

2015 PLS-CADD Advanced Training and User Group

Let's Build a Pole

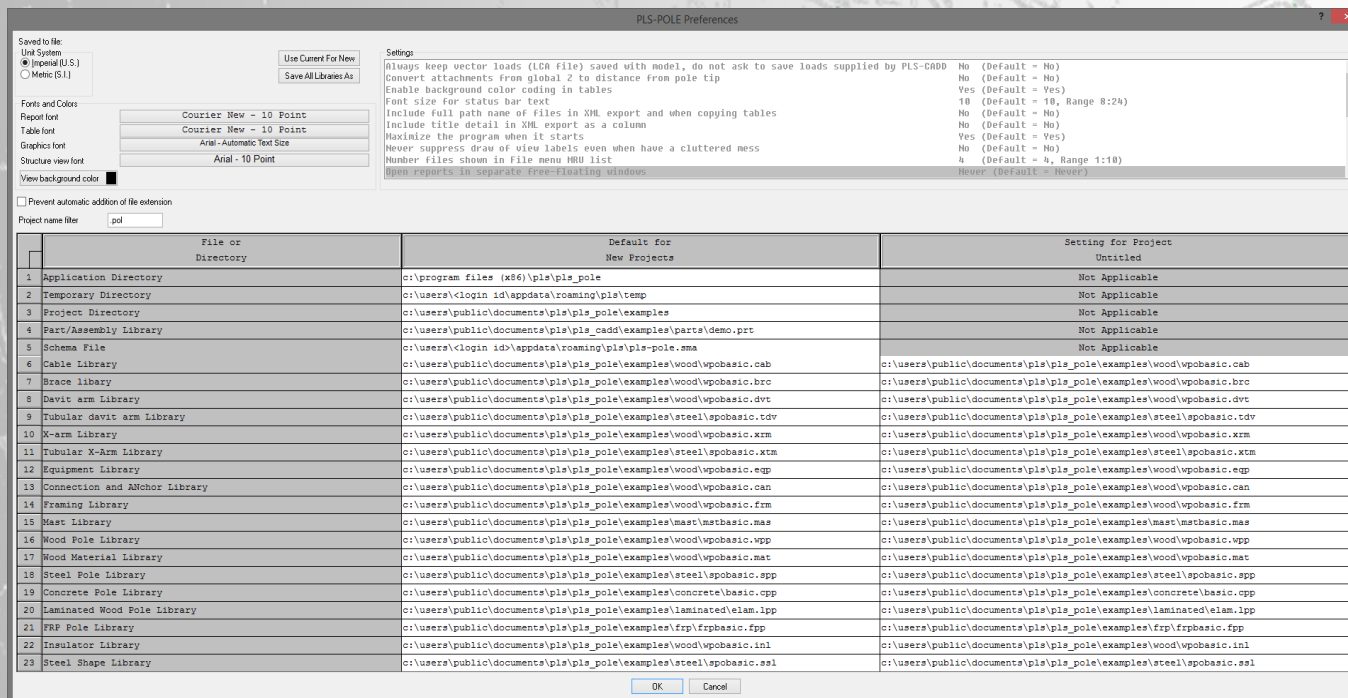
by

Jesse Kohler, P.E.

Power Line Systems, Inc.

Mapping Component Libraries

- Navigate to **File \ Preferences...** to set
- Component libraries can be downloaded from our website at:
http://www.powline.com/files/pls_pole.html

