

Contractometer: What we have learned about Micropile Behaviour from Field Instrumentation

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Outline

- Instrumentation Used
- Typical Test set up
- Results from 4 Tests
- Comments

Contractometer

Mechanics

Cable to data logger

Head of Contractometer

Potentiometers

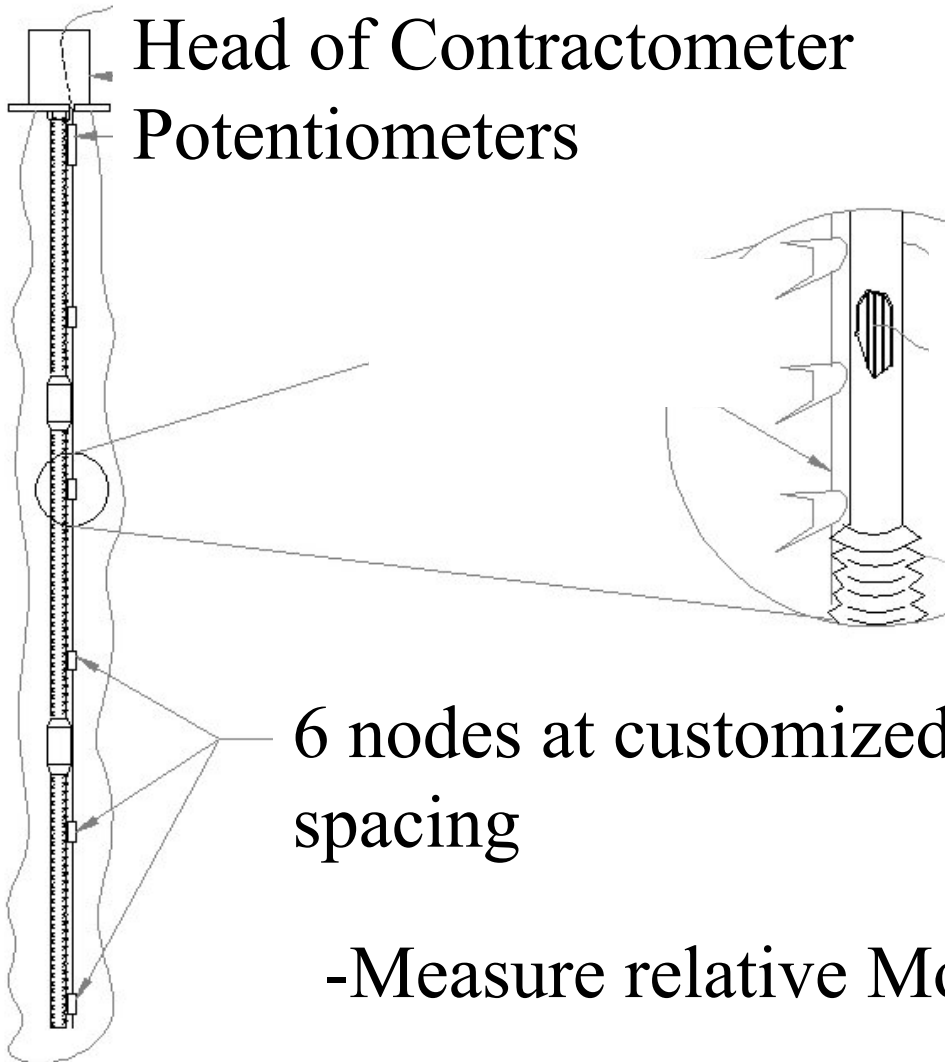
HDPE Tube

Internal fiberglass
Rods

Aluminum anchor
nodes

6 nodes at customized
spacing

-Measure relative Movement



