UNICONE

USER MANUAL

Version 1

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written by

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UniCone is a program for the analysis of results from

cone penetrometer tests: CPT and CPTU

and analysis of pile capacity using CPTU Data

UniCone is developed by

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UniCone Method, Eslami & Fellenius (1997)

Pile capacity by direct CPT and CPTu methods applied to 102 case histories

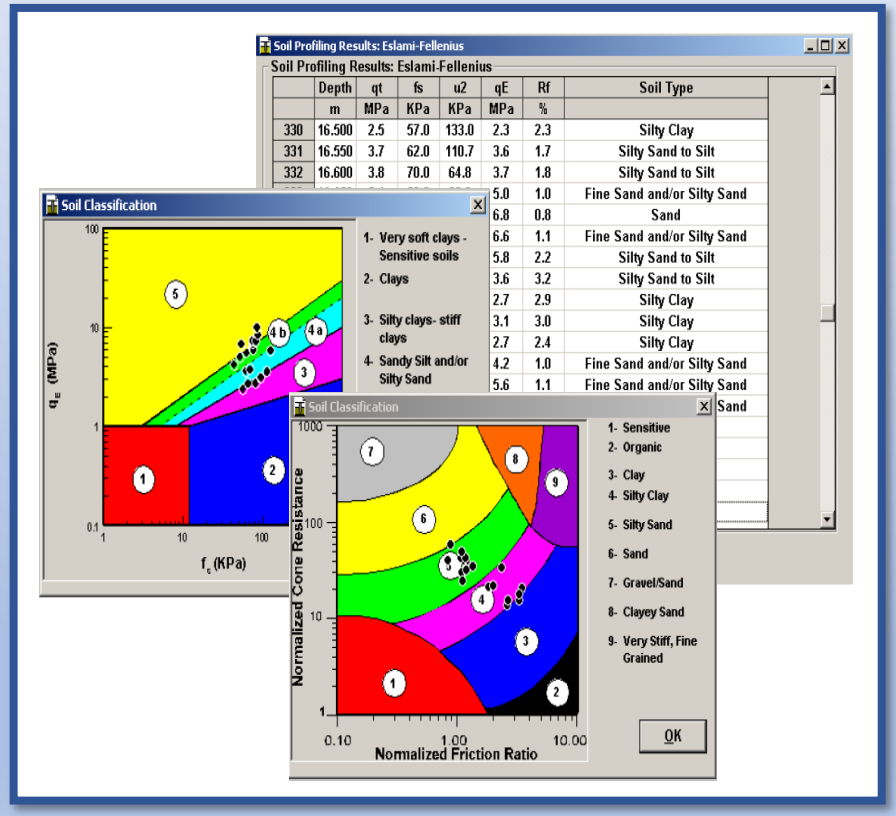
Abolfazl Eslami and Bengt H. Fellenius

Abstract: Six methods to determine axial pile capacity directly from cone penetration test (CPT) data are presented, discussed, and compared. Five of the methods are CPT methods that apply total stress and a filtered arithmetic average of cone resistance. One is a recently developed method, CPTu, that considers pore-water pressure and applies an unfiltered geometric average of cone resistance. To determine unit shaft resistance, the new method uses a new soil profiling chart based on CPTu data. The six methods are applied to 102 case histories combining CPTu data and capacities obtained in static loading tests in compression and tension. The pile capacities range from 80 to 8000 kN. The soil profiles range from soft to stiff clay, medium to dense sand, and mixtures of clay, silt, and sand. The pile embedment lengths range from 5 to 67 m and the pile diameters range from 200 to 900 mm. The new CPTu method for determining pile capacity demonstrates better agreement with the capacity determined in a static loading test and less scatter than by CPT methods.

