

# **PRESSURE PLATE SAMPLE PREPARATION PROCEDURE**

## ***For Coarse Aggregate Soils***

***\*Samples are compacted at optimum water content and max density***

### **1. PREPARING THE SAMPLES**

- A. Obtain **Maximum Dry Density** and **Optimum Moisture Content** from test report
- B. Determine amount of soil and water needed for 4 soil samples (see spreadsheet)
- C. Mix soil and water in large mixing bowl
- D. Place soil in sealed plastic container with a damp paper towel
- E. Let the soil sit for 24 hours

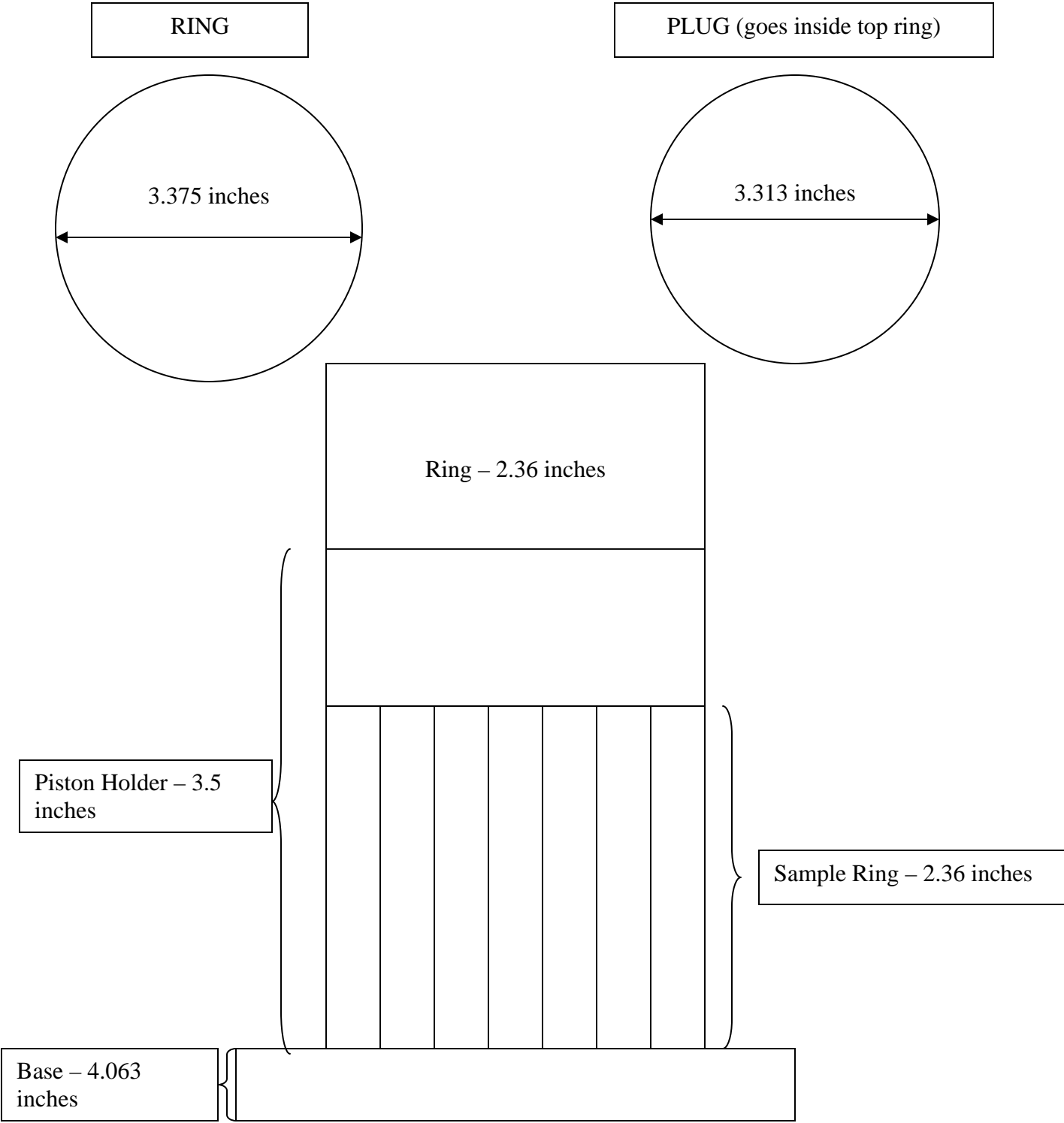
### **2. WEIGHING THE SOIL AND SAMPLE RINGS**

