

EXERPT on ENVIRONMENT
for
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(72)
- submitted by Margaret Heath
to Mayor and Council

Diagnosis Report
Chapel Hill Development Ordinance

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Low-Impact Development and the Environment. There is a general desire to strengthen the environmental standards in the ordinance. The recent flooding has heightened this concern. There is interest in the conservation development concept of Randall Arendt. Conservation or low-impact development seeks development that is more sustainable, allowing the natural environment to function to enhance the quality of the developed environment.

Chapel Hill's ordinance deals with floodplains, water quality, storm water management, and tree and slope protection. These sections should be strengthened. Storm water management is an example. Until recently, a ten-year storm was the design storm; now, the Town is using a 25-year storm. In many urbanizing areas, however, the design storm is the 100-year storm. In the most advanced ordinances, the storm water release rates are lower than the pre-development rates.

The watershed protection district has two standards. The low-density option permits 24% impervious surface, a value that comes from the State's mandated watershed protection. However, experience indicates that above 10% impervious surface, a

watershed suffers symptoms of declining water quality. The Center for Watershed Protection reports that when impervious surfaces exceed 10%, streams are negatively impacted, with unstable stream banks, erosion, channel widening, and poor physical habitat contributing to declining biodiversity. When watershed impervious cover exceeds 25%, streams become non-supporting, meaning that they are solely a means of conveying water and cannot support a diverse stream community.² The existing low-density standards approach the "non-supporting" level of stream health.

All larger developments in watershed protection districts should use wet detention. Detention can be provided project by project, house by house (with water gardens), or on a small watershed basis. The small watershed basis is generally thought to be superior, because they can all be wet basins and are larger and easier to maintain. However, watershed retention requires active government participation and management. Most large developments should be required to provide wet basins. Smaller developments are the most difficult to manage for water quality. Individual homes or small commercial uses may use water gardens and get good water quality benefits.

In addition to impervious surface, a significant element of water management for both quality and quantity is the type of land cover. Forest and natural grasslands are superior to lawns. Some communities are requiring lawns to include plant types that are not watered or fertilized. Chemically treated lawns are a significant source of potential pollution. Another water management concept is to require a natural buffer along a waterbody (or streams leading to the waterbody). A forested stream buffer with no lawn is the best buffer. Buffers can range from 25 to 300 feet wide.

The water quality district overlaps with the watershed district. If the watershed district is good, there is no need for the water quality district. That district does not impose standards on single-family or two-family zoning, so it misses the majority of the Town's zoning. Further, the standard is subjective. What does "it is desirable to encourage" mean? If there is not a firm standard for infiltration, then developers do not know what is expected and the Town can only try to arm-twist developers.

The resource conservation district (RCD) contains two resources, the floodplain and a stream buffer. These two can overlap. The district is confusing because the areas are not defined in a mutually exclusive manner. What would normally be considered floodplain is extended by two feet in elevation; this area is actually functioning both as a floodplain and a buffer. The stream buffer area of 75 or 100 feet can include floodplain areas and, in some instances, could lie entirely within a floodplain. Wetlands, forests, drainage ways, and steep slopes are other resources that are not covered in the resource conservation district. The ordinance permits some impervious surface uses within the floodplain; this is a mistake unless the use is water-dependent, such as a boat ramp. Infrastructure should also avoid these areas, and the Town must be rigorous in seeking to limit road or utility crossings.

²Center for Watershed Protection, *Rapid Watershed Planning Handbook: A Comprehensive Guide for Managing Urbanizing Watersheds*. CWP: October, 1998.

The ordinance should specifically include wetlands as a resource conservation district area with the same protection level as floodplains. There is no reason uses should be permitted in either of these areas, except for essential crossings of these areas. If there is flood damage on a regular basis to structures in the floodplain, the Town should work with appropriate Federal officials to relocate the structures. This should be built into the standards.

