

# ***FLORIDA SOIL AND ENVIRONMENTAL SERVICES***

**Ronald J. Kuehl**  
**Tel (386) 418-4374**  
**Fax (386) 418-4374**

**12517 NW 116<sup>th</sup> PL.**  
**Alachua, FL 32615**

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## **Report on Soil Borings**

**10006 NW 53<sup>rd</sup> Ave.**  
**The Hammock subdivision**

**by Ronald J. Kuehl, Soil Scientist**  
**April 29, 2010**

Eight soil borings were made to a depth of about 8 feet with a hand auger in the undeveloped lot located at 10006 NW 53<sup>rd</sup> Ave. in the Hammock subdivision, on April 27, 2010. This a rectangular-shaped lot that is located north of the street. At the time the borings were made, the lot was heavily wooded and contained a variety of trees including sweet gums, hickory, and oaks. Sweet gums were observed scattered throughout the area in which the borings were made, but it appeared that a large number of small sweet gums are in the more sloping areas in which borings #3 thru #6 were made. Sweet gums commonly grow in areas in which there is a shallower water table and considerable moisture occurs in the soils throughout the year. Often the sweet gums occur in which clay occurs near the surface because water perches above the clay and the soils remain wet for long periods of time. Sometimes though on the lower areas of a slope the soils are wetter even though clay does not occur near the surface.

This is a sloping lot that slopes downward considerably from the higher lying front area along the street to the lower lying back area of the lot. There appears to be a "table-top" area that extends from the front center area along the street into the (left) west central area of the lot. Several of the borings were made in this "table-top" area. The area slopes downward considerably below the "table-top" area. Borings #4 and #5 were made in the much lower lying area that lies below the "table-top". Borings were also made in the eastern area that slopes downward to the northeast to give the buyer and builder information on the depth to clay and depth to seasonal high water table throughout the area. The general location of each of the soil borings is shown on the sketch that is included with this report.

## **Results of soil borings**

The "table-top" area of this lot is a very good location for the building of a house, based on the soil borings. Boring #1 was made about 50 feet east and 75 feet north of the southwest corner of the lot. Boring #2 was made in a slightly lower area, about 75 feet north of boring #1. On the more sloping area, boring #3 was made about 75 feet north of boring #2, and boring #4 on the lower part of the slope was made about 50 feet north of boring #3. The borings showed sands overlying loamy

soils (sandy loams). The underlying loamy soils have just a small increase in clay-size particles compared to the overlying sands. Because the clay content of the sands and the underlying loamy soils is low, the shrink-swell potential of the soils can be expected to be low also. Soils with a low shrink-swell potential and are good soils upon which to build a house. Clay does underlie the sands and loamy soils on this lot, but the soils with the higher clay content occurred at depths of 5.5 feet or more in all the borings in the western (left) side of the lot. In soil borings #2 and #4 in the western central area, soils with a higher clay content were not encountered above a depth of 8 feet, the depth of the borings.

Soil borings #1 and #3 in the western (left) area of the lot showed soils with a higher clay content (sandy clay) underlying the loamy soils beginning at a depth of about 5.5 to 6 feet. Estimated shrink-swell potential of the sandy clay is moderate. The sandy clay has a higher content of clay-size particles along with a smaller amount of sand compared to the loamy soils. Clay with an expected high shrink-swell potential was observed beginning at a depth of about 6 to 6.5 feet in borings #1 and #3. Most builders try to maintain about 4 to 5 feet of soils with a low shrink-swell potential under the foundation of a house.

In the borings in the eastern (right) side of the area that slopes downward to the northeast, the soils with the higher clay content (sandy clay or clay) were encountered at a slightly shallower depth in the borings. However, the clay still should not be a concern as the builder will likely add sandy fill to the pad area of the house. The addition of fill will further increase the depth to any soils with a higher clay content. Boring #5 was made on the lower slope, about 90 feet east of boring #4. Boring #6 was made about 50 feet south of boring #5. Boring #7 was made about 75 feet south of boring #6 and boring #8 was made in the front area, about 75 feet south of boring #7. Borings #5, #6, and #8 showed sandy clay beginning at a depth of about 5 feet overlying clay at a depth of about 6 to 7 feet. In boring #7, sandy clay was observed beginning at a depth of about 4 feet and the depth to the underlying clay with an expected high shrink-swell potential was about 6.5 to 7 feet.

