“Looking Back and Looking Ahead”

How Iowa State Shaped a Career in Geotechnical Engineering

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My Personal-Professional Journey

1975  BS. Construction Engineering
1977 M.S. Geotechnical Engineering
1979 PhD. Geotechnical Engineering
1980 PostDoc Iowa State
1982 NAS Bulgaria
1984-1989 Associate Prof. Clarkson College
1989 – Professor Univ. of Massachusetts
Coordinator – GT Program -10 Years
Department Head - 6 Years
1. Understand the Fundamentals of Soil Mechanics & Soil Behavior
You Don’t Know What Path Your Career Will Take So Learn Basics

- Composition
- Shear Strength
- Consolidation
- Modification/Stabilization
2. Understand How Composition May Influence Soil Behavior and That Soils Are Inherently Complex
S.E. Iowa Loess
W = 12.7%
Dry Density = 87.2 lbs/ft$^3$
FIG. 1. Geologic cross section after sliding and smoothing up for equipment.
3. Don’t Be Afraid to Be an Expert Witness
Especially if You Think You Can Help Someone
“The Day the House Fell Again?”
4. Understand Surficial Geology

The Best Way to Understand Surficial Geology is to Go Look at it!
5. Be a Life-Long Student and Take Advantage of Opportunities to Learn Something New

You Won’t Learn Everything at University and You Simply Can’t Learn Everything Anyway
6. Understand and Appreciate the Classic GT Literature

A Lot of Really Good Fundamental Work Has Already Been Done – But Isn’t in Textbooks

1960 – 3 GT Journals
2017 – 27 GT Journals
Often Simple is Best

Free Swell Test
Linear Shrinkage Test
Fall Cone Test
SPT-Torque Test
Free Swell Test
1956
Linear Shrinkage Test

1958
Fig. 3. The cone apparatus developed by John Olsson in 1915 for experimental determination of the shear strength of clay.
$f_s = 4.1 \ N_{60}$

Graph showing the relationship between $f_s$ (kPa) and $N_{60}$ (blows/0.3m). Points are categorized by Std-1, Std-2, Std-3 (donut), and Std-4 (Safety). The line $f_s = 4.1 \ N_{60}$ is also plotted on the graph.
What’s Going on Now and What’s In the Near Future?

Finishing Academic Work at UMass - 2018

Completing Several Projects

Helicals & Jacked Piles in Clay
Adhesion of Drilled Piles in Clay
Changes in Clay Behavior from Bored Piles

(Meyerhof & Murdock 1949)
Grout Migration
Fig. 1  Relationship of observed adhesion (expressed as a percentage of theoretical adhesion) to cohesive strength of clay
Fig. 2. Variation in water content

Fig. 3. Variation in shear strength
Pipe Piles in Clay
H-Piles in Clay

![Graph showing water content and depth for H-Piles in Clay. The graph includes data points for Water Content (%) and Depth (ft.) with markers for W8 at Pile Surface and W8 at Failure Surface, along with BH1 and BH-2.]
Soils and Geotechnology in Construction
June 2017

In Situ Testing Techniques in Geotechnical Engineering
December 2017

Design, Installation and Applications of Helical Piles and Anchors
June 2018
Lessons I was Taught
(but didn’t know it at the time)

1. Understand the Fundamentals of Soil Mechanics
2. Understand How Soil Composition May Influence Soil Behavior and That Soils are Inherently Complex
3. Understand Surficial Geology
4. Don’t Be Afraid to be an Expert Witness
5. Be a Life-Long Student & Take Advantage of Opportunities to Learn Something New
6. Understand & Appreciate the Literature
Remember
It’s The Journey!