

COMPARISON OF COMPUTER PROGRAMS FOR ANALYSIS OF REINFORCED SLOPES

- Program Review -

1 Objective & Method

1 Program Highlights

- Comments on important program features.

2 - UTEXAS4

3 - SLOPE/W

4 - SLIDE

6 - XSTABL

7 - WINSTABL

8 - RSS

9 - SNAIL

10 - GoldNail

11 - Summary

13 Summary Table of Program Features

- Compare the programs side by side!

15 Table of Analysis Methods

- Conditions of equilibrium, assumptions, and comments.

16 Program Ratings

- Discussion of program performance in key areas.

16 - Accuracy

16 - Computation Time

17 - Learning Curve

17 - Data Entry/Analysis Time

18 - Reinforced Slope Design

18 - Unreinforced Slope Data Entry

18 - Soil Nail Data Entry

19 - Tiedback Wall Data Entry

19 - MSE Wall Data Entry

19 - Output Time/Quality

20 Summary Table of Program Ratings

- Which program will suit your needs?

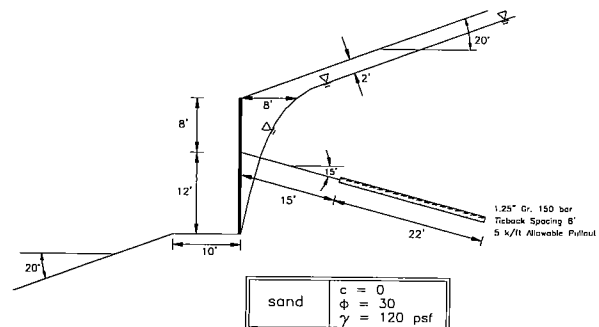
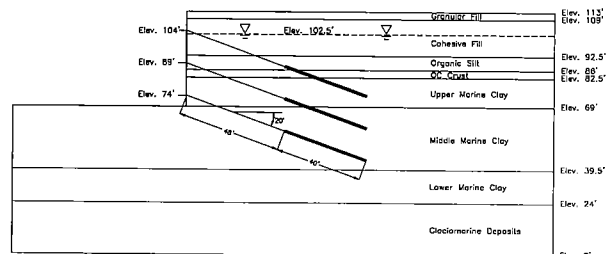
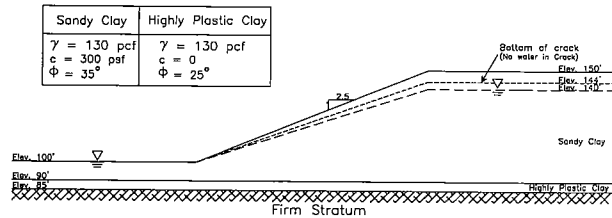
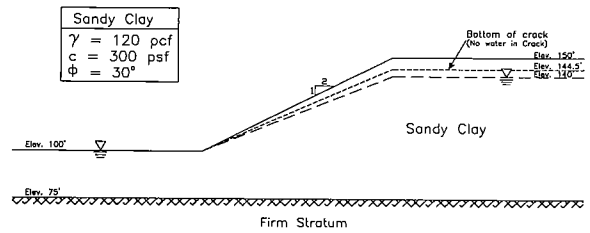
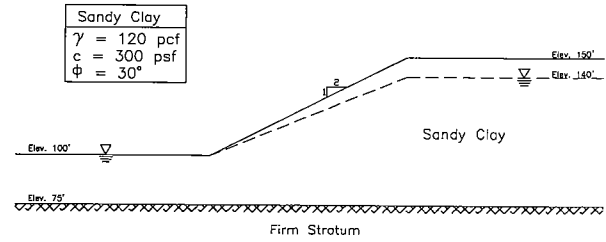
- Lessons Learned -

21 Analysis Difficulties

- The calculated solution may be incorrect!

