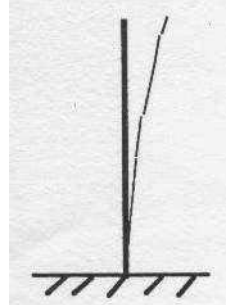


# Lighting Poles and Vibration

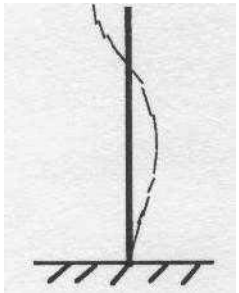
## Read before installation

Wind is usually an unseen, but always potentially very powerful natural force. All lighting poles, regardless of design and choice of material are vulnerable to these wind forces. Destructive pole vibration is not a common phenomenon, but when it occurs, the results may be devastating.

Lighting poles are generally affected by winds in two ways. The most common type is called “sway” or first mode vibration. When this happens, the maximum movement occurs at the pole top and is perpendicular to the wind direction. The movement is low frequency and usually not harmful to the pole. Small movement at the top of the pole is normal. Excessive movement is a reason for concern and requires close inspection for cracks.



The second, and less frequent vibration type, called second mode vibration, can be destructive to both the lighting pole and the luminaire. This vibration movement is higher in frequency and the



point of maximum movement is located half to two thirds up the pole. The pole movement is again perpendicular to the direction of the wind. Under very rare circumstances, the wind induced vibration exaggerates the pole movement as it synchronizes with the pole/luminaire system natural frequency. Excessive pole movement and even pole failure can result.

There are signs to look for when checking for the effects of second mode vibration.

Premature lamp failure, loosening of screws or accessory components and a rapid, unfamiliar “ticking” sound as the pole vibrates are all typical conditions indicating possible

second mode vibration. Hairline cracks just above the pole base weld are further indicators

of vibration induced metal fatigue and of a need to repair or replace materials. You should consult a licensed structural engineer to confirm your concerns.

Predicting which location and which luminaire/pole assembly will be susceptible to destructive vibration is not easy, if even possible. Typically the most vulnerable lighting poles are located in wide open areas with no buildings or structural features to break up the constant wind patterns. Wide open parking areas, bridges, airport structures and mountain passes are examples of prime concern areas. It takes a low steady wind, usually 5 – 20 mph to set up conditions for damaging vibration.

Your Hubbell Lighting agent can supply lighting poles with vibration dampeners to minimize the destructive effects of wind induced vibration. Some Hubbell dampeners are impact type, consisting of a solid mass supported loosely inside a hollow tube, that when forced to vibrate, collides with the tube sides and prevents harmonic vibration build-up quickly. Factory installed, internally mounted dampeners can be supplied in most poles. Other Hubbell dampeners are friction type that can be installed in the field.

If your lighting application calls for luminaire and pole assemblies located in a wide open windy area, we strongly recommend the use of vibration dampeners. Consult local authorities to determine if such conditions are common in your area. If you note any of the above listed signs of destructive vibration in your newly installed lighting equipment, a dampener may be an answer to minimize your vibration problems. Contact your Hubbell Lighting Inc. agent for availability.

## Lighting Poles and Vibration

The Hubbell Warranty for poles specifically excludes fatigue failure or similar phenomena associated with wind and /or structural induced vibration. See Hubbell Lighting’s Limited Warranty and Limitations of Liability for details.

**Follow the installation and maintenance guidelines  
on these pages**

# CRITICAL POLE INSTRUCTIONS

## AFTER INSTALLATION – GIVE THESE INSTRUCTIONS TO THE FACILITY MANAGER/OWNER

**WARNING!!!** Failure to properly install and maintain this pole may result in pole and /or light fixture damage, pole collapse and/or electrical shock hazards resulting in significant property damage or death.

