIES AND SUBSTRUCTURES AS OUTLINED ABOVE.
5. DURING THE ENTIRE CONSTRUCTION PERIOD, IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN CONDITIONS AT THE PROJECT SITE TO MEET THE REQUIREMENTS OF THE FEDERAL OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) AND CALIFORNIA OCCUPATIONAL REGULATIONS. THIS PROVISION SHALL COVER THE CONTRACTOR'S EMPLOYEES AND ALL OTHER PERSONS WORKING UPON OR VISITING THE SITE. THE CONTRACTOR SHALL BECOME FULLY INFORMED OF ALL APPLICABLE STANDARDS AND REGULATIONS AND INFORM ALL PERSONS AND REPRESENTATIVES RESPONSIBLE FOR WORK UNDER THIS CONTRACT.
6. PROVIDE BARRICADES AND PROTECTIVE DEVICES SEPARATING CONSTRUCTION AREAS. PROVIDE TEMPORARY PASSAGES AS REQUIRED. PRIOR TO DELIVERY OF MATERIALS TO CONSTRUCTION ZONE AND REMOVAL OF WASTE FROM SITE, CHECK WITH THE OWNER FOR ACCEPTABLE ACCESS ROUTE AND TIME. UNDER NO CIRCUMSTANCES USE AREA OUTSIDE THE CONSTRUCTION ZONE WITHOUT PRIOR CLEARANCE FROM THE OWNER.
7. TAKE ALL MEASURES TO ACCOMPLISH THE WORK WITH THE MINIMUM OF INTERRUPTION TO NORMAL BUILDING PROCEDURES. NOTIFY OWNER IN ADVANCE OF HVAC, ELECTRICAL OR OTHER BUILDING SYSTEM SHUT-OFFS. MINIMIZE NOISE AND DUST GENERATION TO MAXIMUM EXTENT POSSIBLE.

CODE INFORMATION

ALL CONSTRUCTION SHALL BE DONE IN ACCORDANCE WITH:

2022 CALIFORNIA ADMINISTRATIVE CODE, PART 1, TITLE 24 C.C.R

2022 CALIFORNIA BUILDING CODE (CBC), PART 2, TITLE 24 C.C.R.
(2021 INTERNATIONAL BUILDING CODE VOLUMES 1-2 & 2022 CALIFORNIA AMENDMENTS)

2022 CALIFORNIA ELECTRICAL CODE (CEC), PART 3, TITLE 24 C.C.R
(2020 NATIONAL ELECTRICAL CODE & 2022 CALIFORNIA AMENDMENTS)

2022 CALIFORNIA MECHANICAL CODE (CMC) PART 4, TITLE 24 C.C.R
(2021 UNIFORM MECHANICAL CODE & 2022 CALIFORNIA AMENDMENTS)

2022 CALIFORNIA PLUMBING CODE (CPC), PART 5, TITLE 24 C.C.R
(2021 UNIFORM PLUMBING CODE & 2022 CALIFORNIA AMENDMENTS)

2022 CALIFORNIA ENERGY CODE (CEC), PART 6, TITLE 24 C.C.R.

2022 CALIFORNIA FIRE CODE, PART 9, TITLE 24 C.C.R
(2021 INTERNATIONAL FIRE CODE & 2022 CALIFORNIA AMENDMENTS)

2022 CALIFORNIA GREEN BUILDING STANDARDS CODE, PART 11, TITLE 24 C.C.R.

2022 CALIFORNIA REFERENCED STANDARDS, PART 12, TITLE 24 C.C.R

TITLE 19 C.C.R., PUBLIC SAFETY, STATE FIRE MARSHAL REGULATIONS

SHEET INDEX (TOTAL SHEETS = 6)

VICINITY MAP

Warren HS Football LED Retrofit
FIELD LIGHTING
DOWNEY, CA 90241

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Oskaloosa, Iowa 52577
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DRAWING TITLE: TITLE SHEET/CODE/INDEX
SCALE: SEE PLAN
REVISIONS:
REFERENCE:

PROJECT NO. 215339
DATE: 12/15/2023
DRAWN BY: J.Donahue
DRAWING NO. T1
1 OF 6

REV 4 - Per Addendum 1

DSA-TITLE1_E

GENERAL NOTES:

GENERAL NOTES:

SCOPE OF WORK

Remove existing pole top fitter section, along with associated lights and ballast boxes. Install new pole top fitter section with new crossarms and lights. Install new security and ball tracking fixtures. Install new ballast boxes.

APPLICABLE BUILDING CODE

All construction and workmanship shall conform to the 2022 California Building Code, California Code of Regulations – Title 24, Parts 1 & 2.

Existing poles and foundations were checked per the current building code using the following lateral forces:

Wind Design Data:
- Vult = 95 MPH (Exposure C); Vasd = 74 MPH (Exposure C)
- Risk Category = II

Seismic Design Data:
- Ie = 1.0
- Risk Category = II (Self Supporting Poles)
- S_s = 1.701
- S_1 = 0.610
- Site Class = D–Default
- S_{ms} = 1.361
- S_{m1} = 0.691
- Seismic Design Category = D
- Basic Seismic–Force–Resisting System = Non–Building Structure, not similar to buildings
- Cs = 0.325 (STRENGTH LEVEL)
- R = 1.5
- Ω = 1.5
- Analysis Procedure = Equivalent Lateral Force Procedure
- See Pole Foundation Schedule for maximum pole seismic forces.

GENERAL CONSTRUCTION

These notes shall be used in conjunction with the plans and any discrepancies shall be brought to the attention of the Engineer.