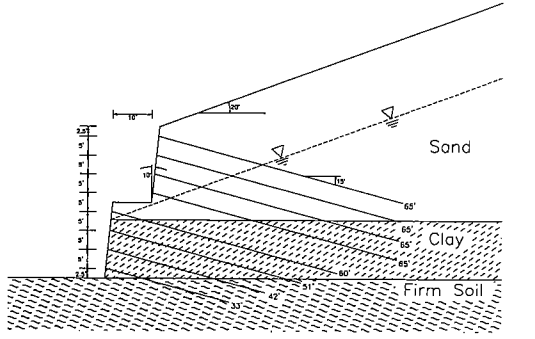
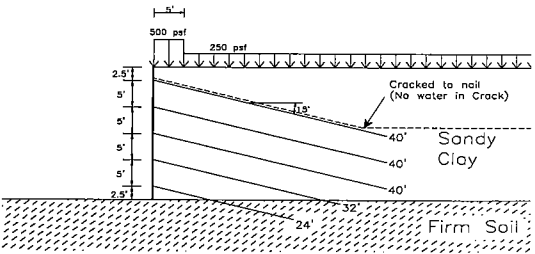
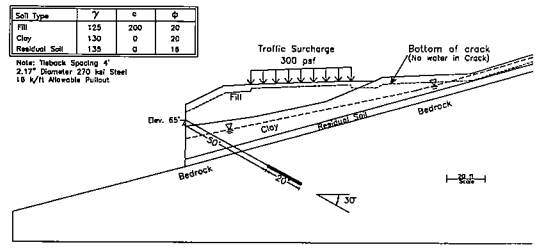
21 - Causes of Difficulties

22 - Tips for Coping with Difficulties



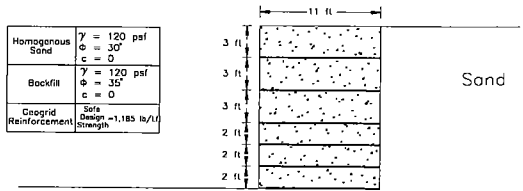
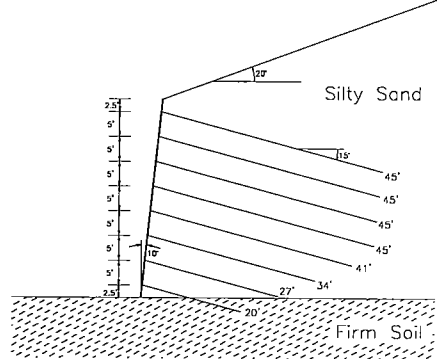
- Sidebars -

- 2 **UTEXAS4 Update**
- Reinforced slopes require a larger range of acceptable side force inclination.
- 4 **SLOPE/W Search Tip**
- Toe circles made easy.
- 6 **Slide Update**
- Speed increases, new soil models, and more!
- 7 **Minimum Required Force for Stability**
- A useful tool for preliminary design.
- 9 **RSS Reinforcement Limitations**
- Horizontal reinforcement limits applicability, but makes the program ideal for MSE reinforcement.
- 10 **MSE Walls - Include the bottom layer?**
- Important analysis tips.
- 11 **MSE Reinforcement in GoldNail**
- Development length definition problems.
- 12 **Equivalent Tension Crack**
- What to do if there is no program option.
- 12 **Definition of Factor of Safety**
- Fundamental program differences that can change F.
- 16 **Piezometric or Phreatic Surface?**
- An important difference affecting the factor of safety.
- 17 **Language Barrier**
- Problems encountered with different types of reinforcement in specialty programs.
- 23 **Program Comments**
- Search methods and contours increase confidence in analysis.



- Appendices -

- 24 **Appendix A**
- Results for example problems.
- 25 - Factor of Safety Summary Table
- 26 - Spencer's Method
- 27 - Bishop's Modified Method
- 28 - Janbu's Simplified Method
- 29 - Difficulty Index
- 30 **Appendix B**
- Example slopes and critical slip surfaces.
- 124 **Appendix C**
- Detailed notes for each program, with comments on analysis methods and search routines, capabilities, and limitations.
- 125 - UTEXAS4
- 128 - SLOPE/W
- 130 - SLIDE
- 132 - XSTABL
- 135 - WINSTABL
- 137 - RSS



- 144 **Appendix D**
- Calculations
- 139 - SNAIL
- 142 - GoldNail
- 145 - Soil Nail Capacity
- 147 - Equivalent Bond Stress for SNAIL
- 148 - Crack Depth

- 149 **Appendix E**
- References

