Project Overview

Geotechnical Data Management System
Project Goals

- Development of a web-based GIS enterprise system for geotechnical data
  - Capable of serving the broad needs of practicing geotechnical professionals
  - Enable internal and external customers access to search, input, and export geotechnical information

- Flexible to allow for future inclusion of new “modules”
Team/Resources

Participants
- Federal Agencies: FHWA, ACE, USGS
- State Agencies: OhioEPA, OhioDNR
- Local Government: City & County Engineers
- Consultants
- Academia
Initial Studies

- Needs Assessment
  - Justification
  - Begin formulation for the system
- Synthesis Study with FHWA
  - Practices by DOTs
  - Management Systems used in the UK
Major Discoveries

- **Oracle** database with Oracle Spatial for main engine
- **gINT** for borehole logging and graphic presentation of logs
- **ESRI** product for GIS applications with 3D Analysis
- **Equis** for data management
- **Falcon** for document management
Major Components of the System

- Electronic conversion of the historical geotechnical archives
  - 75 years of data collection
Achieved Files

- 21,000 Project Files
- Pilot Study
  - 1,538,000 sheets of 8.5” x 11” records
  - 50,300 plan sheets of 24” x 36” records
- Production Run
  - Cost: $360,000
  - Time: 18 months
Description

- Card Files
- GQL Database
**Job No. 06855**

**Year** 1968

**Changes**

**File No.** EES-137

**Job No.** 12-99-31

**Design By** RACKOFF ASSOC

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### RECON | AUGER | CORE | DRIVE ROD
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By: Snyder Gorey
Dates: 7/3-8/68, 7/16-10/68
No. of Holes or Soundings: 2
Footage: 97.5, 118.0
Samples Tested: 15

### SITE PLANS
- **Date Redd:** 5-27-68
- **Revised Plan:**
- **Topo Sheet:** 434-13-NE
- **Samples Accounted For:**
- **Transmittal Date:** 8/24/68
- **No. of Tracings:** 3
- **Filed with year:** 5-1-79
- **Remarks:**

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### Auger Data | Drive Rod | Core Data
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<table>
<thead>
<tr>
<th>No. of Holes</th>
<th>Footage</th>
<th>Samples</th>
<th>No. of Soundings</th>
<th>Footage</th>
<th>No. of Holes</th>
<th>Footage</th>
<th>Samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
<td>6</td>
<td>110.0</td>
<td>2</td>
<td>97.5</td>
<td>15</td>
</tr>
</tbody>
</table>
Description

- Card Files
- Project Boxes
Description

- Card Files
- Project Boxes
- Plan Sheets
Description

- Card Files
- Project Boxes
- Plan Sheets
- Project Files
<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Height of Bridge</th>
<th>Length of Bridge</th>
<th>Span Type</th>
<th>Material</th>
</tr>
</thead>
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<tr>
<td>612.0 x 792.0</td>
<td>2</td>
<td></td>
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</table>

**Paulding County**

**PAU-09-16-26**

**OVER G. & S. MARION COLUMBUS CREEK**

**PAU-09-06-09**

L.N.L. R. D. R. 5/8/77
Major Components of the System

- Electronic conversion of the historical geotechnical archives
- Management of current geotechnical data
- Presentation of boring logs and laboratory testing results
- Inventory and ranking of geohazard sites
Underground Mine Subsidence
Landslides
Major Components of the System

- Electronic conversion of the historical geotechnical archives
- Management of current geotechnical data
- Presentation of boring logs and laboratory testing results
- Inventory and ranking of geohazard sites
- Remediation cost database and application
Cost Remediation Database

- Developed for planning purposes
- Utilizes information developed from the field inventory forms for geohazards
- Calculates estimated cost of preferred and alternative remediation measures
Major Components of the System

- Geologic Site Management Program
- Instrumentation and monitoring of high risk geologic sites
- Geotechnical support for construction projects
- Operations and Maintenance reporting
- Structural Engineering support
Major Components of the System

- Geotechnical research
- Software application interfacing
- Web portal for a GIS-based enterprise system
GIS Layers

- ODNR-DGS/DW/DS
  - Soil Survey
  - Bedrock Geology
  - Bedrock Topography
  - Bedrock Structure
  - USGS Landslide Maps
  - Mine Maps
  - Water Wells
Geotechnical Standards are consistent at State and Federal Levels

- British Standards Institute (BSI)
- Association of Geotechnical & Geoenvironmental Specialist (AGS)
- COSMOS/Caltran
- USACE
- AASHTO
- ASTM
Modifications to the SSI

- Reflect the new standards
- Identify the requirements for the electronic submission of data
- Implement Electronic Data Deliverable (EDD)
- More to come...
Team/Resources

- **Budget**
  - $500,000.00

- **Time Line**
  - 3 Years

- **Support**
  - ODOT
    - Office of Information Technology
    - Office of Technical Services
    - Office of Geotechnical Engineering
  - Consultants
What progress have we made?

1. Card Scanning
2. GQL Application
3. Pilot Scanning
4. Production Scanning
5. GIS Layers
6. Needs Assessment
7. Synthesis Study
Expectations

- Review and familiarize with ODOT’s geotechnical data and its uses
- Provide guidance to the consultant
- Participate in testing of the system
- Provide feedback and recommendations for future improvements
Current Status

- What work has been completed?
  - Card Scanning by OPI
  - Pilot Scanning of Project Files by Dayton Imaging
  - Pilot Production Scanning by OPI
  - Needs Assessment by GeoDecisions
  - Synthesis Study with FHWA by GeoSyntec
Schedule

- Continuation of scanning

For MORE INFO...
List location or contact for detailed schedule (or other related documents) here
Lidar Survey Study

- **Jef-7-13.5**
  - Jobes Henderson
    - 3D Survey with Geologic Mapping
Lidar Test Site

SR 7 Jefferson County near Belmont County line
Field Process

- Scans were collected every 50 feet
- Control points were surveyed using GPS, and all scans were registered to state-plane coordinates
Office Process

- Removed vegetation and other interference
- Identification of stratigraphy and discontinuities
- Field verified with a geologist
What’s Next?

- Establish Standards
  - AGS
  - USACE
  - COSMOS
- Meeting with Steering Committee
  - Review of Assessment
- Contract for Principle Consultant
  - Detailed Assessment
What would you like designed in ODOT’s data management system?

Submit ideas or suggestions to Kirk Beach

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