



Transmission Line Structures



2009: Rendering of Proposed Structure Type
single circuit structure



2009: Rendering of Proposed Structure Type
double single circuit structure

Photo: Nifong/Sinclair



Following images are from LIDAR scans

Existing Lines Along Nifong: looking west



EXISTING - W NIFONG BLVD AND SINCLAIR RD
(LOOKING WEST)

55 SINCLAIR RD

Transmission Lines Along Nifong: looking west



NEW - W NIFONG BLVD AND SINCLAIR RD
(LOOKING WEST)

56

SINCLAIR RD

Existing Lines Along Nifong: looking east



Transmission Lines Along Nifong: looking east



Existing Lines Along Grindstone



GRINDSTONE PKWY, WEST OF S ROCK QUARRY RD. -
EXISTING DISTRIBUTION AND 69-KV LINE

Transmission Lines Along Grindstone



GRINDSTONE PKWY, WEST OF S ROCK QUARRY RD.
NEW DOUBLE CIRCUIT 161-KV & 69-KV

Steel vs. Wood Overview

Steel Pole Construction

- Engineered material; consistent, controlled properties
- Reduced safety factors required
- No height or span limitations
- Self supporting angles and deadends
- More flexibility during design
- More flexibility during construction

Wood Pole Construction

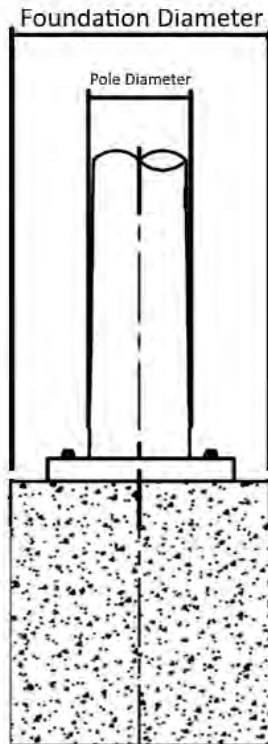
- Natural material; varying properties
- Height & span limitations – more poles required
- Angles & dead ends are not self-supporting; require down guys – more intrusion on properties/easements
- Limited design adjustments during construction

Steel vs. Wood – Size Comparison



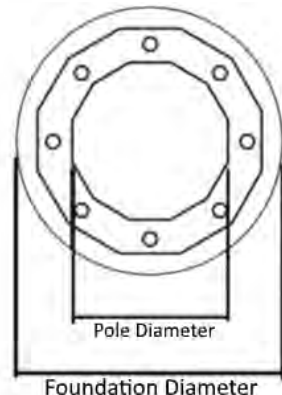
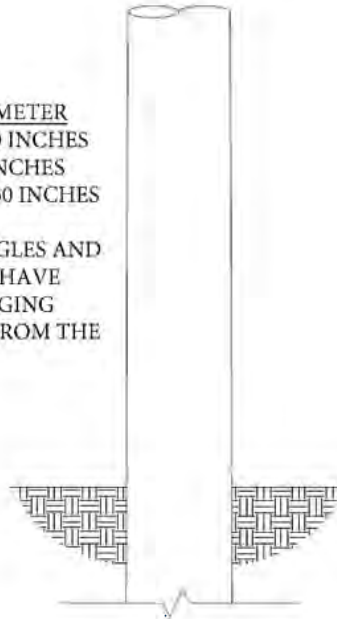
STEEL POLE DIAMETER
 TANGENT ~2-3-FT
 ANGLE ~2-1/2 -5-FT
 LARGE ANGLE ~3-5-FT
 DEADEND ~4-5-FT
 LARGE DEADEND ~4-6-FT

CONCRETE FOUNDATION DIAMETER
 TANGENT ~4-5-FT
 ANGLE ~5-6-FT
 LARGE ANGLE ~7-8-FT
 DEADEND ~7-8-FT
 LARGE DEADEND ~9-10-FT



WOOD POLE DIAMETER
 TANGENTS ~20-30 INCHES
 *ANGLES ~20-30 INCHES
 *DEADENDS ~20-30 INCHES

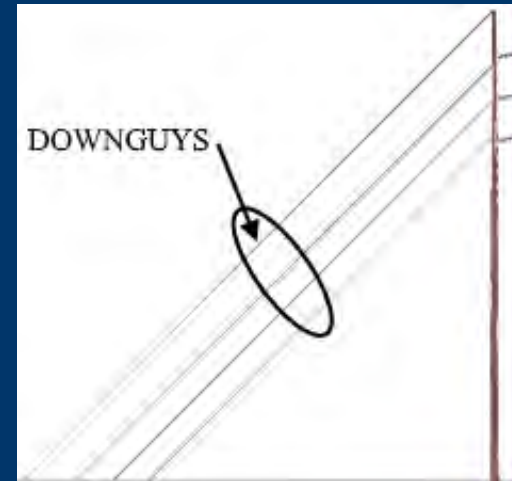
*WOOD POLE ANGLES AND DEADENDS WILL HAVE DOWNGUYS RANGING FROM ~60-80-FT FROM THE POLE BASE.



