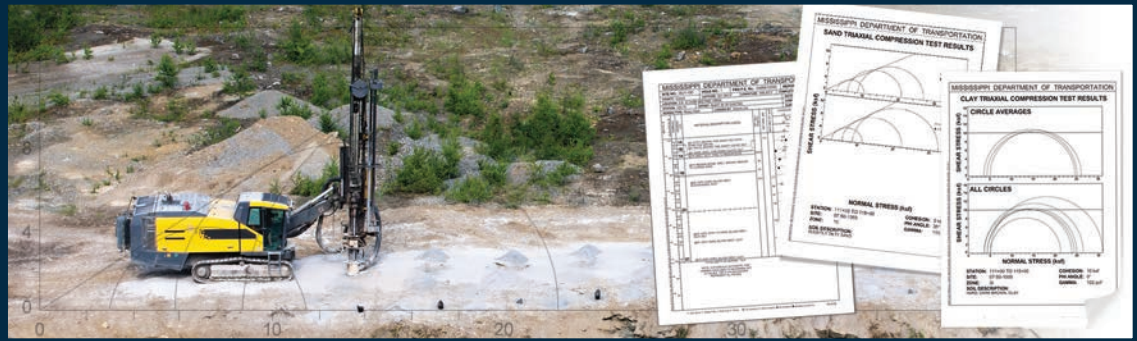




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## Project Summary

### Organization:

Mississippi Department of Transportation

### Solution:

Geotechnical and Geoenvironmental Engineering

### Location:

Jackson, Mississippi, United States

### Project Objective:

- Streamline workflow for geotechnical data collection and reporting.
- Implement accessible, centralized, searchable database tied to GIS applications.
- Expand gINT's geotechnical database structure to accommodate triaxial test data.

### Products used:

gINT, MicroStation

## Fast Facts

- MDOT's geotechnical division converted from a workflow based on manual data entry and spreadsheet exchange to a gINT-enabled data management and reporting process.
- gINT was easily customized to enable data entry and reporting to meet MDOT's requirements.
- gINT enabled other engineering disciplines and stakeholders to easily access geotechnical data required for road and bridge projects.

## ROI

- MDOT realized immediate productivity gains after the phased implementation of gINT.
- The geotechnical division is now able to generate boring logs in 15 minutes compared to 45 minutes to 1 hour pre-implementation.
- MDOT saw a 50 percent reduction in the amount of time it took to set up a project, create multiple boring logs, redline and correct the logs, and get final approval.

# Mississippi Department of Transportation Cuts Geotechnical Reporting Time in Half Using gINT

## Mississippi Department of Transportation Streamlines Workflow for Collection and Reporting Geotechnical Data

### Statewide Transportation Asset

The Mississippi Department of Transportation (MDOT) Geotechnical Division produces geotechnical investigation reports for roadway and bridge projects throughout the state. To streamline the process of recording geotechnical data, integrating lab data, and producing necessary reports, MDOT implemented Bentley's gINT geotechnical data management and reporting application, customizing the application to meet all of the department's requirements. gINT enabled MDOT to reduce by half the amount of time it took to set up a project, create multiple boring logs, redline and correct the logs, and get final approval.

"The implementation of this application will significantly impact the overall quality of roads and bridges in Mississippi," said the Mississippi Transportation Commission in a joint statement with MDOT. "This technology will reduce the time it takes to accurately record data and communicate that information to the district offices and serves as a great asset for improving our transportation network for years to come."

### Disjointed Manual Workflow

Headquartered in the state capital of Jackson, MDOT is responsible for providing a safe intermodal transportation network that is planned, designed, constructed, and maintained in an effective, cost-efficient, and environmentally sensitive manner. In 2012, the department awarded more than \$406.8 million in construction contracts throughout the state. The geotechnical division was hard pressed to keep up with production of reports due to a disjointed workflow with different departments using different software applications. Geotechnical lab requests and test results were communicated via Excel spreadsheets, then manually transferred into separate reporting tools. As a result, information was archived as individual Excel or PDF documents with no search or query capabilities. Moreover, the manual data entry raised the possibility of introducing errors.