Shrink-swell potential is a measure of the shrinking of the soil when dry, and swelling or expanding of the soil when wet. Shrink-swell potential is dependent on the type and amount of clay in the soils. When the clay content is low, as it is in the sands and underlying loamy soils (sandy loams) on this lot, the shrink-swell potential is low also. Soils with a low shrink-swell potential are good materials upon which to build a house. The sandy clay observed in the borings has a higher content of clay-size particles and an estimated moderate shrink-swell potential. The underlying clay has a high clay content and low sand content and can be expected to have high shrink-swell potential.

At the time the soil borings were made, the soils were dry to slightly moist throughout. A water table was not encountered above a depth of 8 feet in any of the soil borings. After periods of heavy rainfall, the seasonal high water table (also called the wet season water table) can be expected for periods of time at a depth of about 5 feet in the higher lying "table-top area in the front area of the lot in which boring #1 was made. The seasonal high water table was estimated to occur at a depth of about 3.5 feet in boring #2 and a depth of about 2.5 feet in boring #3. On the lower lying areas of the slope in which borings #4, #5, and #6 was made, the seasonal high water table was estimated to occur at a depth of about 2 feet. On the higher lying slopes in the eastern area of the lot, the seasonal water table can be expected to occur for periods of time at a depth of about 2.5 feet in

the area in which boring #7 was made, and a depth of about 3.5 feet in the front area of the lot in which boring #8 was made. The depth to the seasonal high water table is estimated from the colors of the soils. Brown and yellowish brown color in soils indicates that the soils remain dry for most of the year. Soils that are saturated with water for long periods of time are gray in color.

### **Summary**

The “table-top” area of this lot is a very good location for the building of a house, based on the soil borings. The soils in this more level higher lying area have good natural drainage. The sands and underlying loamy soils have a low shrink-swell potential and depth to the underlying sandy clay or clay with a higher shrink-swell potential was more than 5.5 feet in each of the borings in the left side of the lot. Most builders try to maintain about 4 to 5 feet of soils with a low shrink-swell potential under the foundation of a house.

Moving down the slope off the “table-top” area, the depth to the seasonal high water table becomes shallower. Estimated depth to the seasonal high water table in boring #1 on the “table-top” area was 5 feet while the estimated depth in borings #4, #5, and #6 on the lower lying slope was about 2 feet. Even though clay does not occur at a shallow depth on the lower part of the slope, the lower areas receive surface water and lateral movement of subsurface water from the higher lying areas.

In the borings in the eastern (right) side of the area that slopes downward to the northeast, the soils with the higher clay content (sandy clay or clay) were encountered at a slightly shallower depth in the borings. This will likely not be a problem though as the builder may be able to add sandy fill to the lot so that excavation of the underlying clay would not be needed. The addition of fill would also be helpful in elevating the house above the water table that appears to occur at a shallower depth following periods of heavy rainfall in the eastern area of the lot than in the “table-top” area in the western part of the lot.

### **Suitability of the soils for a septic system filter field**

Sandy soils in which a water table does not occur at a shallow depth are best suited for the installation of a septic system filter field. Soils that have a shallow water table do not allow enough downward movement of water for a septic filter field. The State of Florida regulations require that the bottom of the septic filter field be located at least 24 inches above the seasonal high (also called the wet season) water table. Usually the septic filter field extends about 18 inches below the soil surface. Therefore, the wet season water table must remain below a depth of about 42 inches (24 inches + 18 inches = 42 inches).

The depth to the seasonal high (wet season) water table is estimated from the colors of the soils. A brown or yellowish brown color indicates that the soils remain dry for most of the year. Gray colors in the soils indicate that the soils are saturated with water for periods of time during the year in the area in which the gray colors have developed. The borings that were made showed that

the seasonal high water table depth ranges from a depth of about 5 feet in the higher lying “table-top” area to a depth of about 2 feet on the lower, more sloping areas.

If the house and septic filter field can be located on the higher areas of the lot, the septic filter field will likely only need to be elevated a small amount and it should be possible to easily blend the filter field into the slope of the land so that it is not noticeable. Because the water table does occur at shallower depths in the soils on the lower part of the slope, a higher above ground, mounded septic system filter field will likely be needed.

