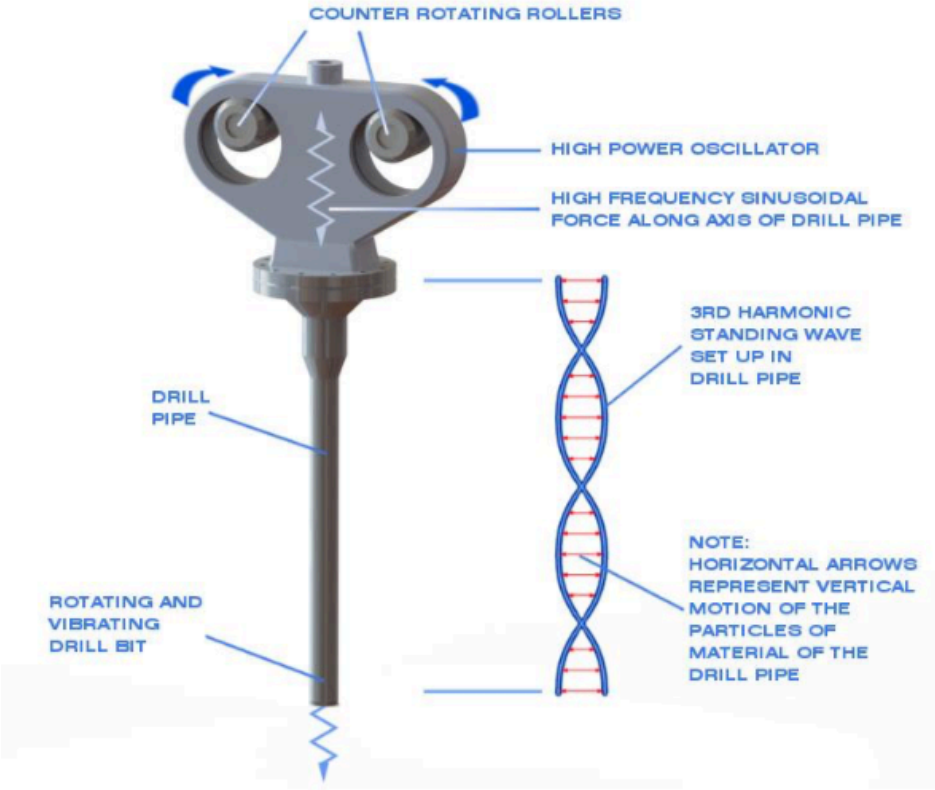
ABOUT SONIC DRILLING

PRINCIPLE OF SONIC DRILLING:

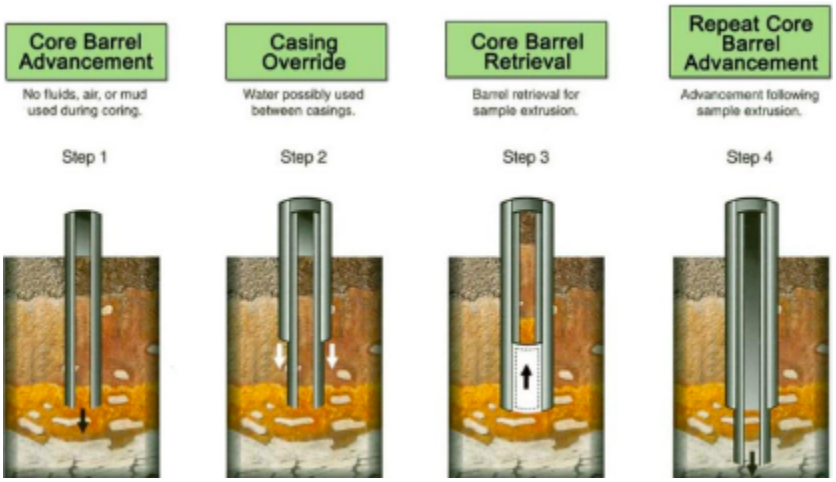


- **High frequency (50-150 hertz) mechanical vibration combined with rotation and down-pressure**
- **High speed eccentric counter-rotating rollers**
- **Resonance occurs when vibrations coincide with the natural resonate frequency of the pipe thus, drill energy is delivered to the bit face**
- **Borehole advancement is the result of shearing and displacement**

VIBRATION REDUCES FRICTION WITH SOILS

ABOUT SONIC DRILLING

PROCEDURE:



Step 1: Core Barrel Advancement

- **The core barrel is advanced using sonic frequencies. When necessary this step can be performed using no fluids, air or mud**

Step 2: Casing Override

- **After the core barrel is in place, casing is sonically advanced over the core barrel, protecting the bore hole's integrity in loose unconsolidated ground**

Step 3: Core Barrel Retrieval

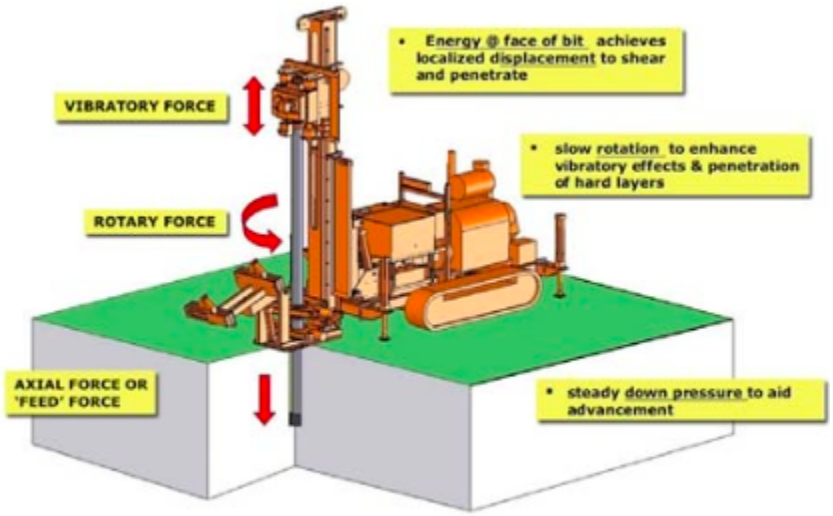
- **The core barrel is retrieved, producing a relatively undisturbed sample with *near 100% core recovery***

Step 4: Repeat Core Advancement

- **Steps 1 through 3 are repeated to depth, producing a continuous core sample through unconsolidated formations with *less than 1% deviation***

ABOUT SONIC DRILLING

ILLUSTRATION OF SONIC DRILLING:



Basic Principle of Sonic Drilling

Vibratory Force:

- **Provides velocity and localized displacement to shear and penetrate**

Rotary Force:

- **Provides slow rotation or slewing to enhance vibration effects**

Axial Force or Feed:

- **Provides a steady push or pull to aid with advancement or retraction**

High frequency (50-150 Hz) mechanical vibration combined with rotation and down-pressure