Effective in-situ tests for measurement of soil properties for over water or deep investigations using wire-line methods

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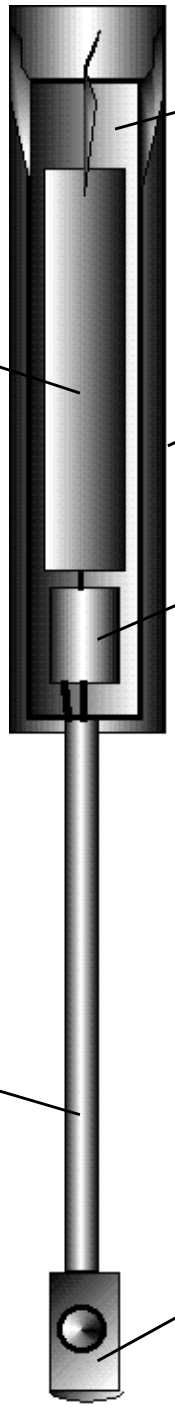
Advantages of Wire-Line Testing

- Speed – 3 to 4 times faster than conventional testing
  - Eliminate screwing on and off rods
  - No electronic cable for the tests
    - All measurements made down the hole inside the probe
- Can quickly drill through obstructions
- Hole has less inclination

Wire-line Dilatometer Tests



Nitrogen bottle

"core barrel" and Hooking system

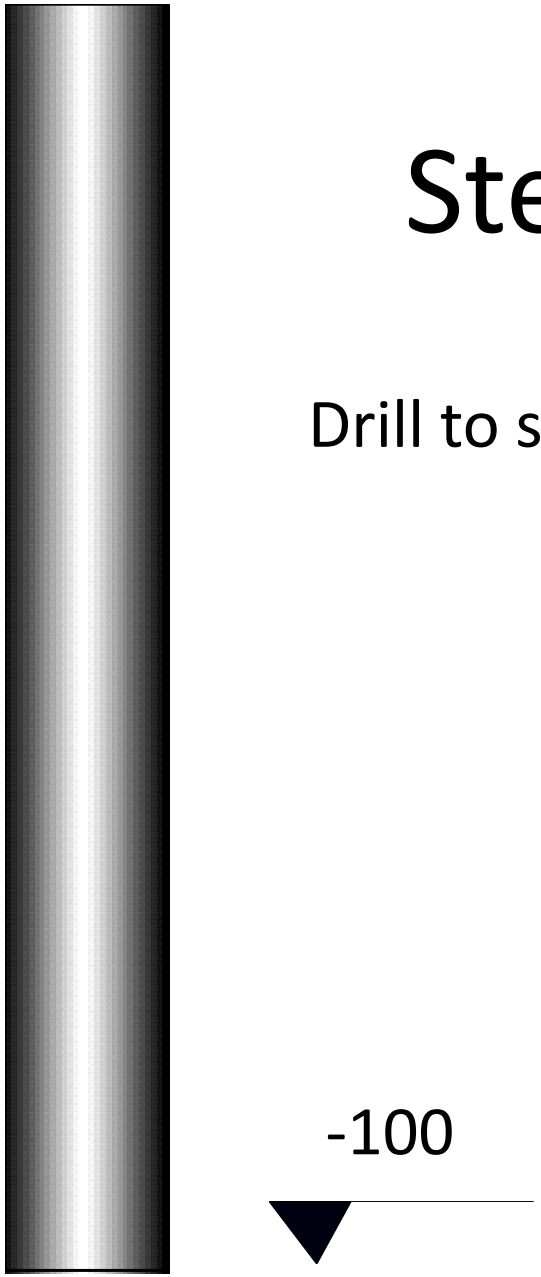
Wire-line Casing

electronics

GENERAL VIEW OF WIRE-LINE DILATOMETER

50 mm diameter rods