Contractor must check all dimensions, clearances and job conditions before starting work. Engineer shall be notified immediately of any discrepancies or possible deficiencies.

The drawings and specifications represent the finished structure. All bracing, temporary supports, shoring, etc., is the sole responsibility of the Contractor. Observation visits to the job site by the Engineer do not include inspection of construction procedures. The Contractor is solely responsible for all construction methods and for safety conditions at the worksite. These visits shall not be construed as continuous and detailed inspections.

Design, material, equipment, and products other than those described below or indicated on the drawings may be considered for use, provided prior approval is obtained from the School District, Engineer, and the Division of the State Architect.

All changes in approved plans shall be made by means of construction change documents (CCD) approved by the Division of State Architect, as required by Section 4–338, Part 1, Title 24, CCR. All CCD documents shall be signed by the Architect and Owner. Addenda shall be signed by the design professional in general responsible charge.

Substitutions shall be considered as a CCD and shall be approved by DSA prior to fabrication or use.

A Class 1 or Class 2 Project Inspector employed by the District (Owner) and approved by the Division of State Architect shall provide continuous inspection of the work, the duties of the inspector are defined in Section 4–342, Part 1, Title 24, CCR.

All Tests And Inspections shall be performed by an Independent lab employed by the School District and approved by DSA.

Reference pole location drawings provided by the Architect, Structural Engineer, or Electrical Engineer for actual pole placement and site location.

LIGHT POLE FOUNDATIONS

Reference chapter 18A, sections 1806A, 1807A, and 1810A of the 2022 edition of the California Building Code. assume class 5 soils.

Assumed allowable end bearing soil pressure: 1,500 psf (table 1806A.2) or 250 psf skin friction (section 1810A.3.3.1.4)

Assumed allowable lateral passive soil bearing pressure: 200 psf/ft for isolated poles not adversely affected by a 0.5 inch motion at the ground surface (section 1806A.3.4).

STEEL POLE

All miscellaneous structural steel items conform to AISC 360–16.

All weldment conforms with AWS D1.1 specification for GMAW fillet utilizing E70S–X filler metal or SAW fillet utilizing F7XX–EXXX or F8XX–EXXX filler metal.
GMAW procedure conforms to AWS A5.18.
SAW procedure conforms to AWS A5.23.

All field welding shall be in compliance with AWS D1.1 specification.

All welding shall be continously inspected by an AWS CWI certified inspector approved by DSA.

All exposed steel shall be hot dipped galvanized to ASTM A123 latest standards.

TESTING AND INSPECTION

Testing and inspection in accordance with Title 24, Part 1 & Part 2 & project DSA 103 form.

STEEL MATERIALS:
Structural steel – 2202A.1 & 2205A.1
Cold formed steel – 2210A.1
Identification – 2202A.1

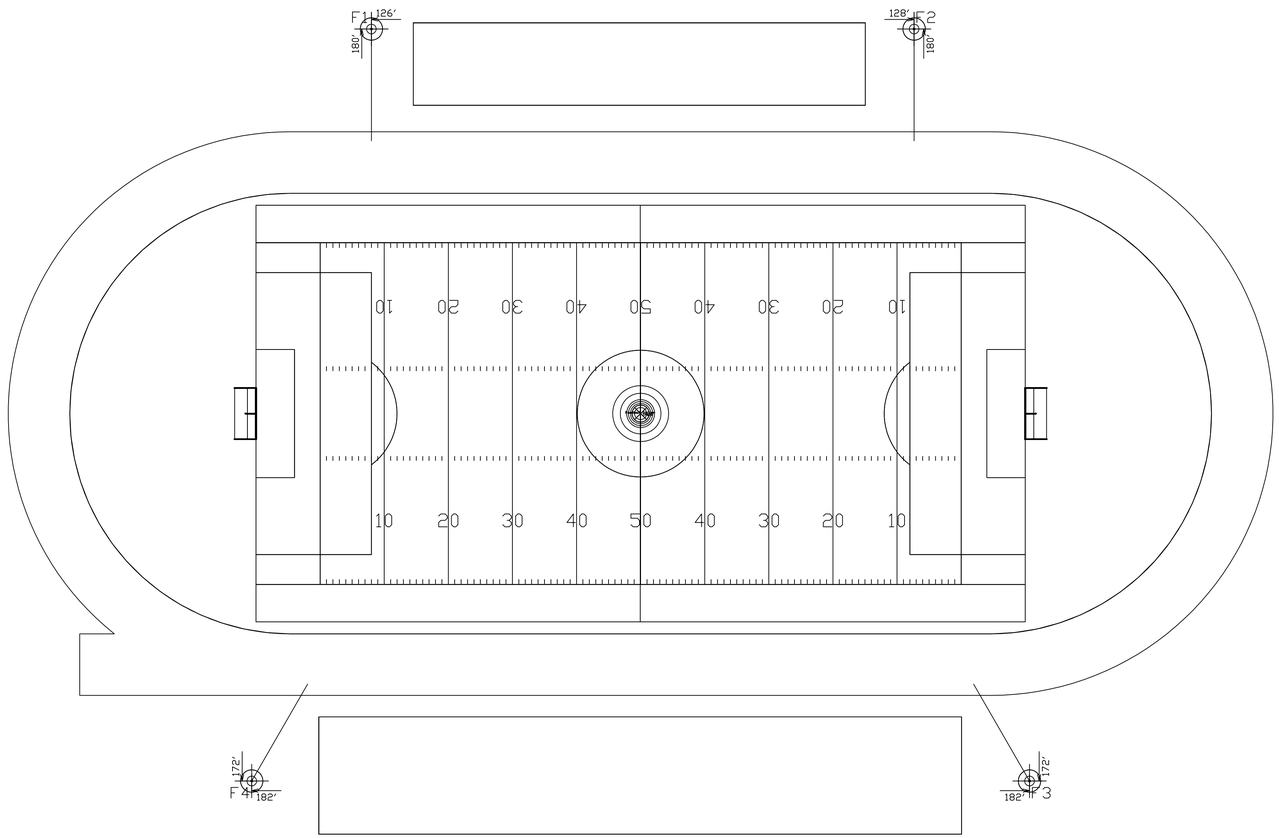
STEEL QUALITY:
Tests of structural steel & cold formed steel – 2202A.1

