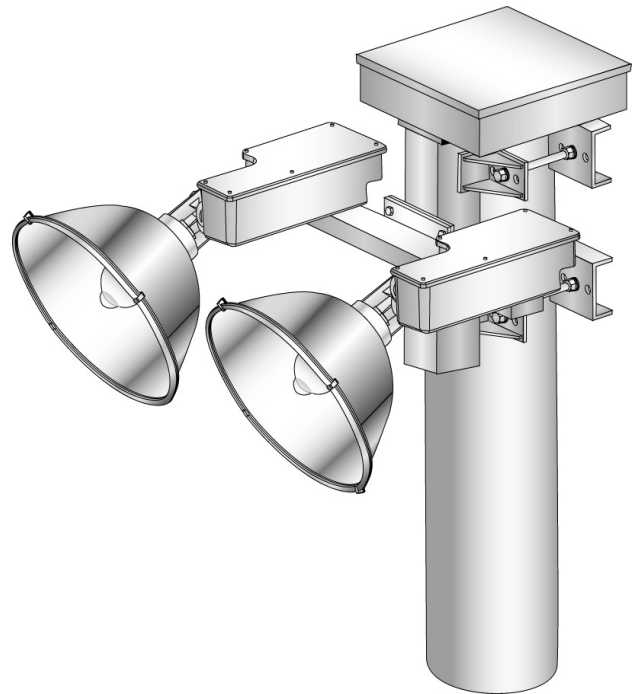
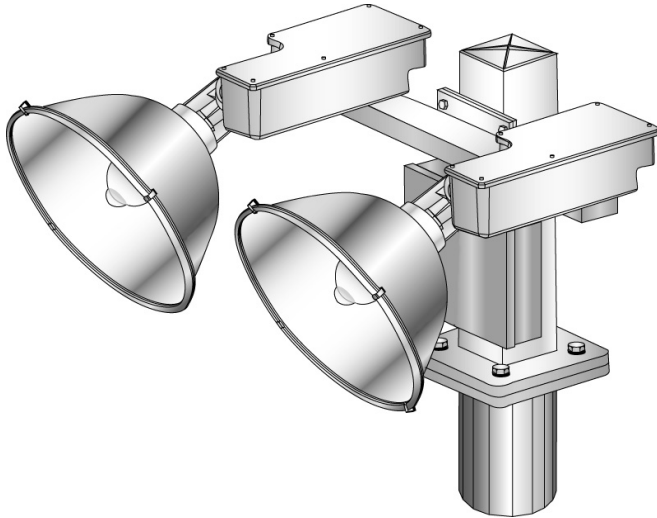


SLS INTEGRAL SYSTEM INSTALLATION MANUAL



**Hubbell Lighting
Outdoor & Industrial**

701 Millennium Blvd.
Greenville, SC 29607
864-678-1000
www.hubbell-itg.com

www.sportslighting.com

268-1139-9901 REV. E

Read all of the following instructions prior to installation and formulate an action plan for installation of your SLS system. Different foundation/pole/crossarm combinations require their own unique plan. Ensure that these instructions are available for future servicing of this installation.

Warnings:

- Disconnect power before installation or servicing.
- Install, operate and maintain to meet all applicable codes.
- This system is to be installed and maintained by qualified personnel only.
- Cover all open ground holes for direct burial poles at job site when not erecting poles.
- Supply voltage must match that of ballasts in integral fixtures.
- Ensure that all supply and ground wiring is sized to meet the requirements of the installation.
- All plugs are to be connected and disconnected **only** when the power is turned off. Failure to do so could result in personal injury or damage to the plugs.
- Check junction box wiring to verify single or three-phase layout.
- Proper equipment, procedures and personal safety gear must be utilized per the requirements of the task to ensure safety.
- Read and follow the lamp manufacturer's warnings and use information before installing lamps.
 - Wear safety glasses and protective gloves while working with lamps.
- Use **only** mounting hardware furnished by Hubbell Lighting, Inc. to assemble components together.
- **Do not** alter structural members in any manner such as by drilling, welding, bending, etc.
- Additions to the installed SLS system such as flags, banners, etc. are prohibited unless approved by Hubbell Lighting, Inc.
- Use **extreme caution** when working near overhead power lines or underground utilities. Verify the existence and location of all underground utilities at or near the job site prior to proceeding with installation.
- When handling poles or pole sections, remember that they are tapered and thus require that the lifting device be secured in a manner as to prevent slippage.
- For concrete poles, a thru-hole is provided at the proper 1-point pick-up location to enable a steel bar to be inserted as a safety stop for the sling during the erection process (this bar is **not** a lifting device).
- For concrete poles with cap plate, do not lift pole by cap plate.
- Slip fit sections of multi-section steel poles must be secured in a manner to prevent separation during the erection process.
- Recommended lifting point for complete steel pole/crossarm assemblies is at pole top just under the cap plate.
- **Do not** lift complete pole/crossarm assemblies by any of the crossarm members. Secure lifting device to the pole only. Take care to not damage or misalign the reflectors during the erection process.
- Slings for handling poles and crossarms should be made of or covered with nylon or some other nonmetallic material to protect the pole finish. The lifting capacity of the sling must be verified.
- Avoid damage or misalignment of SLS system components during handling and storage operations.
- If the galvanized finish on any component is damaged in field, touch-up area with spray-on galvanizing.

Soil Analysis/Foundation Design

- It is recommended that soil-boring samples be taken at the job site and the information then submitted to a Registered Professional Engineer for evaluation and issuance of a foundation design. Contact SLS for foundation designs if needed.
- Refer to **Fig. 1** for an example.

Field Layout/Pole/Crossarm Alignment

- Identify pole locations on site per Hubbell Application Engineering documentation. Refer to **Fig. 2**.
- Refer to **Fig. 3** for pole elevations.
- Refer to **Figs. 2, 4 & 5** to align and plumb each pole/crossarm to the field.

Foundations (direct burial and anchor bolt)

- The foundation is to be constructed in accordance with the design supplied for your installation and per applicable code requirements.
- Underground supply wire entry into poles are as follows:
- Concrete and steel (direct burial) – 18" below ground line on sides of pole, parallel to field.
- Steel (anchor bolt) – bottom, center of pole.
- For installations with the lightning rod (LR) option, install components that will be covered during backfilling. (See installation instructions provided with the LR (lightning rod) option).

Direct Burial Foundations

- Bore hole per required diameter and depth.
- If a footing with steel rebar cage is required, center the cage in the bottom of the hole and pour concrete to the level specified on the foundation design drawings.
- Concrete must cure 24 hours before proceeding with installation.
- Place the pole (or pole bottom section for steel pole when concrete backfill is required) in the center of the hole; align and plumb.
- See light position check in Final Notes section prior to backfilling.
- Make provisions for underground supply wiring entry into pole before completion of backfilling. For installations with the lightning rod (LR) option, install components that will be covered during backfilling. (See installation instructions provided with the LR (lightning rod) option).
- Avoid damage to the protective coating on steel pole bottom section during backfilling.
- Backfill per foundation design drawings. Poles must be supported until backfilling has been completed.
- If concrete backfill is required, the concrete must be allowed to cure 7 days prior to assembling remaining pole sections or sports lighting equipment to them. Full strength concrete cure takes at least 28 days, so evaluate anticipated weather conditions that may involve severe winds and plan installation accordingly.

Anchor Bolt Foundations

- Anchor bolts, hardware and anchor bolt setting templates are furnished by pole supplier.
- Construct foundation per design drawings.
- Ensure that the concrete has cured a minimum of 28 days prior to installation of poles.
- Thread one bottom nut and insert one flat washer onto each anchor bolt.
- These bottom nuts should be set so that when the pole base plate is set on top of them the base plate will be level and as close as practical to the foundation.
- Lift the pole onto the anchor bolts while routing the underground supply wiring into the pole bottom.
- Insert one flat and lock washer and thread one top nut onto each anchor bolt.
- Check the pole to ensure that it is aligned and plumbed correctly.
- Tighten all anchor bolt nuts on the tip side of the base plate snug then an additional one-quarter turn.
- Check to make sure that hardware is bearing completely against the base plate.
- It is common practice to secure anchor bolt nuts in some manner to prevent unauthorized turning or removal.
- Refer to **Fig. 13** for anchor bolt detail.

