

**STANDARD SPECIFICATION
EARTH GROUNDING
Section 16000 (Straight Shaft Model)**

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Related Work Specified Elsewhere:
 - 1. Electrical General Provisions (Section xxx)
 - 2. Basic Materials and Methods (Section xxx)
- B. Work Specified Herein:
 - 1. Electrolytic Earth Grounding Installation
 - 2. Testing Procedures

1.02 GENERAL

- A. Grounding Systems: Electrolytic Maintenance Free
- B. Components: XIT Grounding electrode with 4/0 AWG (or as specified) exothermically welded pigtail, protective cover box and sufficient quantity of Lynconite II backfill for a standard installation.

Part 2 - PRODUCTS

2.01 PRODUCTS

- A. General
 - 1. Self contained ground system(s) using electrolytic action to enhance the grounding performance shall be provided where specifically indicated on the drawings.
 - 2. The ground rod shall operate by hygroscopically extracting moisture from the air to activate the electrolytic process improving performance.

3. Ground rod system shall be U.L. listed and manufactured for ten years or more.
4. Ground rod system shall be 100% self activating/sealed and maintenance free. No additions of chemical or water solutions required.
5. To achieve specific earth resistance, contact the manufacturer for engineering and applications support, 1-800-962-2610 / 1-310-214-4000 or support@lyncole.com.

B. Electrode Unit

1. All copper ground rod shall consist of a 2" nominal diameter hollow copper tube with a nominal wall thickness of .083". The tube shall be permanently capped on the top bottom. Air breather holes shall be provided in the top and drainage holes shall be provided in the bottom of the tube for electrolyte drainage into the surrounding backfill material (Lynconite II).
2. The XIT rod shall be filled from the factory with non-hazardous Calsolyte™ salts to enhance grounding performance.
3. Ground rod shall be a minimum of ten feet long for straight (vertical) installation.
4. A stranded 4/0 AWG copper ground wire shall be exothermically welded to the side of the rod for the electrode to grounding conductor connection.

C. Protective Cover Box

1. Fibrelyte composite box for traffic applications. Includes bolt down flush cover with "breather" holes, XIT model XB-12F

-OR-

Precast concrete box with slots for conduit entrances. Minimum size ten inch diameter by twelve inches high. Cast iron grate flush cover with "breather" slots, XIT model XB-12C.

D. Backfill Material

1. Natural volcanic, non-corrosive form of Lynconite II clay grout backfill material free of polymer sealants. Quantity of 50 lb. bags varies with the length of the electrode and diameter of the hole.
2. Shall absorb approximately 13 gallons of water per 50 lb. bag for optimal 30% solids density.
3. PH value 8-10 with maximum resistivity of <1 ohm-m at 30% solids density.

2.02 ELECTROLYTIC GROUNDING SYSTEM: INFORMATION & SPECIFICATIONS

- A. Manufacturer: Lyncole XIT™ Grounding, 3547 Voyager St., Torrance, CA. 90503, Phone 800-962-2610 / 310-214-4000, www.Lyncole.com.
- B. Shaft configuration: Straight Shaft. Standard lengths: 10, 12, 15, 20, 40 ft. or custom.
- C. UL Listing: 467J.
- D. Warranted for 30 years with a minimum life expectancy of 50 years.
- E. Material: Type K Copper 0.083" nominal wall thickness.
- F. Construction: Hollow tube, 2.125' O.D., filled with non-hazardous Calsolyte™ salts.
- G. Weight: 3.5 lb. per lineal foot.
- H. Ground Wire Termination: Exothermic connection to 4/0, or as specified conductor. U-bolt with pressure plate provided as test point.
- I. Straight shaft Model No: K2-10CS, K2-12CS, K2-15CS, K2-20CS& K2-2-40CS. Model designation for a 20 foot system in two coupled sections would be K2-2-20CS.

PART 3 – EXECUTION

3.01 INSTALLATION

A. General

1. To achieve specific earth resistance, contact Lyncole for engineering design assistance. Preliminary step in grounding design requires a “Wenner four-point” soil resistivity test be performed at the job site by Lyncole or others.
2. Install ground rod system in compliance with manufacturer’s instructions or recommendations.

B. Excavation

1. Bore minimum 6" diameter hole, 6" deeper than the length of rod to be installed. This insures that the top of the XIT electrode will not come in contact with the top of the protective cover box.
2. If the electrode is longer than 10 ft, a minimum 8 in. diameter hole should be utilized. This is to insure that the system will be completely surrounded by the Lynconite II backfill material.