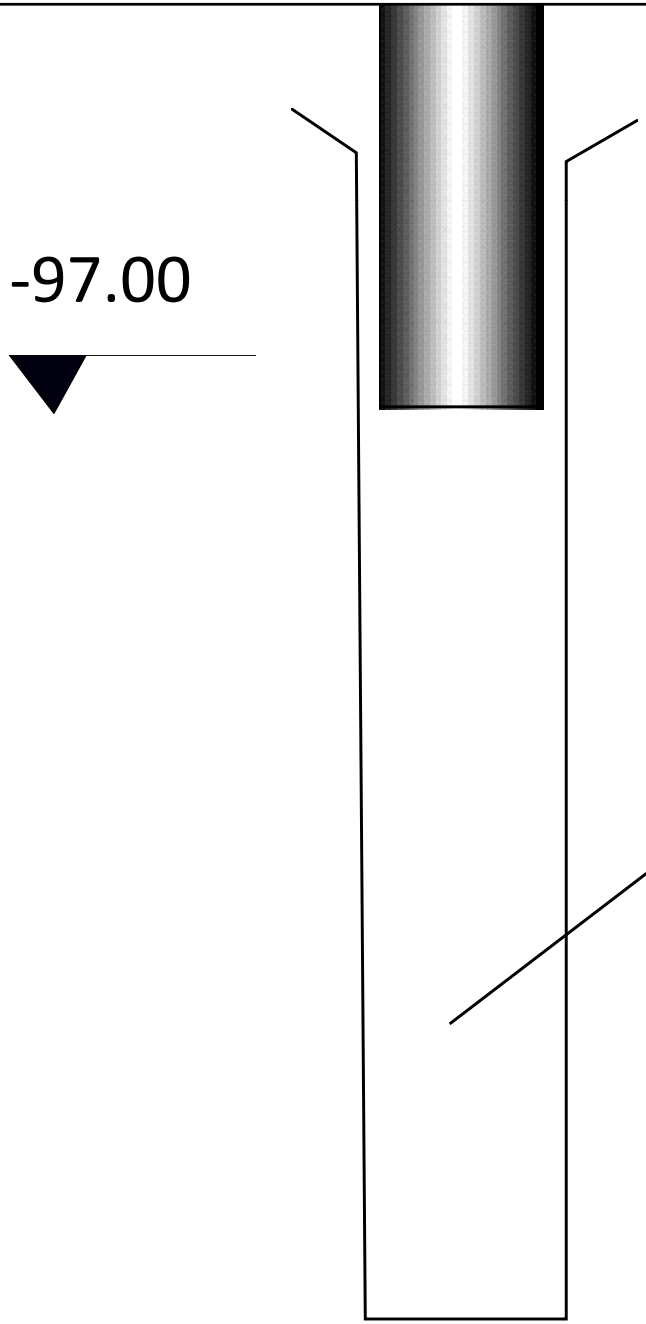
DMT blade



Step 1

Drill to start DMT depth -100 m

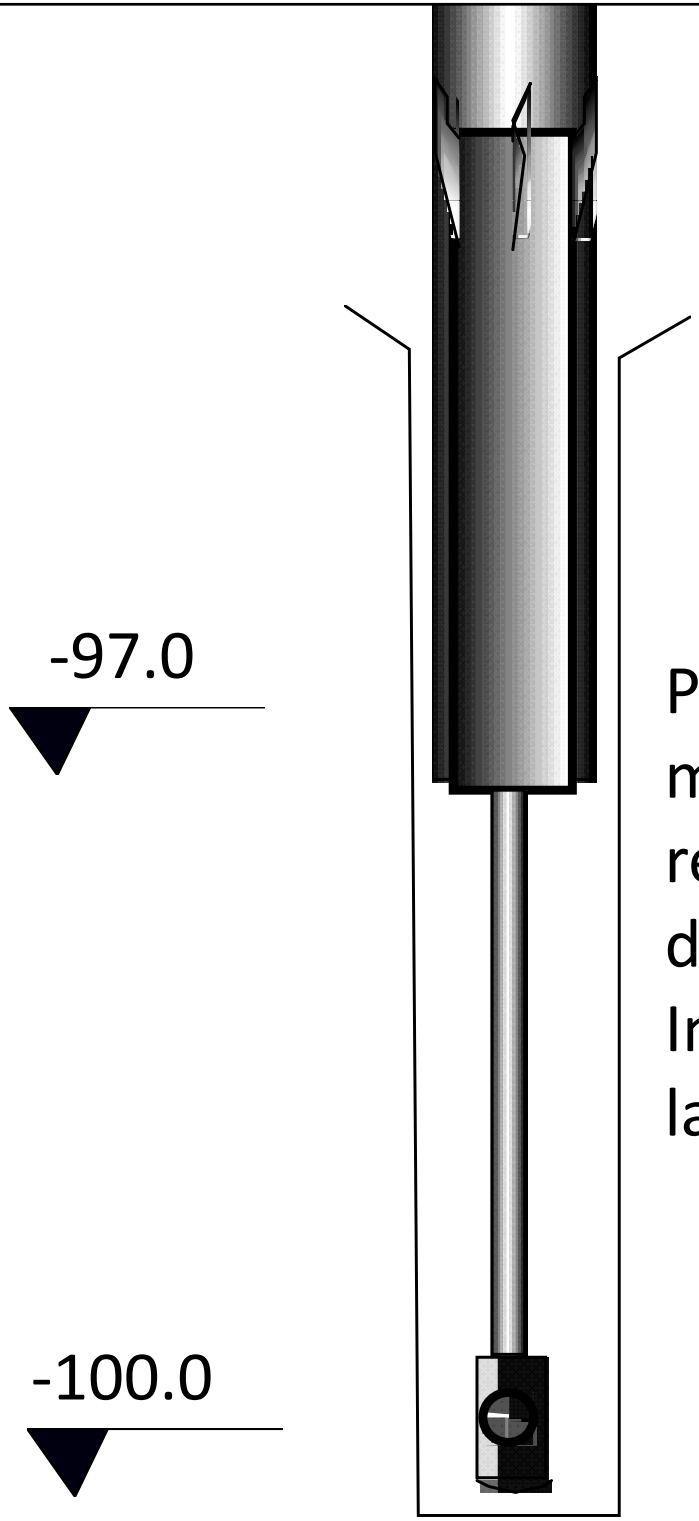
-100



Step 2

Lift the wire-line casing up to -97.0 m

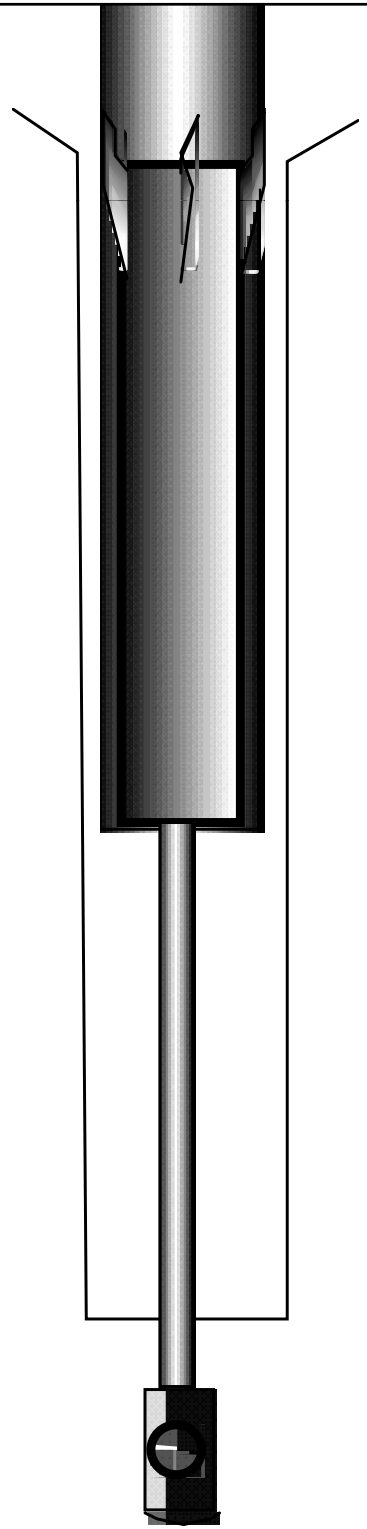
Step 3



Prior to the inserting the DMT probe, the microcomputer inside the corebarrel is reset and the synchronization with depth is done.