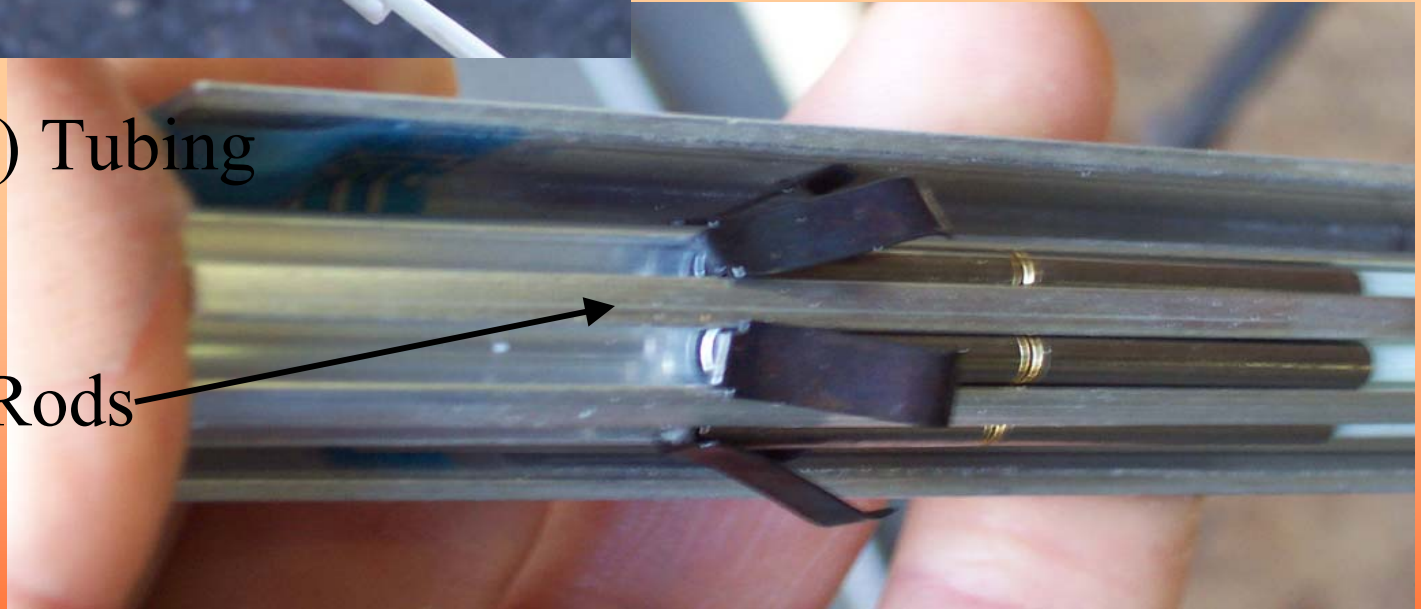
Contractometer Mechanics



(HDPE) Tubing

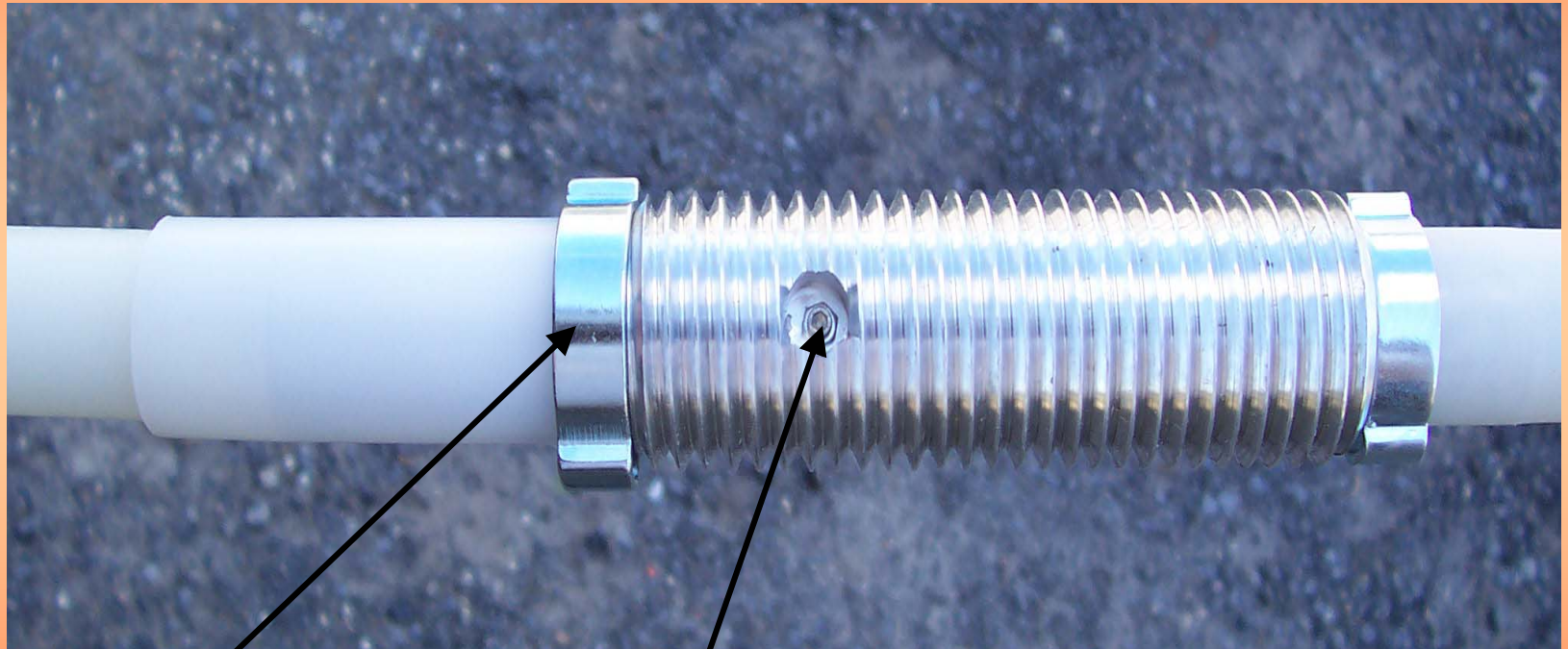
Fiberglass Tubing

Fiberglass Rods



Contractometer Mechanics

Aluminum Anchor



Seal

Stainless Screw

The accuracy of the contractometer is 1% of the potentiometer length

