UniSettle

A Microsoft Windows application developed to assist engineers in performing stress and settlement calculations involving complex site conditions, multiple loads, vertical drains, and stone columns. UniSettle calculates total and effective stresses, pore pressure distributions, total and differential settlement, layer compression, consolidation settlement, immediate compression, and secondary settlement. Time and duration of loads and excavations are used to compute pore pressure dissipation and to produce settlement vs time.

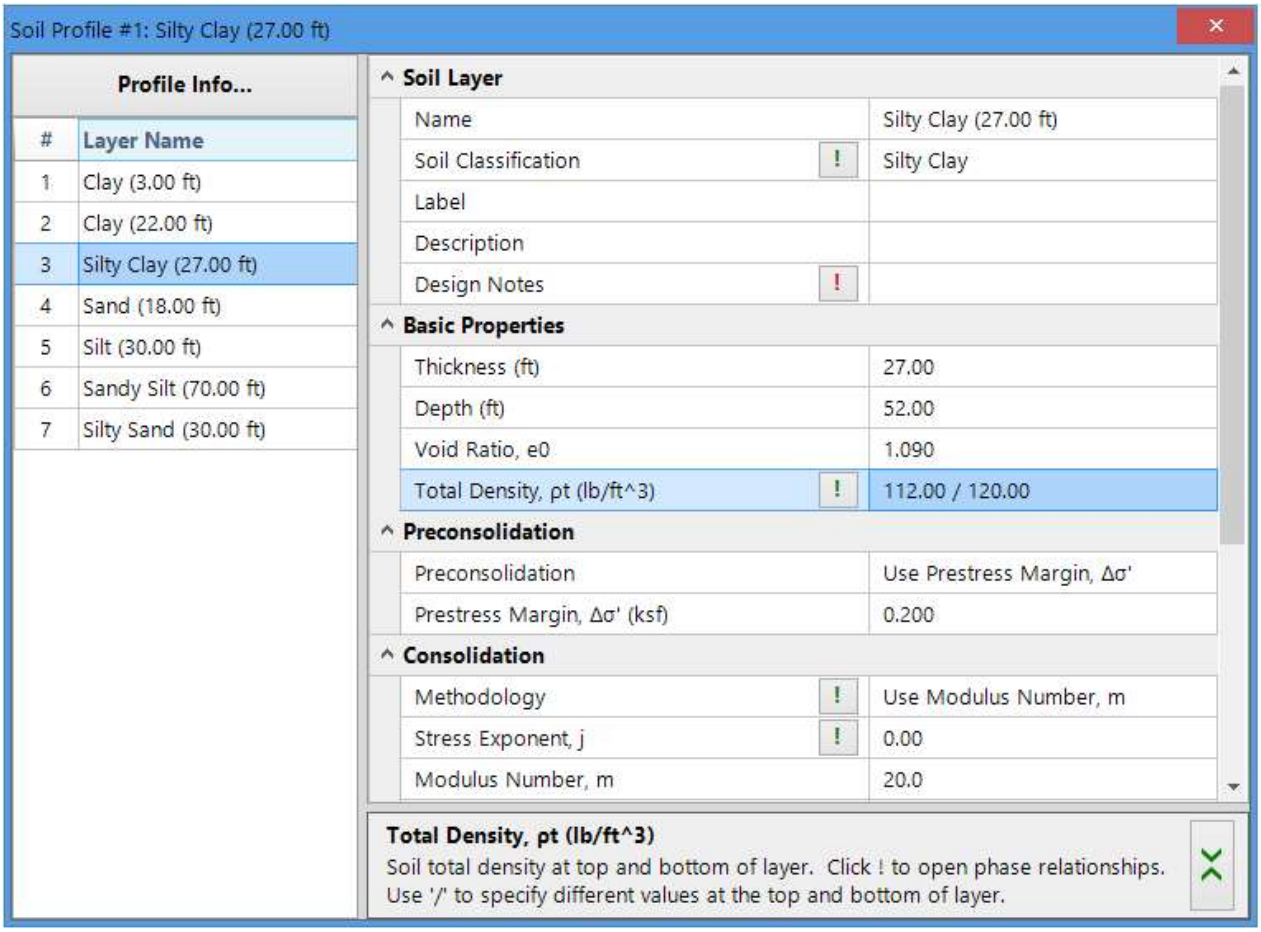
All results are presented in tabular and graphical form. Tables and charts are designed to display depth, elevations, soil layers, and more.