Insert the Wire-line DMT Core Barrel and latch it into the wire-line casing.

Step 4

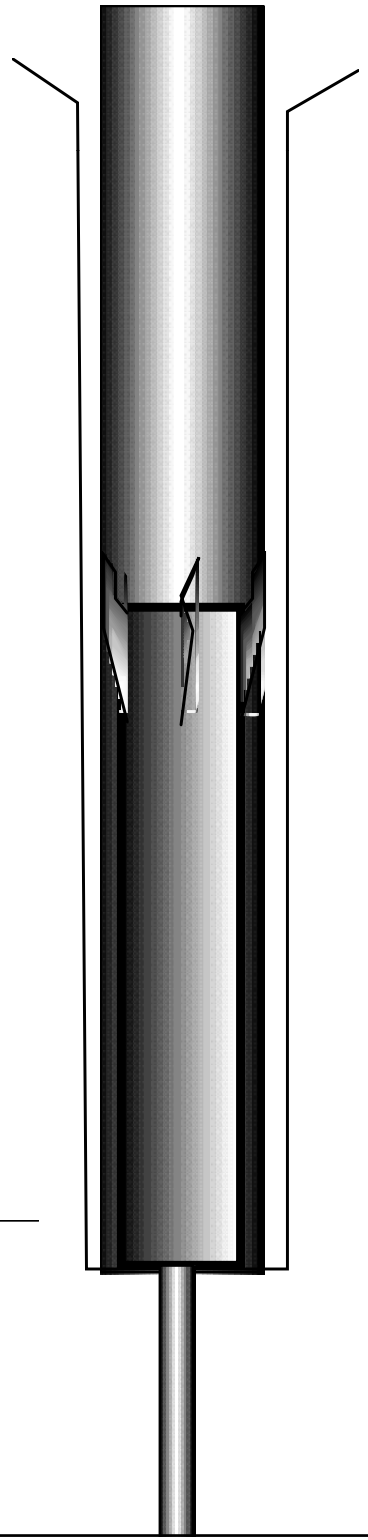


-100.2……-103.0

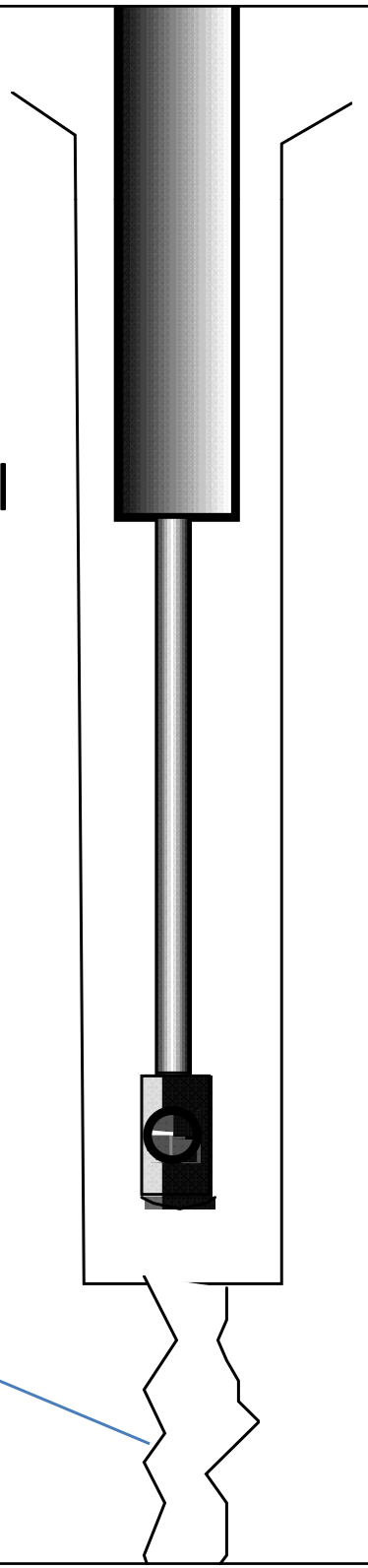
Push the wire-line DMT into the soil, in 20 cm test intervals.
After each interval the pushing is stopped for a certain time interval, and the DMT test is performed