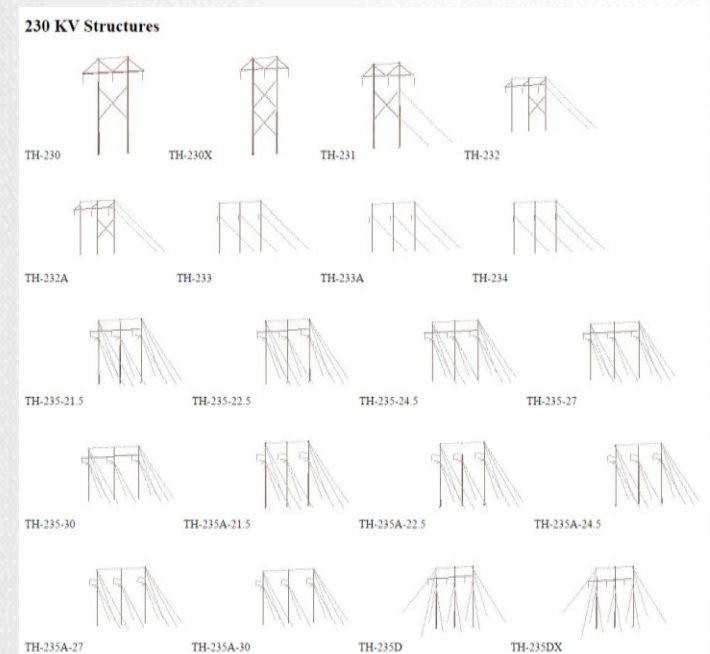
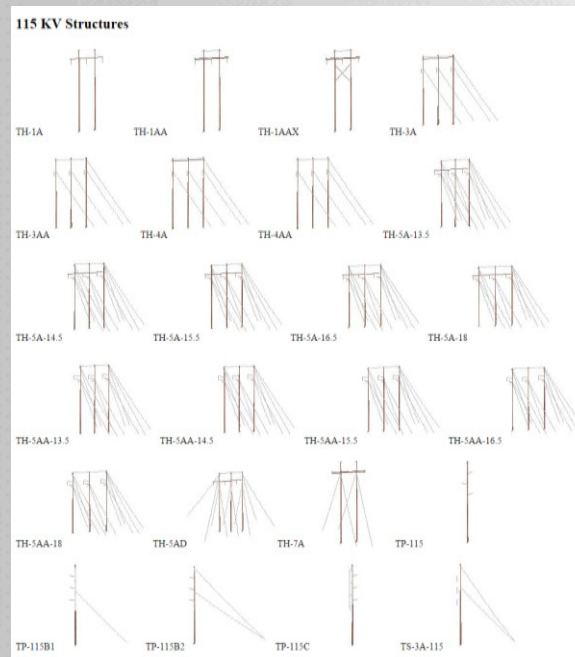
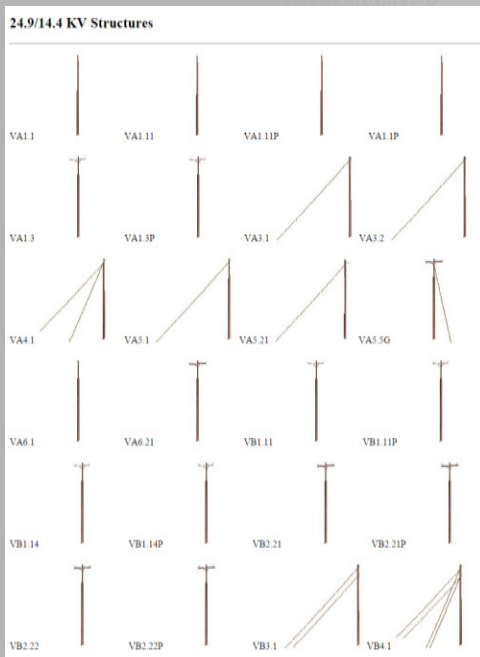


Component Libraries for Download

- **Wood Pole Properties and Materials**
 - Based on ANSI O5.1.2008
- **Steel Pole Properties – Various Manufacturers**
 - DIS-TRAN Steel, LLC
 - FWT
 - Nello
 - ROHN Products
 - Sabre Tubular Structures
 - Thomas & Betts
 - Valmont
- **Laminated Wood Poles – Various Manufacturers**
 - Laminated Wood Systems
 - McFarland Cascade
- **FRP Poles – Various Manufacturers**
 - Creative Pultrusions, Inc.
 - Duratel, LLC
 - RS Technologies, Inc.
 - Shakespeare
- **Insulators – Various Manufacturers**
 - Hubbell Power Systems / Ohio Brass
 - K-LINE
 - LAPP
 - MacLean Power Systems
- **Braces – Various Manufacturers**
 - Hughes Brothers
 - DIS-TRAN Wood Products
 - Brooks Manufacturing
- **Crossarms – Various Manufacturers**
 - PUPI
 - REA / RUS
 - Brooks Manufacturing
- **Davit Arms**
 - Thomas & Betts
- **Guys & Cable**
 - Generic – Based on publicly available ASTM A363 & A475 data