STRUCTURAL STEEL INSPECTIONS: Table 1705A.2.1
Shop fabrication inspection – 1704A2.5
Welding – 1705A.2.5, DSA IR 17–3 and AWS D1.1.

NOTE: Field verify existing pole conditions & repair any defects, if found. Repair procedures and details to be reviewed and approved by Structural Engineer of Record and DSA.

These plans are for construction approval. An application number and approval of these drawings by the Division of The State Architect of California must be secured to build from these plans.

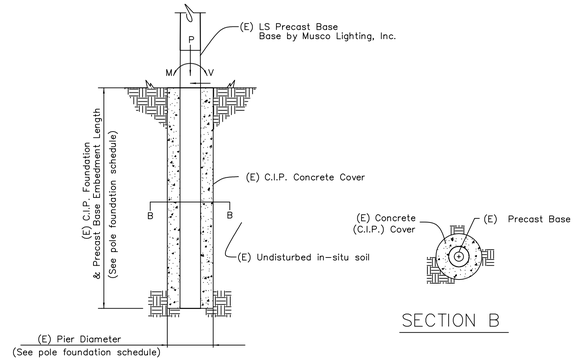
INDEX OF SHEETS



POLE ORIENTATION PLAN

N.T.S.

NOTE: THIS PLAN IS A PICTORAL REPRESENTATION OF THE SITE LAYOUT. REFERENCE APPROPRIATE ARCHITECTURAL SITE PLAN FOR ALL NECESSARY INFORMATION.



A (E) FOUNDATION DETAIL
N.T.S.

(E) POLE FOUNDATION SCHEDULE

POLE TYPE–# OF FIXTURES (MAX) (LSS=LIGHT STRUCTURE)	MARK (SEE POLE ORIENTATION PLAN)	WIND OR SEISMIC (SEISMIC FORCE INCLUDES OVERSTRENGTH FACTOR=1.5)	ASD LEVEL FORCES (MAX)			(E) C.I.P. DEEP FOUNDATION		(E) PRECAST BASE
			MOMENT (M) FT–LBS*	SHEAR (V) LBS	VERTICAL (P) LBS**	DIAMETER INCHES	EMBEDMENT FEET	EMBEDMENT LENGTH
(E)LSS90B–13	F1–F4	SEISMIC	168,500	2,594	7,594	36"	18'–0"	18'–0"
		WIND	174,700	2,914	4,930			

*Moment (M) computed below grade at Shear (V) = 0.
**Vertical (P) load includes steel pole, light fixtures, and attachments. Vertical (P) load for wind is the dressed pole weight for erection purposes. Vertical (P) load for seismic also includes weight of precast base above groundline.

Warren HS Football LED Retrofit
FIELD LIGHTING
Downey, CA

PROFESSIONAL ENGINEER
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DRAWING TITLE: NOTES, FOUNDATION DETAIL
SCALE: SEE PLAN
REVISIONS:
REFERENCE:

