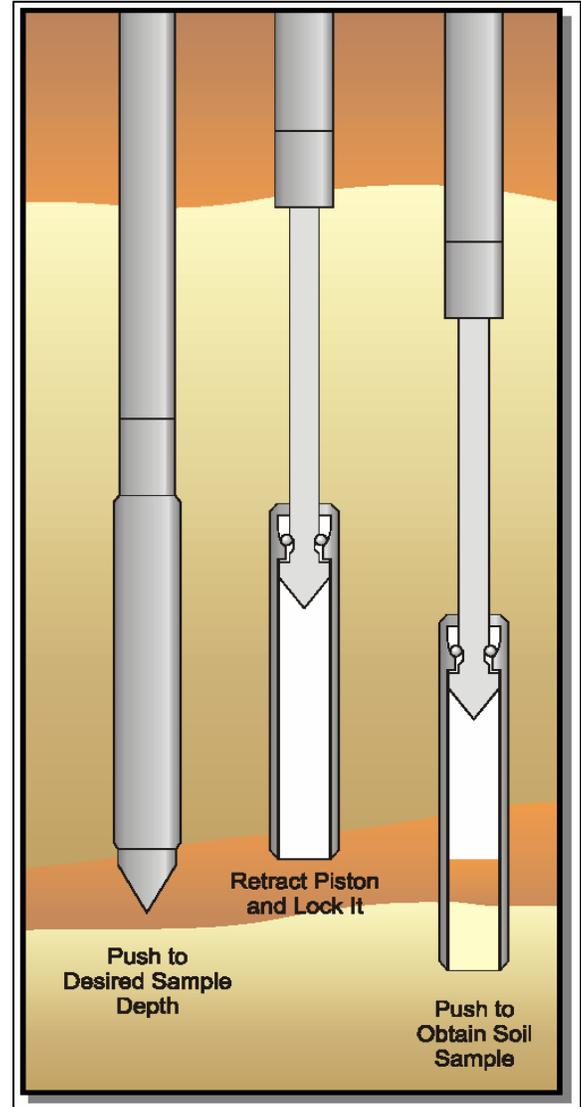


# Soil Sampling “Push, Wiggle, Slam, & Twist”

## DIRECT PUSH METHOD

Gregg Drilling and Testing, Inc. collects soil samples using a piston-type sampler which remains closed until positioned at the required depth, *Figure SS*. This minimizes the potential of cross contamination caused by sloughing. The samples can be deployed by a static hydraulic push or dynamic hammering and vibration. Static push methods preserve most of the soil fabric and micro lithologies but can distort layers near the sampler walls. In very soft formations (1 - 12 blows per foot), the sampler may "plug off" when the internal skin friction of the sampler exceeds the bearing capacity of the soil. This method is most often employed with CPT equipment and RamSet rigs, but can sometimes be used with traditional drill rigs. Normal daily production can average 150 feet of sampling (samples collected every 5'). This method is not effective in formations denser than 70 blows per foot with SPT.

Dynamic hammering (syn "GeoProbe") methods are excellent for shallow (0-35 feet) rapid sample collection. The hammering mobilizes soil grains near the sampler walls which allows the sampler to penetrate even moderately dense (SPT 50 blows per foot) formations without "plugging off". The hammering usually destroys or remolds the soil fabric but can be used to collect reliable samples for chemical analysis. Average production rates can exceed 220 feet per day (collecting samples every 5').



*Figure SS*

## **VIBRATION METHOD**

Gregg Drilling and Testing, Inc. utilizes a vibration sampling method that is effective in collecting continuous core soil samples if the soil has high moisture content and is in shallow in depth. A variable frequency selector allows the operator to adjust the rotation rate of an eccentric cam until resonance is achieved and the soil particles near the sampler walls fluidize allowing sampler penetration. The method usually maintains excellent lithologic structure although some distortion may occur near the edges. The equipment is hand portable for shallow sediment sampling from small rafts or barges over water.

## **SLAM METHOD**

The Standard Penetration Test is the most traditional soil sampling method. It involves driving a split barrel (spoon) sampler with a 140 lb. hammer from a 30" drop. Split spoon samplers are usually 18" long and have a 2" or 2.5" inside diameter. For a geotechnical measurement of the penetration (SPT) resistance, an ASTM standard D1586-84 exists which requires a 1.5" ID sampler. The drive rods and cable are marked at the surface with three successive 6" increments so that the advance of the sampler can be observed and number of blows recorded. The first six inches of penetration is considered "seating". The second 2 increments of penetration are summed and recorded as "standard penetration resistance" or "N-value". Generally, the higher the "N-value", the denser the soil. For environmental applications, Gregg Drilling normally prepares the 2" ID samplers with 6" long brass or stainless steel liners. Upon completion of the penetration and retrieval of the samplers, the liners are removed by sterile-gloved personnel. The end of the liners are covered with Teflon sheeting and capped securely. The samples are then labeled and cooled to 37°F and shipped with appropriate "chain of custody" documentation.

## **TWIST METHOD**

Gregg Drilling and Testing, Inc. offers a system to collect continuous core soil samples that latches into the auger stem and is advanced as the augers rotate into the ground. A 5-foot long 2.5" ID core can normally be retrieved for very accurate lithologic description and good environmental testing integrity. The fabric of the soil is usually disturbed and the core should not be used as a reliable geotechnical sample. The sampler can also be lined with clear plastic tubing for long term storage.

