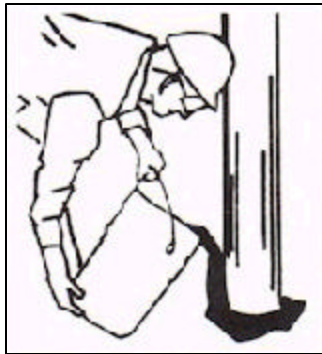


# **POLY-SET<sup>®</sup>** **Just Got Better!**

Introducing



**Our Newest Addition  
to the  
World of Engineered Backfills**



## **UTILITY STRUCTURAL SYSTEMS**

2201 N. Collins St., Suite 240 • Arlington, Texas 76011  
(800) 367-9273 • [www.utilitystructural.com](http://www.utilitystructural.com) • [info@poly-set.com](mailto:info@poly-set.com)

# Introduction

For 30 plus years, Utility Structural Systems has been dedicated to helping the electric utility industry make the “wires” portion of their companies become more reliable. In today’s deregulated environment, reliability has become vitally important.

With Poleset, we brought you the first polyurethane foam for setting and straightening utility poles of all types. Poleset was initially a standard backfill foam but with the combined efforts of Utility Structural Systems and utility field personnel we realized something more was needed. We again revolutionized the industry by bringing to market the industry’s only water-insensitive polyurethane backfill. Poleset had taken an enormous step forward in research. Never before had the industry been exposed to such a product. In 1989, Utility Structural Systems took another giant step forward by developing the first CFC-Free polyurethane backfill system for the utility market. With these major improvements Utility Structural Systems changed the name of the product from Poleset, to POLY-SET®.

We are now proud to bring you POLY-GROUND®. Utility Structural Systems has again led the industry in supplying the first electrically conductive polyurethane backfill for setting poles. It has been almost four years in the making, and we are now ready to release the product for use and testing in your system. We feel POLY-GROUND® will become the backfill of choice for the electric utility industry, with features such as:

## 1. ENHANCES THE SAFETY OF THE WORKERS:

- A better grounded system provides a safer environment for all linemen

### Potential dangers under fault conditions:



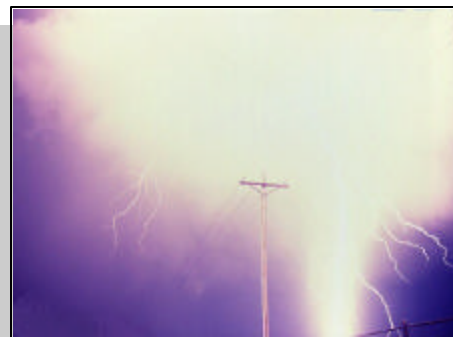
Touch Potential



Step Potential

## 2. INCREASES THE RELIABILITY OF YOUR SYSTEM BY:

- Increasing your electrical system’s efficiency and effectiveness; your transformers, relays, arresters, cut-outs, and switch gear will operate faster and safer.
- Improves your protection from lightning. Your fault protection will improve, as well as your CFO (Critical Fault Overload).\*



\* This information will be included as soon as it is available.

## Introduction (continued)

- Equipment poles are more prone to leaning than normal tangent poles due to the increased weight. With leaning poles, it is possible for the grounding electrode, required on most equipment poles, to be pulled loose from direct contact with the soil, or at best have poor contact with the soil. This reduces the effective ground required for the sensitive equipment now being used on the electric system.



### 3. ENHANCES CUSTOMER SATISFACTION:

- Decreases harmful effects of harmonics in your system. POLY-GROUND® will help maintain the 60 cycle circuit so that electronics will perform better, computer charges and discharges are curtailed and periodic interruptions will occur less frequently.

**Common causes:** 'non-linear loads' such as adjustable speed drives, rectifiers, computers/office equipment and fluorescent lighting. These devices use electricity (current) differently from motors or incandescent lights, distorting the normal voltage and current patterns.

**Common symptoms:** include transformers and motors overheating, electrical wiring overloading/overheating (especially neutrals in three phase systems), capacitor failure, resonance.

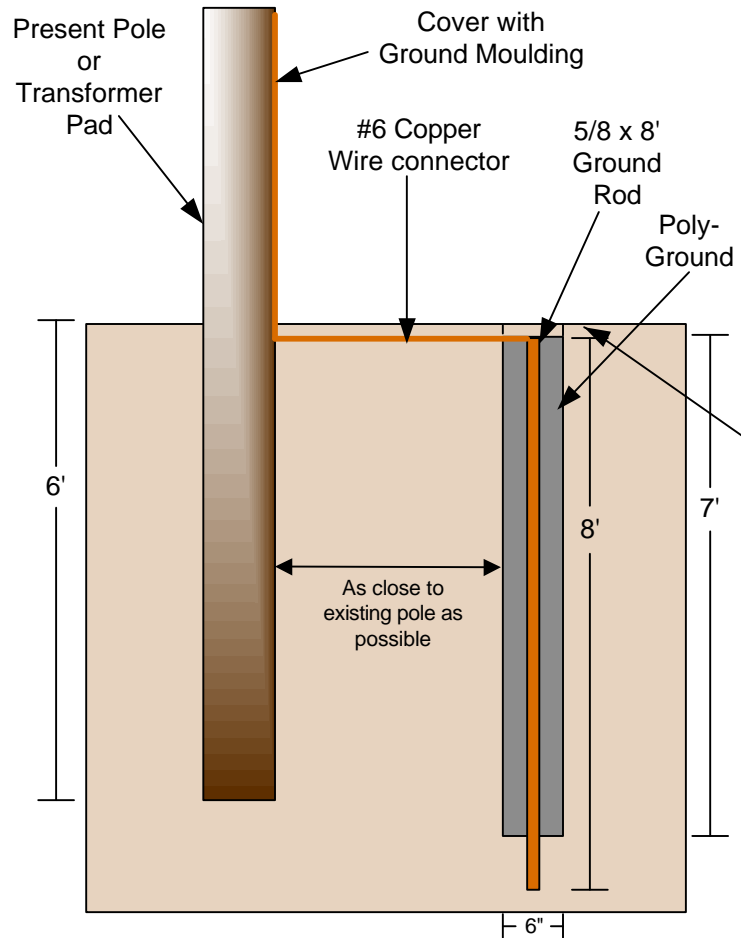
By reducing the harmonic effects that are ever-present on most power lines, the utility will quickly realize several immediate benefits:

- Reduction of overloaded neutral conductors.
- Reduction of overheated transformers and motors.
- Timing errors in sensitive electronic equipment are reduced

These are just a few of the benefits of POLY-GROUND®. POLY-GROUND® maintains the reliability associated with POLY-SET® with the added element of grounding.

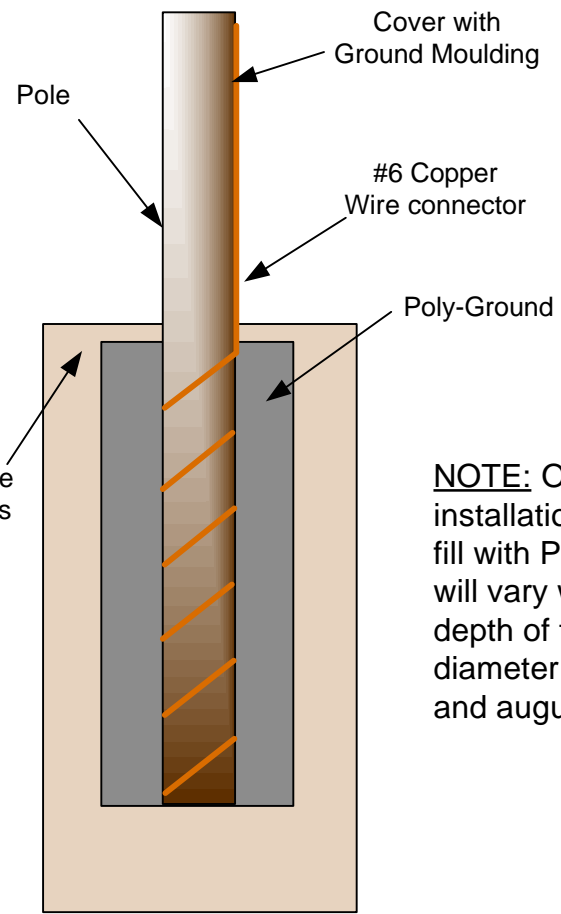
If you have questions or need additional information on POLY-GROUND® please contact the Customer Service center or a Sales Representative at (800) 367-9273. You can also visit our website at [www.utilitystructural.com](http://www.utilitystructural.com) or send an e-mail to [info@poly-set.com](mailto:info@poly-set.com)

## Ground Rod Installation on Existing Poles / Transformer Pads (1.36 ft<sup>3</sup> Void)



**NOTE:** The depth from the surface to the installation is 6" on both methods

## New Pole Ground Method



**NOTE:** On a new pole installation the void to fill with Poly-Ground will vary with the depth of the hole, diameter of the pole and auger size.

- If rock is encountered, install 8' ground rod horizontally in trench (width =6", length= 10' cover = 4") on top of the rock and fill the void with Poly-Ground (clean the rock surface as much as possible to ensure the Poly-Ground is bonded to the rock).
- Inspect present ground, make sure connections are tight, install ground moulding if not already present on the pole
- Locate and avoid all underground utilities.
- Replace all concrete or asphalt surfaces to same or better condition.

## Better Soil Resistivity Means Lower Ground Resistance!

In areas where the soil resistivity is relatively high (greater than 30 ohm-meter), it may not be possible to obtain a low ground impedance of the grounding system. Of all the possible solutions that a utility can opt to change (and given the fact that the resistance of the grounding electrode itself is negligible) the most opportune and immediate improvement can be made by changing the soil resistivity around the ground rod itself. Soil resistivity is the single most important factor affecting the resistance of the grounding system and yet, it is most often overlooked.

Since soil conditions are constantly changing, why not put something around your pole, or grounding electrode that actually maintains a constant state of conductivity regardless of what the surrounding soil may do. The moisture contents of soils are constantly changing with the seasons. When the moisture contents of the soil rise above 20% by weight, the resistivity of that soil decreases. But when the moisture content goes below 20%, the resistivity rises at a phenomenal rate. Below are some examples of varying soil resistivity's expressed in ohm-meters:

Soil Description	Median	Min	Max
Topspoils, loams	26	1	50
Inorganic Clays of high plasticity	33	10	55
Fills-ashes, cinders brine washes	38	6	70
Silty or clayey fine sands with slight plasticity	55	30	80
Porous limestone, chalk	65	30	100
Clayey sands, poorly graded sand-clay mixtures	125	50	200
Fine sandy or silty clays, silty clays, lean clays	140	80	200
Clay-sand-gravel 1 mixture	145	40	250
Marls <sup>3</sup>	155	10	300
Decomposed granites, gneisses <sup>4</sup> , etc.	300	100	500
Clayey gravel, poorly graded gravel	300	200	400
Silty sands, poorly graded gravel	300	100	500
Sands, sandstone	510	20	1,000
Gravel, gravel-sand mixtures	800	600	1,000
Slates, shistis <sup>5</sup> , gneiss rocks, shales, granites, basalts	1,500	1,000	2,000
Quartzites, crystalline limestone, marble, crystalline rocks	5,500	1,000	10,000



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