PROJECT NO. 215339

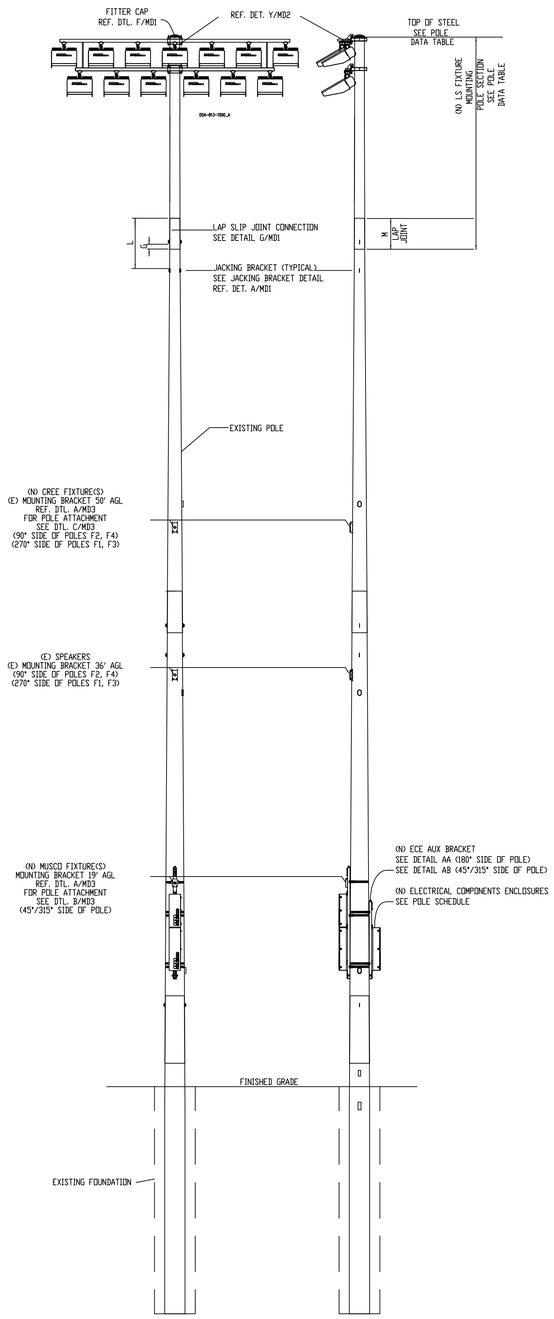
DATE: 11/30/2023

DRAWN BY: V.Alexander

DRAWING NO. MT1
2 OF 6

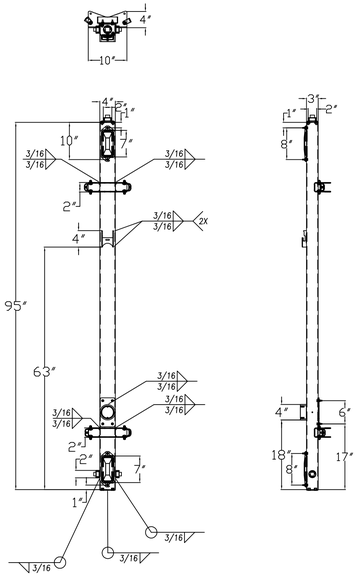
REV 1 - Per Addendum 1

DSA–TITLE1_E

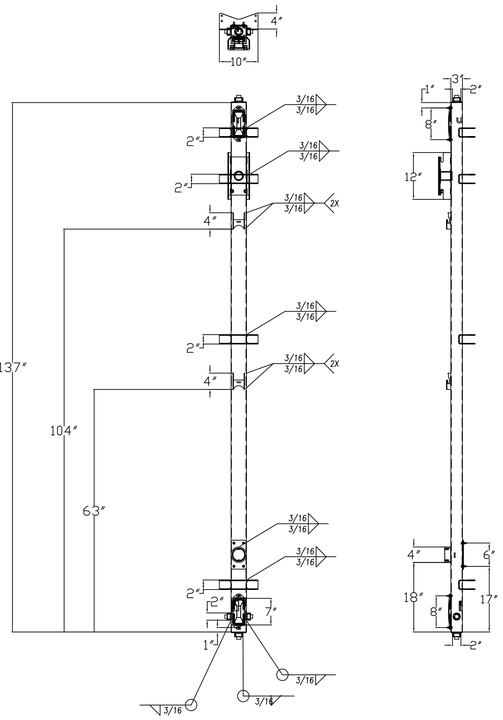


(E) LSS90B POLE FRONT VIEW
N.T.S.

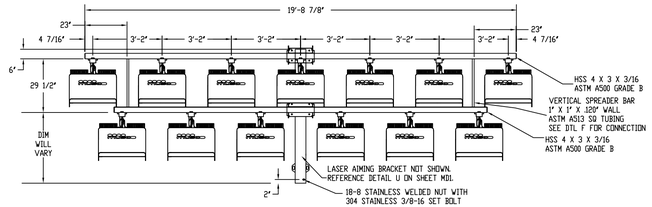
(E) LSS90B POLE SIDE VIEW
N.T.S.
DSA-90BBASE_A



AA 6P W/O BTF ECE AUX NON-HUB
N.T.S.



AB N.T.S. 6P,6PX-LP W/ BTF ECE AUX NON-HUB



B 13 FIXTURE CONFIGURATION
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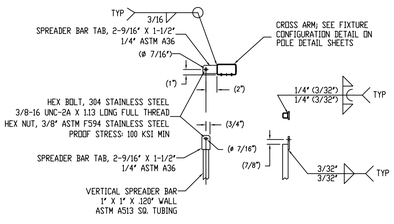
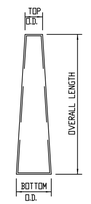


F BOLT ON SPREADER BAR DETAIL
SCALE: N.T.S. DSA-SpreaderBarBoltOn-LED_A



TOP/MIDDLE/BOTTOM
POLE SECTION

1. CONTAINS COMBINED EPA OF LIGHT FIXTURES, CROSS ARM AND MISCELLANEOUS FIXTURE MOUNTING APPARATUS.

FIXTURE WEIGHT 90 LBS. THIS INCLUDES THE WEIGHT OF FIXTURE, CROSS ARM & MISC. MOUNTING APPARATUS. ELECTRICAL BALLAST BOX WEIGHT 20 LBS PER FIXTURE SERVICED

POLE SCHEDULE

SITE LOCATION	POLE MARK	REFERENCE LOCATION	POLE TYPE	FIXTURE CONFIGURATION	TOTAL EPA[1]	BALLAST BOX REQUIREMENTS
SEE SITE PLAN (BY OTHERS)	F1-F4	SEE POLE ORIENTATION PLAN	LSS90B	13 - SEE DETAIL B/MS1	45.7	SEE DETAIL SL,SL.D/MD1

DSA-POLESCHE_C

NOTATION	DIMENSION
	LSS90B
G	1'-6"
L	5'-6 1/2" NOM.
M	3'-3 1/4" NOM. 2'-3" MIN.