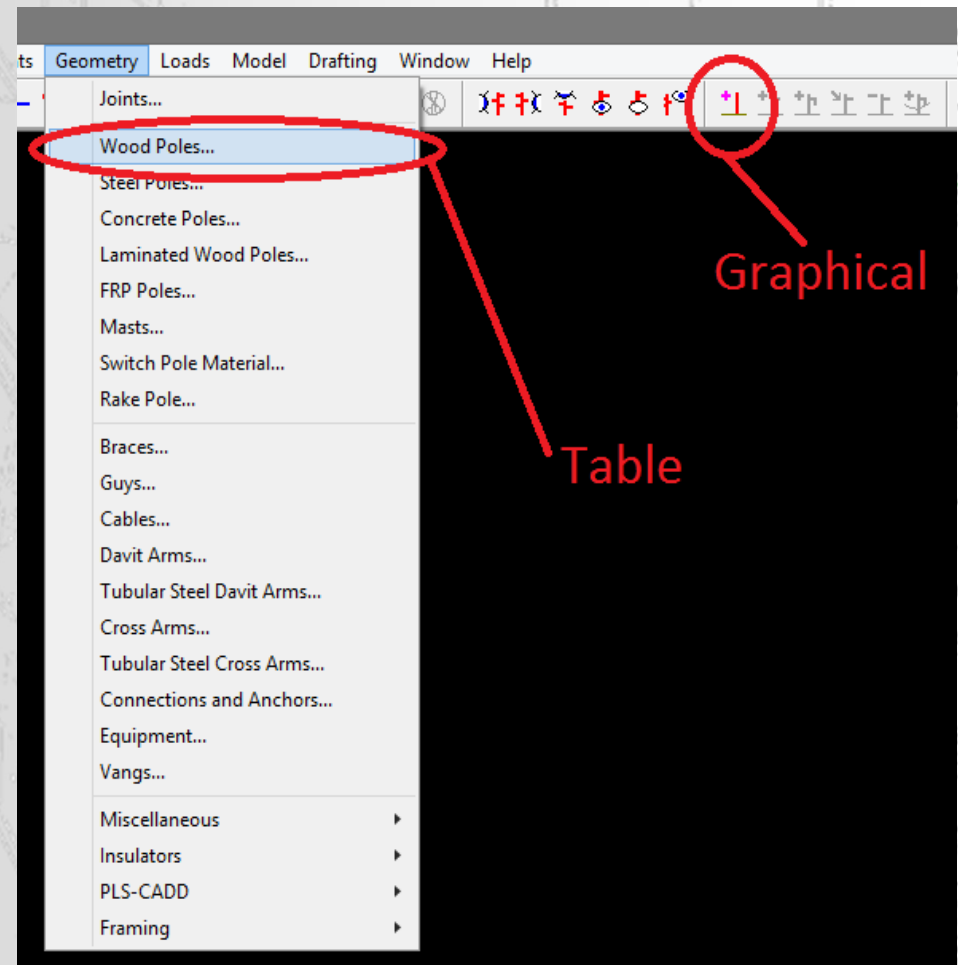
Short Cut

- Download the RUS structure library of structures
 - Models can be used as starting points or examples
 - Structures range in voltage from 14kV up to 230kV
 - 332 Models in the library



Step 1: Add a Pole

- Add with graphical commands
- Add through tables.



Step 1: Continued

- Graphical add commands are simpler and faster
- Tables give more flexibility and options
 - More poles
 - Custom embedment
 - Rake
- Anything can be table edited

Add Pole

Select the material for your pole, then the pole property:

Wood - standard

Wood - field measured

Steel

Concrete

Laminated

FRP

Pole Property: DF-H6-45

Wood Pole Material: DF-Douglas Fir


OK Cancel

Step 1: Continued

Options in the table include:

- Pole Label
- Tip/Base Joint connection method for things like A-Frames or push poles.
- Location of pole relative to PLS-POLE origin
- Inclination for things like modeling rake.
- Property set i.e. dimensions
- Material property set i.e. MOE, MOR, Density, ANSI 05.1 Status
- Attachment labels / Joints along the pole
- Base Connection Method: Fixed, Pinned, Pinned Frame
- Embedment Overrides: Percentage based and Constant based
- Pole cuts: Top or Bottom