Poles (concrete and steel)

- When unloading poles from freight carrier:
 - Verify that all required materials have been received.
 - Check all poles or pole sections for possible damage incurred during shipping.
 - Use proper pick-up points and equipment for lifting poles or pole sections to prevent damage.
 - Match pole ID mark with that described on the lighting layout provided by Hubbell Lighting Applications Engineering and unload at these locations on the job site. Unload with the pole base as close as possible to the foundation.
 - For concrete poles with cap plate, do not store pole with cap plate supporting the pole weight. Blocks and chocks should be placed under the pole or pole sections to aid in assembly and lifting.

- If the job site permits, it is recommended to assemble the sports lighting equipment to the pole before erection. The pole should be oriented so that attachment points are accessible without requiring rotation of the pole.
- For installations that require front and back aimed fixtures, it will be necessary to elevate the top end of the pole to provide clearance for the reflectors if the assembly is completed prior to erection.
- Hoisting must be smooth and continuous without abrupt jerks.
- Tag lines can be used to guide the pole to the foundation during erection.

Concrete Poles

- Refer to the cast-in nameplate on the pole for information about pole length, weight & ID mark.
- Poles must be lifted, stored and erected using only the following points marked on the pole or indicated on documentation shipped with each pole.
- **C.G.** (center of gravity) – This location is shown for informational purposes only, it is not a pick-up point.
- **2 Point Pick-Up** – These locations are the proper 2 point pick-up points. Equal length slings are required. The pole will hang horizontally when using these points. **No** sports lighting equipment is to be attached to the pole before it is erected using the 2-point pick-up.
- **1 Point Pick-Up** – This location is to be used for pole erection. A thru-hole is provided at this point to enable a steel bar to be inserted as a safety stop for the sling. Sports lighting equipment may be attached to the pole before it is erected using the 1-point pick-up.
- **Storage** – These locations are the points at which the pole must be supported for storage at the job site. The pole must be stored in a straight and level condition so that no bowing or bending occurs. While the sports lighting equipment is being attached to the pole, support the pole using these storage points. If the weight of the equipment at the pole top could cause undesirable deflection during erection, the pole top must also be supported.
- **Ground Line** – This location indicates the level to which the pole should be embedded in the ground. Verify foundation design embedment requirements.

Steel Poles

- Check each pole section's straightness to ensure that there was no damage incurred during shipping. Manufacturing tolerances permit a variance from a string line by up to ¼ inch in 20 feet.
- Avoid damage to the pole surfaces during handling operations.
- Pole sections should be laid flat and blocked for storage and assembly.
- Pole sections may be assembled horizontally or be vertically depending on job site requirements.
- Slip-fit the pole sections together by the following sequence:
 - Match pole ID numbers to identify shaft sections that make up one complete assembly.
 - Ensure that there are no projections or dirt in the telescoping areas.
 - If a lubricant is needed to slip sections together, soapy water is recommended.
 - Refer to **Fig. 6** for shaft alignment and slip-fit tolerances.
 - 15/16" diameter holes are provided in each section for attachment of a pulling device.
 - Force the sections together snugly using devices such as come-alongs, hydraulic jacks, etc.
 - Ensure adherence to slip-fit tolerance described in **Fig. 6**.
 - All joints must be lashed securely together to prevent slipping apart during erection. Listed below are some methods to do this:
 - Come-alongs with tight cable lashings.
 - A single, full-length cable, fastened at the base (or bottom hand hole) and the top of the pole.
 - Plumbing of the pole should be done early in the morning when there is minimum heat effect from the sun and when there is no appreciable wind. The heat from the sun on one side of the pole can cause a visible bow to occur.

Sports Lighting Equipment Assembly to Poles

- Refer to **Figs. 7** for component matching at each pole location. Components **must** be installed at locations identified on the Hubbell Application Engineering documentation. **Verify all labeling.**
- Refer to **Figs. 8** for standard crossarm system layouts.
- Refer to **Fig. 10** for clamp-on component mounting to **concrete** poles.

- Refer to **Fig. 11** for cap plate component mounting to **steel or concrete** poles.
- Refer to **Fig. 9** integral fixture mounting to crossarm.
- Refer to Hubbell Application Engineering documentation and instruction sheet shipped with integral fixture for detailed aiming and axial reflector mounting instructions. **Verify if protective hulls are required.**
- Install proper lamps.
- Install lens assemblies to reflectors.

Final Notes

- Supply wiring and strain relief to be furnished by the Contractor.
- Refer to instruction sheet shipped with integral fixture for detailed instructions on installing, aiming and servicing the integral fixtures.
- Feed supply wiring through the pole base into the crossarm junction box and make electrical connections to the terminal blocks. Ensure that each pole/junction box is properly grounded.
- Check one light position on each crossarm assembly to verify that it aligns with the requirements specified on the Hubbell Applications Engineering documentation.
- Locate the spot on the field where this light should be aimed.
- To allow for your height, take two steps toward the pole from this spot.
- Using **binoculars**, look at the lamp and reflector of the light aimed at this spot.
 - If the light is aligned properly:
 - Axial optics: The lamp and the back of the reflector will form a perfect bull's-eye.
 - Horizontal optics: The center of the lamp arc tube will be centered in the reflector.
 - If adjustments must be made, the following is required:
 - Steel base plate poles: Crossarm must be rotated.
 - Steel direct burial pole: Pole or crossarm must be rotated.
 - Concrete pole with cap plate components: Pole or crossarm must be rotated.
 - Concrete pole with clamp-on components: Pole must be rotated.

An aiming kit is available for re-adjustment of optics when vertical adjustments must be made or if displacement of pole location is required due to obstructions not accounted for during lighting design (i.e. power lines, underground obstructions, etc.).

These instructions are not intended to be a comprehensive guide to every possible installation issue.

Always put safety first. If in doubt, call us.

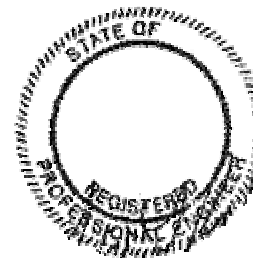
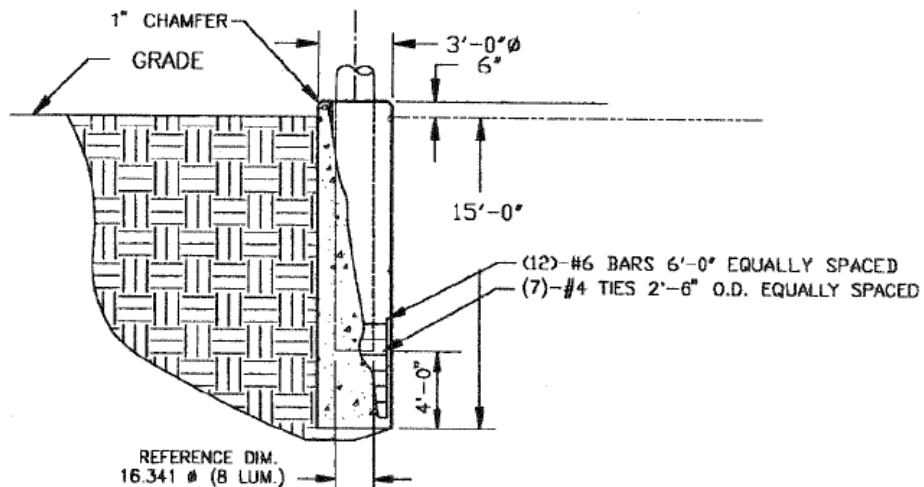
Direct Embedded Foundation Design Sample (Fig. 1)

(This is a sample only, your SLS installation will require it's own design)

