Introduction

- PLS-CADD and PLS-POLE Have Been Used for Distribution For Decades
- Poles, Wires, Insulators and Hardware Are All Voltage Independent
- Loadings from Wind, Ice, and Temperature are Effectively the Same
  – Wind May Vary with Height
    - ASCE 74 Has "Exposure Categories"
  – Ice May Vary with Height (some codes)
  – Tensions Change with Conductor Temperature
    - Sag-Tension Traditionally Not Considered in Distribution Design
- So Why Hasn't PLS-CADD (and PLS-POLE) Been Adopted by the Distribution Industry?

Introduction

- It's Too Hard For My Distribution Engineers To Use!
- All of Those Menu Items!
- My Distribution Engineers Don't Know What "x" Is;

    Where 'x' = Terrain;

    or Weather (Wind, Ice, Temperature);

    or Load and Strength Factors;

    or Sag-Tension Fundamentals (Ruling Span, Initial, Creep, Load);

    or Tension Limitations;

    or Tension Changes and Unbalanced Loads;

    or Structural Analysis (Linear, Nonlinear, Buckling, Deflections);

    or Clearances

    Etc., etc., etc.

Introduction

- Introducing PLS-Distribution!
- A Streamlined Version of PLS-CADD and PLS-POLE
- Simplified Menu Items
- Common "Distribution" Terminology Menu Items
- Advanced Functions Removed
- "Dangerous" Items Unavailable
- Standards Based
- The Engineer of Record (EOR), or the "Distribution Supervisor" Can Develop and Edit Standards
 - Criteria
  - PLS-POLE Framings

Introducing PLS-Distribution!

Philosophy

- The PLS Model is The Same Model!
- A Model Can Be Opened In Either PLS-Distribution or PLS-CADD/PLS-POLE.
- With CBL Capabilities, The Model Can Be Left Open And The "Key" Switched Mid-Project
- Due To The Benefits of Finite Element (SAPS), PLS-Distribution Is Available In Both a 'Standard Edition" (Without SAPS) or a 'Finite Element Edition (With SAPS)
  - Differential Tension Balanced By Deflecting Poles
  - Jumper Modeling
  - Concentrated Loads
- Thermal Calculations, Advanced Reports, P&P Drawings, XML Exports and Other Features Can Be Performed in a Supervisor Edition or Full Version With Distribution Model

Summary Of Key Features

- Simplified Menu and Terminology
- New Toolbar Buttons
- Work in Plan or 3D View. Profile and Sheets Views Not Available.
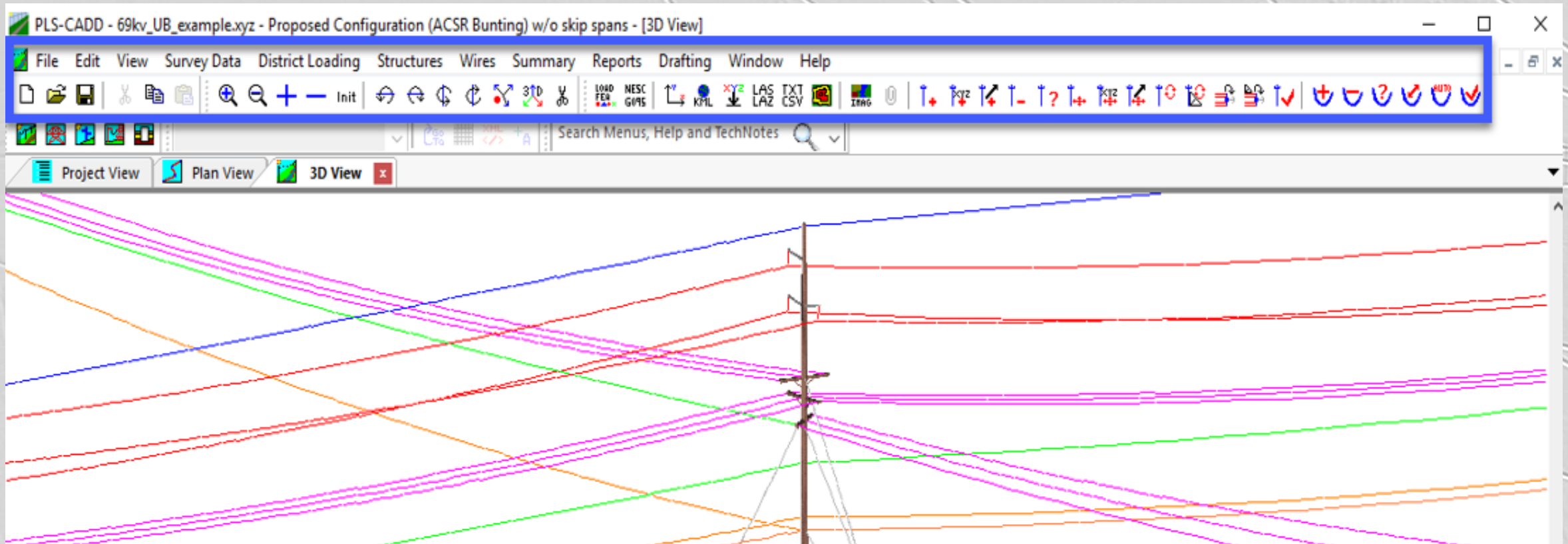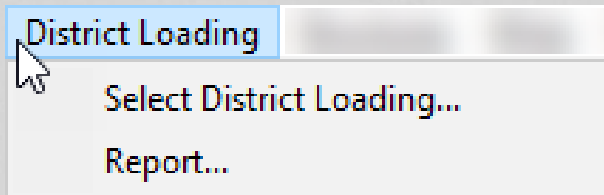
Summary Of Key Features