Wood Pole Connectivity ? x



Model Check Report

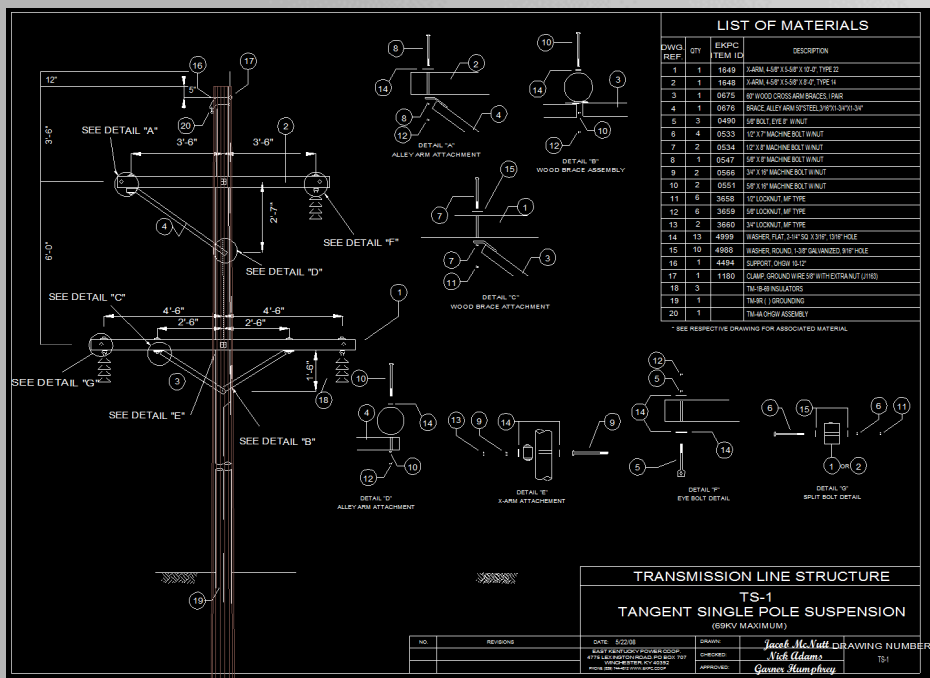
No errors or relevant warnings detected.

Note: poles may be located in one of two ways:
 1) By tip and base joint. This is only appropriate for A-Frame, Y-Frame and other complicated structures.
 2) By X, Y and Z of base and X, Y inclination angles. This should be used for single poles and simple frames. For example, to locate a single pole at 0,0,0 leave the tip, base, X, Y, Z and X, Y angle columns all blank.

Pole Label	Tip Joint	Base Joint	X of Base (ft)	Y of Base (ft)	Z of Base (ft)	Inclin. About X (deg)	Inclin. About Y (deg)	Wood Pole Property Set	Material Property Set	Attach. Labels	Base Connect	Embed % Override	Embed C. Override (ft)	Top Cut Length (ft)	Bot. Cut Length (ft)
1															
2															

Step 2: Add Attachments (optional)

- Add DXF drawings
- Add photos



Step 3: Add Elements

- Cross arms and tubular cross arms
- Davit arms and tubular davit arms
- Braces
- Guys and cables
- Equipment (xfmr, switch gear, etc.)
- Vangs
- CANs (connection & anchor)
- Insulators

Step 4: Link Insulators

- Add set/phase links to insulators for stringing wire in PLS-CADD
- Chained insulators need links too