MONOPOLE REACTIONS	
OVERTURN-	123.3FT-K
SHEAR-	2.2K
MAX. DOWN-	2.1K

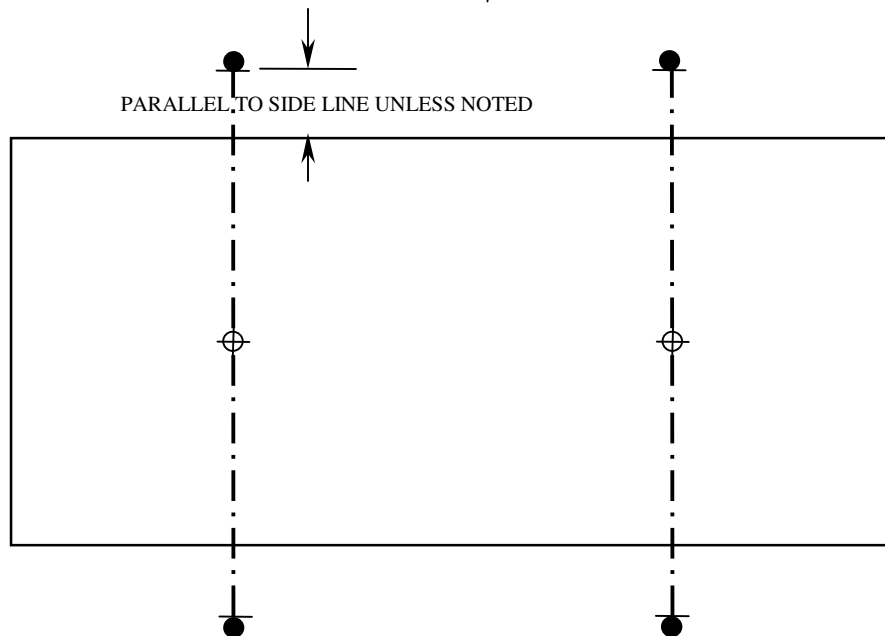
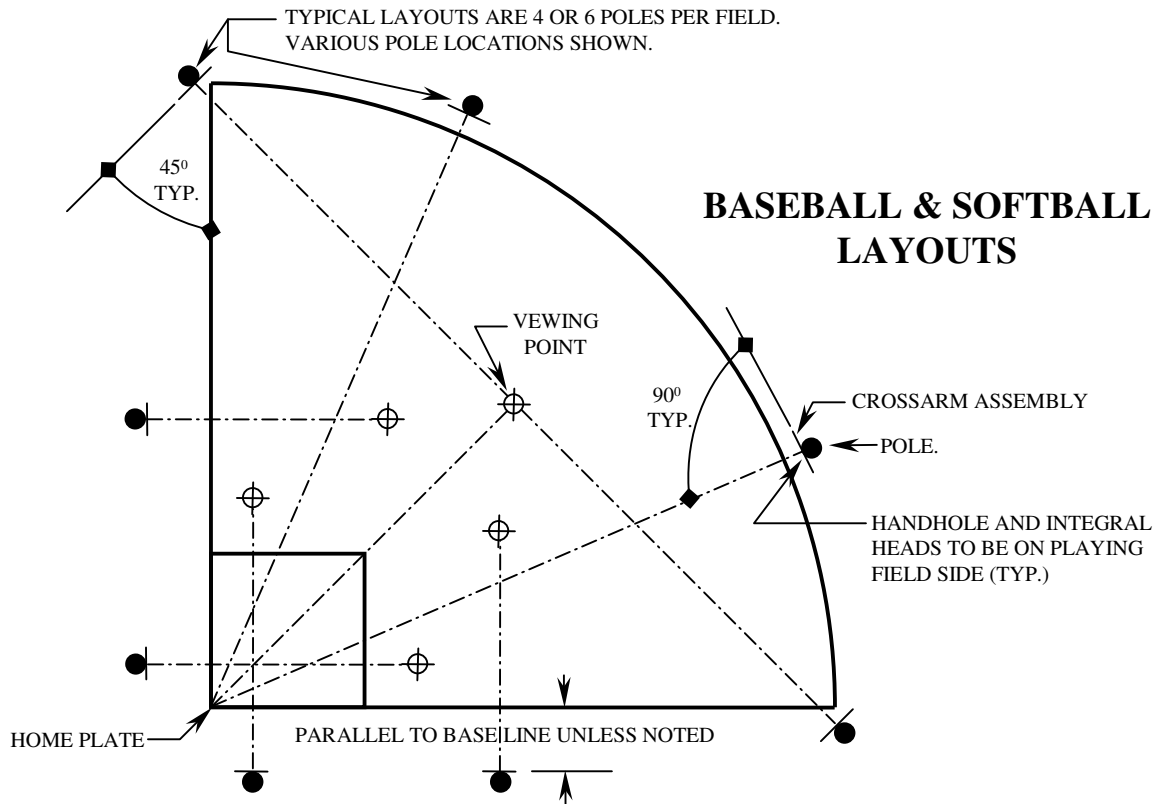
GENERAL NOTES:

1. TYPE 1 CONCRETE 3000 PSI STRENGTH AT 28 DAY CURE.
& TO BE INSTALLED PER ACI-318 CODE REQUIREMENTS.
2. REBAR TO BE GRADE 60 WITH ASTM-615 DEFORMATIONS.
3. ALL REINFORCING STEEL TO HAVE MINIMUM OF 3" CONCRETE COVER.
4. CONCRETE 4.1 CU. YDS.
5. SHAFT DESIGNED PER GEOTECHNICAL REPORT BY PROFESSIONAL SERVICE INDUSTRIES, INC. PROJECT NO. 130-B5023 JOB: LOGSTON FIELD LIGHTING, LOGSTON, BELPRE, OH.
6. CONCRETE TO HAVE SLUMP OF 5" TO 7".
7. USE TREMIE IF REQUIRED. DO NOT DROP CONCRETE THRU WATER.



DWN	CKD	Date	Job #
DRAWING NO.			

POLE LOCATION / ALIGNMENT DETAILS (FIG. 2)

