

2022 PLS-CADD Advanced Training and User Group

Electrical Features Update

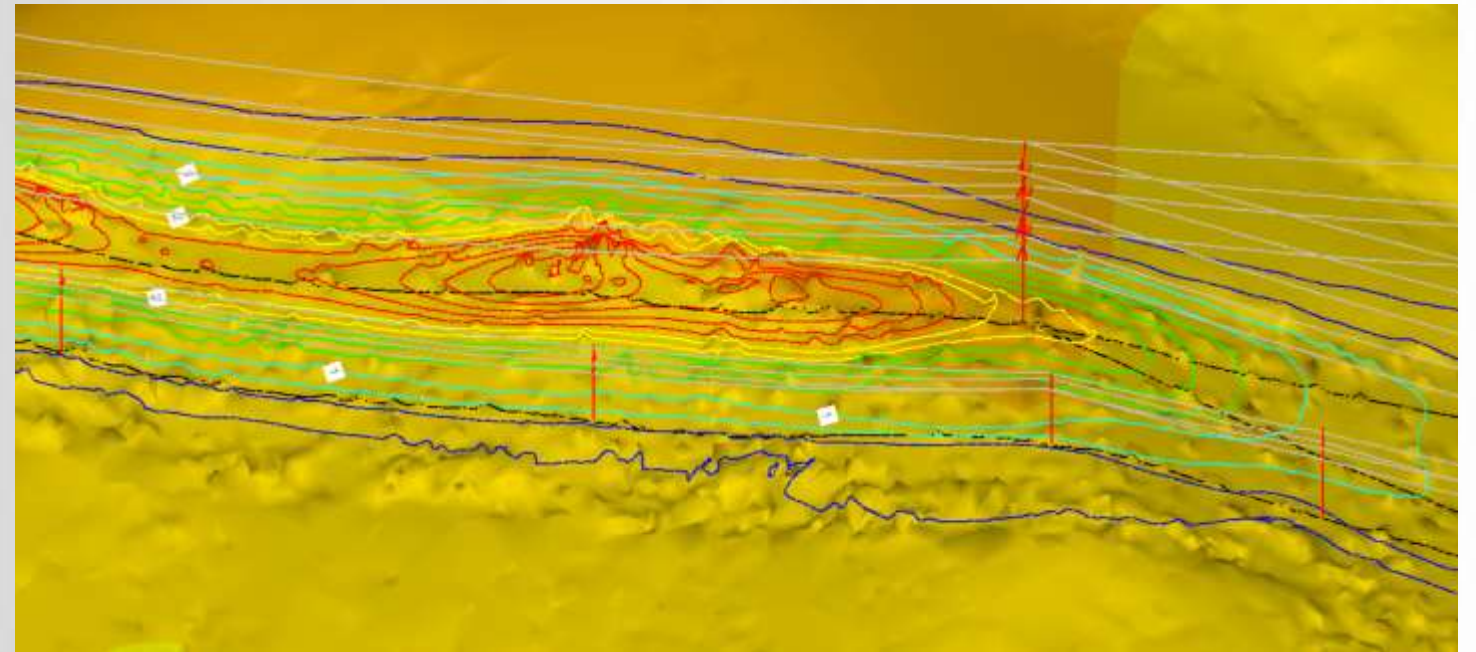
by

Nathan Brazy

Power Line Systems

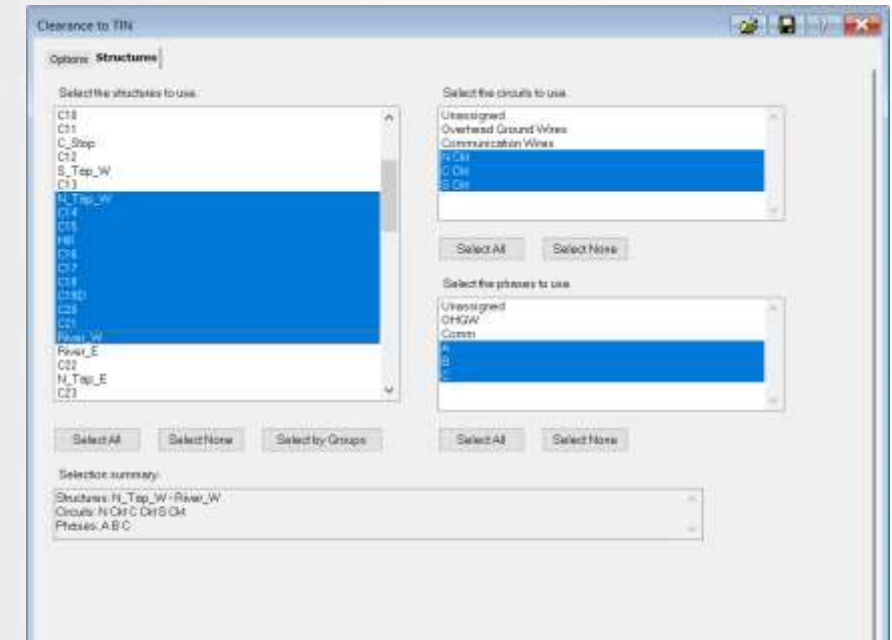
Introduction

- Circuit Labeling
- Full Line Constants
- 3D EMF
- Structure Space Potential



Circuit Labeling

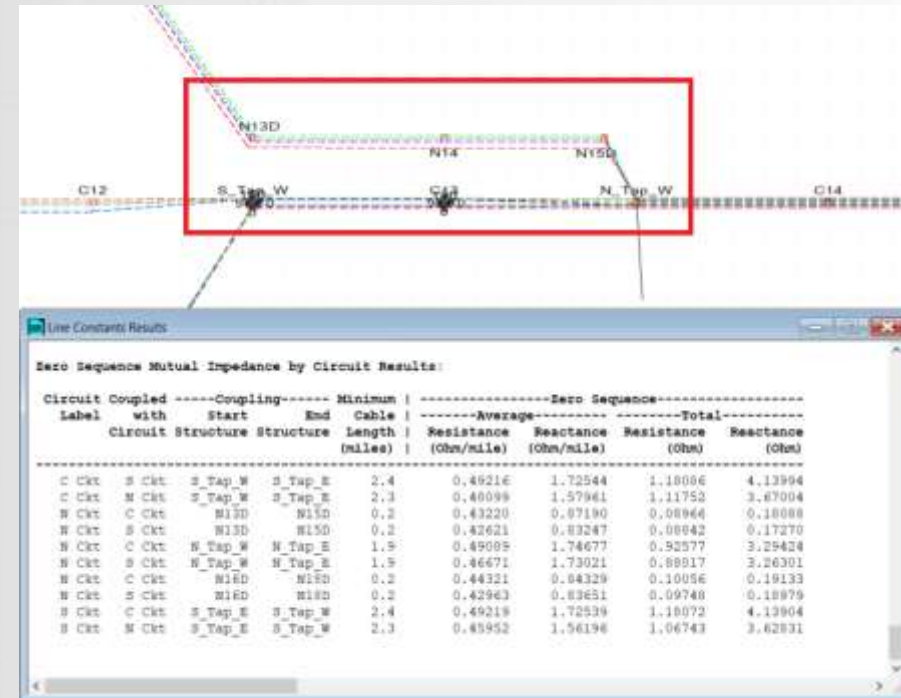
- PLS-CADD
 - Filtering for Reports
 - Configure Sections by Circuit
- PLS-GRID
 - Grid Map View



Circuit Label	Voltage Ph-Ph (kV)	Current (Amps)	Display Weather Case	Display Condition	Display Wind Dir.
1. Overhead Ground Wires	0.0	0.000 Deg F		Max Sag FS	Left
2. Communication Wires	0.0	0.000 Deg F		Max Sag FS	Left
3. N Ckt	345.0	700.000 Deg F		Max Sag FS	Left
4. C Ckt	345.0	600.000 Deg F		Max Sag FS	Left
5. B Ckt	345.0	500.000 Deg F		Max Sag FS	Left