Step 5

END OF PUSHING:
Retrieve the wire-line DMT Core Barrel

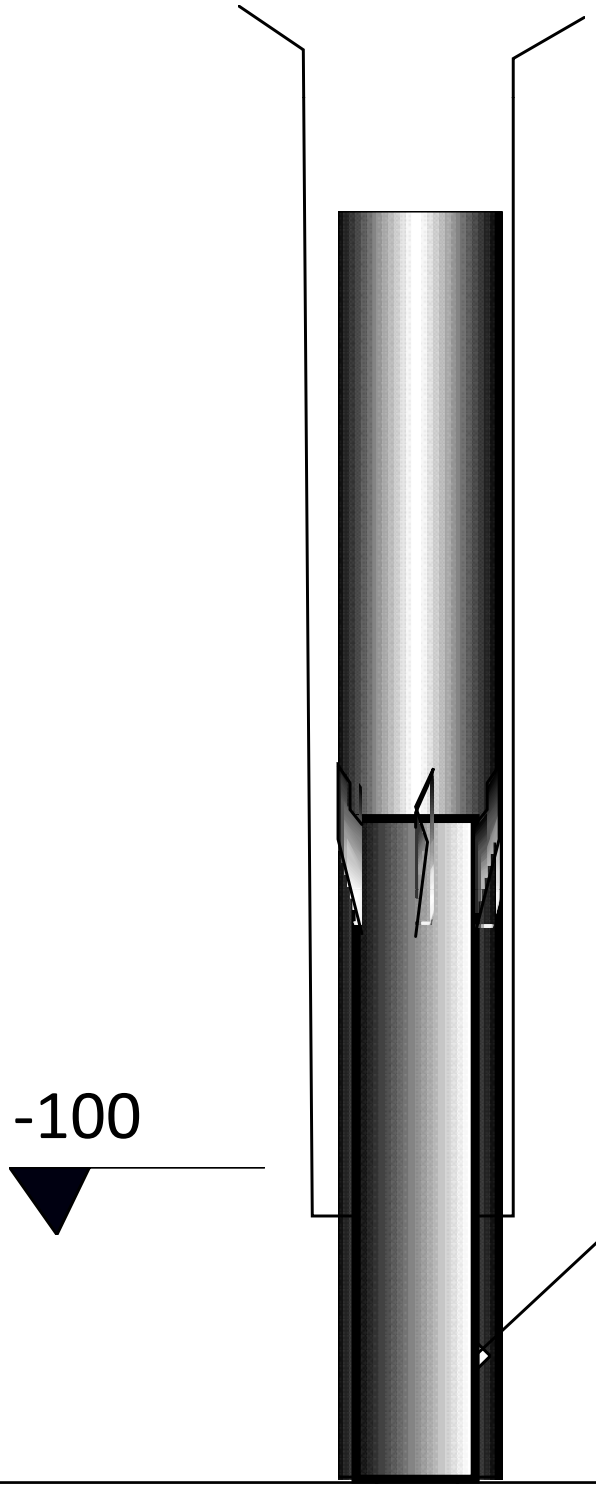


-100



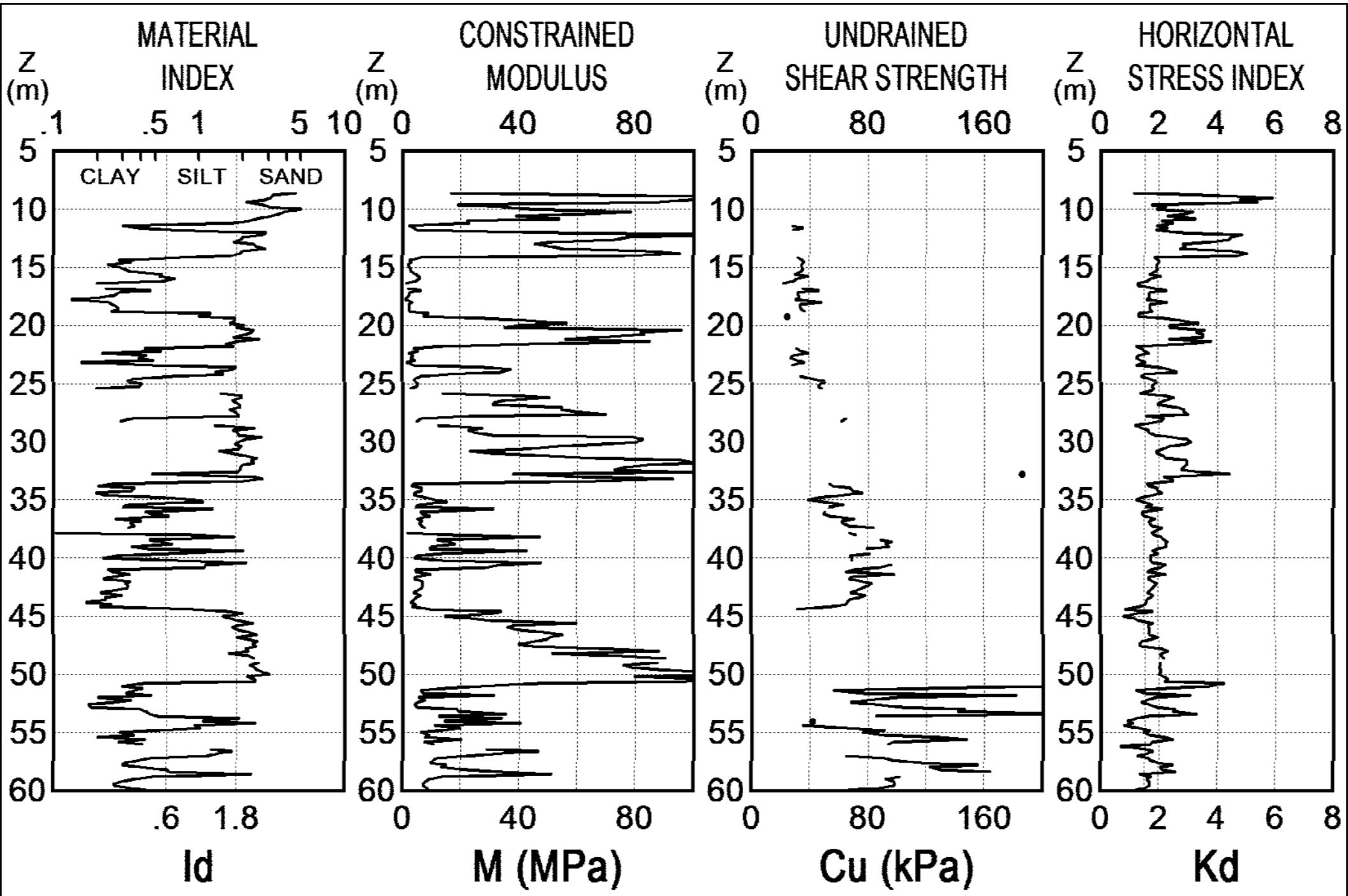
Remolded soil

Step 6



Insert a tri-cone bit and wash out the remolded soil. Resume DMT below drilled zone. (Step 1)

Remolded soil



Wire-line dilatometer test data

Upcoming Use of Wire-line DMT

- Massimo and I will be performing a wire-line DMT to a depth of 135 m for a nuclear power plant project near Washington D.C. in June
  - Will be the deepest DMT sounding
  - Will be some cemented sand layers that we will have to drill through

Roller Bearing to Prevent Piezocone from Rotating while Drilling/Advancing

Wire-line CPT probe

Conclusions

- For deep soundings and ones over water, wire-line methods are 3 to 4 times more efficient
  - Should gradually replace conventional methods
- No difference in data quality
- Can easily drill through otherwise non-penetrable layers
- Less inclination
- Less rod friction