POLE DATA TABLE

POLE TYPE	PIECE MARK	MAX NUMBER of X-Arms	POLE SECTION	TOP O.D. (INCHES)	BTM. O.D. (INCHES)	OVERALL LENGTH	STRAIGHT LENGTH	TAPER LENGTH	THICKNESS (INCHES)	TOP OF STEEL NOMINAL	ASTM REFERENCE
LSS90B	MP-1BTT-1	2	FIXTURE MOUNTING	9.462"	12.000"	18'-1 1/2"	-----	18'-1 1/2"	.179	87'-5 7/8"	A595A (Fy=55 ksi) or A572, Gr 55 or 65

DSA-90BDT_A

REV 1 - Per Addendum 1

DSA-90_A

Warren HS Football LED Retrofit
FIELD LIGHTING
Downey, CA

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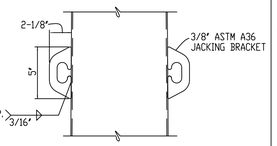
DRAWING TITLE: POLE DETAIL
SCALE: SEE PLAN
REVISIONS:
REFERENCE:

PROJECT NO. 215339

DATE: 11/30/2023

DRAWN BY: V.Alexander

DRAWING NO. MS1
3 OF 6



A JACKING BRACKET DETAIL
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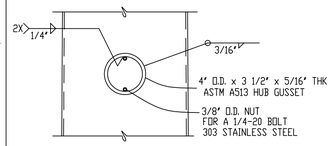

B HUB DETAIL
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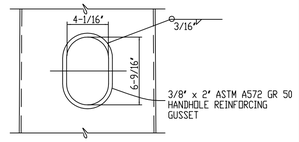

C HANDHOLE SLEEVE DETAIL
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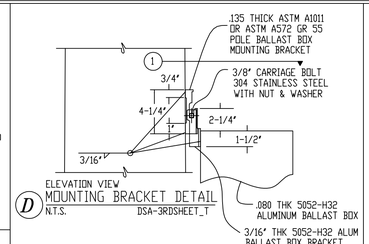

D MOUNTING BRACKET DETAIL
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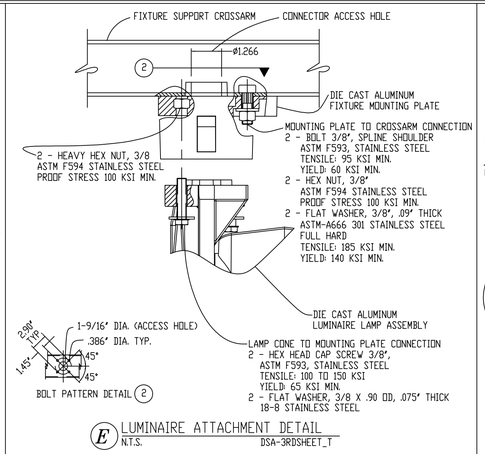
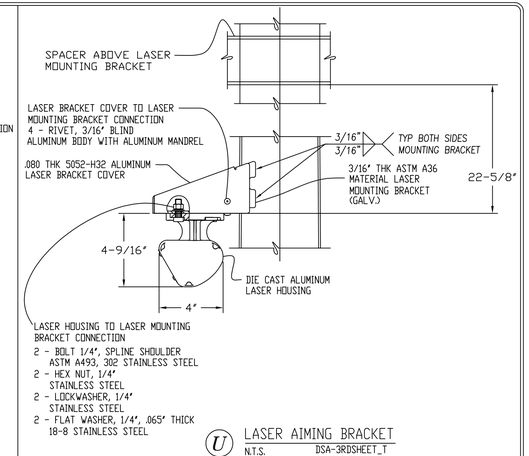


E LUMINAIRE ATTACHMENT DETAIL
N.T.S. DSA-3RDSHEET_T



U LASER AIMING BRACKET
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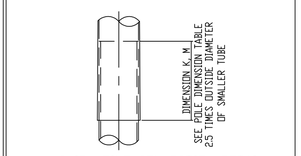
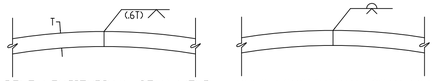


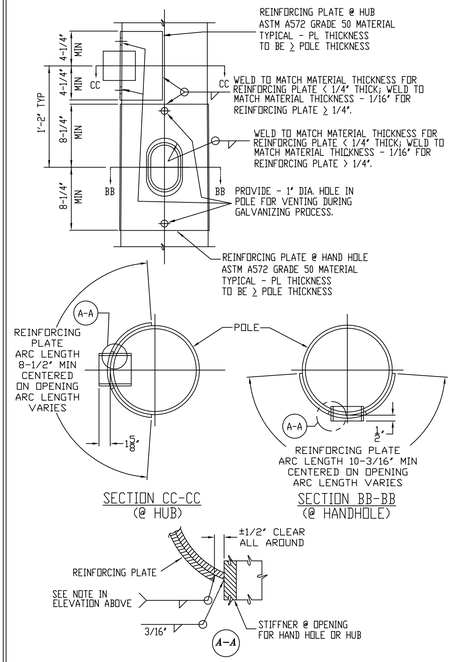
G SLIP JOINT CONNECTION DETAIL
N.T.S. DSA-LAP



