Soil Settlement Analysis Software

VDispl

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Inconsistencies in Settlements Textbook and FORTRAN Code

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During review of the legacy FORTRAN code for the VDispl software, we referenced the Settlements Analysis book linked in the README file in order to correlate each calculation with its corresponding theories and formulas. This process revealed many potential errors in the code and the formulas presented in the textbook, along with some inconsistencies between calculations made in the code and calculations shown in the textbook. This document is a compilation of all such occurrences.

Notes

All references to FORTRAN code are relative to line numbers in the *most recent* version of the code, found under **Resources/fortran_src/vdisp.for** while all references to the pages in the Settlements Analysis textbook refer to a page number of the PDF linked in the README.md file.

Potential Errors in Textbook

Having examined the many formulas in the book during the research and analysis of the FORTRAN code, we have come across some potential errors in the textbook, ranging from variable names to questionable units.

Units for unit weight of water, γ_w:

On page 12 of the Settlements Analysis PDF, under heading 3, there is a reference to a constant γ_w, which represents the unit weight of water. This constant is known to be 9.807 kN/m^3 in SI units, however the textbook lists it as 0.031tsf. The unit tsf — tonnes per square foot — seems to be a unit of pressure which can be converted to N/m^2. We have no current explanation for this discrepancy.