Compression Tests



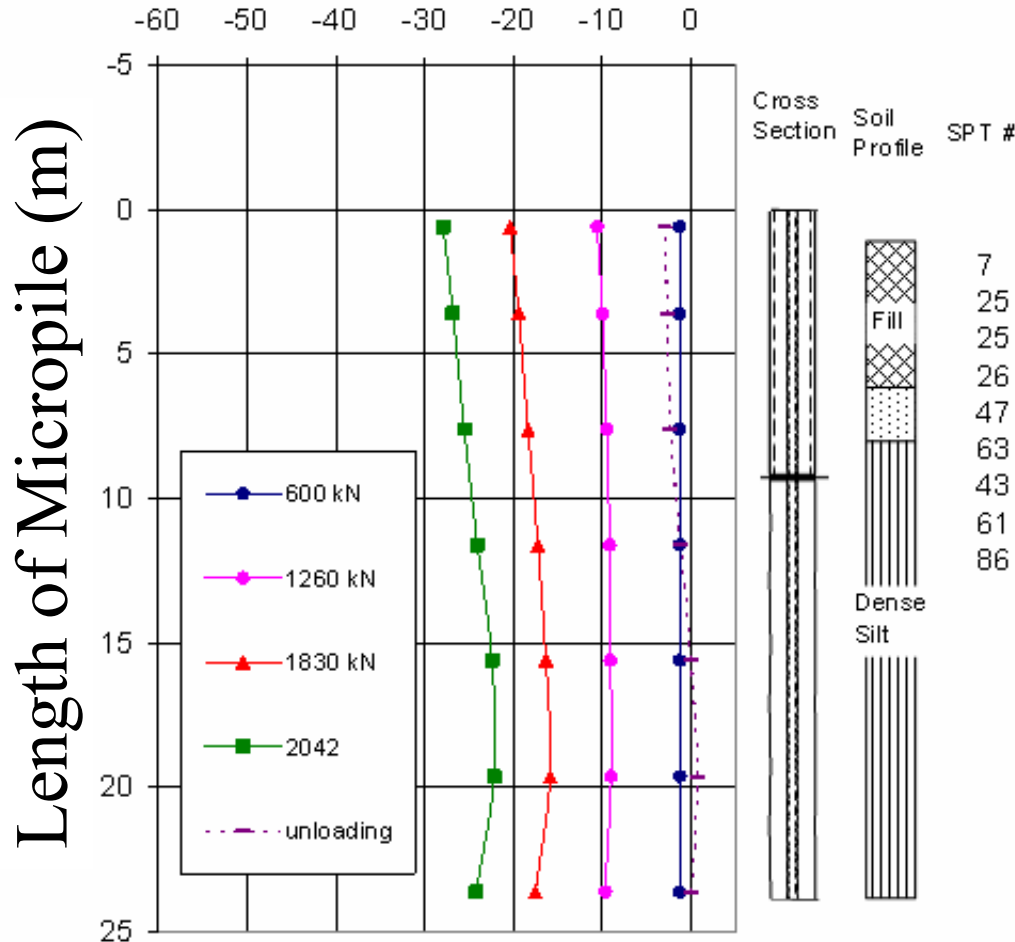
Dial Gauges
on Bearing
Plate

Cycle Loading



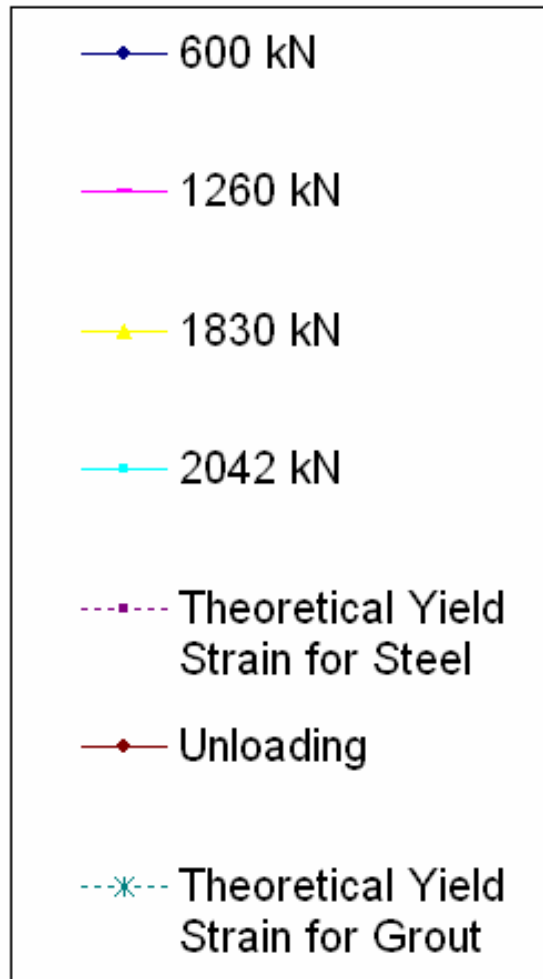
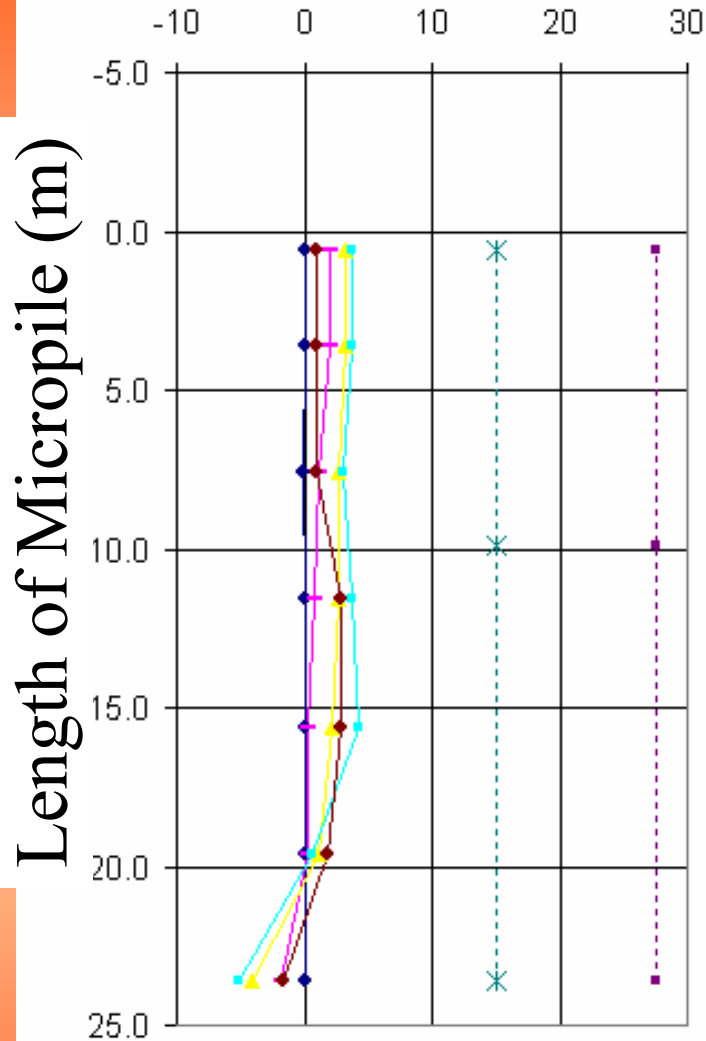
Micropiles in Alluvial Soils