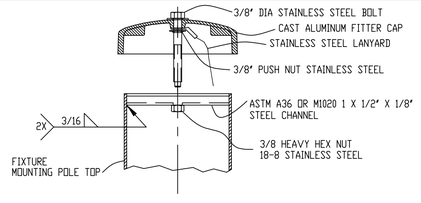
POLE LONGITUDINAL SEAM WELD
DETAIL TYPICAL CONDITION *
N.T.S. DSA-3RDSHEET_T

POLE LONGITUDINAL SEAM WELD DETAIL
AT LAP SPLICES (FEMALE END) *
N.T.S. DSA-3RDSHEET_T

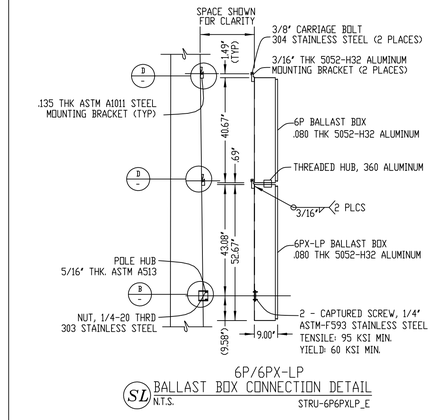
* NOTE- 100% PENETRATION SEAM WELDS MAY BE PROVIDED FULL LENGTH OF POLE SHAFTS PROVIDED WPS'S ARE QUALIFIED BY TEST.



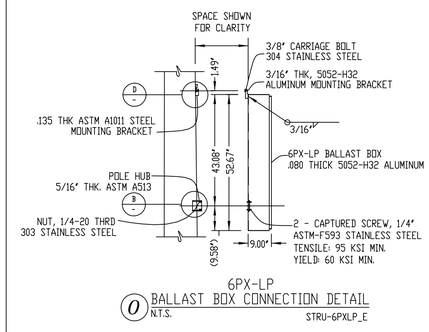
H HANDHOLE/HUB REINFORCING GUSSET
N.T.S.



F FITTER CAP DETAIL
N.T.S. DSA-3RDSHEET_T



SL 6P/6PX-LP BALLAST BOX CONNECTION DETAIL
N.T.S. STRU-6P6PXLP_E



O 6PX-LP BALLAST BOX CONNECTION DETAIL
N.T.S. STRU-6PXLP_E

Warren HS Football LED Retrofit
FIELD LIGHTING
Downey, CA

CONSULTANT
KNA STRUCTURAL ENGINEERS
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KNA JOB NO.: 463.386

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100 1st Avenue West
Oskaloosa, Iowa 52577
800/825-6020

DRAWING TITLE: ATTACHMENT DETAILS
SCALE: SEE PLAN
REVISIONS
REFERENCE:

PROJECT NO. 215339

DATE: 11/30/2023

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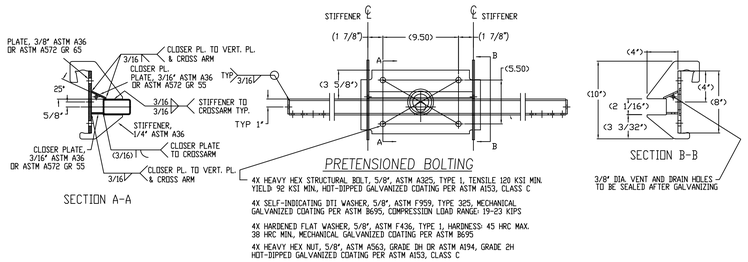
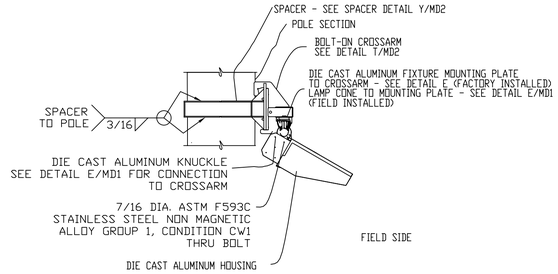
DRAWING NO. 4 OF 6 MD1

