

March 19, 2009

Mr. Robert DeMoura
CC&T Real Estate Services
Ashley River Center, Riverside A
2655 Evatt Lane Suite 107
Charleston, SC 29405

Re: Comments on tree-related points made by Dr. Jean Everett in her "Final Report on the Effects of Developing Angel Oak Village on the Angel Oak" dated March 4, 2009

Dear Mr. DeMoura:

Dr. Everett made several points in her report to the Coastal Conservation League, to which I believe responses or clarifications are needed. I was particularly surprised by her comment that "Most trees, live oaks included, have no set life span. They essentially live forever, unless killed by environmental factors." On the contrary, the life spans of all plants are genetically controlled. Each species has an average maximum range (white oak five to six hundred years; water oak seventy-five to one hundred years; *etc.*). Whether an individual tree reaches the biological potential for its species depends on when various external impacts (pests and environmental) become a significant influence. The senescence/aging process is natural and typically leads to involvement by various pest and environmental factors that contribute to tree death toward the end of the "normal" life span. A major objective in arboriculture and urban forestry is to avoid predisposing trees to such factors prematurely, causing the "typical" life span to be shortened. That has been our objective with the Angel Oak Village project.

I believe our design and approach on this project will successfully protect the Angel Oak and other trees to be retained on the site. I have been involved with individual tree health, cultural maintenance, and protection from a research, teaching and consulting standpoint for more than 38 years. I have served as an unpaid advisor on the Angel Oak through Danny Burbage for more than 20 years, consulted on numerous tree protection/development projects in this country, and worked closely with some of the most prominent and experienced consulting arborists in the United Kingdom on tree/development projects since 1991.

The greatest advantage that we have in protecting the Angel Oak is the amount of undisturbed land that will remain around it. The current best management practice/recommendation in the US is to leave a tree protection zone (undisturbed area) with a radius of 1.5 feet for each inch of trunk diameter measured at 54 inches above ground level (dbh). That would equate to a tree protection radius of about 150 feet for the Angel Oak, which is the area of the current Angel Oak Park. The latest British Standards (BS5837:2005) surprisingly suggest capping the maximum tree protection zone radius at about 49 feet. Despite the smaller protective area requirement, the British are very strict and successful in protecting their "ancient, veteran, and notable" (big and old) trees.

The area actually scheduled to be protected around the Angel Oak is 300 feet to the east; 400 plus feet to the northeast, north, and northwest; and more than 550 feet to the west. The project does not extend to the south along Angel Oak Road. That equates to more than ten acres of forested land on three sides of the Angel Oak. The property south of Angel Oak Road is in agricultural use and conservation easement.

Dr. Everett expressed concern that clearing the trees over much of the area scheduled for construction would cause intolerable degradation to the ecosystem to which the Angel Oak has adapted over time. Field evidence, including the form of the Angel Oak itself, strongly points to many changes to the entire property over time. The wide-spreading crown of the Angel Oak and a 44-inch live oak on the property suggest that they were both open-grown trees. The property has likely been used for agricultural purposes, as well as had trees logged several if not numerous times. The probable changes in land use over several hundred years, along with the very large area to be left undisturbed around the Angel Oak alleviate any concerns in my mind

regarding direct construction/development impacts on the Angel Oak. The size of the undisturbed area should also set aside concerns about extent of the Angel Oak root system, possible connection with roots of other trees, and making the tree more susceptible to wind damage. The Angel Oak will not be isolated. Considerable forested area (ten acres minimum) will remain on site immediately surrounding the tree with other forest and agricultural land to the south that will continue to support wildlife habitat and other ecological aspects.

Certainly, soil water relations must be considered, and Dr. James Gregory will address Dr. Everett's concerns on that topic. However, I do question her concern about a reduction in future evapotranspiration causing increased air temperature issues for the Angel Oak. Such climatic issues are primarily influenced by regional factors and any changes would be minor and not significant.

Her concern about increased traffic around the tree is valid and is a topic which Danny Burbage and I have discussed over many years. We have discussed different treatments, which could be implemented depending on how visitor use increased. Concerns about vandalism are purely speculative, I believe, but that too is a subject that can be handled if necessary.

Dr. Everett's point about increased traffic on Angel Oak Road increasing soil compaction is not a concern to me. Most soil compaction occurs with the first few passes over a site. Some research suggests 95% of soil compaction occurs with the first pass. Obviously, the road, drive, and parking area soil is already very compact.

However, the Angel Oak Village development does present an opportunity to improve soil conditions in the drive and parking area of the current Angel Oak Park if not Angel Oak Road. As you know, we have suggested relocating the drive and parking area (and possibly the visitor building) much further to the west of the current park, and the idea has received favorable consideration from City Staff. While that relocation would somewhat reduce the undisturbed area around the Angel Oak on the west, the benefit would far outweigh that "cost."

We now have equipment (Air Spade or equivalent) that can loosen heavily compacted soil without damage to tree roots. This procedure is being used fairly commonly in the Charleston area (including on City trees) and throughout the country. The entire area of the current Angel Oak drive and parking lot could have the soil "decompacted" to a depth of six or eight inches, have decomposed organic matter incorporated, and mulched to protect against future compaction from foot traffic. We used this treatment on a large, historic overcup oak on the Clemson University campus and the improvement in the health of the tree was phenomenal.

I believe I have addressed the major points of concern that I had with Dr. Everett's report. If you have questions, please contact me.

Sincerely,



Donald L. Ham
Principal