



New Insulator Types

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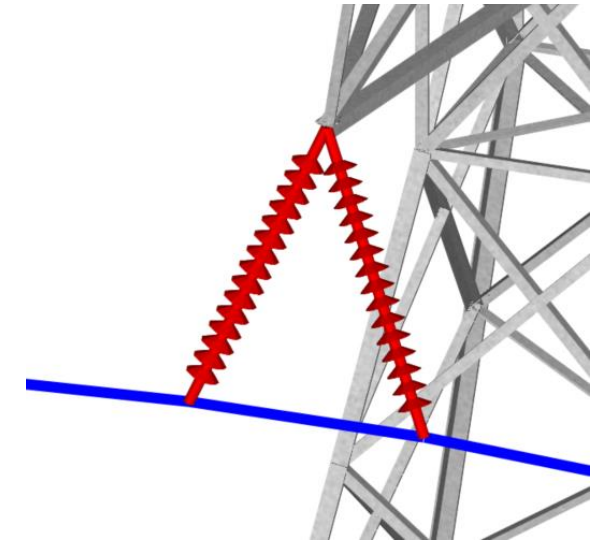
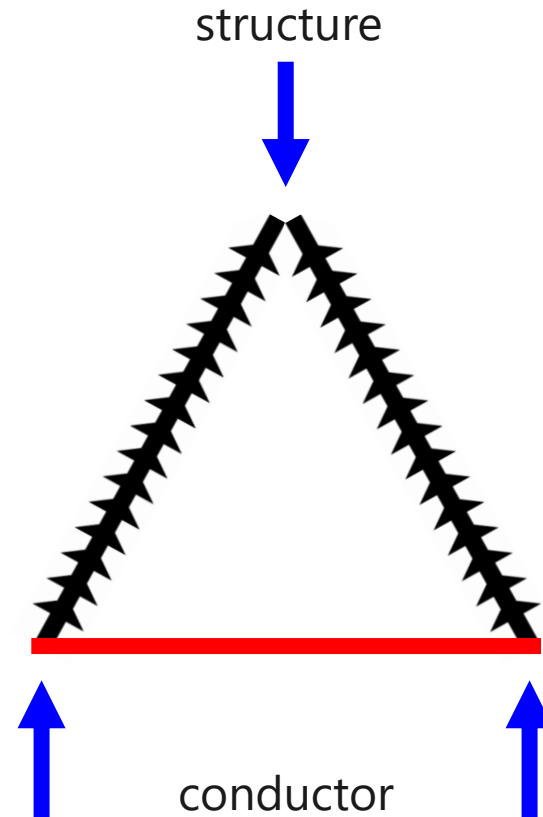
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Terminology

Lambda Insulator

- Two suspension insulators + separator cable
- Supports a conductor at **two** locations
- Attaches to structure at **one** location
- “Inverted V”