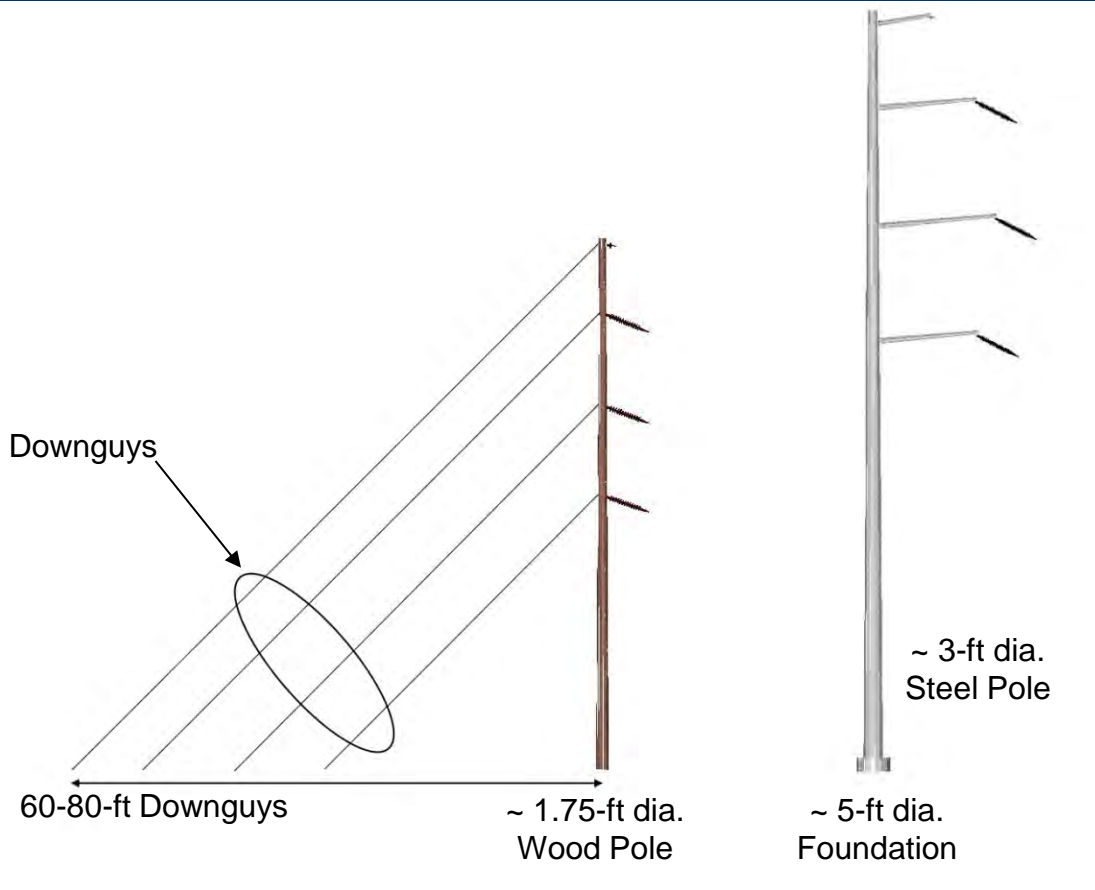
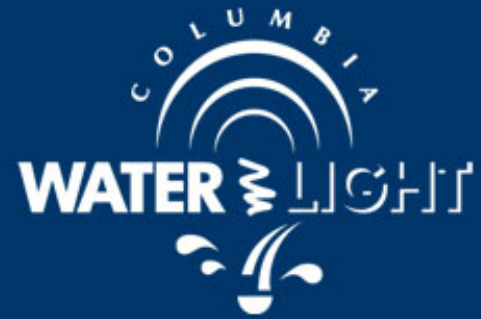
STEEL POLE ON FOUNDATION



WOOD POLE



Steel vs. Wood – Structure View



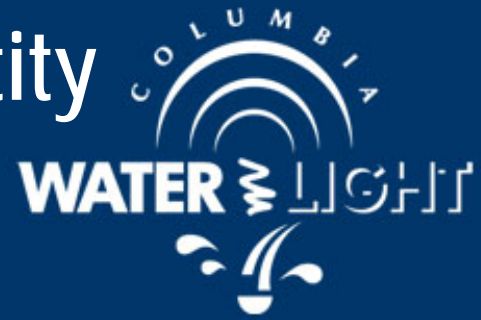
Steel Structures

- Davit arms hang wires away from property
- Majority of structures will have ~4-5 ft. foundations with pole diameter of ~2.5-3 ft.
- Wires higher above ground