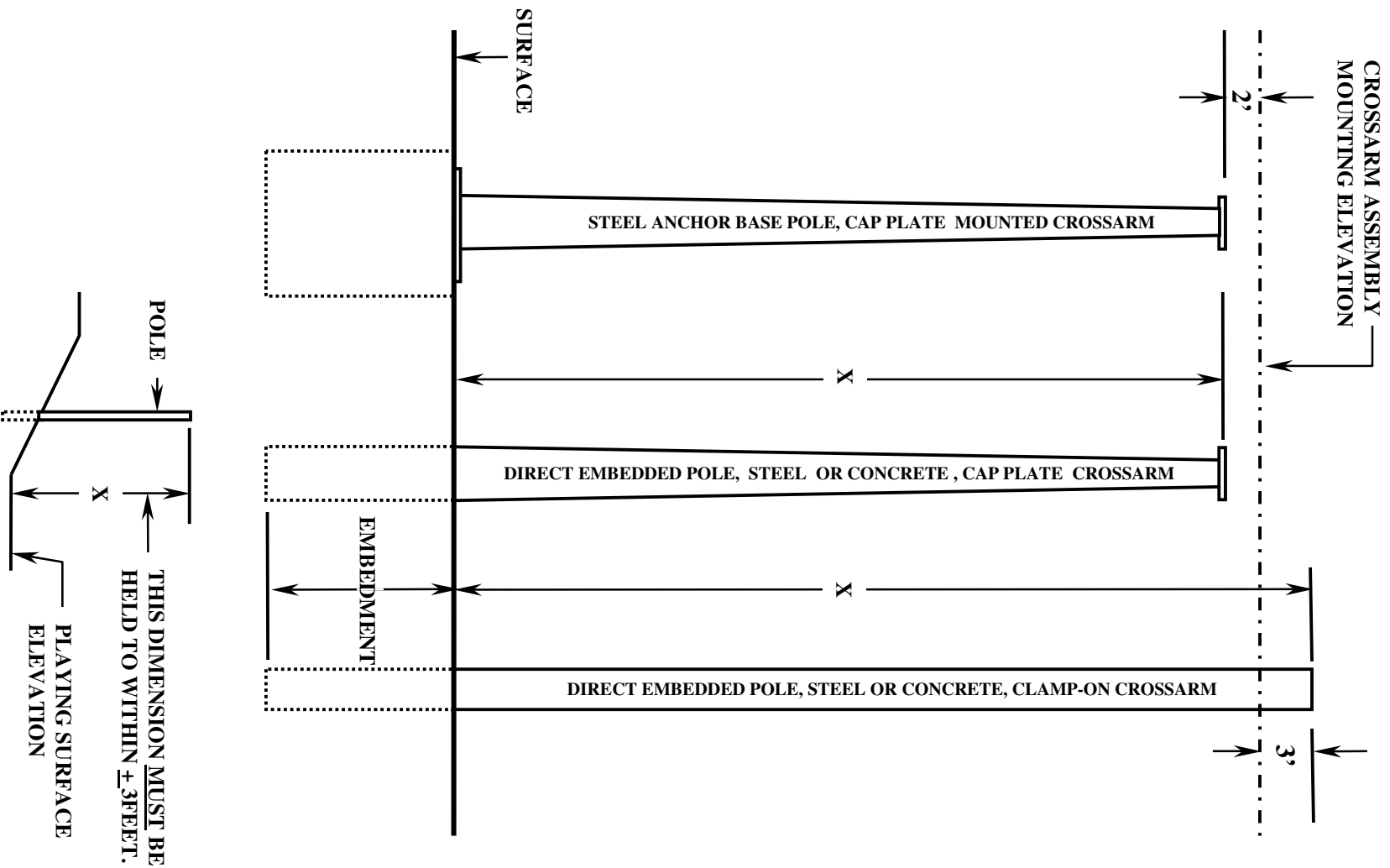


FOOTBALL, SOCCER & TENNIS LAYOUTS

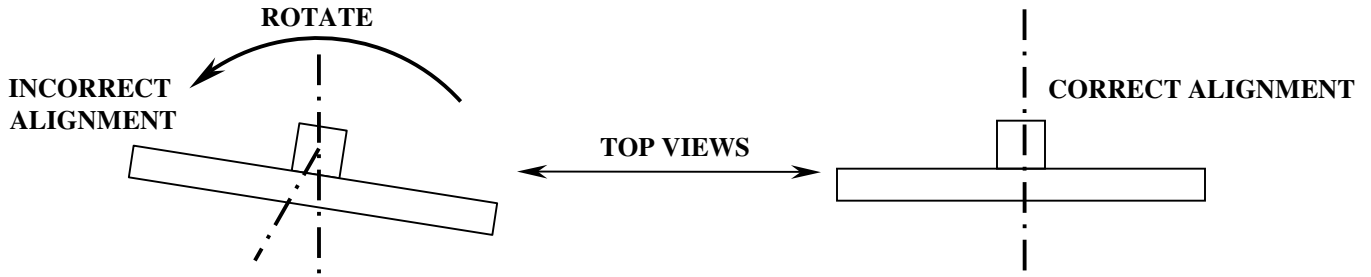
NOTES:

- IDENTIFY POLE LOCATIONS ON SITE PER HUBBELL APPLICATION ENGINEERING DOCUMENTATION.
- INSURE THAT ALL VIEWING POINTS ARE A SAFE DISTANCE FROM POLES DURING THE ERECTION PROCESS A DISTANCE EQUAL TO 1-1/2 MOUNTING HEIGHTS MINIMUM IS RECOMMENDED
- REFER TO FIGS. 4 & 5 FOR ADDITIONAL ALIGNMENT DETAILS

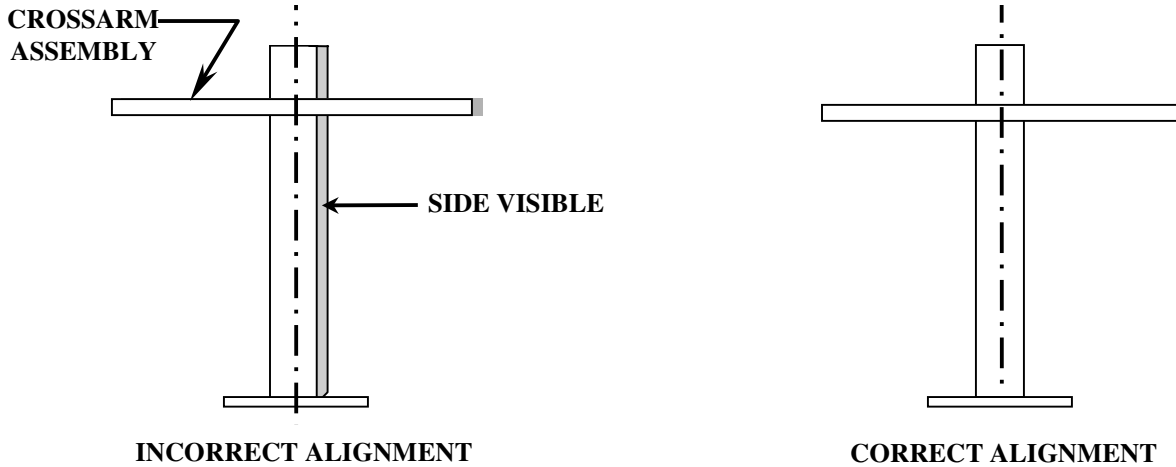
POLE ELEVATIONS (FIG. 3)



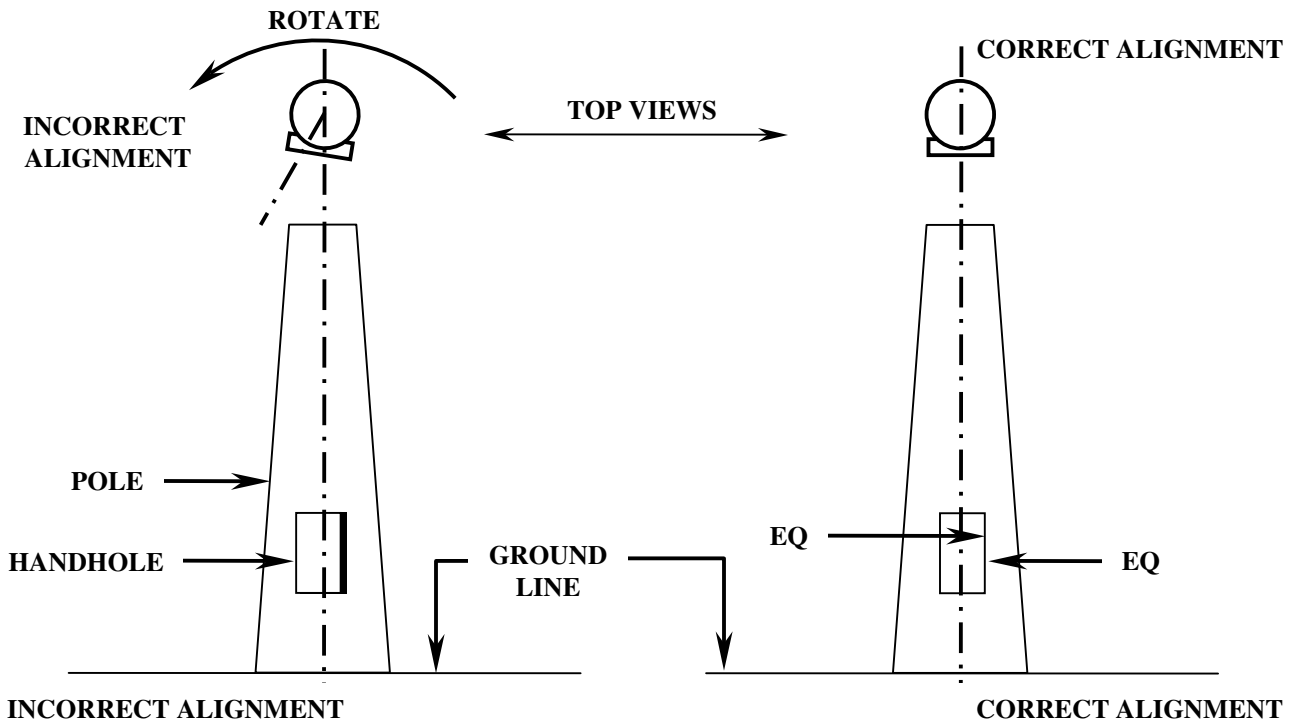
ALIGNMENT DETAILS (FIG. 4)