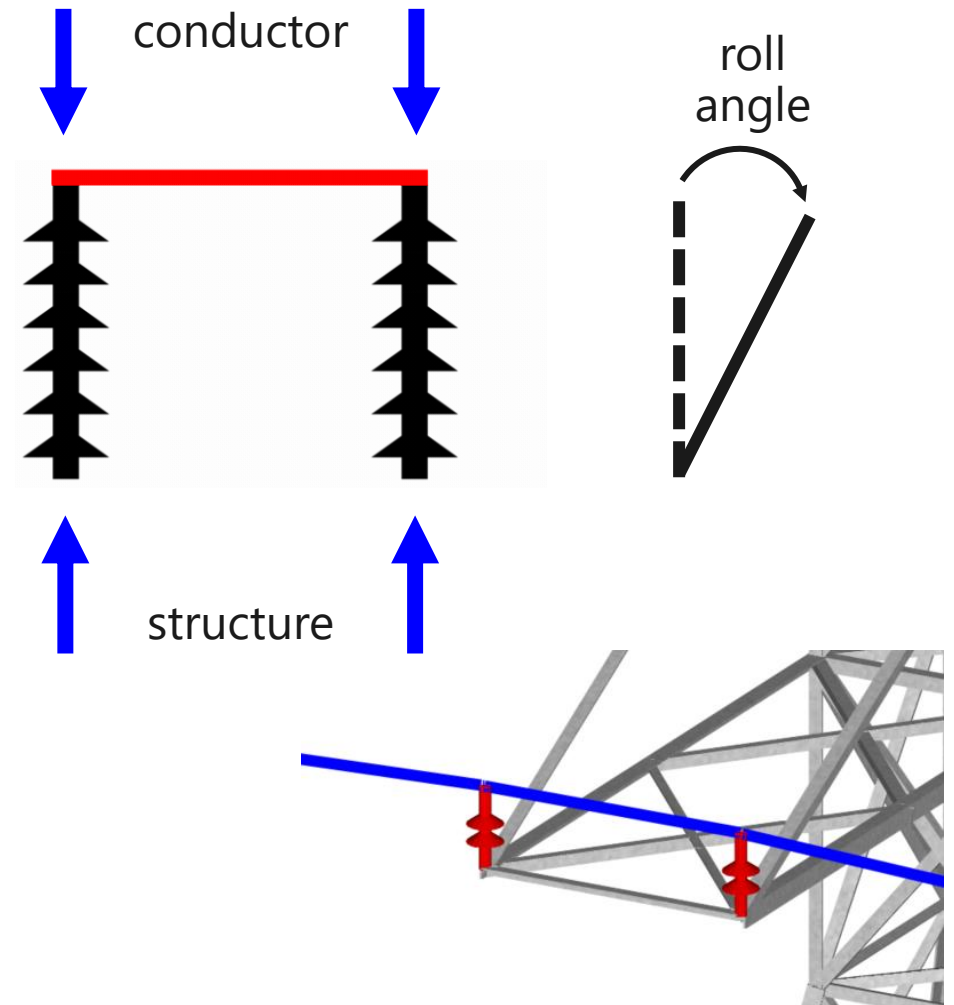
Example use cases: improve reliability at road crossings, provide a small increase in clearance



Double Pin Insulator

- Two post insulators + separator cable
- Supports a conductor at **two** locations
- Attaches to structure at **two** locations
- Rigid
- Point upward (typically)
 - Can have roll angle (tilt in transverse plane for use on angles)