- Simplified Terrain (But It Has Terrain!)
  - Distribution Engineers Can Now Evolve From The Flat Earth Society!
- Import of Worldwide SRTM Terrain Data
  - Screen Extents
  - Corridor Width
- Supports Imagery
  - WMS
  - Own Images
- No Alignment!
  - Eliminates Need for Branch Alignments and Associated Stringing Issues
  - Simplifies Creation of Adjacent Circuits, Taps and Service Drops
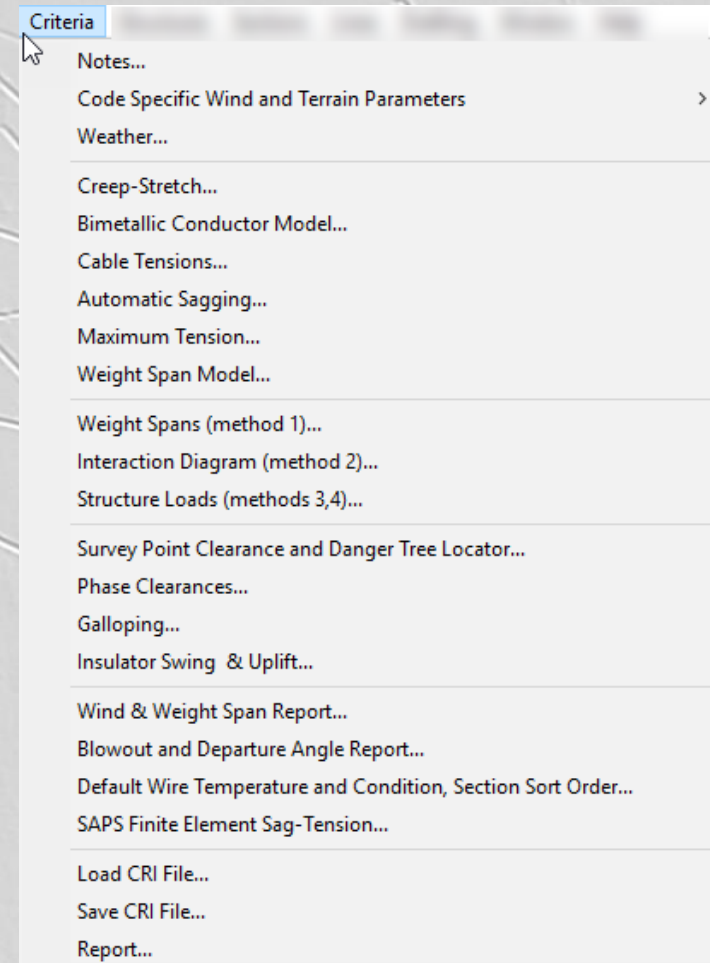
Summary Of Key Features - Criteria

- Simplified (and Renamed) Criteria
- Distribution Engineer Simply Picks "Loading District" (i.e. Criteria File)
- Prohibited From Changing Any Design Criteria
  - Unless Have Access To Full Version
- EOR Can Create and Edit CRI in Supervisor Edition or Full Version
- EOR Can Create Multiple CRI files for Ruling Span or Finite Element Design or for Special Design Regions

Summary Of Key Features – Criteria

PLS-CADD/Distribution

District Loading
    Select District Loading...
    Report...

