



Settle^{3D} 2.0 is coming soon. . .

Join the beta program!

Beta testing is an important part of any software development, but it is especially relevant in geotechnical engineering where the breadth and complexity of problems facing the practitioner is remarkable.

When *Settle*^{3D} 1.0 was released over a year ago, it was Rocscience's first totally new program in over half a decade. Although we were confident that it would live up to the high standards of other Rocscience programs, it was crucial that we get a diverse group of engineers to test it with complex, real world engineering problems before release.

Introduction

Over 90 users volunteered to be Beta testers for *Settle*^{3D} 1.0. Their comments and suggestions greatly contributed to shaping the final release version. Although Beta testing officially ended with the release of the program, user comments, questions and suggestions for new features have kept on coming. It was clear that we would have to soon get to work on Version 2.

Over a year has gone by and Version 2 is now almost finished. User suggestions motivated the introduction of many new features, some of which are described below. Of course all of these features need to be rigorously tested. That is why we hope that you, the users, will participate in the Beta Testing program for Version 2. Beta testing is an invaluable help to us, the developers, but it also allows you, the users, to participate in crafting the final version. For those interested in beta testing *Settle*^{3D} 2.0, details are at the end of this article.

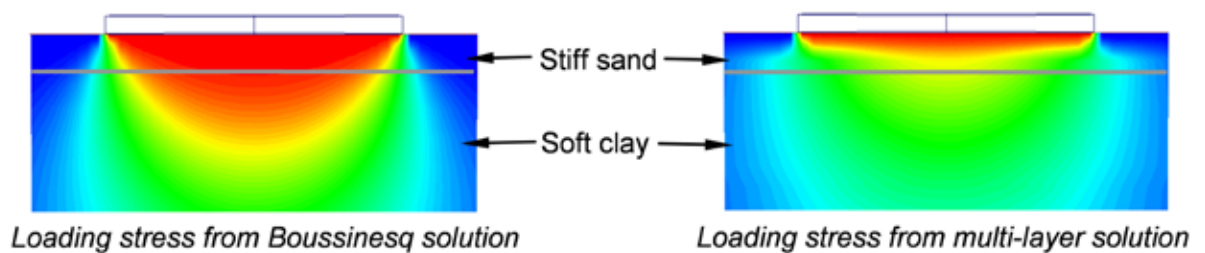
New features in *Settle^{3D}* 2.0

Multi-Layer Stress Calculations

Beta testers of Version 1.0 may recall a multi-layer stress solution in which the stresses calculated beneath loads and foundations depended on the stiffness of the underlying material layers. It was found through the Beta testing program that the solution was not robust enough to handle the real-world applications of our users. Therefore it was dropped in the final release.

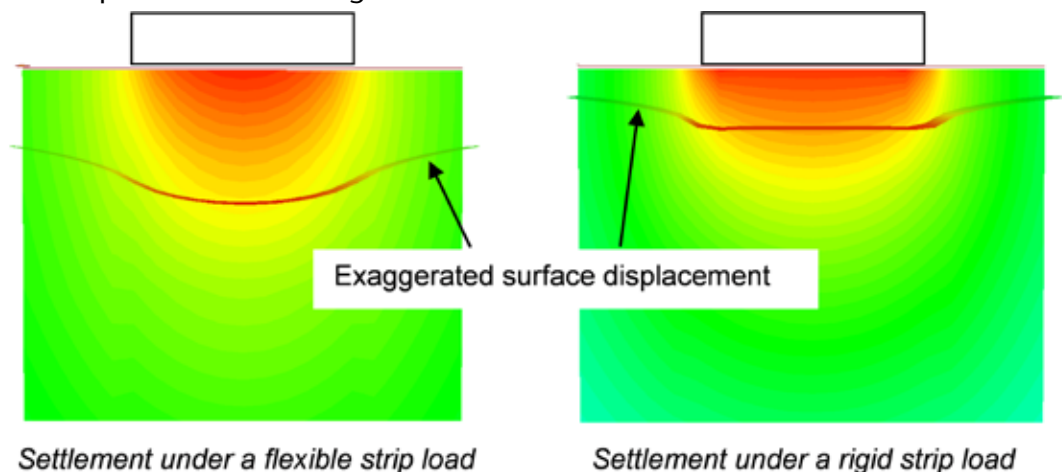
Well, the multi-layer stress solution is back. We went back to the drawing board and a completely different mathematical solution is now being used to solve this problem. All we need now is Beta testers to give it a workout.