Step 5: Miscellaneous

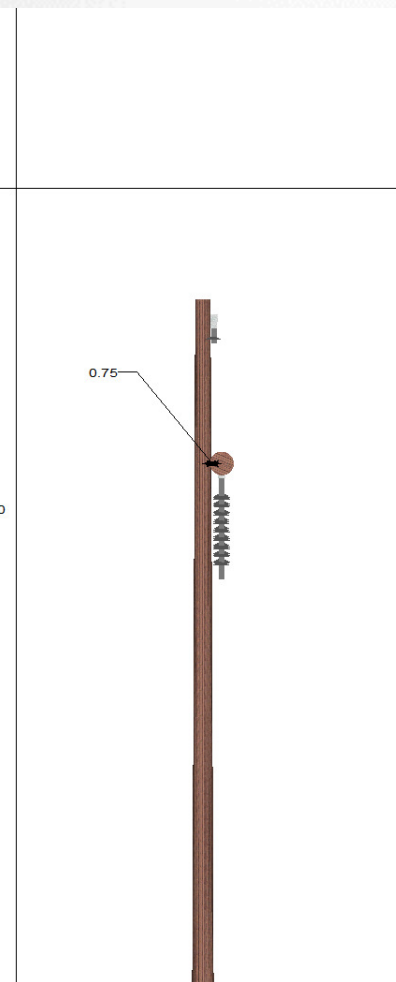
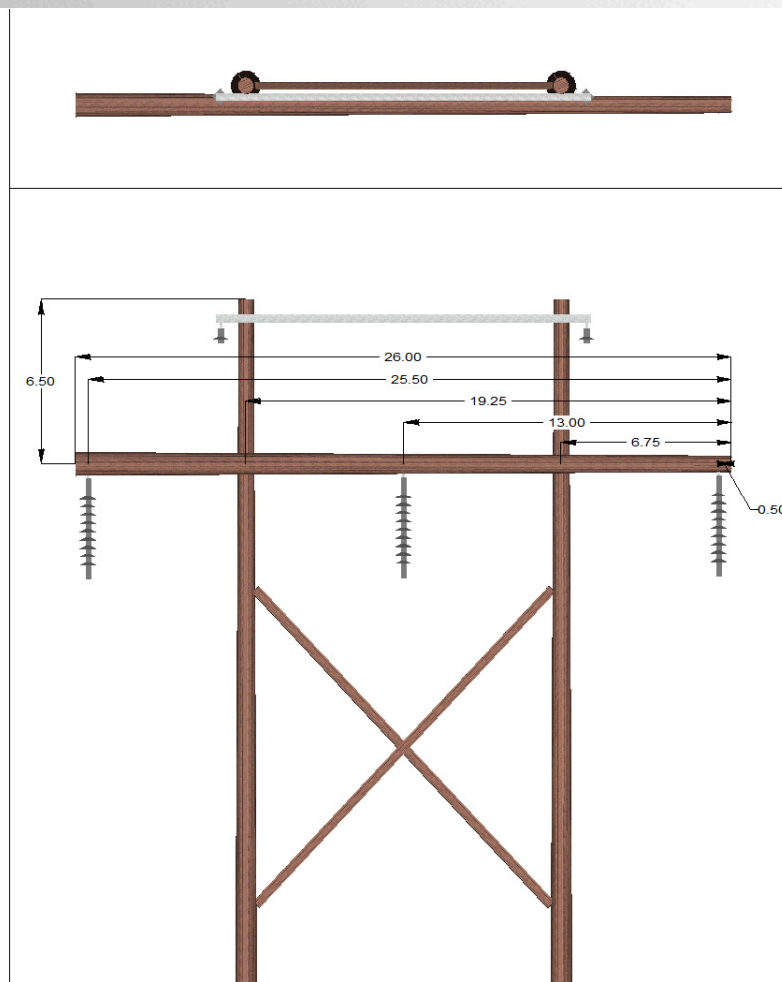
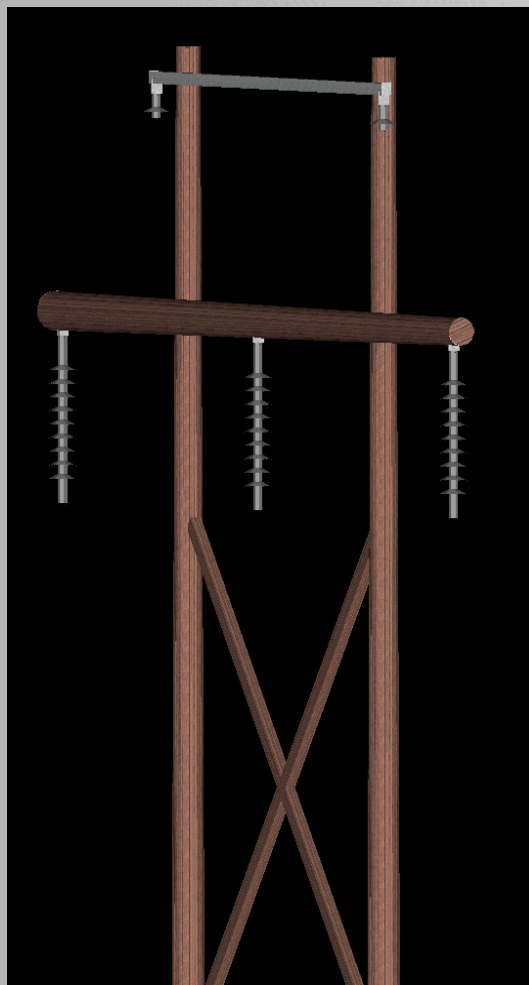
- Rake a pole
- Wood Defects
- Calculate allowable swing/load angles
- Dead loads and drag areas
- Foundation Strength

Examples

- Distribution Pole w/ xfmr and sidewalk guy
- 115kV H-Frame w/ spar arm

Example 2: 115kV H-Frame w/ Spar Arm

Click the pictures below to download .bak



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Any Questions?

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