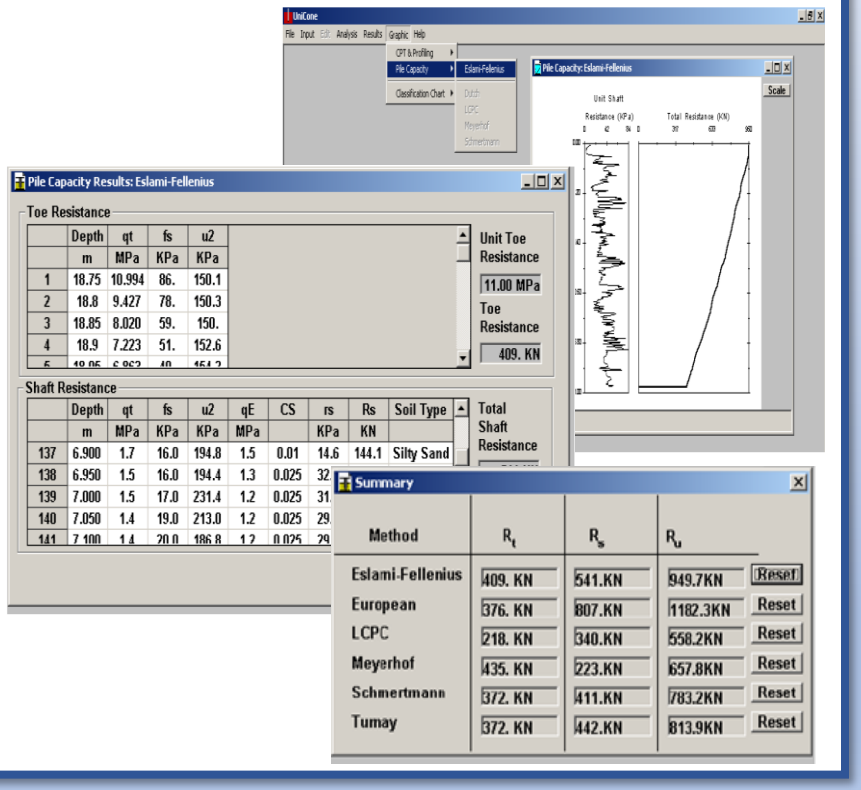
Key words: cone penetration test, pile capacity, toe resistance, shaft resistance, soil classification.

UniCone Inputs & Outputs

Pile Capacity Calculation



Soil Profiling

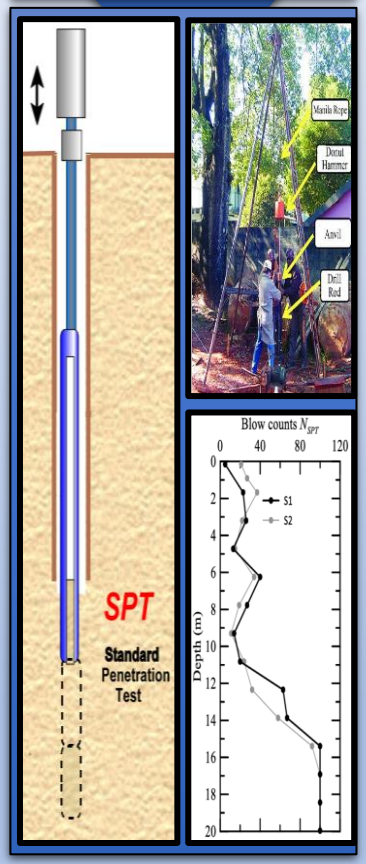


Why In-Situ Testing?

Laboratory Tests Limitations	Field Tests Advantages
Difficulties for undisturbed sampling	Overcome sampling difficulties
Soil disturbance & maintenance	Minimum changes in stress state
Soil volume change	Simple and fast
Omitting confinement pressure	Economical
Size effect and boundaries	Dominant applications in FE

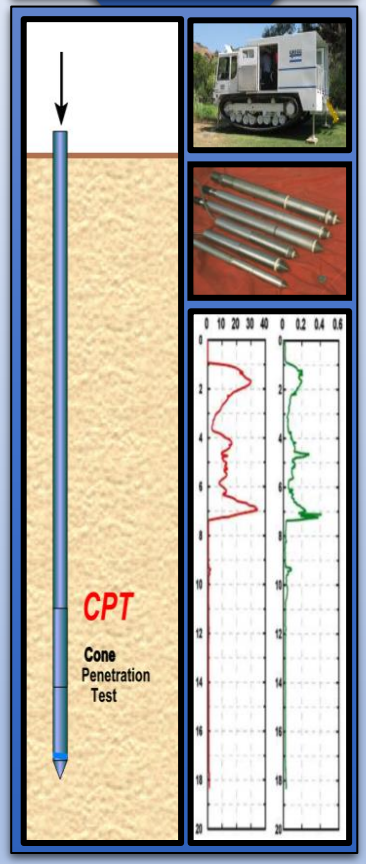
Major Approaches: In Situ Penetration Tests

