

CASE STUDY

Saunders Branch
Sumner County, Tennessee



Site Aerial

Saunders Branch

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The Introduction

About thirty-five miles northwest of Nashville near the town of Gallatin, Saunders Branch is a lake with a channel flowing into Old Hickory Lake very near its confluence with the Cumberland River. The Habersham Land Company, developers of the new town of Habersham near Beaufort, South Carolina, have chosen to develop the five hundred and twenty-eight acre tract surrounding Saunders Branch as a Traditional Neighborhood Development (TND) designed on the principles of new urbanism.

The plan for the development of the Saunders Branch makes an excellent case study for Duany

Plater-Zyberk and Company's Light Imprint initiative. Since the initiative provides a framework for the design of sustainable neighborhoods based on New Urbanism planning principles, the tools for Light Imprint storm drainage can be designed into the master plan for the tract. The development team can realize significant savings of infrastructure construction costs by implementing the techniques. As the development grows and ages, further savings will be realized in maintenance costs over that of typically engineered infrastructure.

The History

Sumner County, where Saunders Branch is located, has much archaeological evidence of Paleo-



Illustrative Master Plan

Indian, Archaic, Woodland, and Mississippian Native American habitation in its early history. Castalian Springs, which is very close to Saunders Branch, is the site of two prehistoric mounds marking areas where Native Americans hunted game that had come to the springs. Anglo-Saxon hunters and explorers began to visit the area in 1765. Permanent settlers began building houses and planting crops around 1776.

Early residents built for permanence. Daniel Smith constructed Rock Castle; William Bowen built his brick house in the 1780s. More than one hundred showplace homes like Cragfont (1802), Fairvue (1832), and Rose Mont (1840s) were constructed with fortunes amassed from agriculture and

raising thoroughbred horses.

During the early part of the Twentieth Century, agriculture became a greater part of the Sumner County economy. There was an expansion of strawberry farming. Then the opening of a Kraft Cheese plant in 1928 caused an increase in dairy production.

In the 1950s, the Tennessee Valley Authority (TVA) and the U. S. Army Corps of Engineers changed the face and the economy of Sumner County. The Corps constructed Old Hickory Dam on the Cumberland River. TVA built a steam electric generating plant at Gallatin. Many new recreational opportunities and a housing boom along the hundreds of miles of shoreline followed the construction of the lake. The economy of Sumner



Green street with porous pedestrian paths



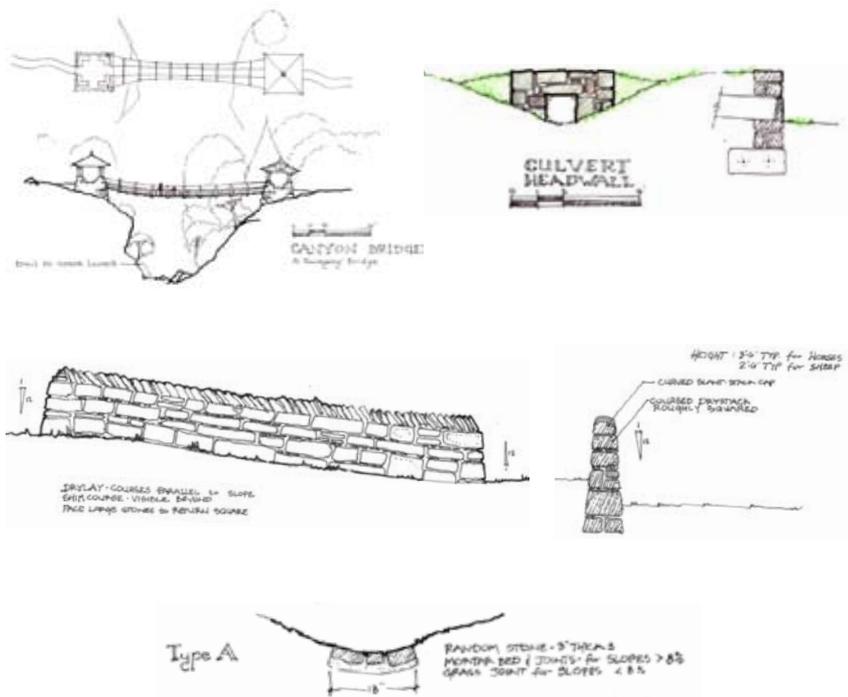
Lot with an attached rain garden



Lakeside drive with a natural filtration swale



Riverside hamlet with a bowl-like cluster of houses



A sampling of infrastructure details

County is not, however, dependent upon tourism. With the addition of new industries and expansion of existing industries, the county's population increased twenty-six percent between 1990 and 2000 to 130,449 residents.