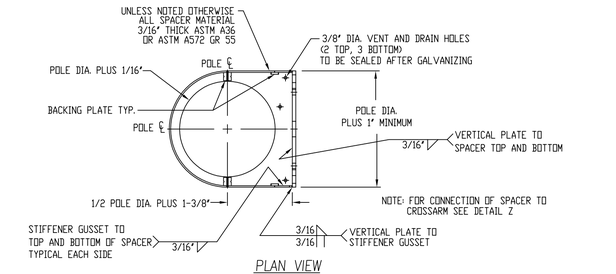
STRU-MD1



T BOLT ON CROSSARM DETAIL
SCALE: N.T.S. DSA-BOLTonBAR-LED_A_1



Z LIGHT FIXTURE (TYPICAL)
SCALE: N.T.S.
DSA-1500-BOLTON_A



Y SPACER DETAIL
SCALE: N.T.S. DSA-BOLTON_L

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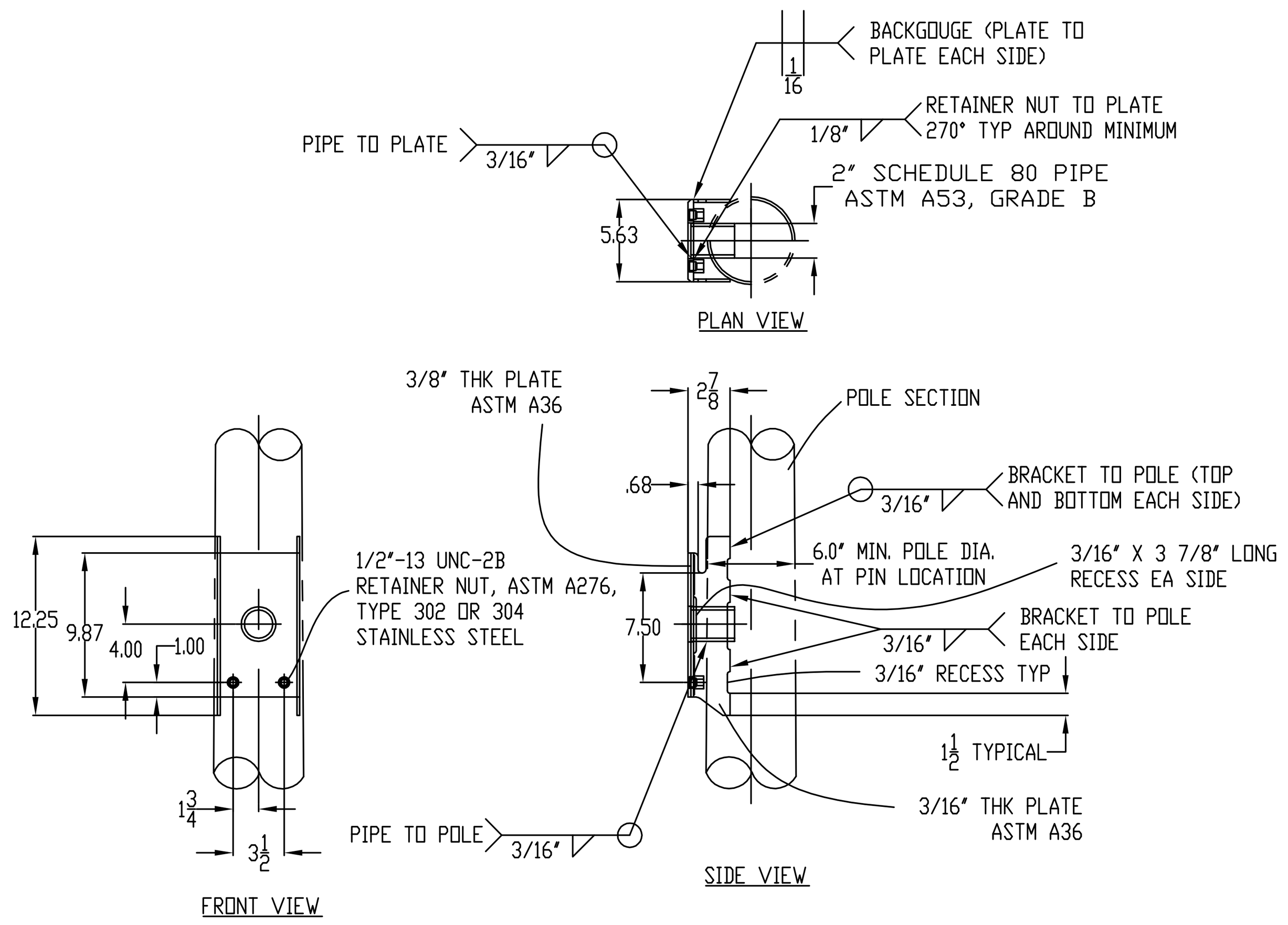
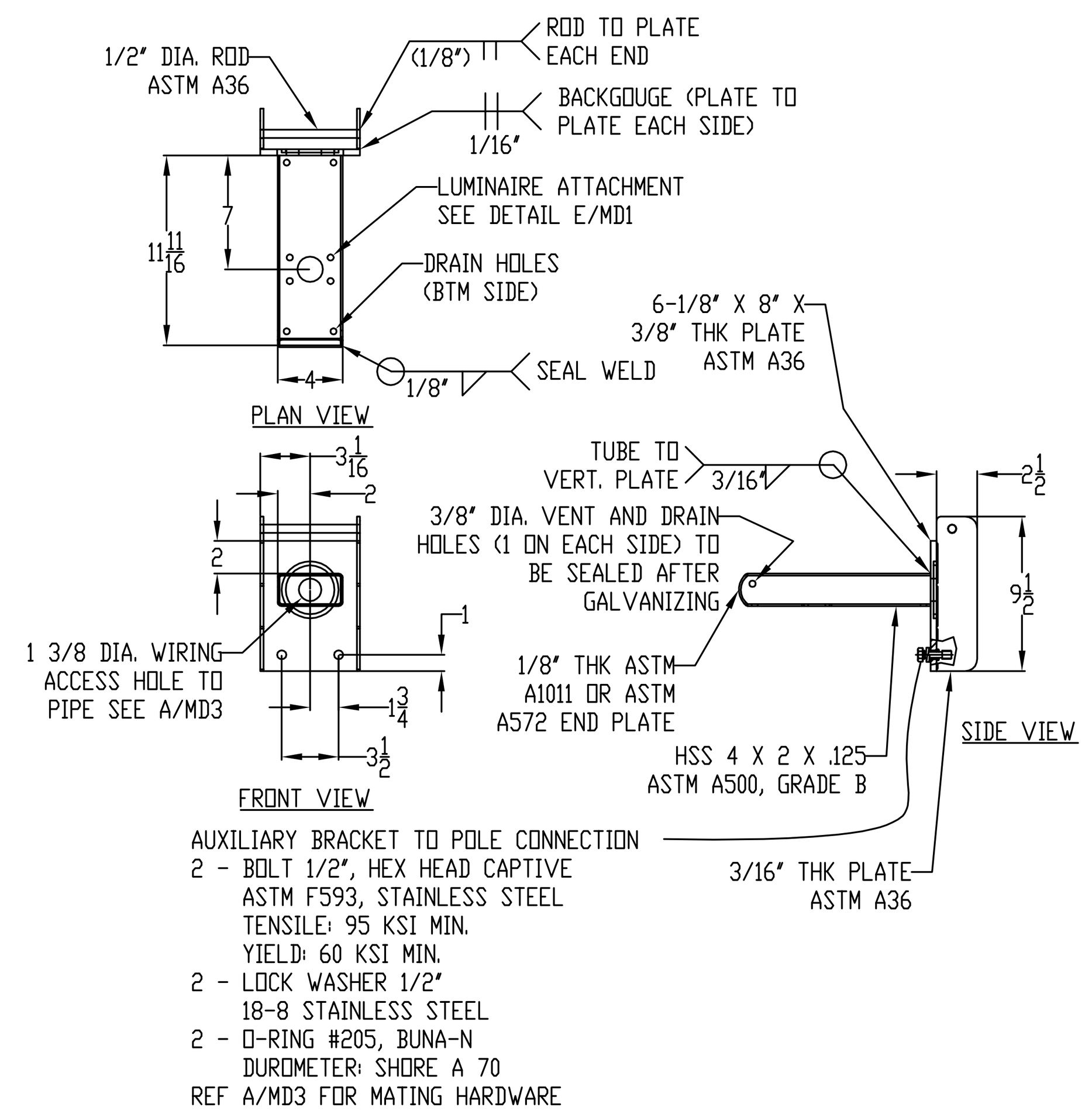
5 OF 6
MD2