### **Soil Descriptions**

Included with this report is a sketch showing the general location of each of the 8 soil borings. In the descriptions, the terms, “loose” and “friable” refers to the consistence of the soil, and indicates the ease in which the soil is broken apart with the hand. Soils with a high clay content and high shrink-swell potential usually have a “firm” or “very firm” consistence, and breaking the soils apart with the hand is difficult. Soils that are loose or friable are much easier to work with than those that are firm or very firm. The following are descriptions of the soils at each of the borings.

#### **Soil boring #1**

Boring was made about 50 feet east and 75 feet north of the southwest property corner of the lot. This boring was made on the higher lying “table-top” area.

- 0 - 6 inches, dark grayish brown, loose, sand, low shrink-swell potential.
- 6 - 16 inches, brown, loose, sand, low shrink-swell potential.
- 16 - 62 inches, dark yellowish brown, loose, sand, low shrink-swell potential.
- 62 - 66 inches, light brownish gray, loose, sand, low shrink-swell potential.
- 66 - 70 inches, light brownish gray, friable, sandy loam, low shrink-swell potential.
- 70 - 74 inches, gray, firm, sandy clay, moderate shrink-swell potential.
- 74 - 96 inches, gray and olive gray, very firm, clay, high shrink-swell potential.

#### **Soil boring #2**

Boring was made about 75 feet north of boring #1, on a slightly lower part of the slope.

- 0 - 6 inches, dark grayish brown, loose, sand, low shrink-swell potential.
- 6 - 14 inches, brown, loose, sand, low shrink-swell potential.
- 14 - 46 inches, dark yellowish brown, loose, sand, low shrink-swell potential.
- 46 - 96 inches, light brownish gray and olive brown, friable, sandy loam, low shrink-swell potential.

#### **Soil boring #3**

Boring was made about 75 feet north of boring #2. This area is much more sloping.

0 - 4 inches, dark grayish brown, loose, sand, low shrink-swell potential.  
4 - 9 inches, brown, loose, sand, low shrink-swell potential.  
9 - 35 inches, dark yellowish brown, loose, sand, low shrink-swell potential.  
35 - 64 inches, light brownish gray, friable, sandy loam, low shrink-swell potential.  
64 - 70 inches, gray, firm, sandy clay, moderate shrink-swell potential.  
70 - 96 inches, gray and olive gray, very firm, clay, high shrink-swell potential.

#### **Soil boring #4**

Boring was made about 50 feet north of boring #3, on the lower part of the slope.

0 - 10 inches, dark grayish brown, loose, sand, low shrink-swell potential.  
10 - 18 inches, brown, loose, sand, low shrink-swell potential.  
18 - 28 inches, dark yellowish brown, loose, sand, low shrink-swell potential.  
28 - 44 inches, light brownish gray and olive brown, loose, sand, low shrink-swell potential.  
44 - 96 inches, light brownish gray and olive brown, friable, sandy loam, low shrink-swell potential.

#### **Soil boring #5**

Boring was made on the lower part of the slopes, about 50 feet east of boring #4.

0 - 7 inches, dark grayish brown, loose, sand, low shrink-swell potential.  
7 - 12 inches, brown, loose, sand, low shrink-swell potential.  
13 - 27 inches, dark yellowish brown, loose, sand, low shrink-swell potential.  
27 - 58 inches, light brownish gray, loose, sand, low shrink-swell potential.  
58 - 82 inches, olive brown and light brownish gray, friable, sandy loam, low shrink-swell potential.  
82 - 96 inches, gray, firm, sandy clay, moderate shrink-swell potential.

#### **Soil boring #6**

Boring was made on the more sloping part of the area, about 75 feet south of boring #5.

0 - 5 inches, dark grayish brown, loose, sand, low shrink-swell potential.  
5 - 10 inches, brown, loose, sand, low shrink-swell potential.  
10 - 29 inches, dark yellowish brown, loose, sand, low shrink-swell potential.  
29 - 38 inches, light brownish gray, loose, sand, low shrink-swell potential.  
38 - 61 inches, olive brown and light brownish gray, friable, sandy loam, low shrink-swell potential.  
61 - 86 inches, gray, firm, sandy clay, moderate shrink-swell potential.  
86 - 96 inches, gray, very firm, clay, high shrink-swell potential.

#### **Soil boring #7**

Boring was made higher on the sloping part of the area, about 75 feet south of boring #6.