Compression (mm)



- Tremie and Pressure Grouted in casing lengths
- Dense silt,
- 273 Diameter
- 100 L/m of grout
- Maximum load 2040 kN
- Design Load 1260 kN

Micro Strain

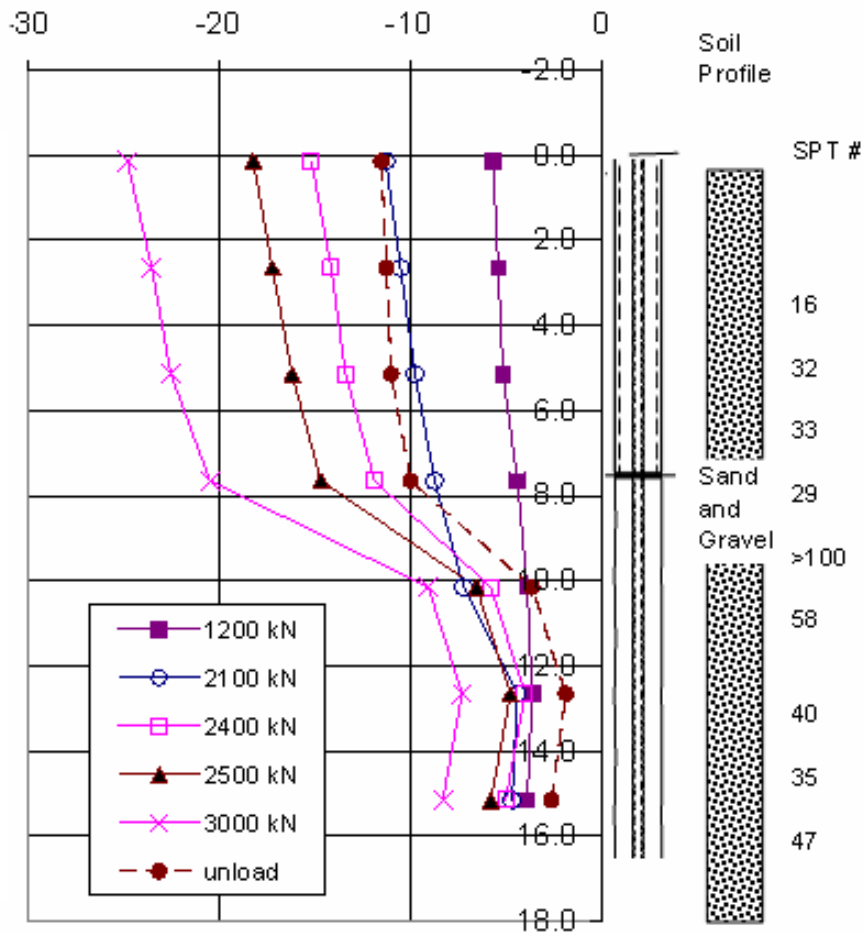


-Structural Capacity was not reached

-Tension at the end

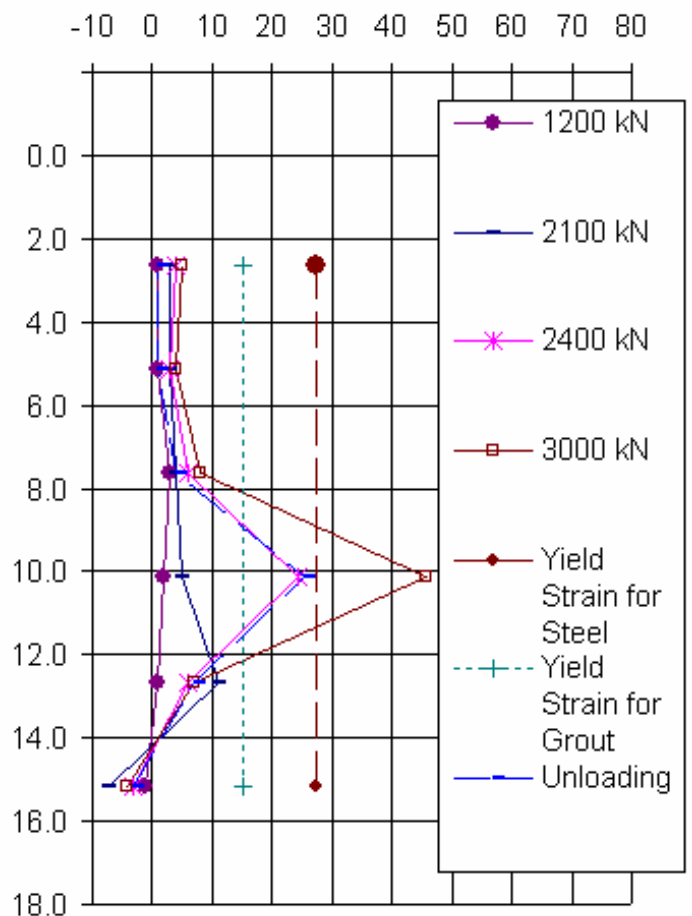
Compression (mm)

Length of Micropile (m)