Below are some of the features available in UniSettle:

- Define multiple soil profiles, fills, loads, and excavations within the same project file.
- Stress distribution of elements as per Boussinesq, Westergaard, or 2V:1H distribution.
- Consolidation is computed from Terzaghi's one-dimensional consolidation theory.
- Consolidation vs time is computed using the degree of consolidation (Uz) or the average degree of consolidation (Uavg).
- Inclusion of vertical drains and stone columns.
- Compute pore pressure dissipation and excess pore pressure at various depths and times.
- Import, interpret, and convert multiple CPTu datasets into a useful soil profile.
- All input, results, and charts may be entered in either Customary US or SI units and be toggled back and forth on the fly.
- Produce a three-dimensional view of all project data.
- All output may be exported to Word or Excel for custom editing and printing.

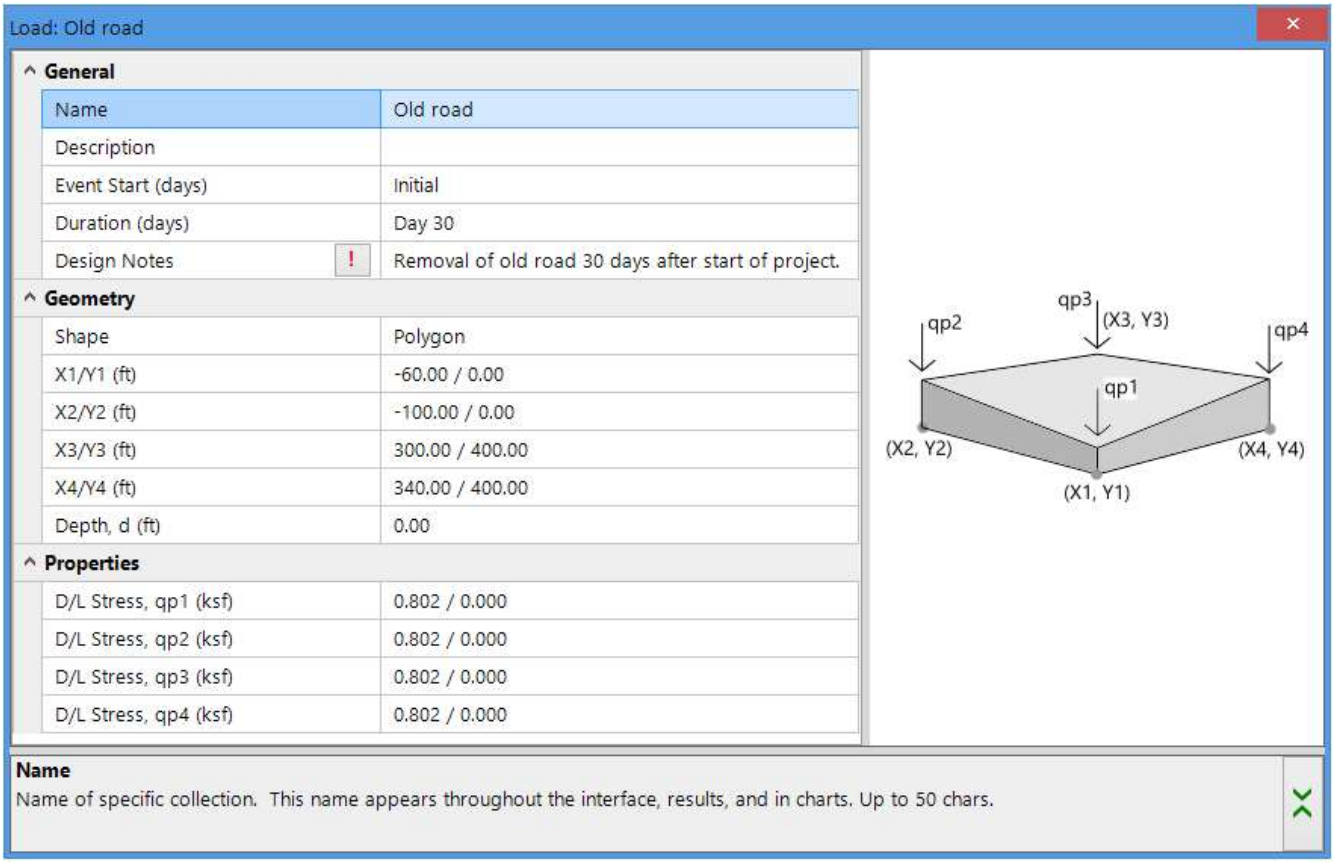
Soil Profile

UniSettle can handle an unlimited number of soil profiles and soil layers within the same site. Soil properties may be constant or vary linearly within the layer. In addition to consolidation, UniSettle can compute immediate and secondary compression. Preconsolidation may be included using prestress ratio (OCR) or prestress margin (Δσ'). Vertical drainage may be over individual layers or the entire soil profile. Horizontal drainage from vertical drains may be analyzed.



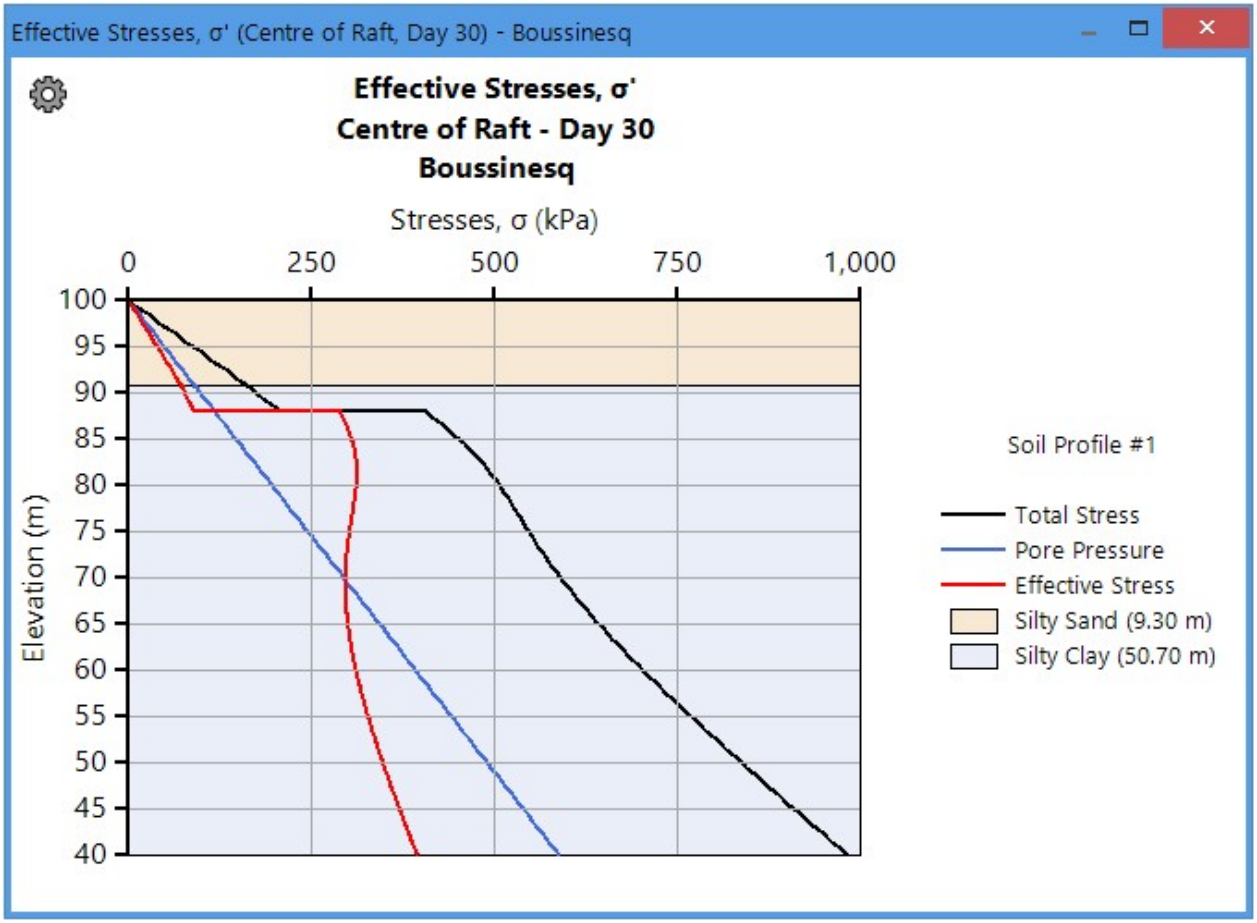
Fills, Loads, and Excavations

All input data are presented and edited using an Excel-type grid and cell system. Stresses may be from a combination of point, line, circular, triangular, rectangular, polygon, cone, ring, or unsymmetrical embankment type loads. The time period and duration of individual elements is used to model the site conditions over time.