PLS-CADD

Criteria
    Notes...
    Code Specific Wind and Terrain Parameters   ›
    Weather...

    Creep-Stretch...
    Bimetallic Conductor Model...
    Cable Tensions...
    Automatic Sagging...
    Maximum Tension...
    Weight Span Model...

    Weight Spans (method 1)...
    Interaction Diagram (method 2)...
    Structure Loads (methods 3,4)...

    Survey Point Clearance and Danger Tree Locator...
    Phase Clearances...
    Galloping...
    Insulator Swing & Uplift...

    Wind & Weight Span Report...
    Blowout and Departure Angle Report...
    Default Wire Temperature and Condition, Section Sort Order...
    SAPS Finite Element Sag-Tension...

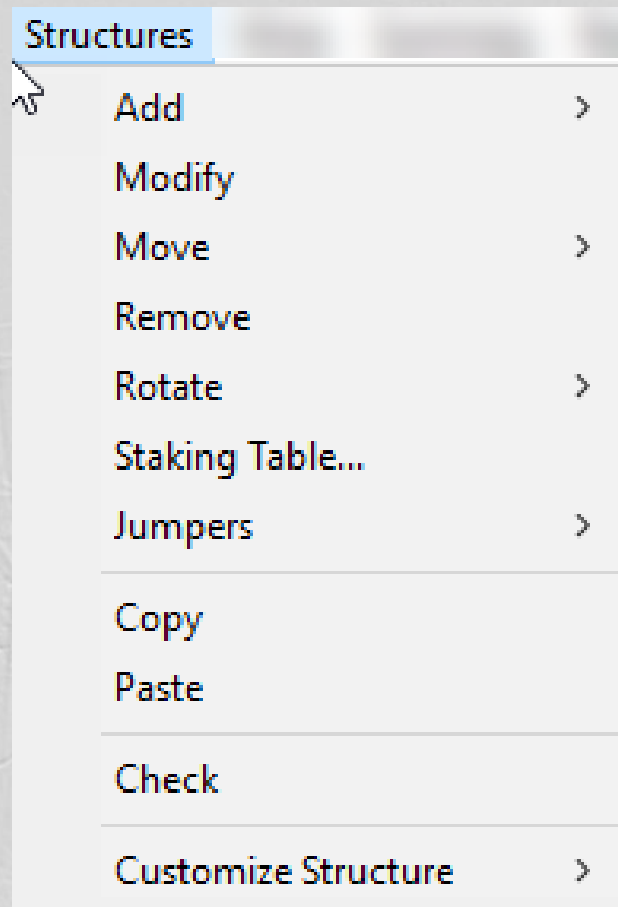   Load CRI File...
    Save CRI File...
    Report...

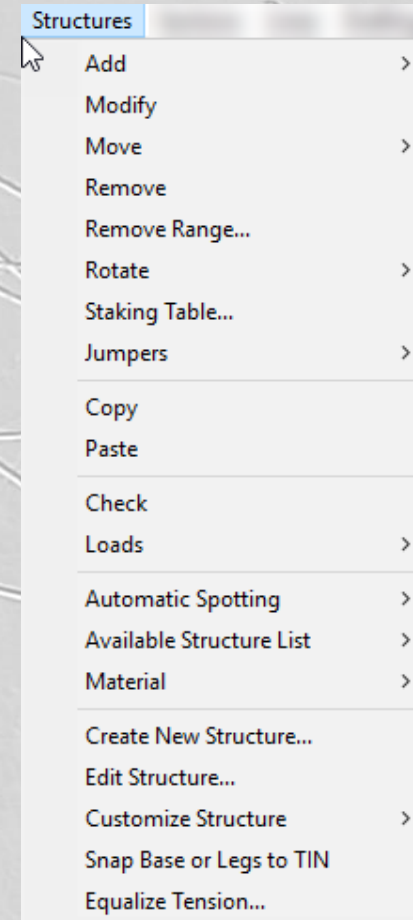# Summary Of Key Features - Structures

- Simplified Structures Menu
- Distribution Engineer Has Limited Functions
- Based on XY Structures (No Alignment)
- M1 Structure Creation, Optimum Spotting and Full Material Functionality Have Been Removed
- Some Customize Structure Functions are Available
  - Can Rotate Frames
  - Can Relocate Guys/Anchors On A Structure-by-Structure Basis
- EOR Has Access To Full Structure Menu Functionality in Supervisor Edition or Full Version