The Site

Known locally simply as Saunders Branch, the lake divides the site into two distinct sections along a north to south line. Two blue line creeks, both requiring protection, rise within the site and empty into Saunders Branch. The U.S. Army Corps of Engineers owns the body of water forming the lake and a continuous strip of land of varying widths around the entire lakefront as well as along the site's western edge fronting the Cumberland River and the southern edge along Old Hickory Lake.

The lowest elevation for the Saunders Branch site is lakeside at 440 feet above sea level. The eastern edge of the site consists of bluffs overlooking the Cumberland River that range up to 70 feet above river level. The highest peak, located on the western side of the site, has an elevation of 596 feet. Only a few feet less in height, the highest peak on the eastern side has an elevation of 592 feet. The two peaks, with fields and woods flowing about 150 feet down their hillsides to the lake, form a natural bowl that captures most all views within the site. That feature allows the development team to control the view sheds from almost every point.

The climate of the area around Saunders Branch provides a long, temperate growing season. Average yearly rainfall for Sumner County is forty-five inches. Additionally, the average yearly snowfall is eight inches.

The Unique Characteristics

Aside from being a beautiful tract of land, the site has other unique characteristics. Certain parts of the site remain as farmland with conservation easements for perpetual protection. Some parts of the site are designated for very large lots that can be developed over time as family compounds with multiple structures.

The Master Plan prepared by DPZ proposes that housing be clustered in the following manner: a town center on the northwestern shore, a marina hamlet on the southwestern shore, a lakeside hamlet on the eastern shore of Saunders Branch, and a riverside hamlet on the site's eastern bluff. The riverside hamlet on the high bluffs overlooking the Cumberland River is to be located in a natural creek basin draining to the river; it provides canoe and kayak access.

Other unique characteristics of the design are the application of light imprint stormwater management and the use of an on-site decentralized wastewater treatment system. The wastewater system chosen consists of a Sand Filtration System (SFS) with the final part of the treatment process concluding with irrigation

of drip fields. The drip fields will be used for soccer fields, softball diamonds, and a skeet shooting range.

The Stormwater Management Techniques

In the first phase of development, the development team will be using Light Imprint Urbanism stormwater management techniques for paving, channeling, storage, and filtration of stormwater.

The development team is limiting the square footage of main houses to no more than 2,700 to 3,000 square feet. Any additional square footage is distributed among accessory structures. This restriction will reduce the amount of runoff from rooftops that will need dispersal or disposal.

Many of the proposed roads follow existing roads and trails that crisscross the property. The developers propose the use of crushed stone pavement for some of the neighborhood streets that will be traveled primarily by residents. Crushed stone will allow stormwater to be absorbed naturally and is a low cost alternative to many forms of paving. More heavily traveled main thoroughfares will be paved with asphalt. Pea gravel and stone paving blocks will be used on roads and pathways where vehicular traffic is very limited.

Among the techniques to be used to channel water, development will take advantage of natural creeks that drain into Saunders Branch and into the Cumberland River. A sculpted watercourse will be an attractive means of chan-

neling water through the center part of Phase 1. Another innovative technique will be footpaths that form a shallow depression. When there is no water to flow, the footpath will just be a walking trail; however, it can also serve as a water channel when needed for runoff from storms.

Storage of stormwater will be accomplished by two techniques. First, it can be stored in a fountain basin that will be a civic feature. Second, two underground vaults are planned near the base of the hill to store stormwater before it would be released into Saunders Branch.

Filtration of stormwater along the Corps of Engineers line will be accomplished by allowing the surface landscape to absorb runoff. Natural vegetation, green fingers, and purification biotopes will filter stormwater along two creeks that run through Phase 1. Rain gardens will be constructed at numerous locations. Indigenous plants used for rain gardens will be well suited for the local climate.

The topography of the Saunders Branch site makes it an excellent choice for Light Imprint stormwater management.