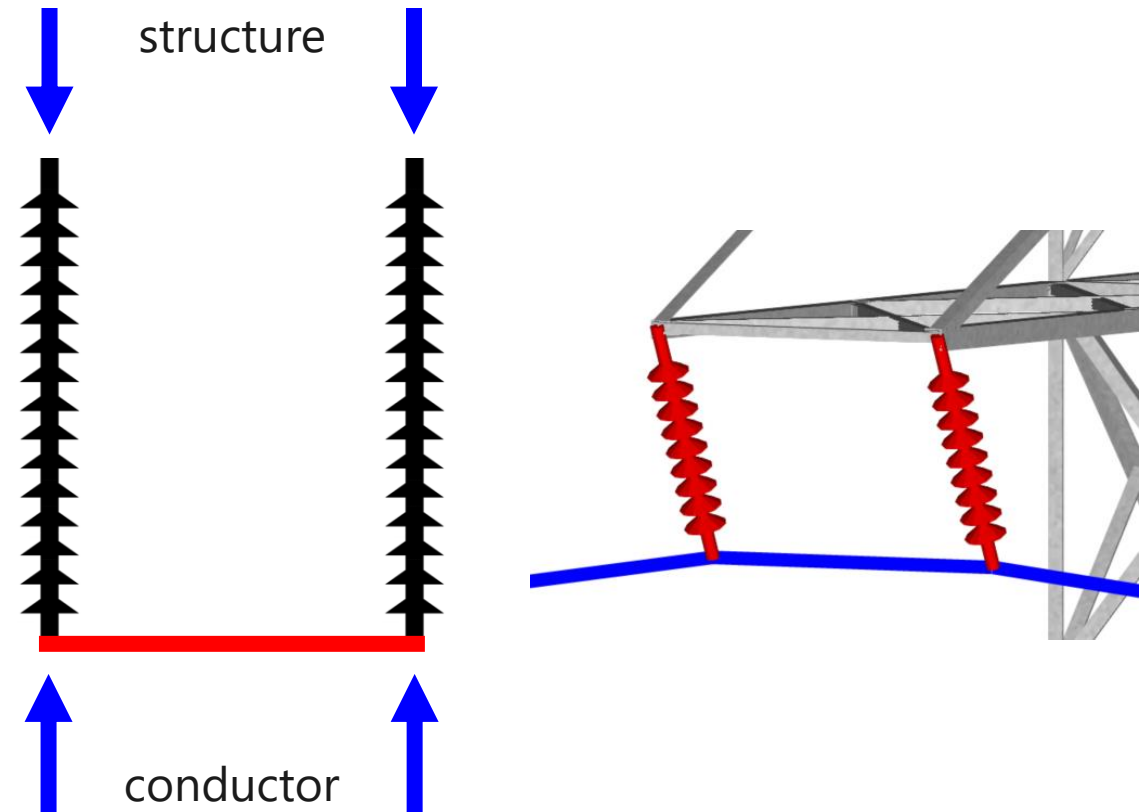
Example use case: distribution design



Double Suspension Insulator

- Two suspension insulators + separator cable
- Supports a conductor at **two** locations
- Attaches to structure at **two** locations
- Flexible
- Point downward

Example use cases: increase clearance to lattice towers at line angles, add redundancy