Summary Of Key Features – Structures

PLS-CADD/Distribution

Structures

- Add ›
- Modify
- Move ›
- Remove
- Rotate ›
- Staking Table...
- Jumpers ›
- Copy
- Paste
- Check
- Customize Structure ›

PLS-CADD

Structures

- Add ›
- Modify
- Move ›
- Remove
- Remove Range...
- Rotate ›
- Staking Table...
- Jumpers ›
- Copy
- Paste
- Check
- Loads ›
- Automatic Spotting ›
- Available Structure List ›
- Material ›
- Create New Structure...
- Edit Structure...
- Customize Structure ›
- Snap Base or Legs to TIN
- Equalize Tension...

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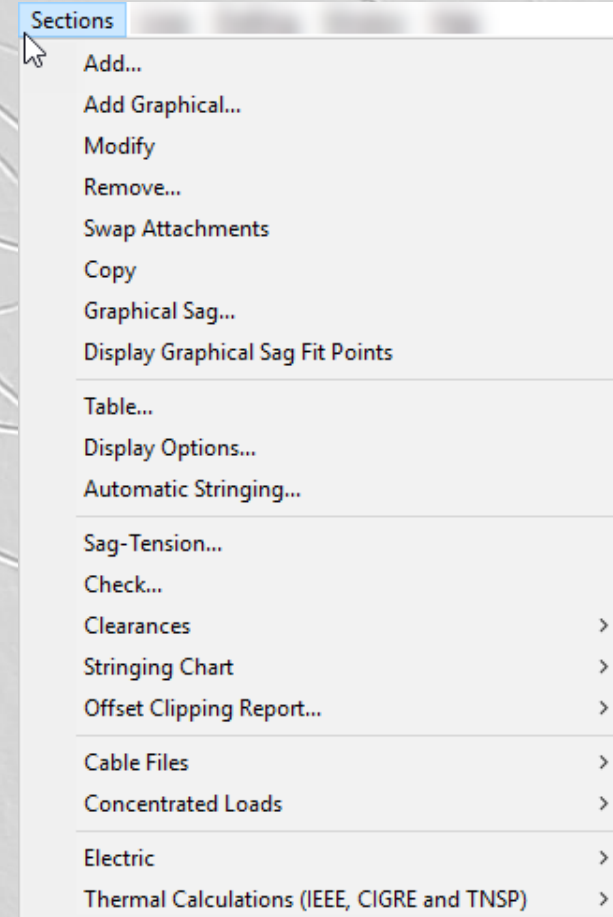# Summary Of Key Features – Wires/Sections

- Simplified Sections (and Renamed) Menu
- Distribution Engineer Has Limited "Wires" Menu Functions
- All Wires Strung Graphically
- Thermal Calculations, Electrical Calculations, Offset Clipping, Concentrated Loads and .WIR File Commands Have Been Removed
- EOR Has Access To Full "Wire" Menu Functionality in Supervisor Edition or Full Version