THE VIEWS BELOW SHOW WHAT YOU WOULD SEE LOOKING THROUGH BINOCULARS AT THE CROSSARM OR POLE FROM THE DESIGNATED VIEWING POINT ON THE FIELD



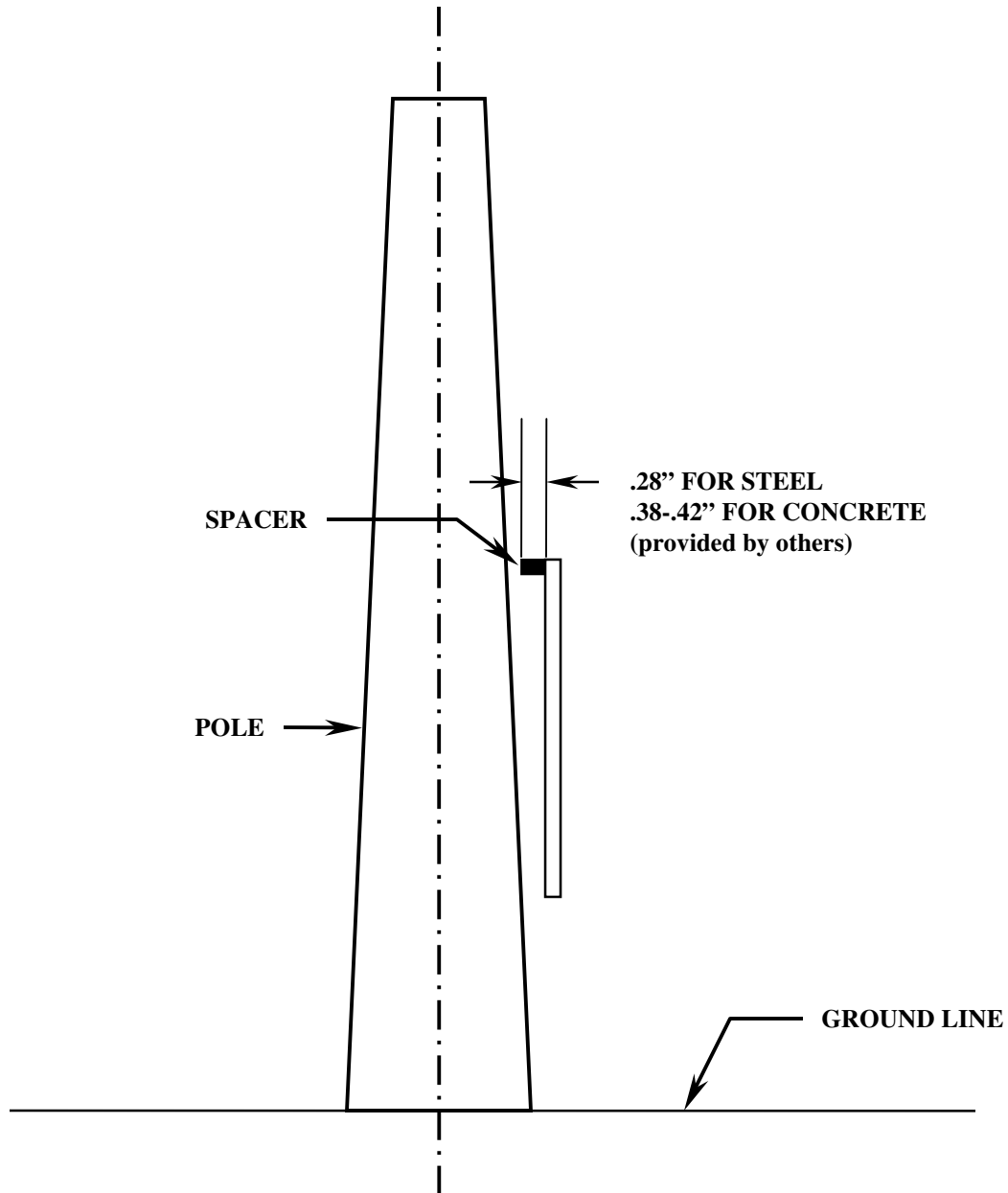
ALIGNMENT DETAIL



POLE ALIGNMENT DETAIL

THIS DETAIL IS CRITICAL IF COMPLETE POLE/CROSSARM ASSEMBLY CAN NOT BE ERECTED AT THE SAME TIME.

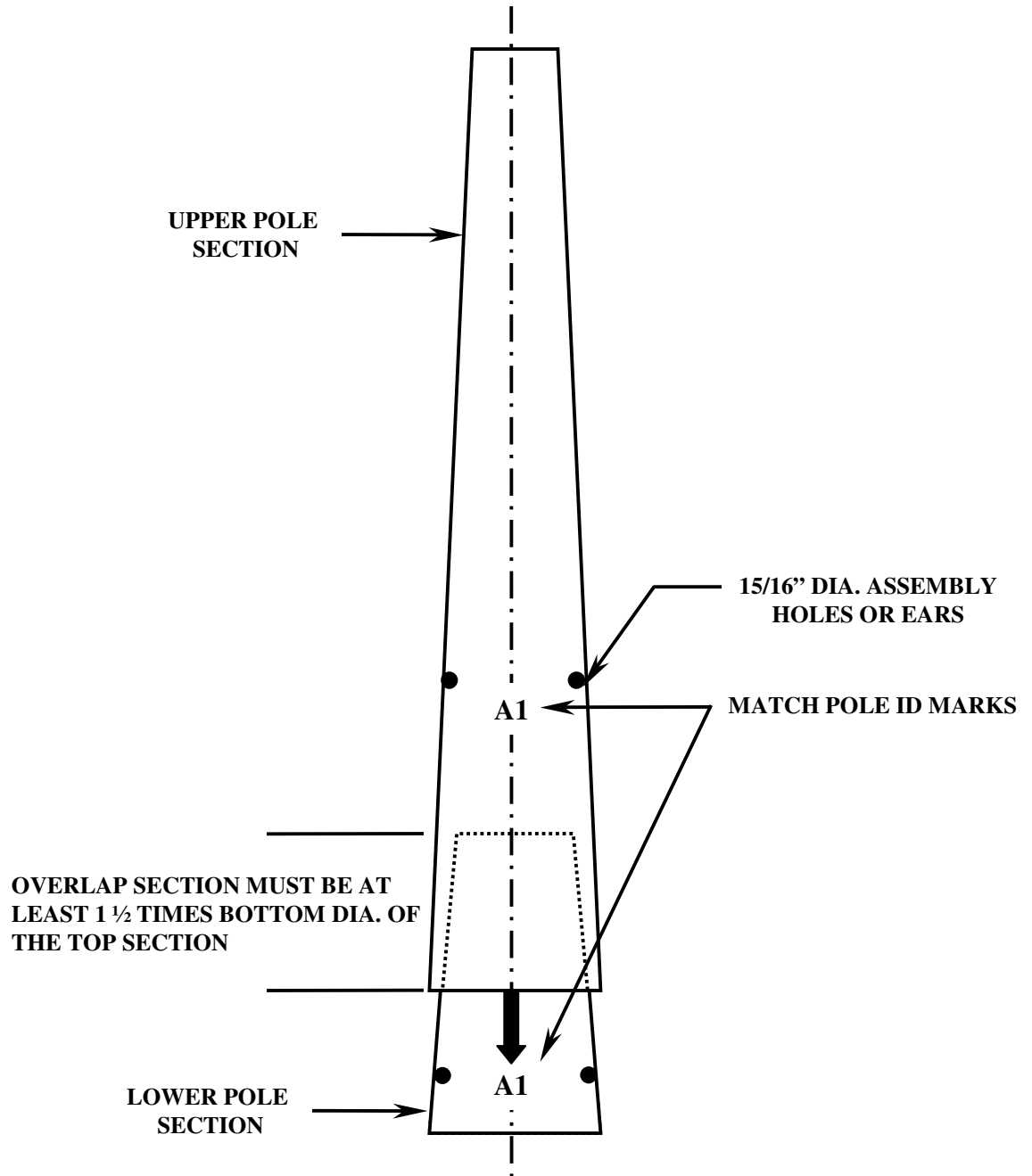
ALIGNMENT DETAILS (FIG. 5)