TND Plan ~ Phase One

CHARTS & GRAPHS:

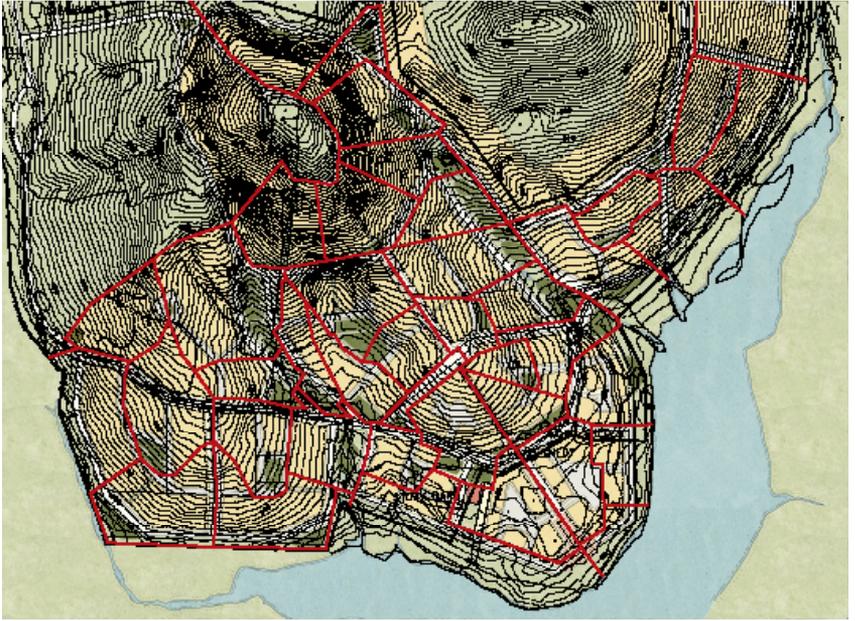
The study, prepared by Duany Plater-Zyberk & Company, contains four plates of plan diagrams. The first two plates compare the master plan before and after the application of light imprint engineering. The third plate shows the Light Imprint TND catchment drainage area plan. The fourth plate annotates the tools used in the Light Imprint Overlay Plan.





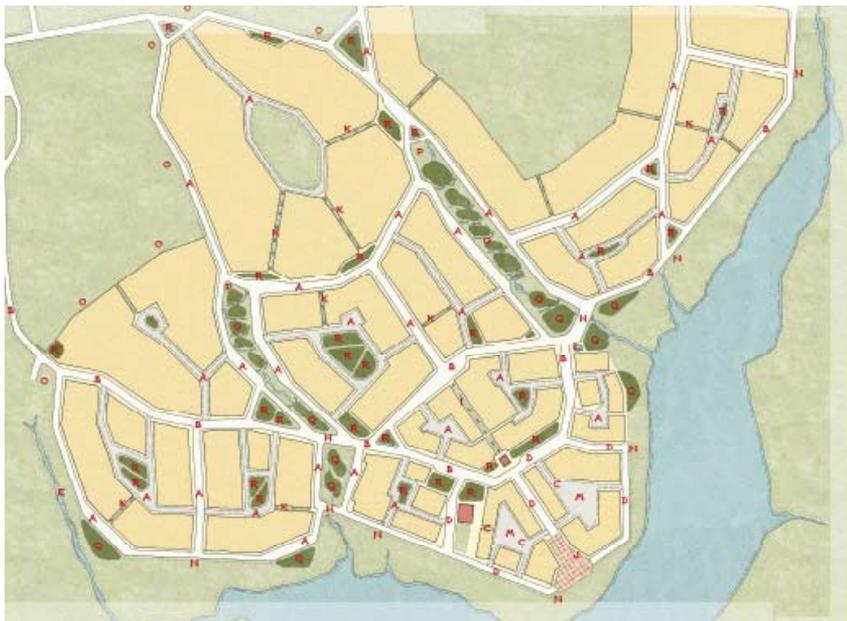
Light Imprint Overlay Plan ~ Phase One

The first two plates compare the master plan before and after the application of Light Imprint engineering.



Light Imprint Overlay Catchment Areas - Phase One





Annotated Light Imprint Overlay Plan

The second two plates show the breakdown of the specific catchment areas and tools used in the Light Imprint Overlay Plan.

PAVING

- A. Crushed Stone/Shell
- B. Asphalt
- C. Pea Gravel
- D. Stone Paving Blocks

CHANNELING

- E. Natural Creek
- F. Vegetative/Stone Swale
- G. Slope Avenue
- H. Concrete Pipe
- I. Gutter
- J. Sculpted Watercourse
- K. Shallow Channel Footpath

STORAGE

- L. Pool/Fountain
- M. Underground Vault-Plastic

FILTRATION

- N. Surface Landscape
- O. Natural Vegetation
- P. Green Finger
- Q. Purification Biotope
- R. Rain Garden