MDOT invited Bentley to conduct a workflow study of the division's geotechnical reporting practices. The objective was to streamline the collection and processing of geotechnical data in the material lab in order to generate the necessary

boring log reports in a timely fashion. In addition, MDOT required the reports to be accessible to different engineering disciplines and be stored in a searchable database tied to GIS applications.

### Customizing gINT for MDOT

Based on the workflow study results, MDOT decided to implement gINT, Bentley's solution for geotechnical and geoenvironmental data management and reporting, with flexible options for defining and customizing reports to best suit user preferences. gINT enables users to gather, manage, present, and report on subsurface data more efficiently and with greater accuracy. Users create virtually any type of subsurface report including borehole and well logs, fence diagrams, cross sections/profiles, site maps, graphs, and tables—all from the same data. Advanced report design tools for conditional formatting, data manipulation, and decision-making save time and ensure consistent, standardized reports.

MDOT's implementation was divided into three phases. In the first phase, the project team created a geotechnical database structure, three geotechnical report templates, and a custom tool to import MDOT's existing Excel spreadsheets into gINT. This was accomplished without disrupting the work of the geotechnical division and materials lab. In the second phase, Bentley expanded the geotechnical database structure to accommodate triaxial test data. The project team created three more triaxial reports that eliminated the need for an in-house custom web application, and created another custom tool to import all external lab data into gINT.

Throughout the customization process, Bentley worked with MDOT to develop a graphical user interface and reporting format that presented data in a way that complemented the workflow and was familiar to consultants and others who use the reports.

### Immediate Productivity Gains

Implementing gINT allowed MDOT's geotechnical division to take ownership of all geotechnical data coming from the materials lab, centralize that data in a searchable database, and take advantage of the Unified Soil Classification System

*“Bentley’s  
commitment to  
meeting our vision  
for customizing  
the gINT software  
allowed us to  
transition flawlessly  
to its use, with very  
little training, but  
substantial time  
savings for every  
project from here  
out.”*

*—Virgil Payne, P.E., Engineer,  
Mississippi Department of  
Transportation*

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(USCS) / American Association of State Highway Transportation Officials (AASHTO) Classification built into gINT. Productivity gains were immediate.

Upon completion of Phase 1, the geotechnical division was able to generate boring logs in 15 minutes using gINT. Previously, it took up to an hour to complete each boring log. MDOT conducted a benchmark study that revealed a 50 percent reduction in the amount of time it took to set up a project, create multiple boring logs, redline and correct the logs, and get final approval. Phase 2 enabled MDOT to replace an existing web application with the gINT triaxial report generation function. gINT not only improved the initial reporting capabilities, but also allowed revisions to be made quickly and efficiently so that those in the field had access to the most up-to-date test results.

MDOT Engineer Virgil Payne noted: “Now, instead of having to worry about continually redoing reports as the information comes in, we can get a preliminary report out and then as we add information, we can easily revise that report to publish a final version for the bridge designers and roadway designers.”

MDOT found that significant opportunities exist for ongoing savings made possible by the use of a database maintained

on a central server. With all boring information now tied to the state plane coordinates, MDOT can also share gINT borehole data with GIS applications. gINT-enabled reporting now provides the geotechnical division with an efficient and consistent means of presenting site conditions and characteristics for the design of Mississippi’s roads and bridges.

### **Future Phase Extends Statewide**

In the upcoming third phase of implementation, the geotechnical database will be modified to support data entry from all districts. A custom tool will be added to support import of soil profile data used by the districts, and a custom fence report will be developed for soil plan reporting. The database structure will be revised to enable the migration of geotechnical data into an enterprise database, as well as support importing alignment profile data from Bentley’s GEOPAK Civil Engineering Suite.

When gINT supports the statewide sharing of geotechnical information, MDOT’s engineering disciplines and stakeholders will be able to use the information for making decisions about project location, design, and rehabilitation.