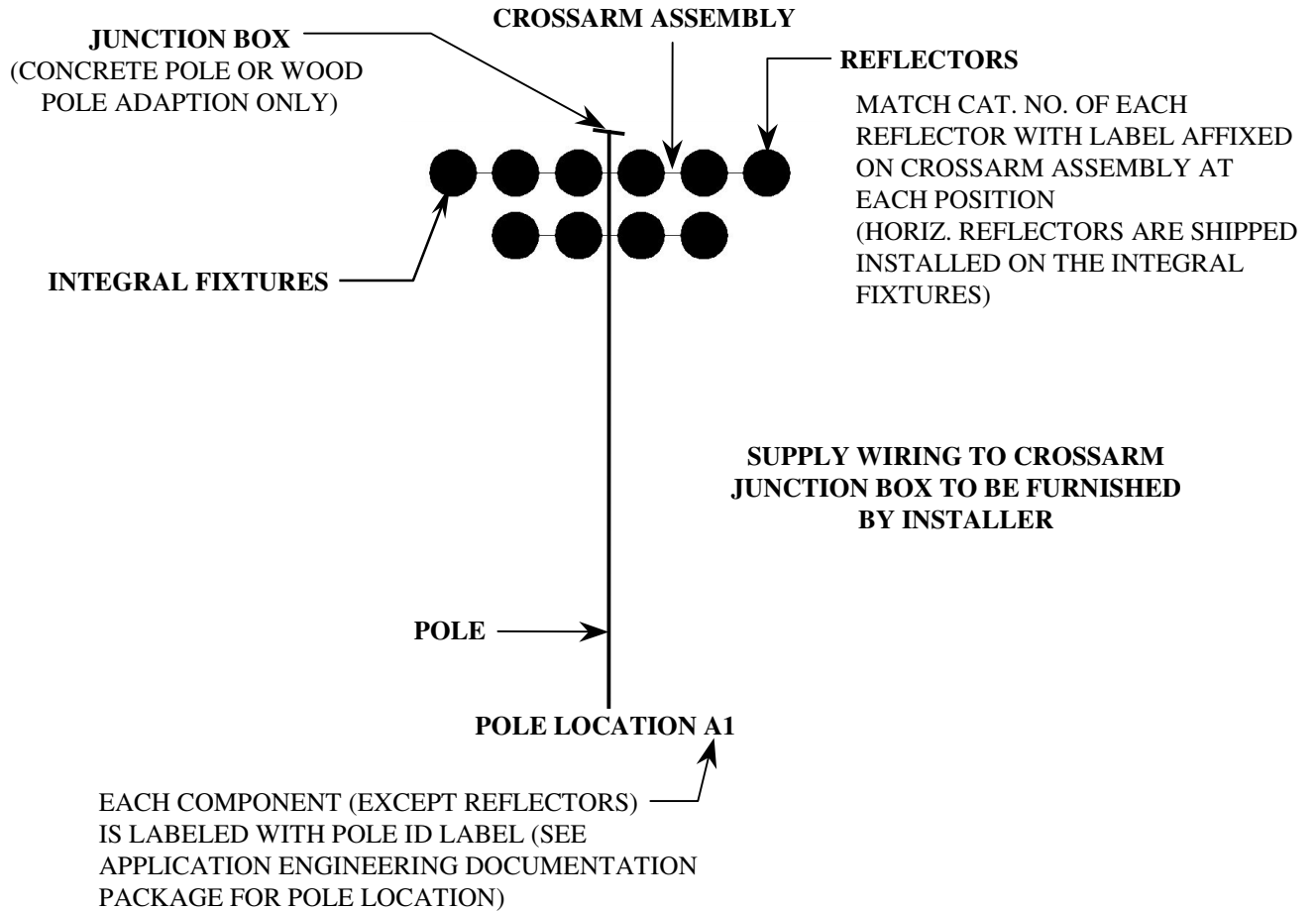
NOTES

- INSURE THAT ALL POLES ARE PLUMB IN ALL DIRECTIONS.
- ALL POLES HAVE TAPER AS NOTED ABOVE.
- WHEN USING A PLUMB BOB OR TRANSIT, A DISTANCE AWAY FROM THE POLE EQUAL TO 1-1/2 MOUNTING HEIGHTS MINIMUM IS RECOMMENDED.

TYPICAL STEEL POLE SPLICE DETAIL (FIG. 6)



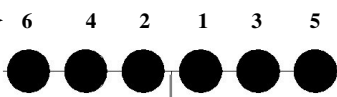
COMPONENT MATCHING (FIG. 7)
(LAYOUT SHOWN IS FOR EXAMPLE ONLY)



STANDARD CROSSARM LAYOUTS (FIG. 8)

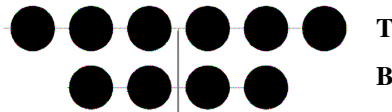
(FRONT VIEW)

FIXTURE POSITION NUMBERS

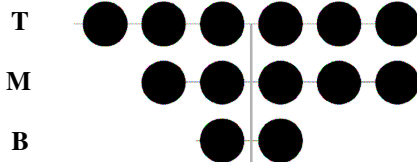


ROW IDENTIFICATION
 T = TOP ROW
 M = MIDDLE ROW
 B = BOTTOM ROW

ONE ROW CROSSARM ASSY.
 (QUANTITY OF FIXTURES SHOWN IS FOR EXAMPLE ONLY)



TWO ROW CROSSARM ASSY.
 (QUANTITY OF FIXTURES SHOWN IS FOR EXAMPLE ONLY)

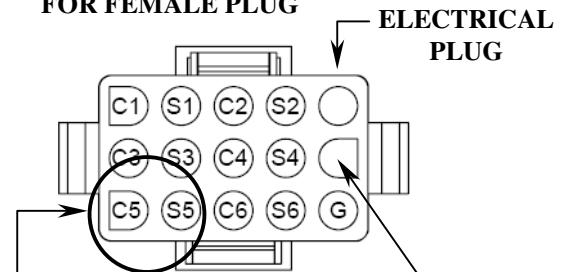


THREE ROW CROSSARM ASSY.
 (QUANTITY OF FIXTURES SHOWN IS FOR EXAMPLE ONLY)

PLUG WIRING ASSIGNMENTS

Notes; (CONC. POLES ONLY)

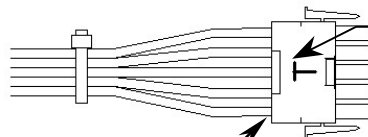
- FRONT VIEW OF MALE PLUG SHOWN
- FIXTURE POSITIONS ARE MIRRORED FOR FEMALE PLUG