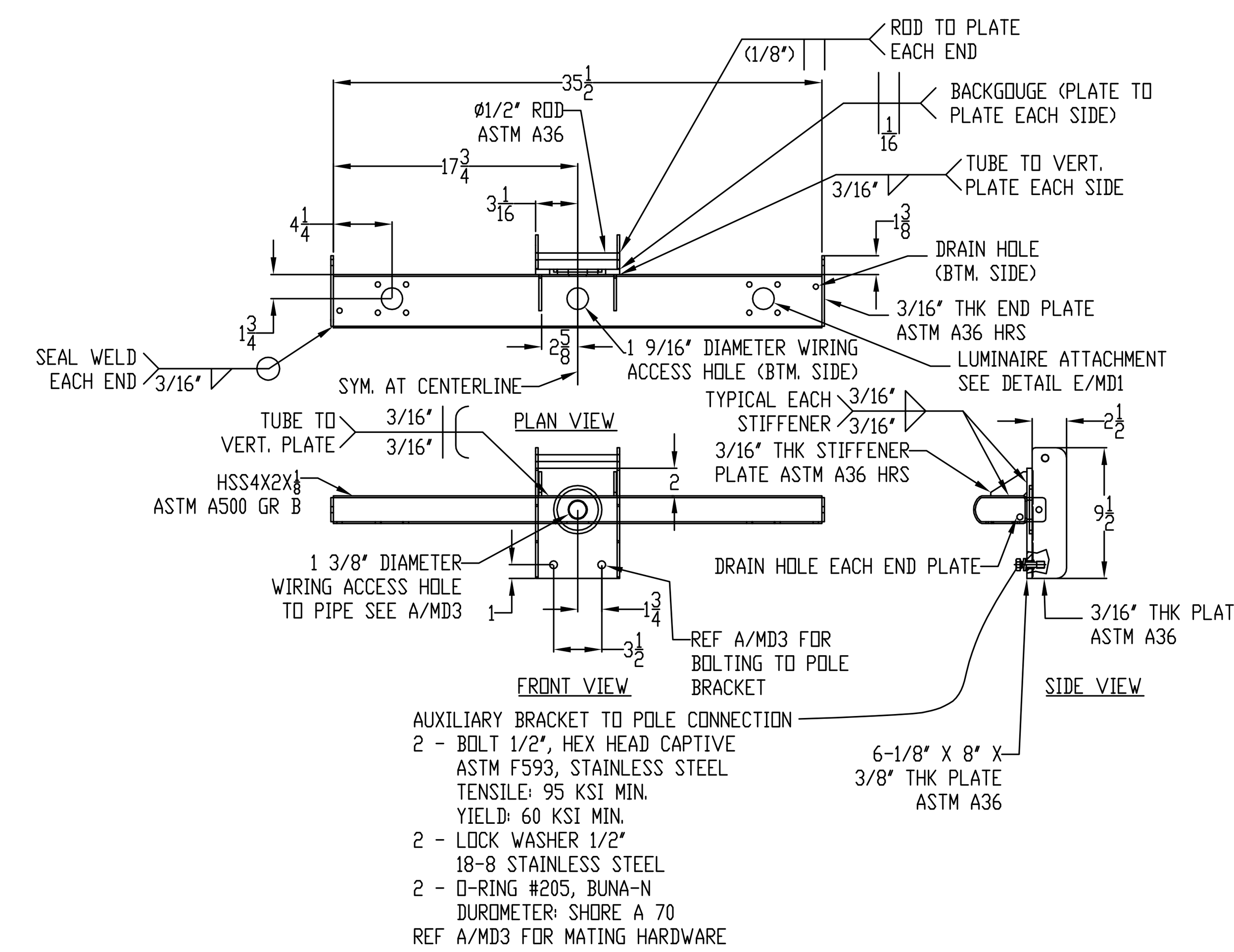
STRU-MD2



(A) BRACKET DETAIL
N.T.S. DSA-Brk-Dtl-L_A



(B) 1P AUXILIARY MOUNTING BRACKET
N.T.S. DSA-1P FIXTURE MOUNT_E



(C) 2P AUXILIARY MOUNTING BRACKET
N.T.S. DSA-2P FIXTURE MOUNT_E

Warren HS Football LED Retrofit
FIELD LIGHTING
Downey, CA

For Review 01/17/2024 11:13:45 AM

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DATE: 11/30/2023

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6 OF 6