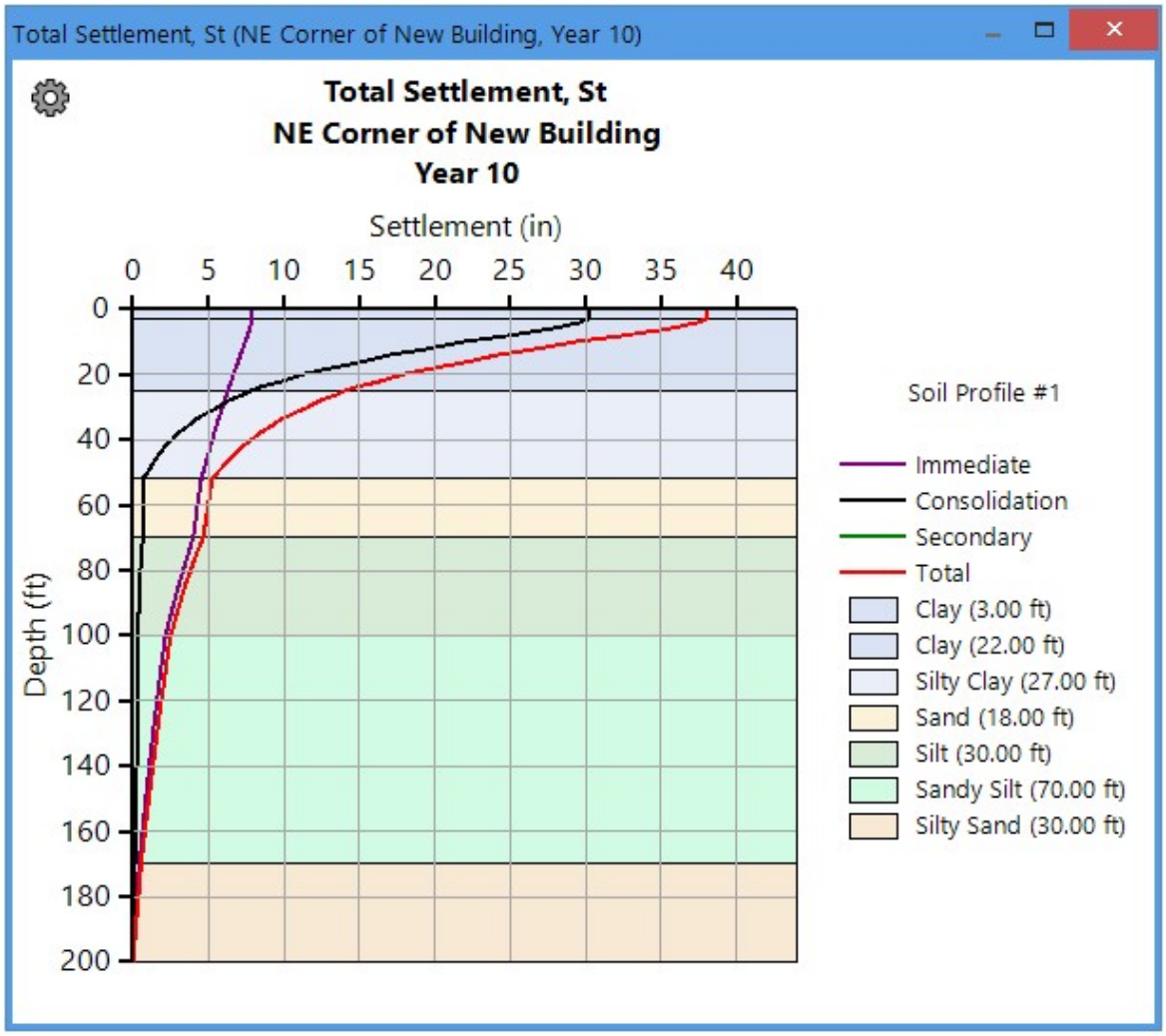
Effective Stresses

Total stresses from elements are distributed according to Boussinesq, Westergaard, or 2V:1H methods and combine the effects of loading and unloading. Total, effective, and differential stresses from any element at any depth or location are available in a single click.



