# **South Carolina Department of Transportation**

# **Geophysics Training Short Course**

# **Homework Assignment #1**

1. List two characteristics of a shear wave
   1. Velocity is less than a compression wave
   2. Insensitive to saturation
   3. Direction of particle displacement is perpendicular to direction of wave propagation
2. In situ seismic tests were used to measures Vs = 800 ft/sec and Vp = 1200 ft/sec:
   1. Is the material most likely a soil or rock? Soil
   2. What is Poisson’s ratio for this material?  
        
         
        
         
        
       = 0.10
3. An incident compression wave encounters the interface between Material 1 and Material 2, and it is observed that the reflection coefficient is approximately -1.0 and the transmission coefficient is approximately 0.0. What can be inferred about the relative stiffnesses of Materials 1 and 2?
4. The accompanying spreadsheet contains data acquired during a seismic cone penetration test (SCPTu):
   1. Interpret the data to develop a shear wave velocity profile
   2. Calculate the average shear wave velocity over the upper 70 ft of the profile