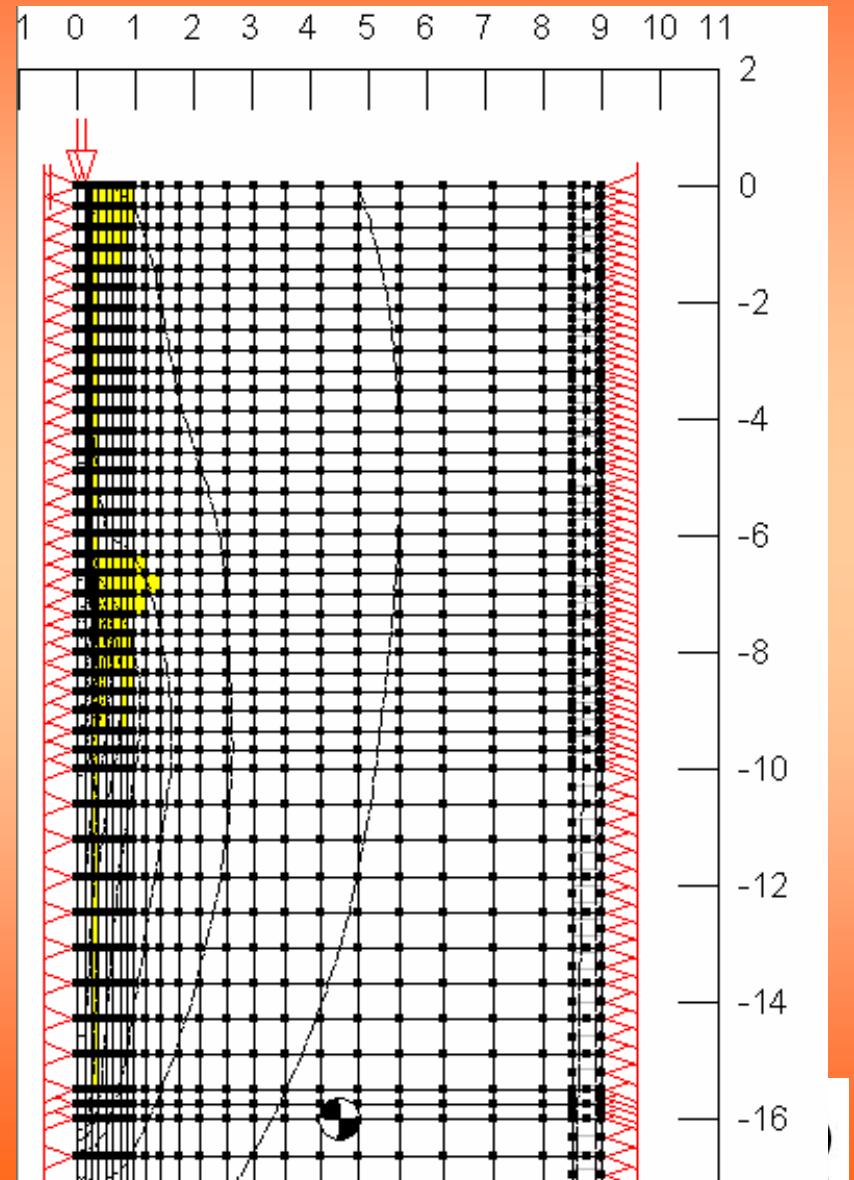
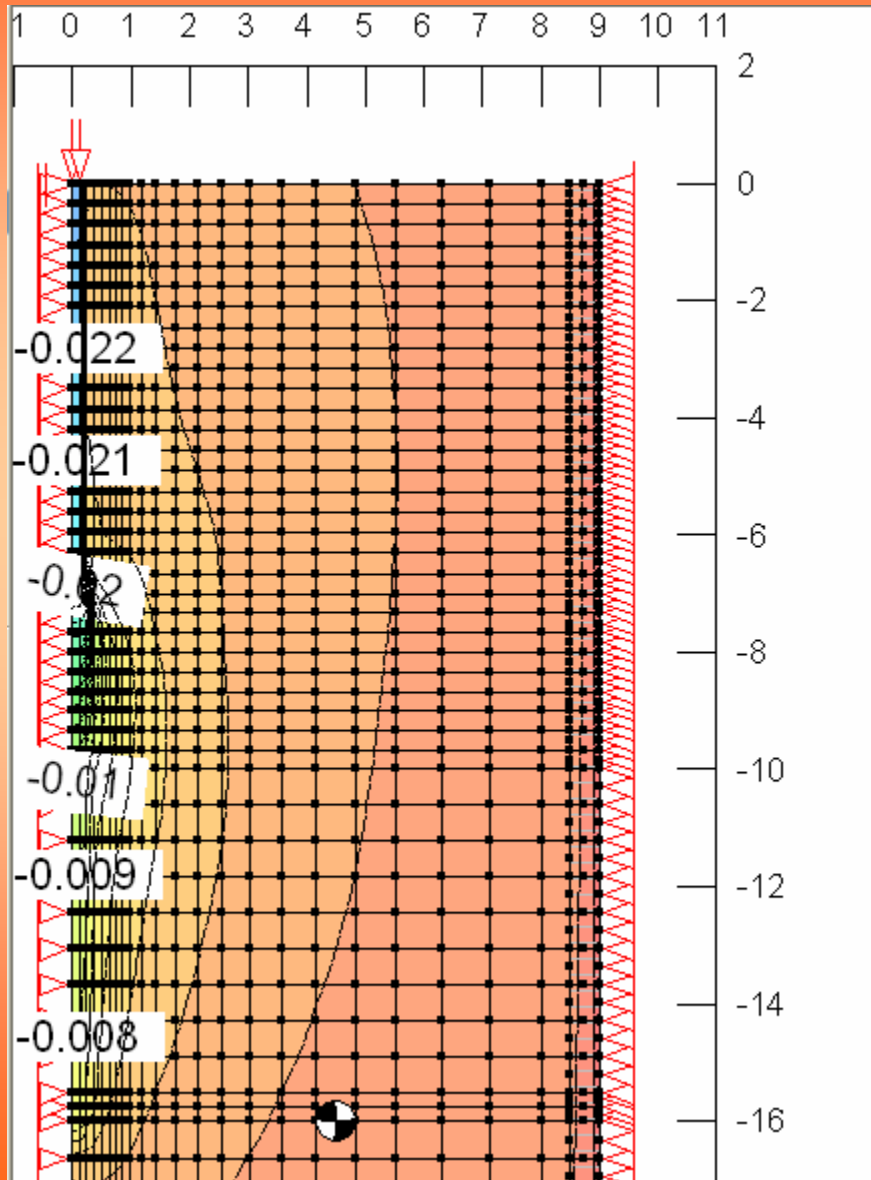
Micro Strain

Length of Micropile (m)