C. Backfill

1. Place XIT unit in the hole, so that the top of unit is about 6 in. below grade.
2. Lynconite II is a highly conductive backfill included with the system. Mix each 50 lb. Backfill grout material with 13 gallons of waster to form a slurry and pour or pump around XIT rod. Pouring the Lynconite II into the water facilitates the mixing process.
3. Backfill to the “Bury to here” label.
4. Place protective box so top is flush with grade level. Use backfill or grout to stabilize box around rod.
5. Remove sealing tape from top breather holes to activate.

D. Connection

1. Connect the grounding conductor to XIT rod pigtail exothermically (thermOweld) or with a high compression irreversible connection (Burndy).
2. Bury grounding conductor 30" below grade or as required by the NEC. Cover bare conductor with a small amount of backfill for protection against corrosion.

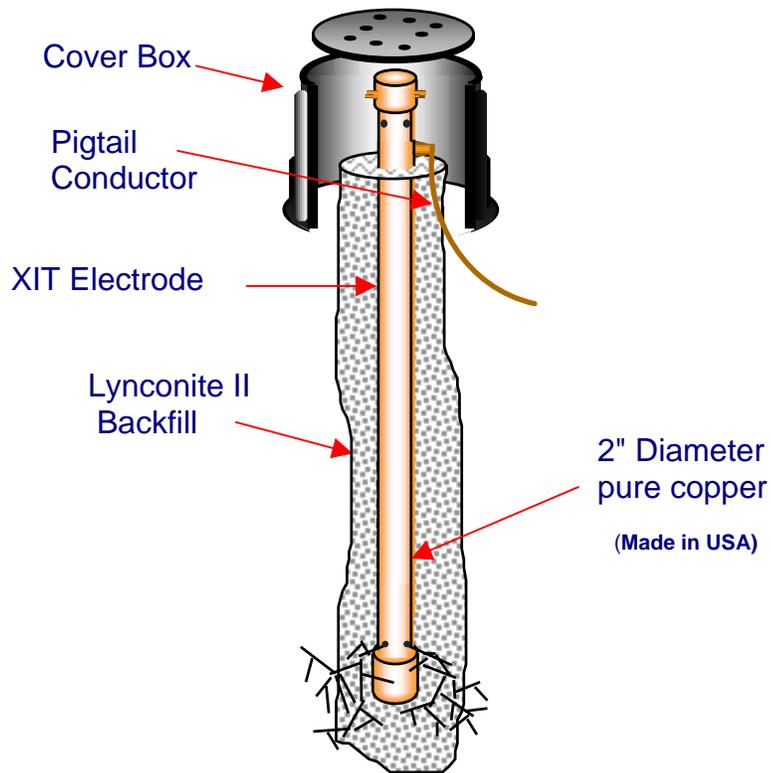
3.02 TESTING

- A. Certified measurements to be taken and submitted prior to connection to main service utility ground. Ground grid resistance shall not exceed 5 ohms.
- B. Upon completion of the ground installation and before connection to the permanent facility power, the electrical contractor shall provide at his expense, a performance measurement of the new earth grounding electrode system. The testing shall utilize either an earth resistance meter and be conducted in accordance with the IEEE Standard 3-point fall of potential method or with a Clamp-on Resistance Test meter.
 1. If the 3-Point fall of potential test is utilized, the ground system must be isolated from any utility neutral connections and/or outside ground references prior to testing.
 2. If the Clamp-on resistance test is utilized, a single path must exist between the ground system and a utility reference.
- C. Notify the Owner's representatives three days prior to the scheduled testing date so they may be present at the time of testing.
- D. The grounding system shall pass either a 3-Point Fall of Potential test or the Clamp-on Resistance test. The minimum of 5 times the length of the electrode for a single rod, or 5 times the diagonal of a ground grid (10 times is desired). Contractor shall provide a plot of the curve of resistance vs. distance to the Owner. The conductor shall immediately notify the Owner's representative if the measured resistance is above 5 ohms.

- E. The Clamp-on Resistance testing shall be completed utilizing a single ground reference path between the ground system and the reference utility. This will be accomplished either through the ground conductor of a single point ground or by means of a temporary bonding jumper between the installed ground system and a utility reference, prior to any bonding to the system. Should the measurement of the resistance be less than 1 ohm to earth, contact the Owner's representative to verify that the ground system has been designed to achieve 1 ohm. If not, the reading is likely a measurement of continuity and not ground resistance.

- F. The manufacturer or an independent testing firm shall be employed for the testing and report. The contractor shall submit a copy of the test report to the Owner's representative within 10 days after testing and before the ground system becomes inaccessible.

- End of Section-



Lyncole XIT Electrolytic Grounding System
1-800-962-2610