The plot below shows the importance of the multi-layer method. The figure shows the loading stress calculated under a circular load using the Boussinesq method compared to the new multi-layer method. You can see that when there is a large stiffness contrast between layers, the calculated loading stress is strongly affected. This in turn will have a significant effect on the calculated settlements.



Rigid Foundations

One of the most requested features for the next version was the ability to consider rigid foundations. In *Settle^{3D}* 1.0, all loads are flexible, meaning that the contact pressure is constant across the load area. This is fine for embankments and fills, but for stiff concrete footings, contact pressures can deviate significantly from a constant value. Many ad-hoc approaches exist to consider this effect, but *Settle^{3D}* 2.0 will include a rigorous, robust method for simulating rigid foundations. The plot below shows an example of the settlement profile calculated with a flexible load compared to the new rigid load solution.



Empirical Methods for Settlement on Cohesionless Soils

Over a dozen different methods have been developed for calculating the settlement of foundations on cohesionless soils (sand). Some of these methods include the Schmertmann method, the method of Schultze and Sherif and the Terzaghi and Peck method. Even though these methods were mostly developed before the age of personal computers, many are still widely used because of the simplicity of the techniques and the ability to obtain results with a minimum of input data.

We have included some of the most popular methods in *Settle^{3D} 2.0*. What we now need to know is, what is your favourite method? Are the ones we have included sufficient for your needs or would you like to see others? Are the methods we have included working for your problems?

Improved Report Generator

New and improved functionality for the information viewer allows users to pick and choose the data they want to see, using an easy-to-use checklist. Properties are more intuitively laid out and images can now be inserted into the report. A page from the new Info Viewer is shown to the right.

Inverse solutions

Settle^{3D} 1.0 is good at forward problems:

- ◆ For a given load, how much settlement will there be?
- ◆ After a certain amount of time, what will be the degree of consolidation?

This is great, but often you want to solve the inverse problem:

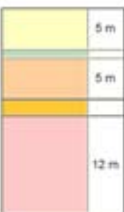
- ◆ What preload do I need to ensure that my building settlement is less than 1 cm?
- ◆ How long will it take to reach 90% consolidation?

New features in version 2.0 allow questions like these to be easily answered with a click of the mouse. We just need you to test it out.

Soil Layers

Layer #	Type	Thickness [m]	Depth [m]	Drained at Bottom
1	Silty Clay 1	5	0	Yes
2	Silty Sand 1	1	5	Yes
3	Silty Clay 2	5	6	Yes
4	Silty Sand 2	2	11	Yes
5	Silty Clay 3	12	13	Yes

Ground Surface Drained: Yes



Soil Properties

Property	Silty Clay 1	Silty Sand 1	Silty Clay 2	Silty Sand 2	Silty Clay 3
Color					
Unit Weight [kN/m ³]	18	18	18	18	18
Saturated Unit Weight [kN/m ³]	18	18	18	18	18
Immediate Settlement	Enabled	Enabled	Enabled	Enabled	Enabled
Es [kPa]	15000	30000	12000	30000	12000
Eur [kPa]	15000	30000	12000	30000	12000
Primary Consolidation	Enabled	Enabled	Enabled	Enabled	Enabled
Material Type	Linear	Linear	Linear	Linear	Linear
mv [m ² /kN]	0.00026316	0.0001	0.000333	0.0001	0.000333
mvur [m ² /kN]	0.00026316	0.0001	0.000333	0.0001	0.000333
Cv [m ² /days]	0.0144	1	0.0216	1	0.0216
B-bar	1	1	1	1	1
Ch [m ² /days]	0.0027	0.0027	0.0027	0.0027	0.0027



And Much More...

Many other features have also been added including collapsible soils, preloads, plotting of new data types, new graphing options and lots of interface improvements. We believe that you will find the new features to your liking and we hope that you will consider joining the Beta testing program for *Settle^{3D} 2.0*.

Beta Testing Program

Beta testers will be provided with a copy of the software and asked to run it over a few weeks in order to provide feedback on program performance and usability. A specific set of questions will be sent out when the beta version is ready to go. Users who participate in this beta program and provide us with their testing results before the end of the testing period will receive a \$100.00 credit towards a purchase or upgrade for *Settle^{3D} 2.0*.

If you are interested in participating, contact us at the email address below. We look forward to hearing from you!

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