Full Line Constants

- Mutual Coupling
 - Adjacent Spans



- Earth Resistivity
 - By Structure

Table 2-9. Effect of Moisture Content on Earth Resistivity

Moisture Content % By Weight	Resistivity, ohm-cm	
	Top Soil	Sandy Loam
0	1,000 x 10 ⁴	1,000 x 10 ⁶
2.5	250,000	150,000
5	165,000	43,000
10	53,000	18,500
15	17,000	10,500
20	12,000	6,300
30	6,400	4,200

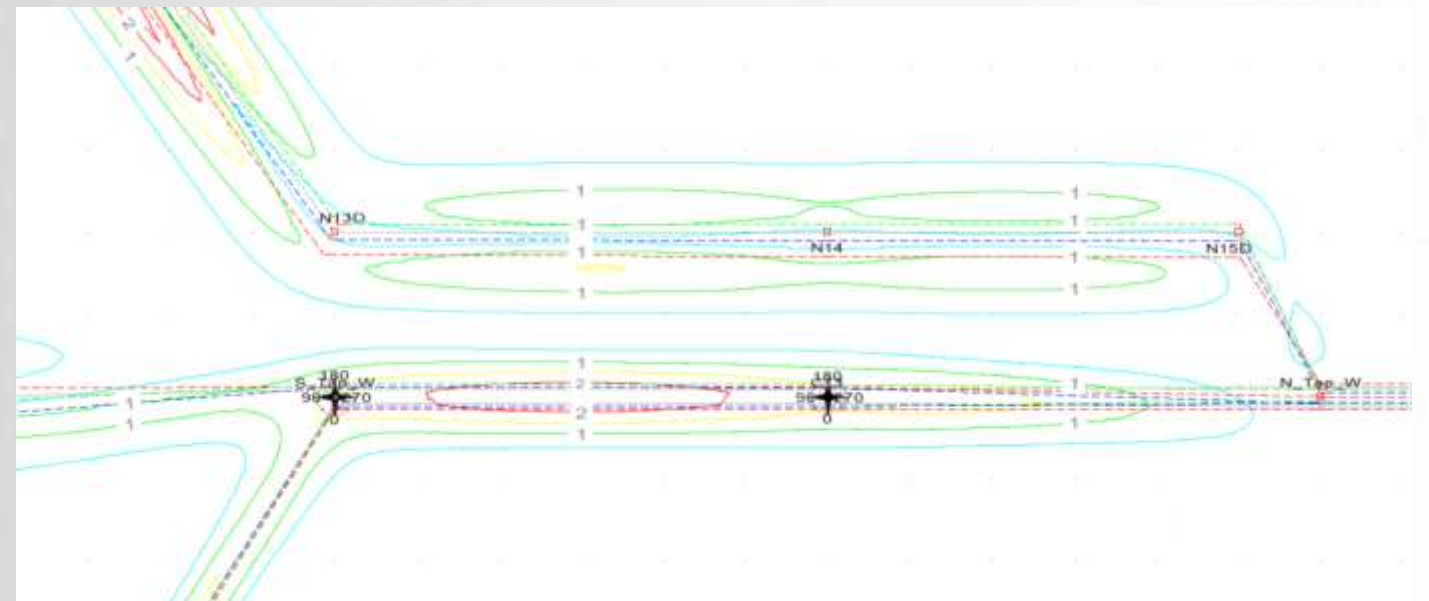
Table 2-10. Effect of Temperature on Earth Resistivity *

Temperature		Resistivity ohm-cm
°C	°F	
20	68	7,200
10	50	9,900
0	32 (water)	13,800
0	32 (ice)	30,000
-5	23	79,000
-15	5	330,000

*For sandy loam, 15.2% moisture.