Summary Of Key Features – Wires/Sections
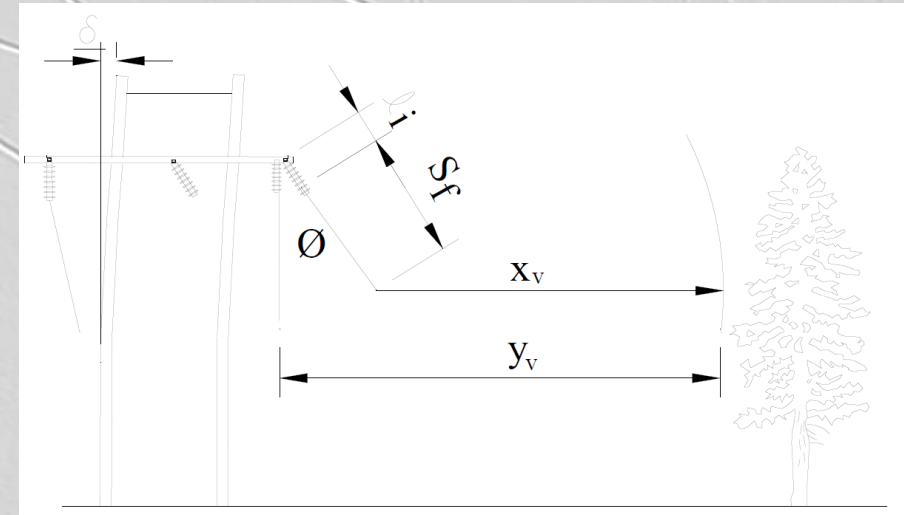
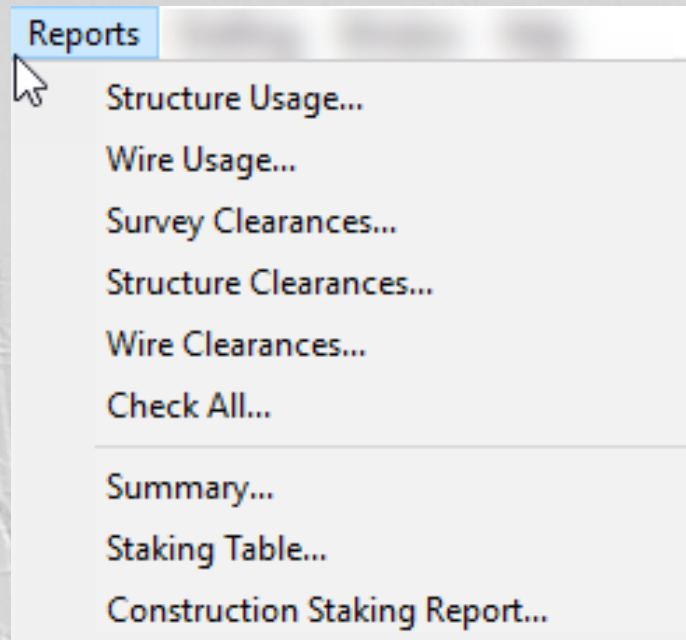**PLS-CADD/Distribution**

PLS-CADD

14
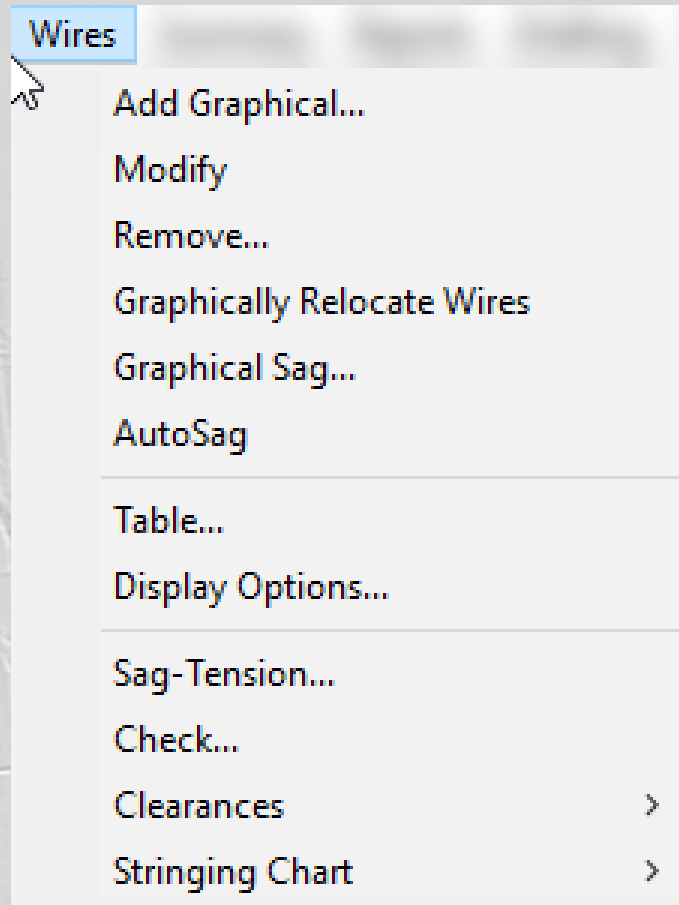
Summary Of Key Features - Reports

- Simplified Lines (and Renamed) Menu

- Distribution Engineer Has Access to Critical Reporting Functions

- Clearance Calculations Can Be Performed
  – To Survey Points and Surface Model, Including Any Sag Condition, Wire Blowout Under Wind, Pole Deflections (In FE Version)
  – Between Wires, Including Crossings, Underbuild Wires, Mid-Span Rolling, etc
  – Between Wires and Structures

- Full Structure Analysis Reports

- Construction Staking Report

- EOR Has Access To All Report and XML Functionality in Supervisor Edition or Full Version

Summary Of Key Features – Reports

PLS-CADD/Distribution

PLS-CADD

Reports

Structure Usage...
Wire Usage...
Survey Clearances...
Structure Clearances...
Wire Clearances...
Check All...