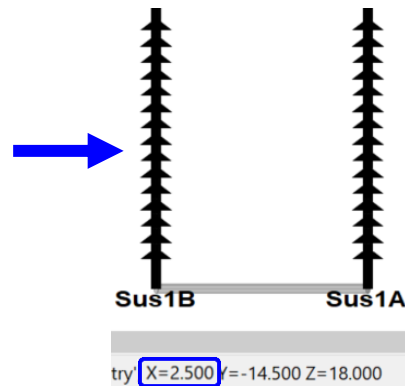


***Note: all three new types are NON-DEADEND insulators and should be used with finite element analysis**

Two Sides

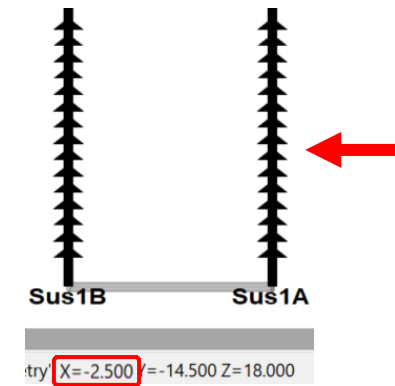
Back Side

- Positive longitudinal offset
e.g. $X = 2.500$



Ahead Side

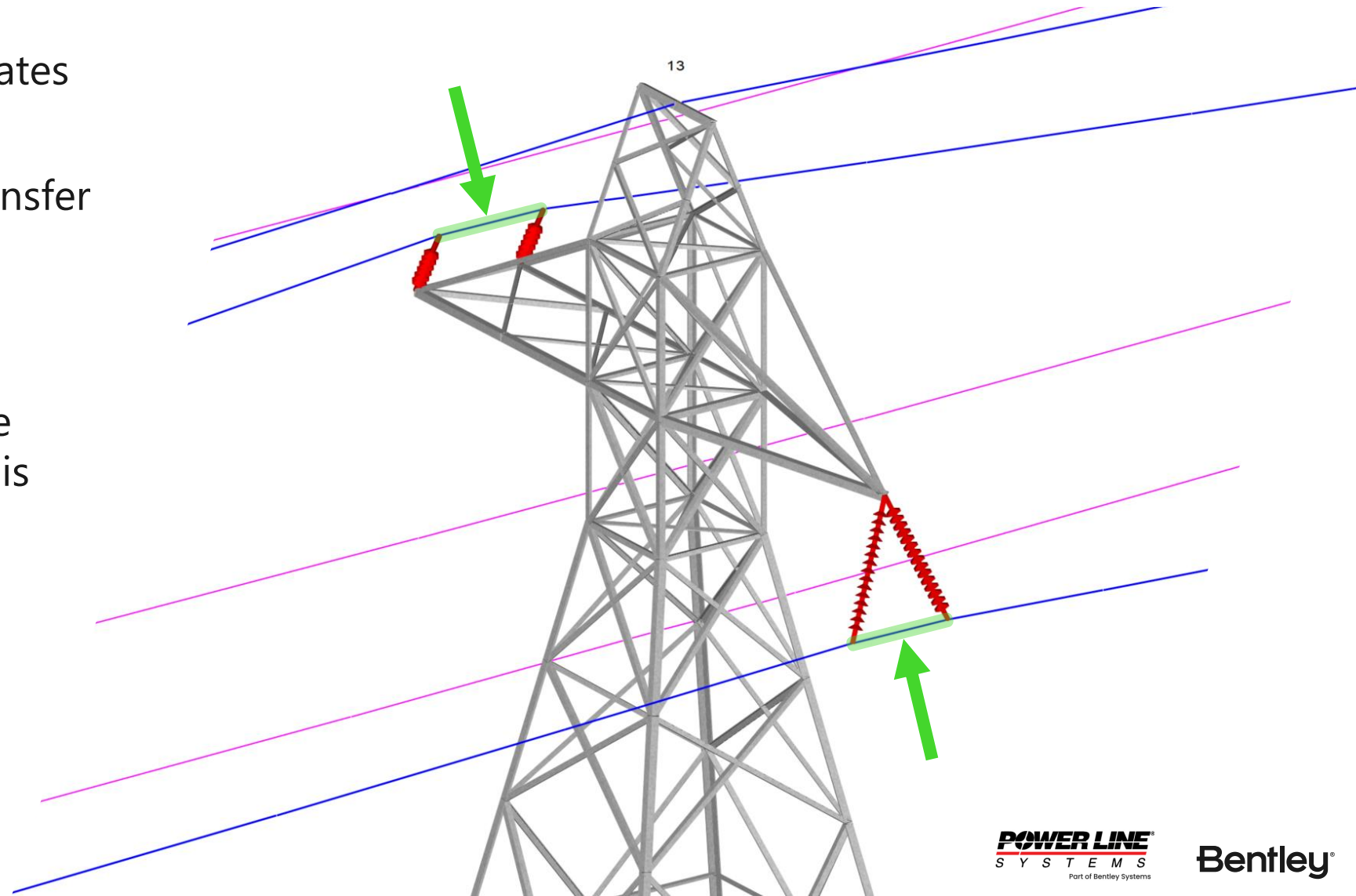
- Negative longitudinal offset
e.g. $X = -2.500$



- Typically, the wire coming from behind the structure is the back span and connects to the back side insulator; likewise with the ahead span wire and ahead side insulator
- PLS-POLE and TOWER issue a warning if back/ahead side assignment is backwards

The Separator Cable

- Cable element that separates the two insulator sides
- Represented as a load transfer element in PLS-POLE and TOWER
 - Substitute for the conductor that will be there when structure is added to PLS-CADD



Modeling

Modeling

Components/Insulators/Lambda Properties...

| | |
|--------------------------------|-------------|
| Label | Lambda345kV |
| Stock Number | LM-1B-345 |
| Length (ft) | 11 |
| Weight (lbs) | 250 |
| Wind Area (ft^2) | 2.408 |
| Tension Capacity (lbs) | 35000 |
| Hardware Capacity (lbs) | 0 |
| Notes | |
| Draw | Sheds |

- Lambda insulator properties look like the single suspension insulator properties
- Only one input per attribute since sides are symmetrical

Modeling

Components/Insulators/Double Pin Properties...

| | |
|-----------------------------------|-------------|
| Label | Dist Pin 30 |
| Stock Number | Dpin1 |
| Length (ft) | 0.583334 |
| Roll Angle (deg) | 30 |
| Weight (lbs) | 8 |
| Wind Area (ft^2) | 0.5 |
| Tension Capacity (lbs) | 25000 |
| Compression Capacity (lbs) | 25000 |
| Cantilever Capacity (lbs) | 10000 |
| Hardware Capacity (lbs) | 0 |
| Notes | |
| Draw | Sheds |

- Double Pin properties look like the post insulators properties, but they include a Roll Angle
- Only one input per attribute since sides are symmetrical

Modeling

Components/Insulators/Double Suspension Properties...

| | |
|--------------------------------|-----------|
| Label | Db1Sus345 |
| Stock Number | |
| Length (ft) | 11 |
| Weight (lbs) | 250 |
| Wind Area (ft^2) | 2.08 |
| Tension Capacity (lbs) | 35000 |
| Hardware Capacity (lbs) | 0 |
| Notes | |
| Draw | Sheds |

- Double Suspension properties will look like the single suspension insulator properties
- Only one input per attribute since sides are symmetrical