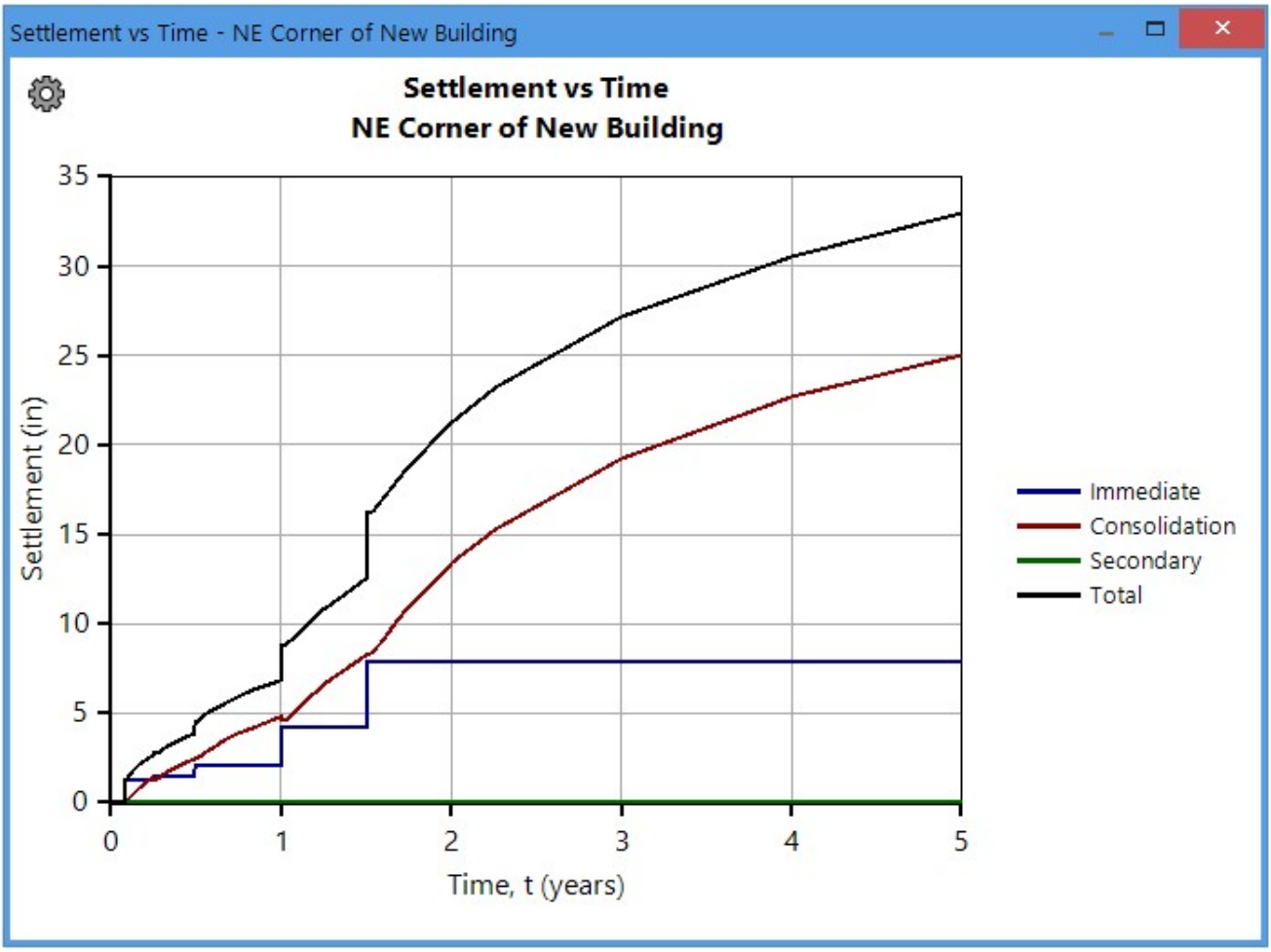
Total Settlement

The total settlement from immediate compression, consolidation settlement, and secondary compression are computed at any depth and location. Settlement is determined using conventional Cc-e0 approach, E-modulus, or Janbu tangent modulus methods. Preconsolidation may be included using prestress ratio (OCR) or prestress margin (Δσ').



