# TBM Soil Conditioning Test Instructions (Home Method)

## 🎯 Objective

Simulate how different household additives affect the flowability (viscosity) of clay-rich soil by measuring how far a small mound collapses after the container is removed.

## 📦 Materials Needed

- Clay-like soil (see sourcing below)

- Clear plastic or measuring cup (~250 ml)

- Spoon or spatula

- Stiff paper or cardboard (acts as base)

- Ruler (marked in cm/mm)

- Timer or stopwatch (phone is fine)

- Bowls for mixing

- Pen and notebook (or phone) to record results

## 👷 Where to Get Clay Soil

- Dig from gardens, creek beds, or roadside construction areas

- OR buy pottery clay, bentonite, or clay-based (non-clumping) cat litter and mix with water

## 🧴 Test Additives (Choose 3–6)

- Control: Water only

- Dish soap (surfactant)

- Cornstarch or flour (thickener)

- Vegetable or olive oil (lubricity)

- Vinegar or lemon juice (acidic modifier)

- Baking soda (alkaline modifier)

- Shampoo, hand soap, or detergent (slip/foam)

## 🧪 Step-by-Step Instructions

1. Mix the Soil:  
- Combine ~½ cup clay soil with your chosen additive.  
- Mix thoroughly until smooth and even.

2. Load the Cup:  
- Spoon the soil mixture into a measuring cup.  
- Lightly compress it to remove air gaps.

3. Seal and Flip:  
- Place a flat sheet of paper or cardboard over the cup’s opening.  
- Hold the paper tightly and flip the cup upside down onto a flat surface.

4. Release the Cup:  
- Lift the cup vertically, leaving the soil mound resting on the paper.  
- Start a 30-second timer immediately after lifting.

5. Measure:  
- After 30 seconds, measure the final height of the soil mound with a ruler.  
- Calculate slump: Original cup height - Final mound height.

## 🧾 Sample Results Table

|  |  |  |  |
| --- | --- | --- | --- |
| Batch | Additive | Slump Distance (cm) | Notes (flow, shape, cracks) |

## ✅ Interpreting Results

- More slump = lower viscosity / more flowable

- Less slump = thicker / more cohesive

- Ideal: flows smoothly but doesn’t collapse

- Use photos to compare results if possible