

Permeability Analysis and Soil Profile
Villages at Noah's Landing
Lakeland, FL
ITL Project No. 10396

Prepared for:

Prepared by:
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Re: Villages at Noah's Landing; Lakeland, FL
Permeability Analysis and Soil Profile

As requested, Imperial Testing Laboratories, Inc. (Imperial) has performed two soil borings for seasonal high water table and groundwater elevation determination. Two permeability tests were also completed at the referenced site. The borings were designated as B-1 and B-2 and the permeability tests are designated as PV-1 and PH-1. The test locations can be found on Figure 1. The following is the report of our findings.

1. Permeability test samples were secured by use of a Shelby tube sampler. A vertical (PV-1) and horizontal (PH-1) sample was secured at the requested depth. The vertical and horizontal permeabilities were secured at 20 inches below land surface (bls). The horizontal sample was obtained via a small excavation to gain access to the subsurface soils at the required sampling depth. The tests were performed in general accordance with ASTM D2434, with applicable modifications. The following calculation was obtained from the referenced test method and was used to determine the coefficient of permeability.

Permeability Calculation: $K = \frac{QL}{Ath}$

Where: K=permeability, cm/sec
 Q=constant rate of flow, cm³
 L=length of portion tested, cm
 A=cross sectional area of specimen, cm²
 t=total time of discharge, sec
 h=constant head measured, cm

Applying the above calculation with test water viscosity corrections and safety factors, Imperial estimates the average permeabilities as follows:

Test No.	Depth of Sample (inches)	Permeability Type	Average Coefficient of Permeability	
			(cm/sec)	(ft/day)
PH-1	20	Horizontal	.000033	.09
PV-1	20	Vertical	.000028	.08

2. Two auger borings (B-1 and B-2) were performed in the locations shown on Figure 1. The purpose of the soil borings was to determine the lithological profile in the tested locations. The borings were also installed to determine the seasonal high water mark depth and groundwater elevation, if encountered.

The borings were advanced by means of a four (4) inch mechanical auger attached to a drilling rig. The borings were installed to twenty (20) feet bls. The borings were conducted in accordance with the standard method of *Soil Investigation and Sampling by Auger Borings*, as found in ASTM D1452. Visual Classifications of all soil samples were accomplished with the aid of the *Unified Soil Classification System*. The following is a summary of the soils encountered. The Driller's field reports are attached.

Boring No.	Depth (in.)	Soil Description
B-1	0-12	Dark gray silty fine sand (dense)
	12-18	Dark gray silty fine sand with tan clayey sand lenses (dense)
	18-36	Dark gray silty fine sand (dense)
	36-45	Dark gray silty fine sand with brown mottled silty fine sand with iron staining
	45-60	Gray to light gray and brown mottled silty fine sand
	60-106	Dark gray silty fine sand
	106-120	Dark gray silty fine sand with light gray fine sand stringers
	120-240	Dark gray silty fine sand
		Seasonal High Water Mark @ 36 inches
		Boring Terminated @ 240 inches
B-2	0-40	Light gray silty fine sand to clayey sand (dense)
	40-48	Gray slightly silty fine sand with iron staining
	48-78	Light gray fine sand
	78-120	Gray fine sand
	120-216	Dark gray silty fine sand
	216-240	Dark gray silty fine sand with light gray clayey sand
		Seasonal High Water Mark @ 40 inches
		Boring Terminated @ 240 inches

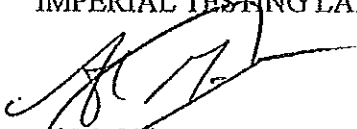
Generally dense to very dense silty to clayey sands were encountered in the upper three (3) feet. Fine sands and fine sands with some silt were encountered below approximately three (3) feet and to the boring termination depths. Some clayey sands were also found near the boring termination depth at the B-2 location. The borings were terminated at 240 inches. The in-situ water table was reported at 73 inches and 76 inches for the B-1 and

B-2 locations. The seasonal high water mark was encountered at 36 inches at B-1 and 40 inches at B-2. According to the *Soil Survey of Polk County, Florida* (USDA-NRCS) the area tested appears to be in soil type #7 or Nielhurst Sand. The results indicate that the area tested is likely a dissimilar soil in the Nielhurst group or a transitional soil type. The results indicate that the soil type may be soil #54 or Pomello-Urban land complex which is in the vicinity of the tested area. Pomello-Urban land complex soils have a seasonal high water table between 24 to 42 inches.

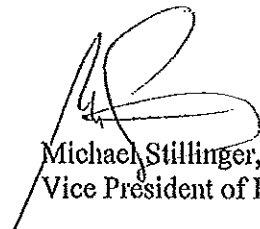
We trust the information contained herein will fulfill your present requirements. However, should you need any additional information, or if we may be of any further assistance, please contact us. We sincerely appreciate this opportunity to be of service to you.

Respectfully Submitted,

IMPERIAL TESTING LABORATORIES



Al McGhin
President



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Cc: Client
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