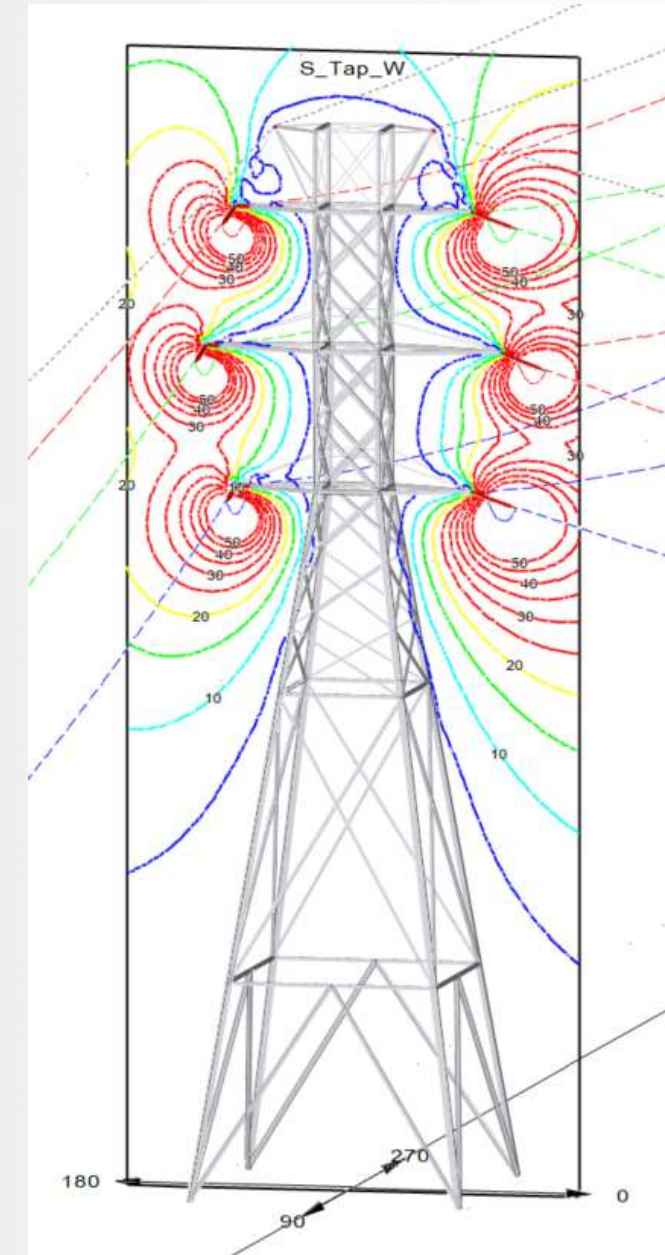
3D EMF

- Electric & Magnetic Fields and Space Potential
- 3D Model of All Wires and Terrain
- Multiple Spans
- Effects of Adjacent Spans
- Ground TIN Contour Map
- Calculate Along Line
- Fully Multithreaded



Structure Space Potential

- Space Potential and Magnetic Fields
- 3D Model
- Multiple Structures
- Accounts for Structure Geometry
- Includes Jumpers
- Cross Section Contour Plot



PLS Resources

- Website: www.powerlinesystems.com
- Tech Notes
 - “Defining and Labeling Circuits and Electrical Phasing”
 - “Full Line Constants Feature”
- Videos
 - “Defining and Labeling Circuits and Electrical Phasing”
 - “3D EMF Calculator”
 - “Structure Space Potential Calculations”

Power Line Systems

IT'S ALL ABOUT YOUR POWER LINES

Advanced Sag & Tension

IEC

FAC 008/009

NESC

Materials Management

LiDAR Modeling

Structural Analysis

PLS-CADD

CSA

Pole Analysis

CENELEC

Distribution

Transmission

NERC Ratings

Line
Optimization

Project Estimating

Questions?

FAC 003

ASCE

Joint Use

PLS-POLE

GO95

Vegetation Management

1000+ Users in 100+ Countries

Storm Hardening

Company Logo

IEEE

Line Ratings

Contact Information

TOWER

Drafting