- A. Obtain 3 rubber bands and cut out 3 pieces of cheesecloth using cardboard template
- B. Obtain 3, 2 inch brass rings
- C. Record the individual weight of each ring with a piece of cheesecloth and a rubber band
- D. Weigh out the amount of wet soil needed for 1 sample (see spreadsheet)

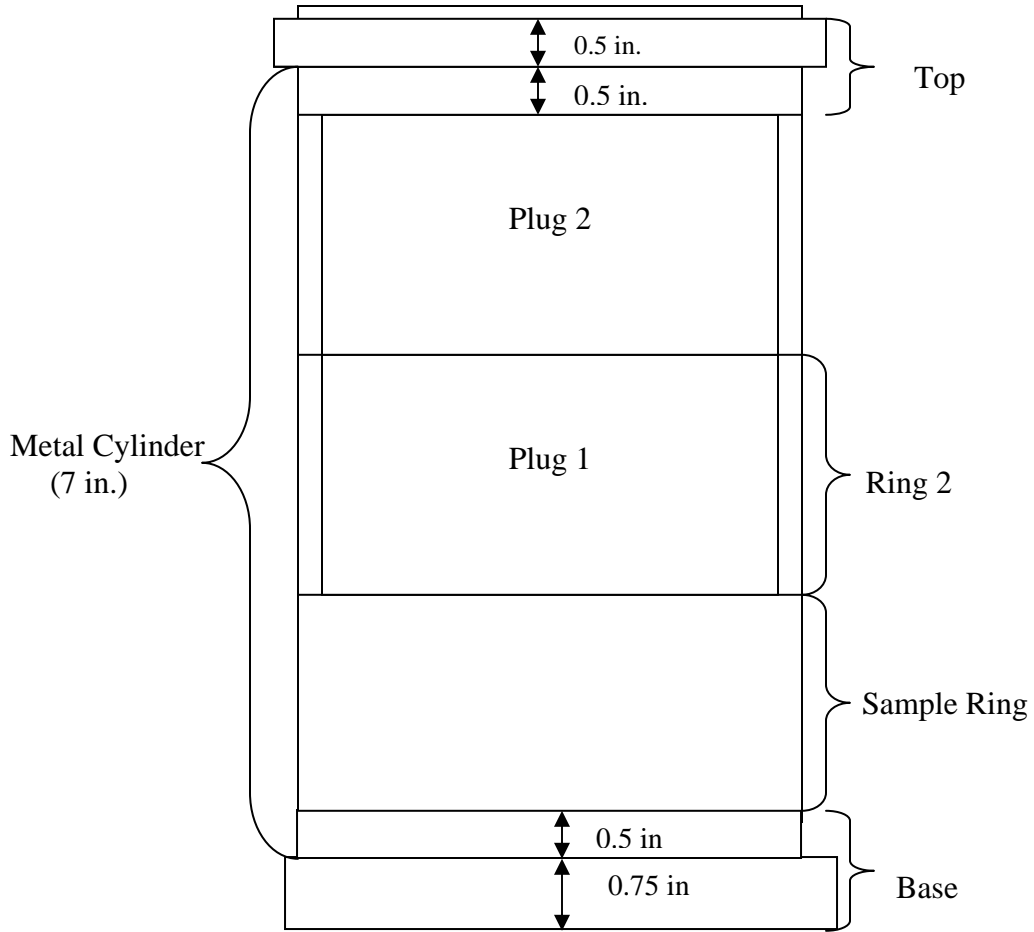
### **3. PACKING THE RINGS (see Figure 1 or Figure 2)**