Summary...
Staking Table...
Construction Staking Report...

Structure Usage...
Section Usage...
Survey Point Clearances...
Clearance to TIN...
Danger Tree Locator...
Structure Clearances...
Wire Clearances...
Structure & Section Usage + Survey Point Clearances...

Summary...
Wind & Weight Span Report...
Blowout and Departure Angle Report...
Structure Loads Report...
Section Sag-Tension Report...
Staking Table...
Bill of Material by Structure Location...
Bill of Material...
Bill of Material Delta...
Construction Staking Report...
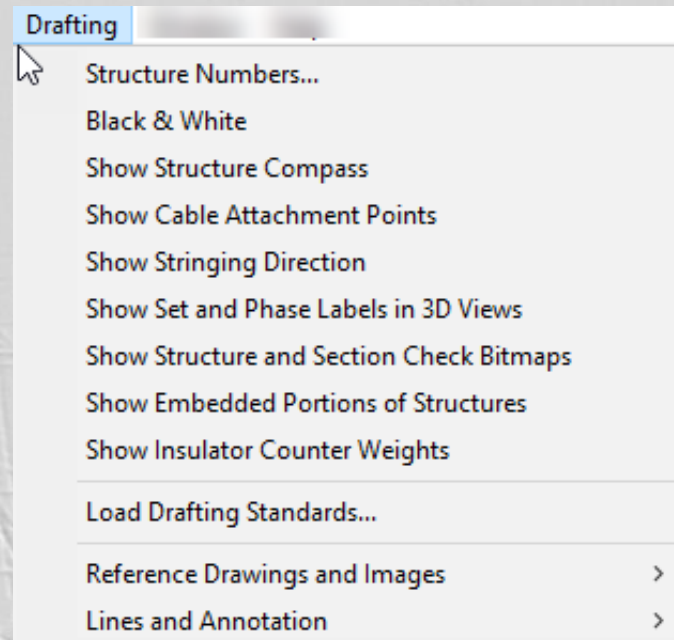Structure Longitude, Latitude, and Height Report...
Thermal Rating Report...

Summary Of Key Features - Drafting

- Simplified Drafting Menu
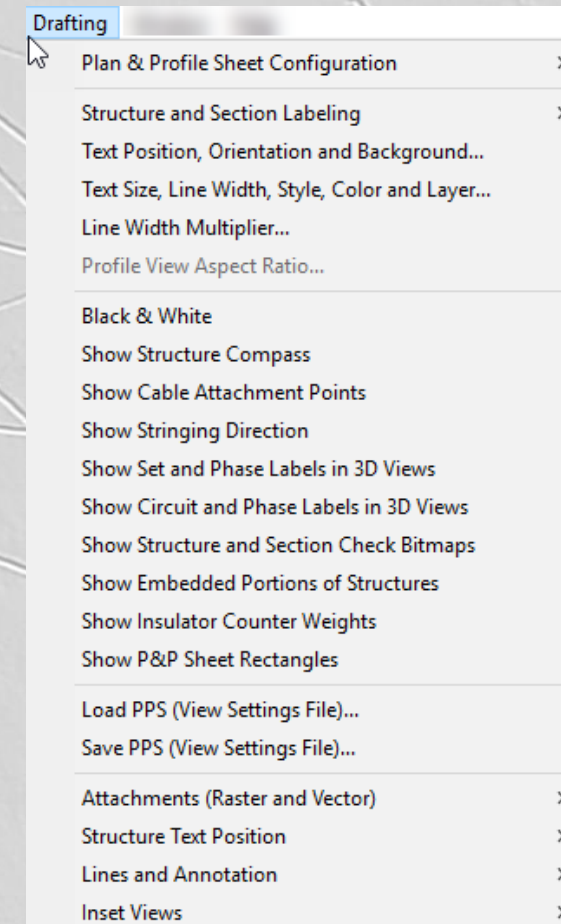- Distribution Engineer Has Limited Drafting Functions
- Drafting Functionality Primarily Limited to Display Options for Plan and 3D Views
  - Can Load and Display Attachments (DXF, TIFF, JPG, SHP, ECW, etc)
  - Can Add Lines and Annotations
  - Can Load Standard P&P Settings
- P&P Drawing Creation Functions Have Been Removed
- EOR Has Access To All Drafting Functions in Supervior Edition or Full Version