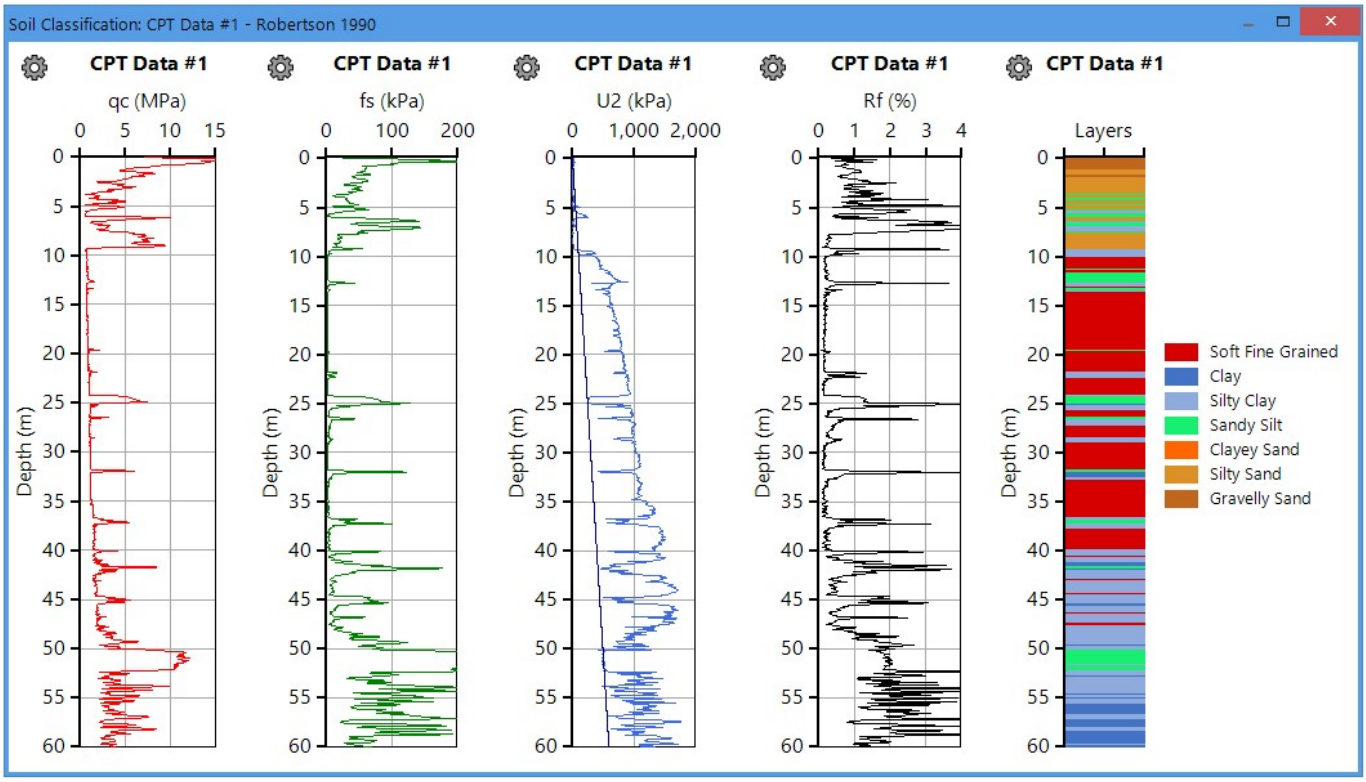
Settlement vs Time

Immediate compression, secondary compression, and consolidation over time are computed using Terzaghi one-dimensional consolidation theory. Vertical drainage may be over individual layers or the entire soil profile. Horizontal drainage from vertical drains at various locations and depths may be included in the analysis.



CPT Data Interpretation

UniSettle has the ability to import multiple CPT datasets. CPT data may be charted and interpreted to produce various soil properties and converted to soil profiles compatible with UniSettle. Soil classification based on Robertson 1986, Robertson 1990, and Eslami-Fellenius 1996 may be produced and charted.



Project 3D View

A three-dimensional perspective view of the entire site is produced with a single click. The list of the elements included in the project view includes soil layers, loads, fills, excavations, vertical drains, and stone columns. A raster image of the project view may be previewed in Word or exported to Windows memory (clipboard).