While the ordinance has sections on tree preservation and steep slopes, these sections are subjective and weak. The strongest ordinances set strict standards for development on steep slopes or forested areas. The second tier of tree protection ordinances relies on mandatory replacement of trees cut. Other steep slope regulations require geotechnical reports; however, these occasionally result in overbuilding and subsequent problems. Few significantly reduce the level of development on steep slopes.

There are several options for making the ordinance more environmentally sensitive. The current standards can be reviewed individually. This might result in expanded or additional overlays. The disadvantage of this approach is that it involves many districts and it is difficult to see the overall relationship between the sections. A second, performance-oriented approach builds a full environmental system that requires environmentally sensitive development and adjusts density based on the environmental constraints that exist on a site. A third approach is to look for development practices that are environmentally sensitive and integrate them into the code. There is a choice to be made between the first and second approach, but the third approach could enhance either choice.

A performance-oriented conservation approach requires the developer to begin the development process with an analysis of the resources that are present on the site. Performance ordinances have clear standards for protection and provide specific calculations that identify the maximum capacity of the site. This eliminates negotiating how much environmental protection is needed, as is the case with subjective standards. Performance regulations make planned or cluster development permitted uses, so that developers are free to cluster to avoid a density penalty. The intensity levels for single-family, cluster, or planned developments are chosen to reward maximum clustering with slightly higher intensities. We believe this is the best approach to environmental protection. In this system, floodplains, waterbody buffers, wetlands, watersheds, and drainage way soils (soils that have evolved to their current condition by the presence of water over or through them) are all water-oriented elements. Slopes and woodland or tree protection are overall environmental protection types.

In terms of development, there are a number of environmentally sensitive design strategies, some of which are not currently considered "normal." Others may even be prohibited. This includes environmental regulations designed to make buildings more sensitive. The "green roof" is just starting to get some attention in the United States, but is heavily used in Europe. Large, flat-roofed buildings are logical candidates for these roofs and the Town could mandate their use or penalize uses that do not. The design of storm water systems in Chapel Hill uses standard engineering practices that substitute pipes for natural channels. The pipes move water faster, increasing flooding; are costly to build and maintain; and can only carry a limited amount of water, thus relying on

streets or other areas to carry storm water flows in larger storm events. A natural system is cheaper and creates better water quality. The Town can mandate maximum use of surface drainage, linked detention, enhanced floodplains or stream channels, and individual water gardens to make a better system. It can also review the normal grass lawn approach to landscaping. Environmentally, native grasses and woodland vegetation are far better surfaces than lawns. Where lots are large enough, there should be incentives or requirements for natural surfaces.

Land Use Intensity (LUI) System. Chapel Hill is unique in using this system³. Other communities that used this system have abandoned it in the past.⁴ The LUI system has three problems. The first is its complexity; the second is its lack of user-friendliness; and the third, and most important, is its weakness in achieving Chapel Hill's goals. The current code uses four different measures for determining whether a development meets the LUI value for the district: floor area, outdoor space, livability space, and recreation space. Each category must be measured to determine if a project meets the standards, and the resulting LUI number is not intuitively meaningful.

Most important, the system does not clearly relate the LUI measurements to specific community objectives. Chapel Hill is very concerned with neighborhood community character. The LUI system was developed as a means of evaluating development in the 1960s. It consisted of a graphic system on which each of the measures was displayed as a curve. The LUI numbers were vertical lines (see Figure 3) so that the values of the curves where the LUI number crossed the curves were the values used. Chapel Hill created its own numbers, but there is no master curve system to document its creation, and staff indicates that the numbers have been adjusted several times. Additionally, the numbers do not relate to either resource protection or affordable housing, important goals identified by the community. One option would be to try to clean up the LUI system and document it. However, there would still be a lack of user-friendliness, and a lack of connection to community goals.

³ There seems to be a myth that the LUI system was borrowed from *Performance Zoning*. In fact, performance zoning was begun *in reaction to* developments done under the LUI system. The LUI system was developed by HUD and the curves were plots of existing developments.

⁴ A number of local governments in Bucks County, Pennsylvania, abandoned the LUI in the early 1970s. The consensus was that developments under the LUI were unattractive.