Summary Of Key Features – Drafting

PLS-CADD/Distribution

Drafting

- Structure Numbers...
- Black & White
- Show Structure Compass
- Show Cable Attachment Points
- Show Stringing Direction
- Show Set and Phase Labels in 3D Views
- Show Structure and Section Check Bitmaps
- Show Embedded Portions of Structures
- Show Insulator Counter Weights

- Load Drafting Standards...

- Reference Drawings and Images   ›
- Lines and Annotation   ›

PLS-CADD

Drafting

- Plan & Profile Sheet Configuration   ›

- Structure and Section Labeling   ›
- Text Position, Orientation and Background...
- Text Size, Line Width, Style, Color and Layer...
- Line Width Multiplier...
- Profile View Aspect Ratio...

- Black & White
- Show Structure Compass
- Show Cable Attachment Points
- Show Stringing Direction
- Show Set and Phase Labels in 3D Views
- Show Circuit and Phase Labels in 3D Views
- Show Structure and Section Check Bitmaps
- Show Embedded Portions of Structures
- Show Insulator Counter Weights
- Show P&P Sheet Rectangles

- Load PPS (View Settings File)...
- Save PPS (View Settings File)...

- Attachments (Raster and Vector)   ›
- Structure Text Position   ›
- Lines and Annotation   ›
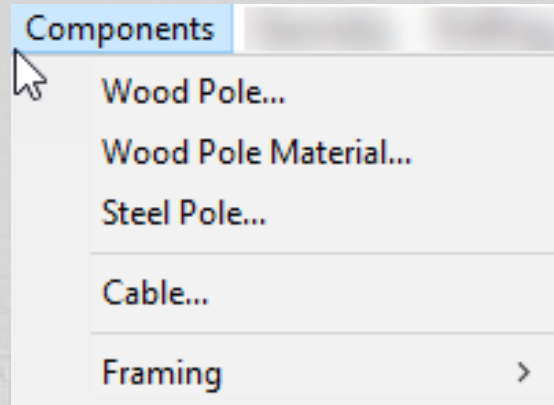- Inset Views   ›
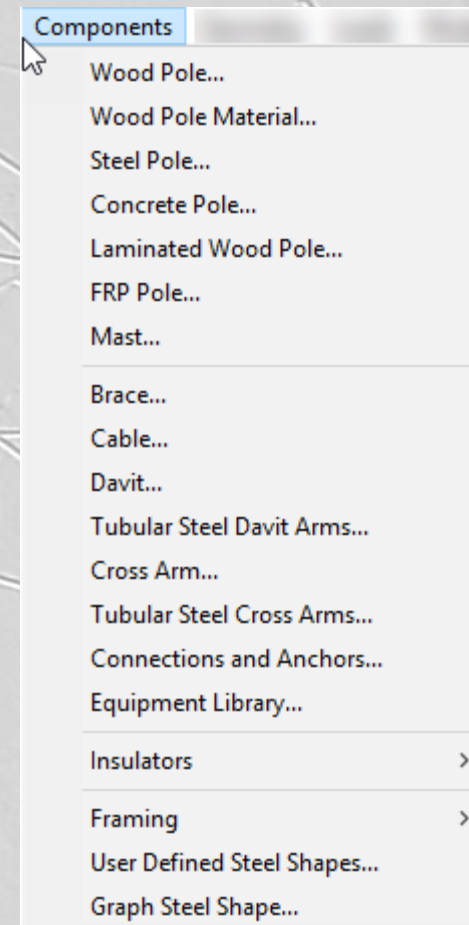
Summary Of Key Features – PLS-POLE

- Limited Version of PLS-POLE Included with PLS-CADD/Distribution
  - Wood and Steel Pole Provided
  - Concrete, Laminated Wood, and FRP Can Be Added
- Structure Modeling Primarily Based on Framing Functions
- Component Access Limited to Guys and Cables
  - Provides Ability to Fully Customize Down Guys and Span Guys
- EOR Can Build and Edit Frames (.FRM file) in Supervior Edition and Stanard PLS-POLE
- EOR Has Access To Full PLS-POLE Functionality in Supervisor Edition and Standard PLS-POLE