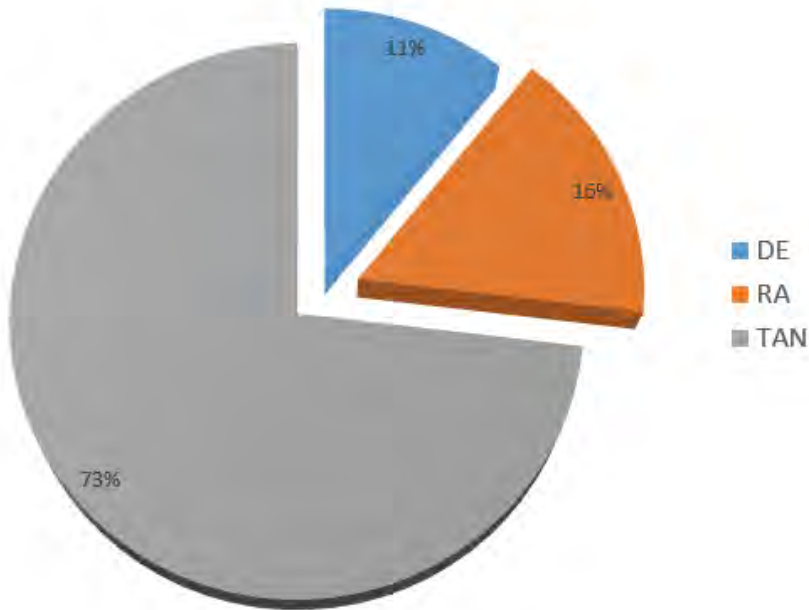
Wood Structures

- Angles and dead ends require down guys
- Wires closer to ground

Steel vs. Wood – Structure Quantity



Percentage of Structure Types

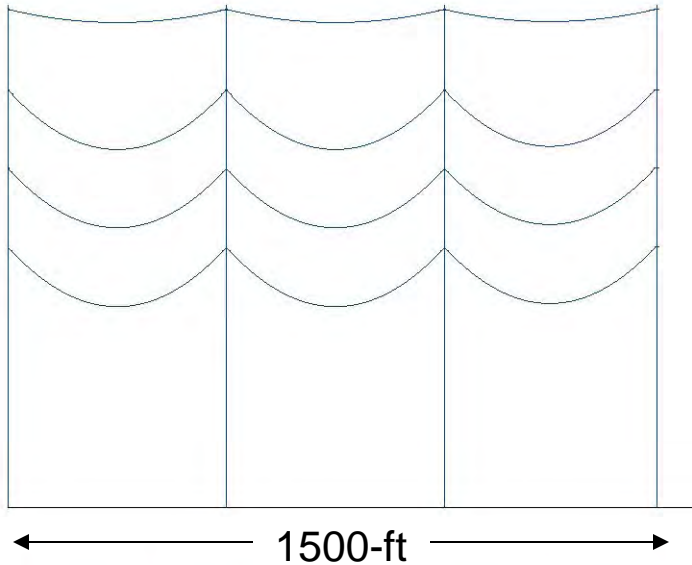


- Steel poles would require 93 structures
- Wood poles would require 145 structures
 - The number of additional structures needed is 52 or an increase of 55.9%

Steel vs. Wood – Span Profile

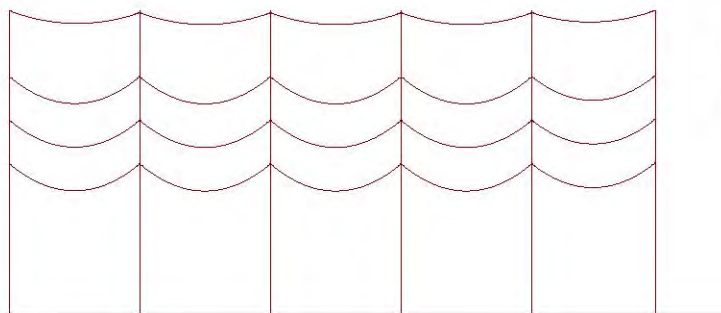


Steel Structures
Typical Span = 500-ft
~11 Structures Per Mile



Higher wire clearances attainable using steel structures

Option A - Wood vs. Steel Comparison	Steel Str's	Wood Str's
Typical Span Length	500	300
Structures per mile	11	18
Structure Quantity	127	212
Clearance above ground	45-ft	25-ft



Wood Structures
Typical Span = 300-ft
~ 18 Structures per Mile

1. Preliminary values
2. Wood poles limited on height due to availability and strength.