**WARNING!!!** To reduce electrical shock and structural collapse hazard:

- Install and maintain to meet all applicable codes.
- Do not install without a light fixture
- Do not overload. Do not attach signs, streamers, banners, flags, pennants or similar items which can cause excess vibration and wind load to the pole.
- Obtain qualified foundation, anchoring and if applicable, vibration certification based on local conditions.
- Provide proper electrical grounding.
- Use electrical connectors and mechanical fasteners that are suitable for this application.
- Provide proper drainage.
- Inspect regularly for excessive vibration, damage, tampering, nut loosening and internal and external structural corrosion.
- Remove damaged or corroded poles and anchors from service.

**Caution!** Remove protective wrap on receiving poles. Continued contact with the wrapping material, while exposed to weather, may stain the finish.

**Foundations:** Local soil and frost conditions vary widely. Consult a registered engineer familiar with these conditions for foundation design and confirmation of re-use suitability of existing foundations.

**Anchor Bolts:** Use bolts and nut kits supplied by Hubbell Lighting or by Hubbell pole suppliers as part of the pole kit. Use bolts and nuts from other sources only on the advice of a structural engineer.

**Templates:** Use factory supplied templates when setting anchor bolts. Hubbell Lighting will deny all claims for incorrect anchorage placement if factory supplied templates are not used. Anchor bolts must be properly located to provide desired light fixture orientation. Anchor bolts must be vertically plumb and extend above the finished foundation surface to the extent called for on the bolt template.

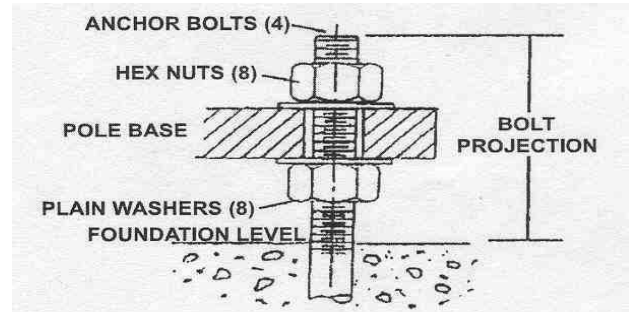
**Luminaire assembly:** Install luminaires and brackets per separately supplied instructions.

**WARNING!!!** Do not support pole by luminaires during pole erection nor allow lifting straps to lift on luminaire attachment points. Resulting luminaire damage or failure may result in property damage, injury or death.

**Pole Erection:** Thread one nut on each anchor bolt to near the foundation. Level from nut to nut. Install a washer on each bolt. Install the pole base on the anchor bolts and install top washers and nuts. Adjust the nuts to plumb the pole and torque as recommended.

**Anchor Nut Torque Recommendations:** (by bolt diameter) FT-LB +/- 5%

Bolt diameter	½"	¾"	1"	1 ¼"
Non-lubricated	29	100	238	475
Lubricated	21	74	180	360



**Finish wiring:** Ensure proper electrical conductor strain relief at the pole top and install the pole cap. Attach ground conductor to the threaded ground location inside the hand hole and install the gasketed hand hole cover.

**Grouting is not recommended..** Drainage must be allowed from the pole base interior. By using the double nut anchor bolt mounting as shown above, drainage openings are provided around the entire pole base. To prevent corrosion with aluminum poles in contact with mortar, cover the contacting surface with two coats of bituminous paint.

**Base or Nut Covers:** (as supplied) Install cover halves around pole base and screw together. Slip one-piece covers onto pole top prior to luminaire installation. Tap aluminum covers over anchor nuts to provide finished look.

**Maintenance:** The owner/maintainer's regular scheduled maintenance program and records must include:

- Periodic inspection for external and internal corrosion, structural damage, nut loosening and luminaire, hand hole cover and system ground integrity.
- Observation for excessive vibrations. If excessive vibration occurs, special vibration dampeners may be required to reduce these unpredictable harmonic problems. Consult factory for dampener information.



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**GIVE THESE INSTRUCTIONS  
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Rev A**