Summary Of Key Features – PLS-POLE/Components

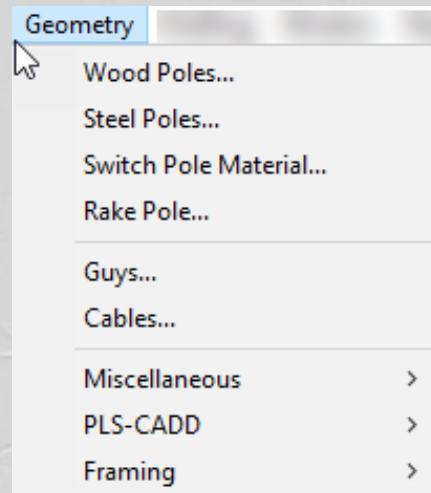# Summary Of Key Features – PLS-POLE/Geometry
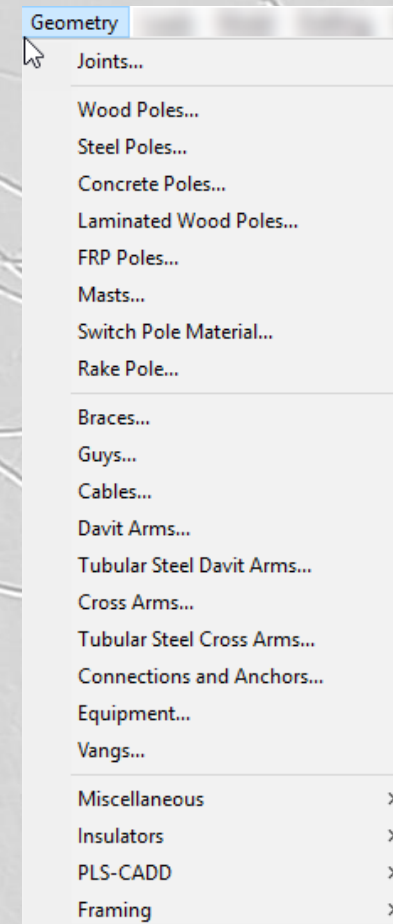
PLS-CADD/Distribution

Geometry

- Wood Poles...
- Steel Poles...
- Switch Pole Material...
- Rake Pole...
- Guys...
- Cables...
- Miscellaneous >
- PLS-CADD >
- Framing >

PLS-CADD

Geometry

- Joints...
- Wood Poles...
- Steel Poles...
- Concrete Poles...
- Laminated Wood Poles...
- FRP Poles...
- Masts...
- Switch Pole Material...
- Rake Pole...
- Braces...
- Guys...
- Cables...
- Davit Arms...
- Tubular Steel Davit Arms...
- Cross Arms...
- Tubular Steel Cross Arms...
- Connections and Anchors...
- Equipment...
- Vangs...
- Miscellaneous >
- Insulators >
- PLS-CADD >
- Framing >

Summary Of Key Features

- Less Expensive Than Full Versions!
- Can Buy 100's of Licenses Economically
- Available in CBL Only

PLS-Distribution Key Takeaways

- Single Model That Can Be Accessed From Full PLS-CADD and Modified
- Includes Terrain (Ground) from NASA's SRTM Data
  - Or Your Own Developed in Full PLS-CADD
- Criteria (NESC, GO95, Your Own Code or Company Standard)
- Same PLS-POLE Analysis as Full Edition of PLS-POLE
  - Framings Based
  - RUS Framings Available
  - Meets ASCE Standards an Manuals of Practices (which NESC References and 2022 Will Reference)
- Over 8,000 Conductors and Cables Ready To Use (And Your Own)
- Same Well Known Sag and Tension Analysis as PLS-CADD
- Ruling Span or Finite Element Conductor Option
- Supervisory Control with Supervisor Edition

Closing

- PLS-Distribution is a Limited Version of PLS-CADD
- PLS-Distirubiton is RS Based
- PLS-Distribution+ is FE Based
- PLS-Distribution Supervisor Edition Allows Full Access
- See https://www.powerlinesystems.com/pls-distribution for Information
- Contact sales@powerlinesystems.com for a Quote

QUESTIONS?

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S Y S T E M S