0 - 6 inches, dark grayish brown, loose, sand, low shrink-swell potential.  
6 - 11 inches, brown, loose, sand, low shrink-swell potential.  
11 - 34 inches, dark yellowish brown, loose, sand, low shrink-swell potential.  
34 - 41 inches, light brownish gray, loose, sand, low shrink-swell potential.  
41 - 49 inches, olive brown and light brownish gray, friable, sandy loam, low shrink-swell potential.  
49 - 80 inches, gray, firm, sandy clay, moderate shrink-swell potential.  
80 - 96 inches, gray, very firm, clay, high shrink-swell potential.

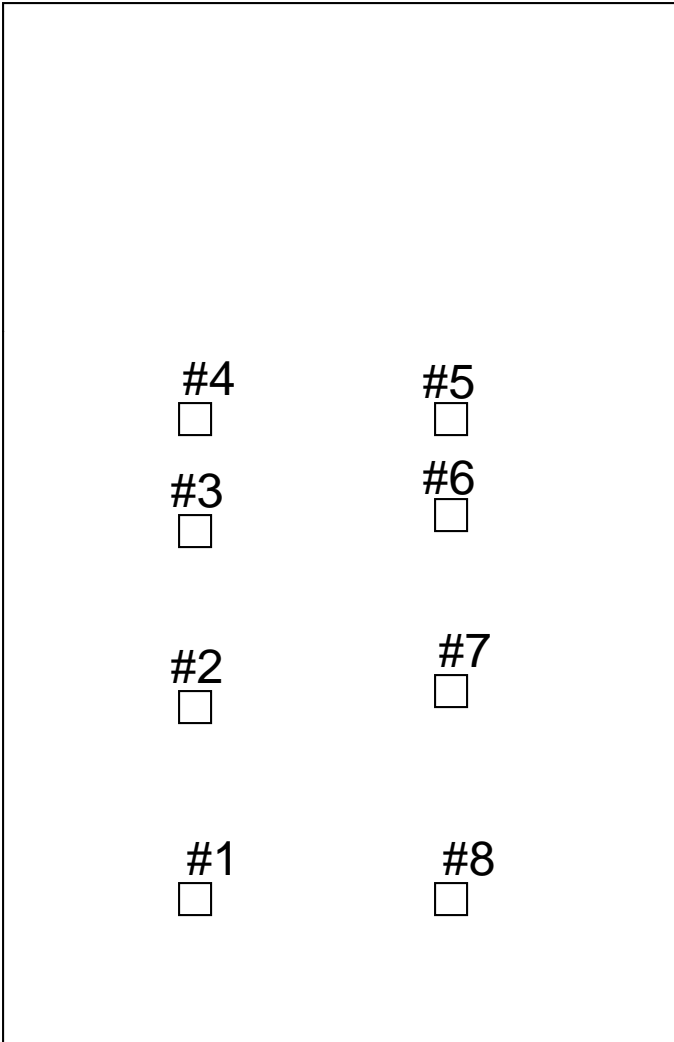
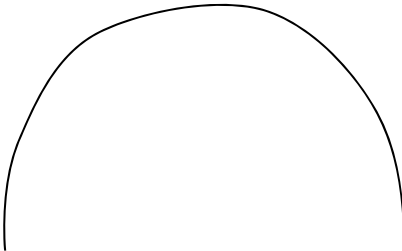
### **Soil boring #8**

Boring was made about 75 feet south of boring #7 on the higher part of the eastern area of the lot.

0 - 7 inches, dark grayish brown, loose, sand, low shrink-swell potential.  
7 - 14 inches, brown, loose, sand, low shrink-swell potential.  
14 - 40 inches, dark yellowish brown, loose, sand, low shrink-swell potential.  
40 - 52 inches, light brownish gray, loose, sand, low shrink-swell potential.  
52 - 61 inches, olive brown and light brownish gray, friable, sandy loam, low shrink-swell potential.  
61 - 73 inches, gray, firm, sandy clay, moderate shrink-swell potential.  
73 - 96 inches, gray, very firm, clay, high shrink-swell potential.

**Location of Soil Borings  
10006 NW 53<sup>rd</sup> Ave.  
Hammock subdivision**

**North**



The boring that is furthest north is apx 275' from the street.  
(per Ron Kuehl 5/2010)

**NW 53<sup>rd</sup> Ave.**