Creating and Delivering Effective Technical Presentations

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Effective Presentations

Creating
- Content
- Visual Aids

Delivering
- Enthusiasm
- Confidence
Presentation Preparation

Creating
- Identify audience and your purpose
- Outline presentation content
- Prepare visual aids
- Rehearse presentation

Delivering
- Check presentation location
- Present

Time
Know Your Audience

Diversity of Audience

Large audience (low expertise)
- Conference
  - Specialty Conference
  - Geotech Seminar
  - Class/Work Presentation
  - Dissertation Defense

Small audience (high expertise)
Outline Presentation

• What should audience learn?
• Level of detail
• Available time
Prepare Visual Aids

THE UNIVERSAL RECIPE

"How to get your manuscript accepted by persnickety editors"

(P.J. Murphyn, 1998)

PowerPoint

Chalkboard

Handouts

Table 3.1: Expected explained standard deviation of mean model parameter, $\eta$, estimated with different methods.

<table>
<thead>
<tr>
<th>Amount of Censored Data</th>
<th>Correlation between Random Parameters</th>
<th>Numerical Simulation</th>
<th>Analytical Approximation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>0.01 0.10</td>
<td>0.0 0.10</td>
<td>0.0 0.10</td>
</tr>
<tr>
<td>25%</td>
<td>0.25 0.13</td>
<td>0.13 0.13</td>
<td>0.13 0.13</td>
</tr>
<tr>
<td>50%</td>
<td>0.15 0.17</td>
<td>0.17 0.17</td>
<td>0.17 0.17</td>
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<tr>
<td>75%</td>
<td>0.0 0.14</td>
<td>0.0 0.14</td>
<td>0.0 0.14</td>
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<tr>
<td>100%</td>
<td>0.25 0.10</td>
<td>0.10 0.10</td>
<td>0.10 0.10</td>
</tr>
</tbody>
</table>

Per-snick-e-ty: a criterion of persnicketiness; 1: being about small details; 2. fastidious in keeping the ideal solution of a problem; 3. requiring great precision; EXACTING.
Load and Resistance Factor Design (LRFD) for Geotechnical Applications

J. Erik Loehr
Associate Professor
University of Missouri – Columbia

2004 Geopier Annual Conference
San Francisco, CA
Outline

Introduction
Benefits of Bioreactors
Challenges for Bioreactors
Impacts on Designs
Where do we go from here?
Conclusions
Benefits of Bioreactor Landfills

• Rapid organic waste stabilization.
  – Increase landfill airspace.
  – Reduce risk of long term pollution.
• Improve leachate treatment-storage.
• Maximize gas production-recovery.
• Reduce post closure & care.
• Increase environmental stewardship.
• Economics.
Important to have clear boundaries between each of the next three “ingredients”

**Materials and Methods**

Objective: Provide sufficient information for results to be reproduced by others

Basic material properties

**Results**

Objective: Present NEW information gained without detailed discussion

If this boundary is not clear, it is difficult to determine what the author’s CONTRIBUTION is. (USE YOUR JUDGEMENT)

**Discussion**

Objective: Describe what the results mean

In light of what we already knew. What are the corresponding implications?
DEPLOYMENT OF SASW SYSTEM

- Source
- Geophones
- Video camera
- Hold-Down Weight
($16 million/year – public facilities alone)

(D. Noe, W.J. Likos)
Probabilistic Measures of Safety

\[ f(FS) \]

Reliability Index, \( \beta \)

Probability of failure, \( p_f \)

Reliability, \( r \)

\[ FS = 1.0 \quad \mu_{FS} \]

Probability

\( \beta \cdot \sigma_{FS} \)
Distribution of major near-surface expansive soil deposits

Colorado Front Range Urban Corridor

(Noe and Dodson, 1995)

(Noe and Tourtelot, 1973)
10-yr Post-Closure
Target Concentration: 0.005 mg/l

Post-Closure Monitoring Wells:

- Well 1
  - Median Conc. = 0.001 mg/l
  - $P(C > 0.005 \text{ g/m3}) = 22\%$

- Well 2
  - Median Conc. = 0.0006 mg/l
  - $P(C > 0.005 \text{ g/m3}) = 17\%$
SURFACE WAVE DISPERSION

Air or Water

Layer 1

Layer 2

Layer 3

Material Profile

Rayleigh Wave

Vertical Particle Motion

Shorter Wavelength, \( \lambda_{R1} \), \( \sim \lambda_{R1} \)

Longer Wavelength, \( \lambda_{R2} \), \( \sim \lambda_{R2} \)