-Sand and Cobbles, 273 dia, 86 L/m
 -Tremie, Pressure and Post Grouted

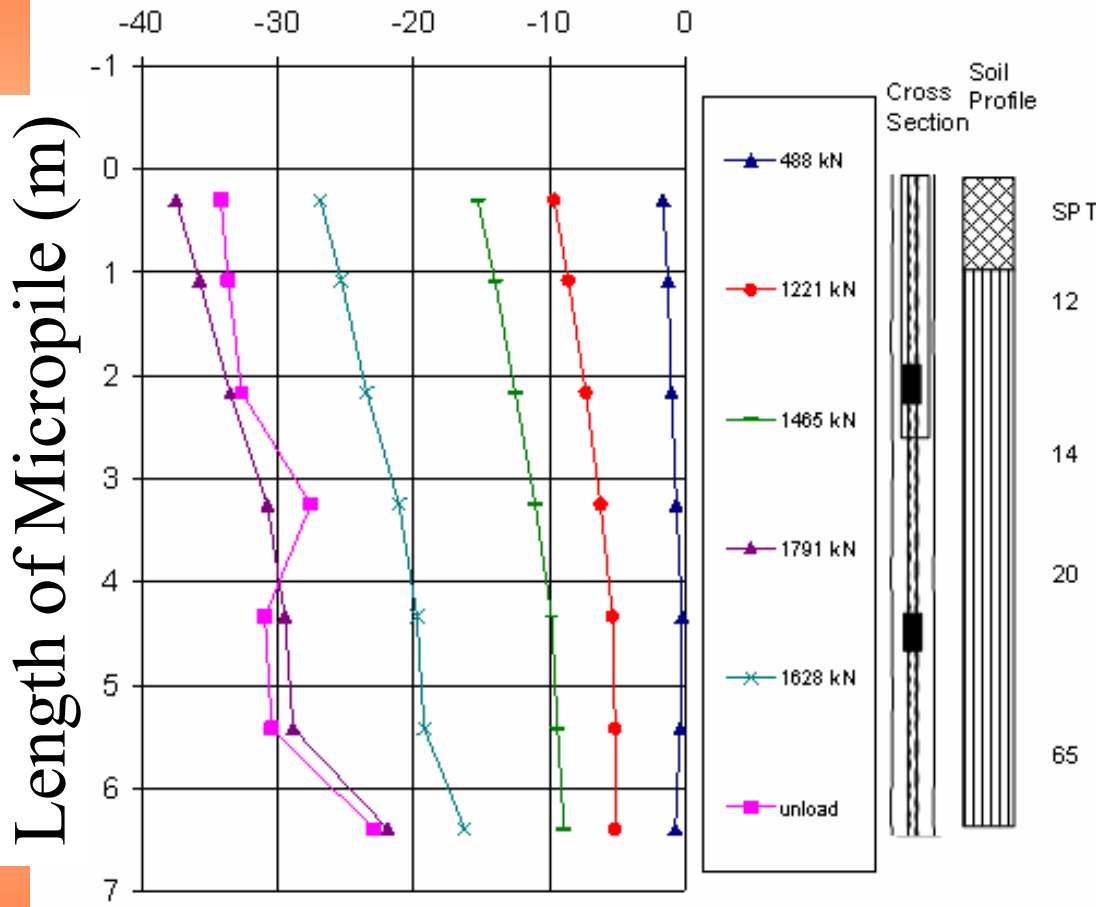
Finite Element Modeling



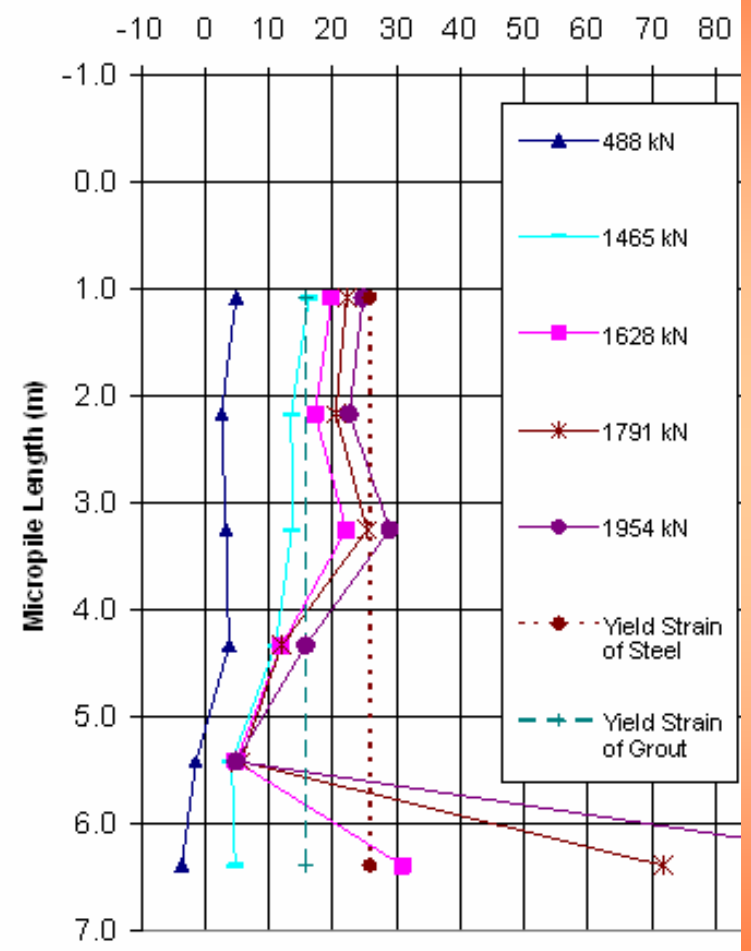


Micropiles in Glacial Tills

Compression (mm)

