



## North American Wood Pole Council

### *Juvenile Wood Concerns*

Some users of wood poles have stated the concern that certain species such as the Southern Yellow Pines, grown in plantations managed to maximize growth rate, may result in pole strengths less than stated in the ANSI O5.1 Standard. The stated basis of this concern is the presence of *juvenile wood* in the top of the poles. In a normal transverse loading situation, upon which the ANSI strengths are based, these concerns are without merit.

Trees add *juvenile wood* in the growing crown of the tree. Although there is no clear demarcation between “*juvenile*” wood and “*mature*” wood, *juvenile wood* in southern pines is generally considered to be the first 10 years of growth starting from the pith center. There are some cellular differences in *juvenile wood* and it normally is rapid growth, which results in lower density, and thus, lower strength. Since *juvenile wood* is added in the growing crown of the tree, the top of the stem has a higher percentage of *juvenile wood* than the bottom. This is true whether the tree is in a natural stand or a “plantation”. At the lower end of the stem the *juvenile wood* is covered by a substantial thickness of mature wood. Under a simple cantilever load the maximum stress point is at or near the groundline for distribution-sized poles, and the stress in the upper portion of the pole is very low. Since, from an engineering perspective, the inner portion of the cross section adds very little to the bending strength of a solid circular cross section, the amount of juvenile wood at the center of the trees is generally of no significance. The ANSI standard has a ring count requirement in the outer 2 or 3 inches of the butt (depending on pole circumference) to ensure the required strength in the groundline area where the maximum stress will normally occur. This ring count requirement is there to address the potential strength issue with rapidly grown trees, whether they were grown in a natural stand or a plantation. Although there may be a significant portion of the top that is *juvenile wood*, the stresses in this area of the pole are low and do not normally control the pole design and selection of pole class.

Should this be a concern to the line designer or pole purchaser? In normal cantilever loading the point of maximum stress in poles is not in the upper portion of the pole and juvenile wood in the top is not a factor of significance. For design situations other than simple cantilever loading, the ANSI standard provides guidance on the appropriate design value to use, and this value takes into account the potential effect of juvenile wood.

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