

LINE DESIGN & STAKING COURSE

Level #1

- Date: Tuesday - Friday, January 8 - 11, 2008
- Time: Tues - Thurs: 8:30 a.m. - 4:00 p.m., Fri: 8:30 a.m. - noon
- Registration Deadline: January 4, 2008
- Fee: \$1,200 - Participants will be billed following the course
- This fee covers the registration costs for level #1 only. Levels #2 and #3 will be held in 2009 and 2010, respectively. There will be an additional registration fee for these levels.
- Location: Colorado Rural Electric Association
5400 North Washington Street, Denver, CO
- Instructor: Anita Bandela, Power Delivery Associations
Freddie Hutchens, Power Delivery Associates
Jody Wheeler, Power Delivery Associates
- Confirmation: A letter will be faxed to all participants confirming their registration in the course
- To Register: Contact Liz Fiddes at the Colorado Rural Electric Association office (303) 455-2700 ext. 103, or e-mail at liz@coloradorea.org
- Audience: This course is designed for the professional development of electric utility line design/staker/technician/engineering personnel.
- Note: There are three levels to this certification program. Participants will have to pass a test to be eligible to move to the next level. In Level #1 students will receive a course guide, the latest National Electric Safety Code book, a 360 degree protractor, an engineers scale, and an engineering calculator that has trigonometric and square root functions.

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Beginning Level #1

There are no prerequisites for Level I course study.

Students will leave this course with the strong foundation necessary to move forward in a career in line design and staking.

In Level 1, participants will gain a strong foundation necessary to help them advance in the field of line design and staking. This level of study will include the basic overhead and underground design and staking typically expected of beginning staking personnel. It includes a comprehensive overview of, but is not limited to:

- Liability Issues
- Safety Equipment
- Vertical Clearance Design
- Communications Skills/Easement Acquisition
- Power System Overview
- Guy and Anchor Design
- Line Equipment Identification
- Specifications & Assemblies
- NESC Requirements

After completion of the course work and exam students should be proficient in designing single-phase line improvements and extensions to include transformer and secondary sizing for residential services.

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Intermediate Level #2

In Level 2 of the three-tiered certification program, participants will build on the foundation created in the prerequisite course of Level 1. After completion of this Level 2, participants will be able to complete the following:

- Layout and design of most overhead and underground projects
- Understand and utilize NESC and sag chart criteria
- Understand permitting requirements for government agencies
- Evaluate and design make ready/remedy for joint use facilities
- Calculate the mechanical loading effects of line design
- Understand conductor blowout and design for/around grain bins

After successful completion of the course work and exam for this level students will have a good grasp of design considerations for line design and staking of most overhead distribution projects including three-phase conversions and work plan projects.

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Advanced Level #3

The information in this level is intended to complete the course of study in line design and staking. More attention is given to understanding how to apply the theories of line design to solve special problems.

Participants will build on the foundation created in the prerequisite course of Level 2. Topics covered in this course include:

- Understand the physical loads on the distribution system and the associated hardware
- Read DOT Prints & Cut Sheets
- Transmission Conductor Crossing Analysis
- Strength Of Pole Top Hardware
- Sag and Stringing Charts
- Un-Level Sag Calculations
- Pole Class Sizing
- NESC: Overload Factors, High Wind, Strength Reduction Factors
- Use of Advanced Tools & Equipment for Field Staking

Students who complete this final level of study will be able to design overhead distribution lines of essentially every type including those involving lake crossings, interstate and railroad crossings, transmission joint-use or crossings and multiple circuit structures.