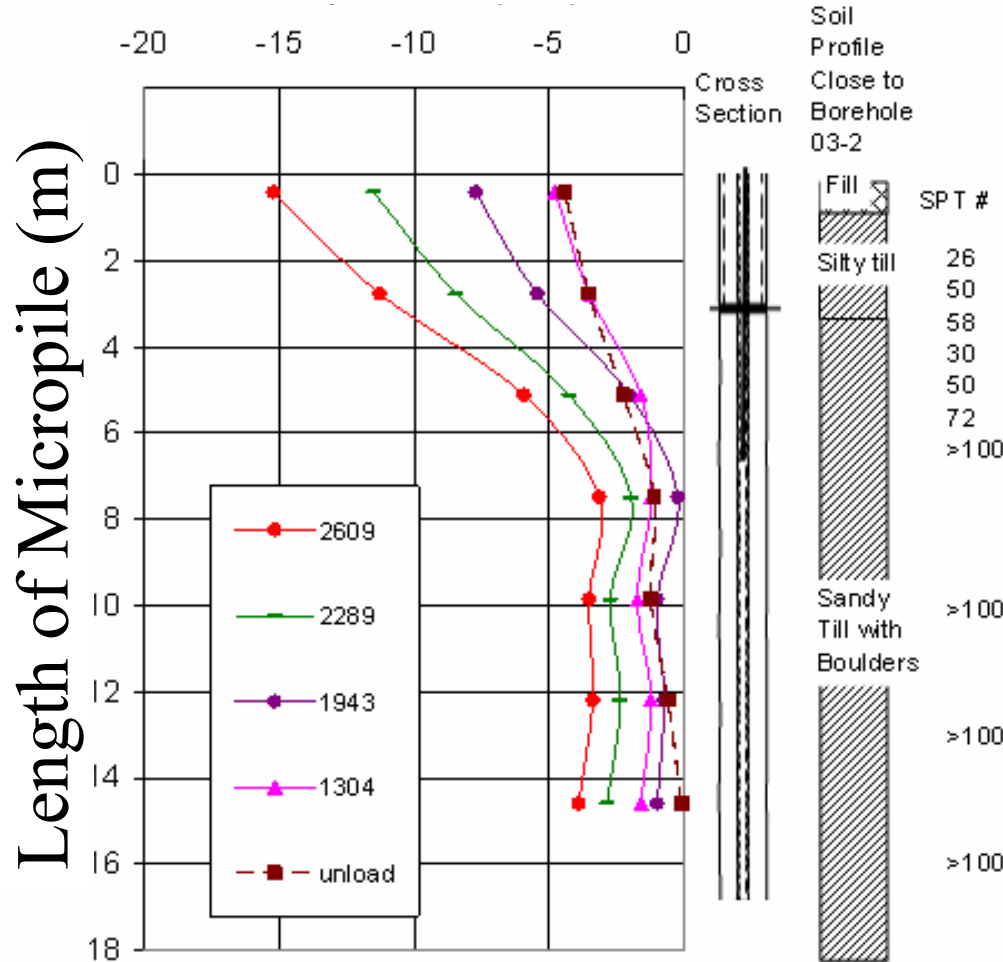


Micro Strain

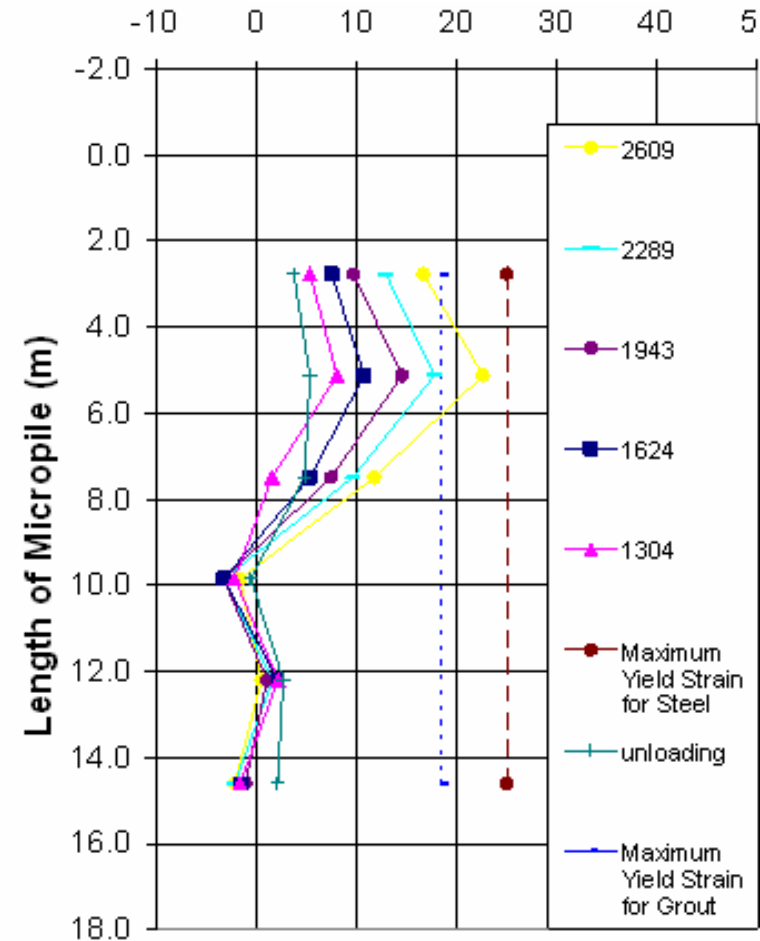


-Glacial till, Shaft Diameter-197 mm
 -Casing OD- 178 mm

Compression (mm)



Micro Strain



-Sandy Till with Boulders, 178 shaft dia – Casing OD 168 mm-Self Drilled Bar

Comments

- There may be no contribution to pile capacity in the cased length
- End bearing may play a significant role in friction piles (0 to 90%)
- Instrumentation of micropiles can lead to more strain compatible designs