- C = LAMP SOCKET CENTER CONTACT
- S = LAMP SOCKET SHELL
- 5 = FIXTURE POSITION #

NOTE THE "D" SHAPE FOR PROPER PLUG ORIENTAITON

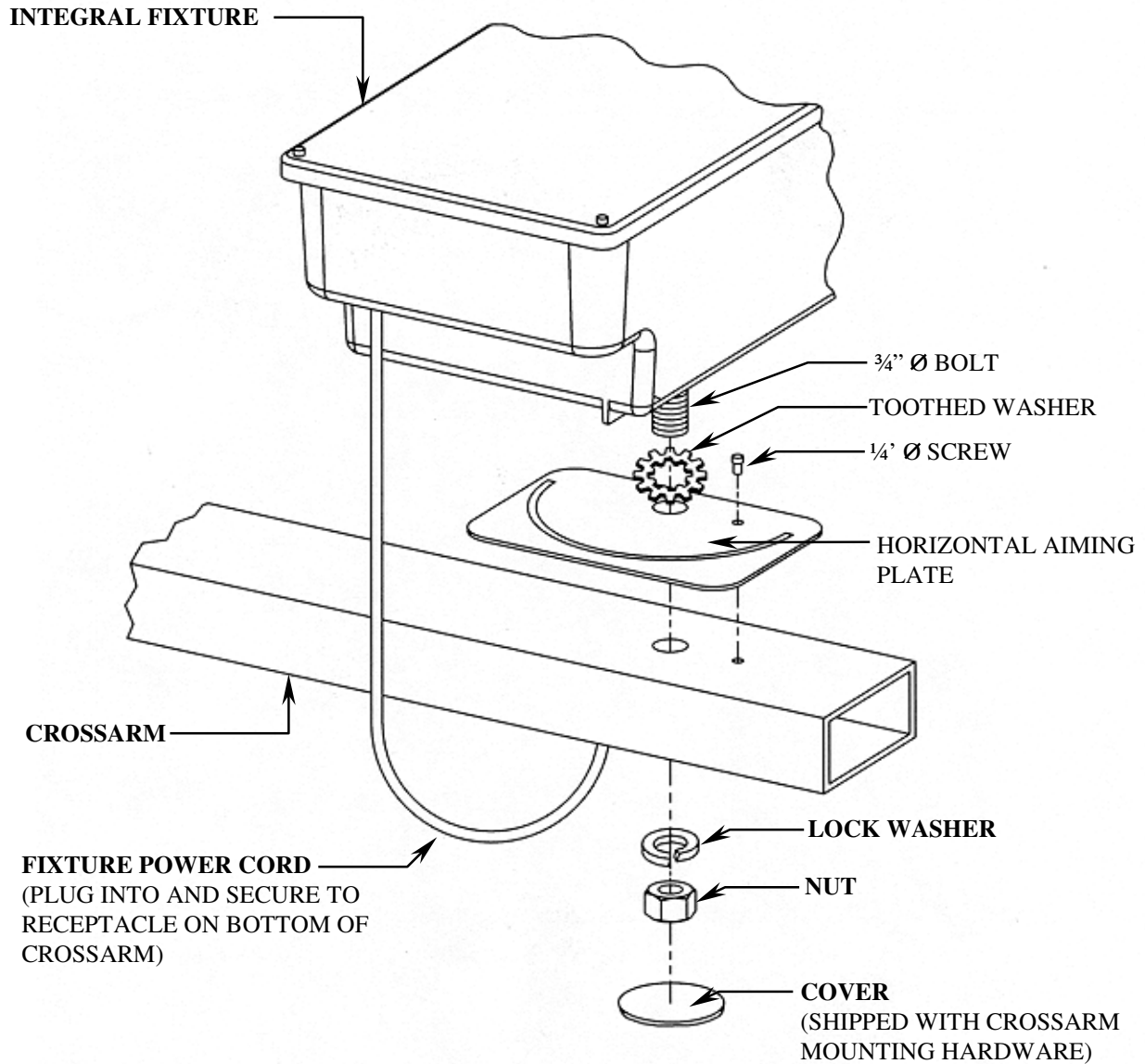
HARNESS INFORMATION



CROSSARM ASSEMBLY ROW ID
 T = TOP ROW
 M = MIDDLE ROW
 B = BOTTOM ROW

PLUG FROM EACH CROSSARM ROW
 (CONC. POLES ONLY)

INTEGRAL FIXTURE MOUNTING TO CROSSARM (FIG 9)

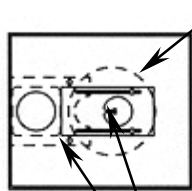


NOTES:

- ALL FIXTURE MTG HARD WARE IS SHIPPED WITH INTEGRAL FIXTURE EXCEPT FOR COVER.
- SEE DETAILED INSTRUCTIONS FOR INSTALLING, AIMING AND SERVICING.

INSTRUCTIONS FOR CLAMP-ON COMPONENT MOUNTING TO CONCRETE POLES (FIG. 10)

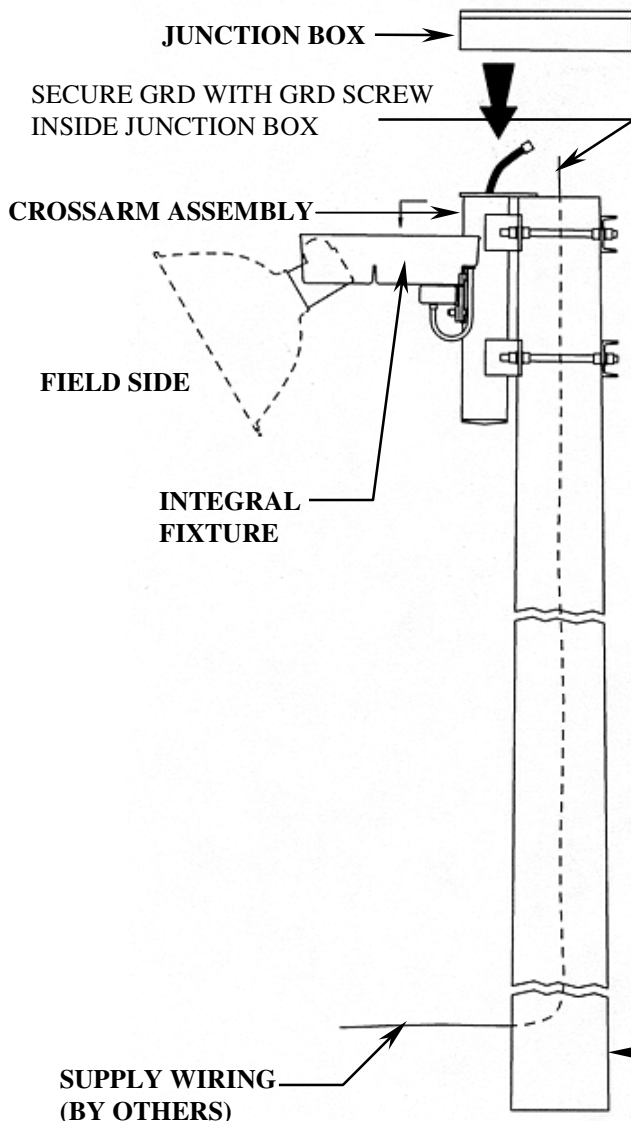
TOP VIEW OF JUNCTION BOX



BIRD GUARD/STRAIN RELIEF PLATE
(ADJUSTMENTS MAY BE REQ'D. FOR HOLE COVERAGE
AND ALIGNMENT OF WIREWAY OPENINGS)

ATTACH SUPPLY WIRE
STRAIN RELIEF HERE

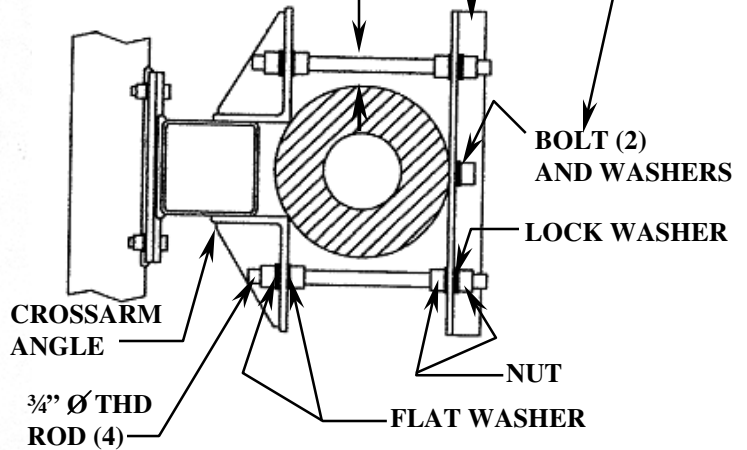
SECURE JUNCTION BOX TO
CROSSARM ASSY. WITH $\frac{1}{4}$ " \varnothing
BOLTS (2), WASHERS & NUTS
SHIPPED WITH JUNCTION BOX



