Lab 5 – 03/08/2017

Name_____

Due Wednesday, March 8th: This worksheet and your pit profile sheet.

Objective: To explore the concepts of shear stress and strength in the snowpack.

Calculating shear strength:
Suppose we used the 10 cm x 10 cm shear frame and pulled values of 0.10kg, 0.12kg, 0.09kg, and 0.12kg on a certain layer of interest. The average pull is calculated at 0.1075kg. We can then calculate the average shear strength at the layer of interest is:

$$T_1 = \frac{(kg)(g)}{\text{area of shear frame}} = \frac{(0.1075kg)(9.8m/s^2)}{100cm^2}$$

$$T_1 = \frac{(0.1075kg)(9.8m/s^2)}{.01m^2} = 105.35Pa = .10535kPa$$

Answer the following questions (Please show your work):

1. What layer did you choose to pull shear frames? Why did you choose that layer?

2. Using the values from the shear frame you pulled, first calculate the average of those values. Then use the technique above to calculate the shear strength of the layer from your pit.

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3. How much additional snow (110kg/m^3) would need to fall on a 35 degree slope to make this layer fail?

4. How does this quantitative assessment agree with the hardnesses and crystal types found in your pit profile?