SPT



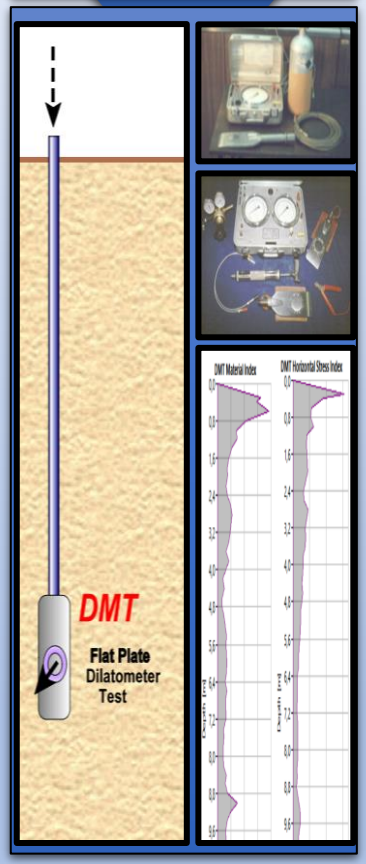
N

CPT



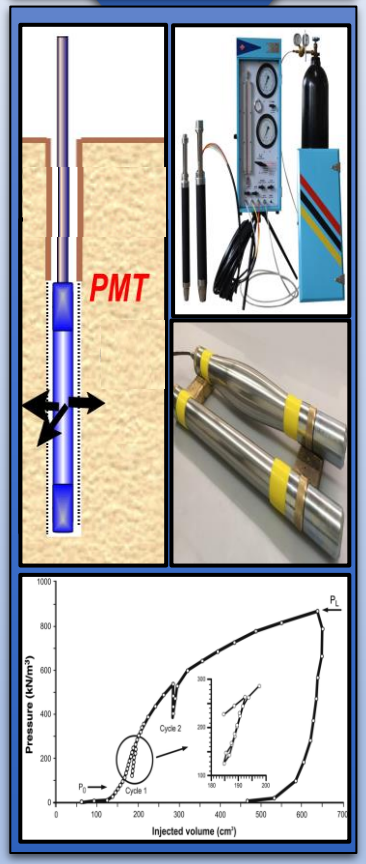
q_c, f_s & u_2

DMT



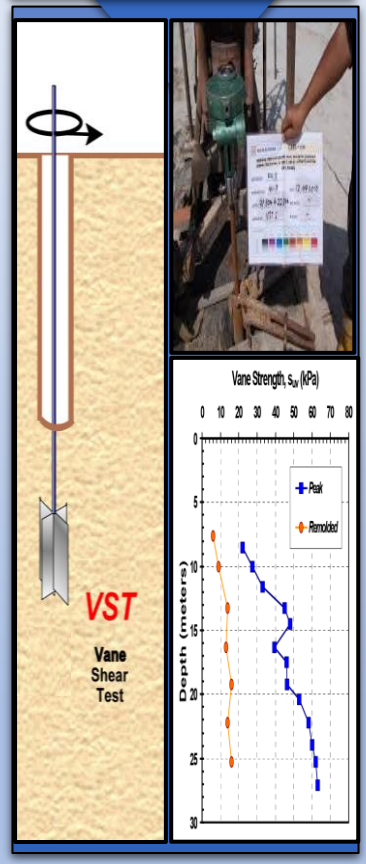
K_D, I_D & E_D

PMT



P_L & P_0

VST



S_u

New Enhancements & Novel Points

1. Soil Behavior Classification (Old, Triangular, Trend & Other)
2. Characterization and Interpretation
3. Relevant Parameters
4. Capacity Appraisal
5. Settlement Estimation
6. Resistance Distribution
7. Load-Displacement ($\mathbf{P} - \Delta$)
8. Lateral Earth Pressure
9. Problematic Deposits Recognition
10. Ground Modification