Dispersion Curve

Rayleigh Wave Phase Velocity

Depth

Wavelength
Anaerobic Bioreactor
Bioreactor Landfill Design - Wet Cell

- Recirculate leachate
- Add additional liquid
- Collect gas

**Objective:**
Degrade and stabilize the waste as rapidly as possible.
Censored Data

Number of Concentration Measurements

Before Remediation | After Remediation

85 | 196

165 | 68
Model-predicted Concentrations

Benzene Concentration (mg/l)

- Measured
- Calculated with Conditioning
- Calculated without Conditioning

- Model-predicted Concentrations
RESULTS: COMPACTION BEHAVIOR

\[
(w_{opt})_{bc} = (w_{opt})_b \times m_b + (w_{opt})_c \times m_c
\]

**Max. error:** 5.6%

\[
(\rho_{d_{max}})_{bc} = (\rho_{d_{max}})_b \times m_b + (\rho_{d_{max}})_c \times m_c
\]

**Max. error:** 2.5%
Allowable Stress Design (ASD)

\[ FS = \frac{R_{ult}}{Q} \geq FS_{\text{required}} \]

where:
- \( R_{ult} \) = ultimate resistance
- \( Q \) = applied load
- \( FS \) = factor of safety

Alternatively,

\[ Q_{allow} = \frac{R_{ult}}{FS} \geq Q_{\text{design}} \]
Calibration of factors by “fitting” to ASD

- Objective to produce designs similar to what we’d get with ASD
- A necessary first step
- Load factors already established
- “lumped” resistance factors determined as:

\[
\phi = \frac{\gamma \cdot Q}{R_{ult} \cdot FS_{required}} = \frac{\gamma}{FS_{required}}
\]

or, for distributed DL and LL factors:

\[
\phi = \frac{\gamma_{DL} \cdot Q_{DL} + \gamma_{LL} \cdot Q_{LL}}{FS(Q_{DL} + Q_{LL})} = \frac{\gamma_{DL} \cdot (Q_{DL}/Q_{LL}) + \gamma_{LL}}{FS(Q_{DL}/Q_{LL} + 1)}
\]
# SOIL PROPERTIES

<table>
<thead>
<tr>
<th>Material</th>
<th>Abbreviation</th>
<th>Density, g/cc</th>
<th>Initial Void Ratio</th>
<th>Compression Index, $C_c$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Sediment</td>
<td>NS</td>
<td>1.75</td>
<td>1.3</td>
<td>N/A</td>
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<tr>
<td>Contaminated Sediment</td>
<td>CS</td>
<td>1.35</td>
<td>3.0</td>
<td>0.85</td>
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<tr>
<td>Soil Cap</td>
<td>CAP</td>
<td>1.87</td>
<td>1.0</td>
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</table>
Factors from Probabilistic Calibration

<table>
<thead>
<tr>
<th>Failure Mode</th>
<th>COV of $s_u$</th>
<th>COV of $s_{uu}$ (%)</th>
<th>$\Psi_{sc}$</th>
<th>$\Psi_{tc}$</th>
<th>$\Psi_{w}$</th>
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<tbody>
<tr>
<td>General</td>
<td>Medium</td>
<td>10 - 30</td>
<td>0.46</td>
<td>0.43</td>
<td>0.42</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30 - 50</td>
<td>0.45</td>
<td>0.35</td>
<td>0.34</td>
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<tr>
<td></td>
<td></td>
<td>50 - 70</td>
<td>0.43</td>
<td>0.26</td>
<td>0.25</td>
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<tr>
<td>Shear</td>
<td>Stiff</td>
<td>10 - 30</td>
<td>0.43</td>
<td>0.44</td>
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<tr>
<td></td>
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<td>30 - 50</td>
<td>0.41</td>
<td>0.36</td>
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<tr>
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<td>0.40</td>
<td>0.45</td>
<td>0.35</td>
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<tr>
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<td>30 - 50</td>
<td>0.37</td>
<td>0.36</td>
<td>0.25</td>
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<td></td>
<td>50 - 70</td>
<td>0.36</td>
<td>0.27</td>
<td>0.17</td>
</tr>
</tbody>
</table>

Note: Target reliability index = 3.2
Spectral-Analysis-of-Surface-Waves (SASW) Methodology
Classroom Assessment Technique #1

Background Knowledge Probe
PowerPoint Conclusions

• Avoid bullets and use graphics whenever possible
• Avoid writing entire sentences on a slide because they are boring and the audience will read them instead of listening to you, and you want them to listen to you.

• Font size
• Color
Proper Attire
“Glossophobia”
Definition: the fear of public speaking
– 75% of all Americans report it
Relieve fear:
– Preparation
– Practice
Laser Pointers

- Avaddy (Beagle)
- Likes:
  - Food
  - Chasing squirrels
  - Laser pointers
- Dislikes:
  - Baths
  - Toenail trims
  - Rain
Body Language
Thank you

MU Geotech Faculty:
John Bowders
Bill Likos
Erik Loehr
Brent Rosenblad