- A. Cover the base with a piece of plastic wrap
- B. Place 1, 2 inch ring on top of the base
- C. Place another 1 inch ring on top of the bottom ring
- D. Place the 7 in. metal cylinder on top of the rings and base
- E. Put 1/3 of the soil in the bottom ring.
- F. Pack the soil down and score the top with a knife or spatula
- G. Repeat the procedure 2 more times with the remaining soil
- H. Place a piece of filter paper on top of the soil
- I. Put 2, 2 in. plugs inside cylinder on top of soil
- J. Place cover on top of cylinder
- K. Compress the soil sample in soil press (see Figure 3) until the top is flush with the metal cylinder
- L. Remove the sample from the tube and attach a piece of cheesecloth to the bottom of the sample with a rubber band
- M. Repeat the process 2 more times

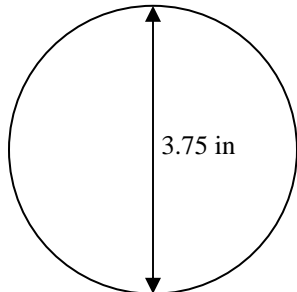
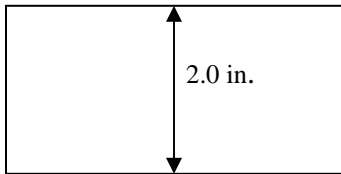
**Figure 1**  
**Compaction Setup and Diagram for Preparing**  
**Tempe Cell Samples**



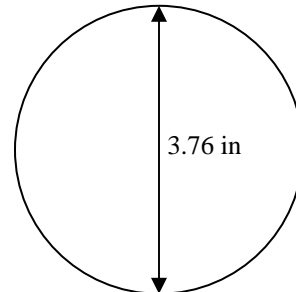
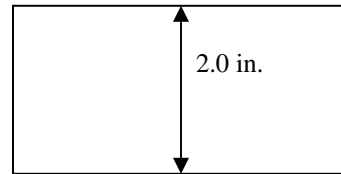
**Figure 2**  
**Compaction Setup for Large Brass Rings/Aggregate Base Compaction**



**Plug Dimensions**



**Ring Dimensions**





**Figure 3: Soil Press**

#### **4. SATURATING THE SAMPLES**

- A. Place all samples, cheesecloth side down, on a pressure plate rated to the pressure you plan to test
- B. Place 3, 1 inch rings on the bottom of a large, rectangular tub
- C. Put the pressure plate with the samples on top of the rings
- D. Fill the tub with **deionized water** until the water is approximately  $\frac{1}{2}$  way up the side of the rings
- E. Place rectangular pieces of PVC on top of the rings
- F. Set containers partially filled with water on top of the pieces of PVC (this step helps to prevent the samples from swelling)
- G. Let the samples saturate approximately 4 days or until the top of the soil glistens

**5. USING THE PRESSURE PLATES**

- A. After the samples have saturated, weigh and record the weight of each one (see data recording sheet)
- B. Place the plate containing the samples into the pressure chamber
- C. Attach the outlet hose to the plate
- D. Place the top on the chamber, making sure to tighten each screw well
- E. Put the drainage hose into a graduated cylinder and cover the cylinder with a piece of parafilm
- F. Set the chamber to desired pressure

**6. MEASURING MOISTURE LOSS**

- A. Record the amount of moisture in the graduated cylinder daily (see data recording sheet)
- B. When there is no change in the amount of moisture flowing into the graduated cylinder, remove the plate from the chamber

**(WHEN REMOVING A PLATE FROM THE CHAMBER, ALWAYS RELEASE THE PRESSURE BEFORE REMOVING THE TOP)**

- C. Record the weight of each of the samples
- D. Repeat for other pressures

**7. DRYING THE SAMPLES**

- A. After all the pressures have been measured, remove the samples from the plate
- B. Obtain 1 drying can for each of the samples
- C. Record the weight of each empty drying can (see data recording sheet)
- D. Remove the soil from the rings (put only 1 sample in a can)
- E. Dry each soil sample at 105° for 24 hours in the lab oven
- F. Record the weight of the dry soil and can for each sample (see data recording sheet)

**8. DEVELOPING MOISTURE CURVES**

- A. Enter data into pressure plate calculation spreadsheet
- B. Obtain gravimetric and volumetric moisture for each soil
- C. Enter data into **Soil Vision** and generate moisture curves for samples