THESE BOLTS SHIPPED WITH POLE
(TIGHTEN TO 20 ft/lbs MAX)

KEEP DISTANCE
TO A MINIMUM

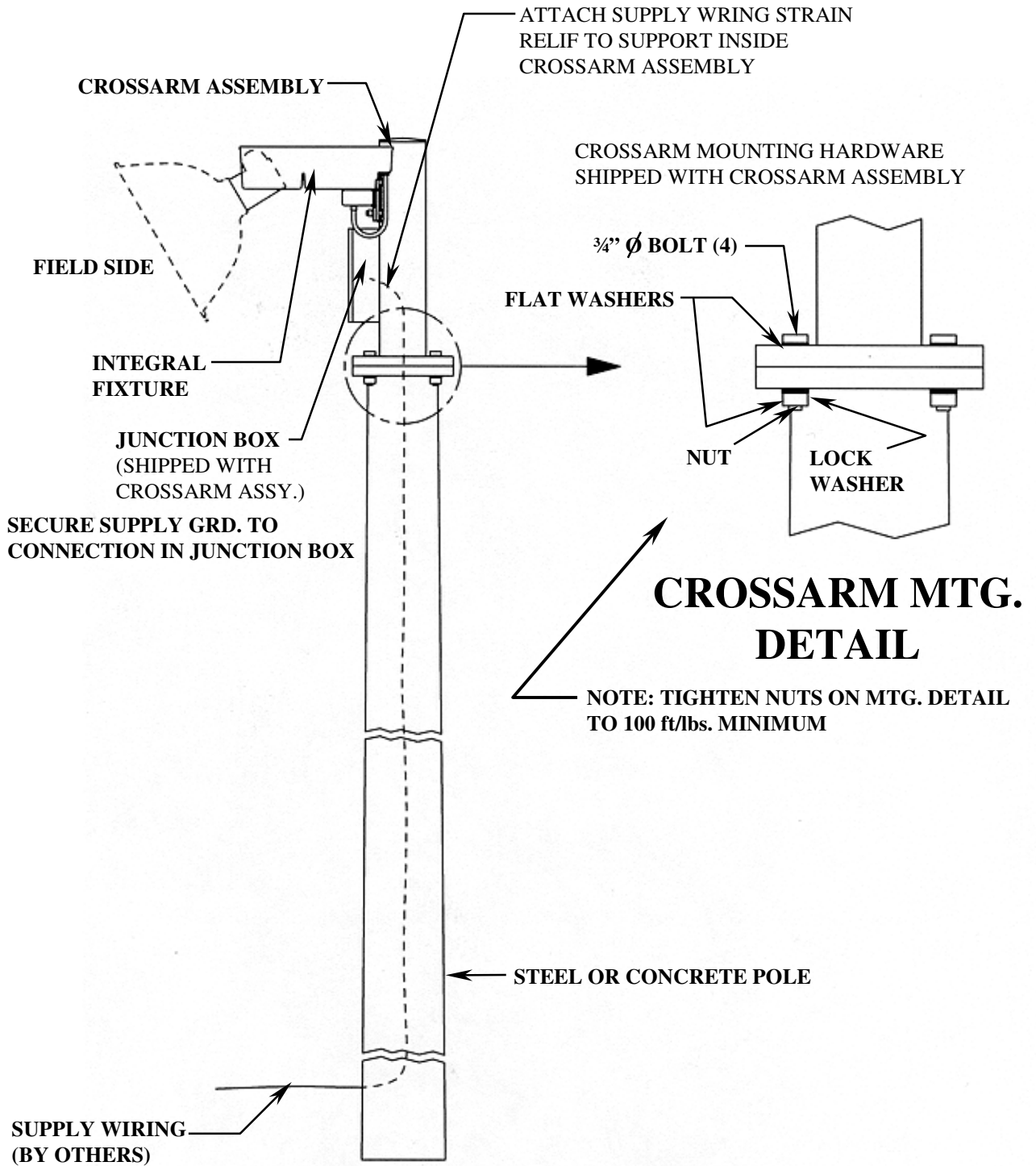
CHANNEL



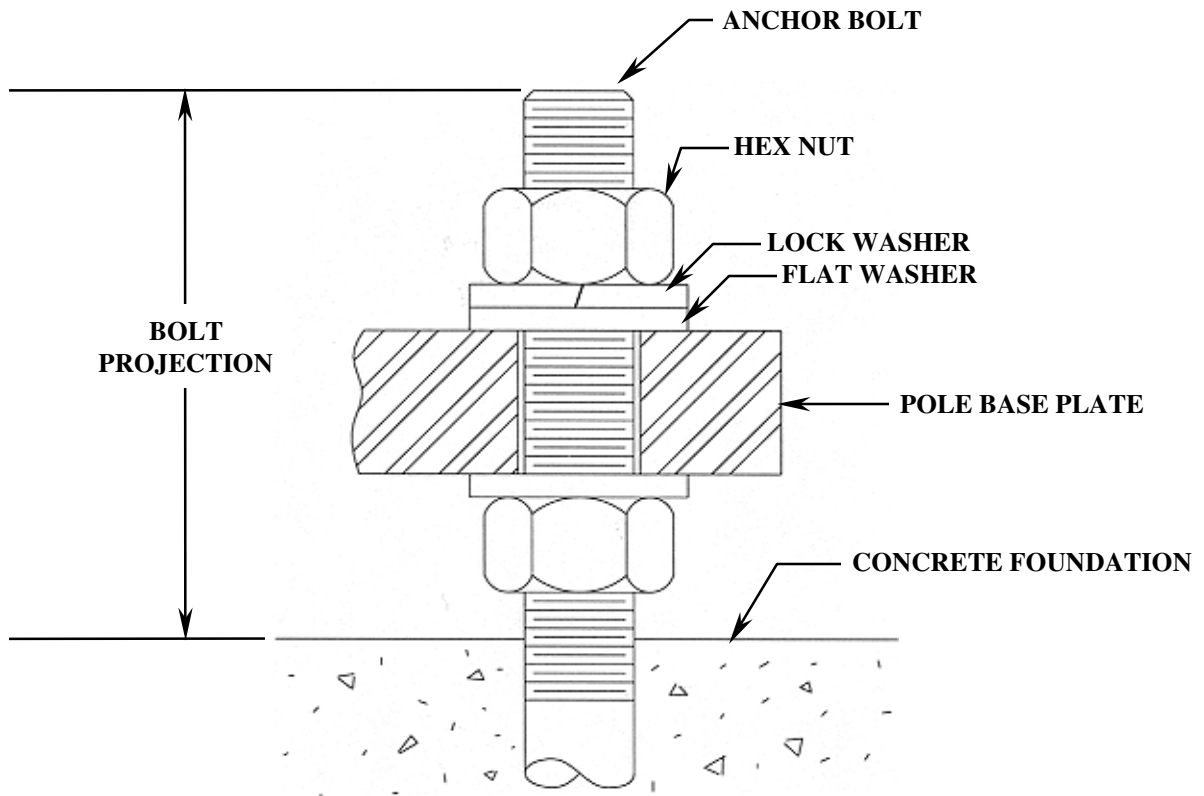
CROSSARM MOUNTING HARDWARE SHIPPED
WITH CROSSARM ASSEMBLY

**NOTE: TIGHTEN ALL NUTS ON THREADED RODS
SNUG THEN AN ADDITIONAL ONE QUARTER TURN. DO
NOT OVERTIGHTEN TO CAUSE BENDING OF CHANNEL
OR CROSSARM ANGLES.**

INSTRUCTIONS FOR CAP PLATE COMPONENT MOUNTING TO CONCRETE POLES (FIG. 11)



ANCHOR BOLT DETAIL (FIG. 13)



SLS ANCHOR BOLT ALIGNMENT DETAILS

