DRISI

Caltrans Division of Research, Innovation and System Information

Research Results

GeoDOG Online Repository

Comprehensive, web-based tool for efficiently managing Caltrans geotechnical documents and data

Geotech/ Structures

MARCH 2013

Project Title:
Implementing and Deploying Data Management Tools within Geotechnical Services

Task Number: 1232
Completion Date: June 30, 2012

The web-based GeoDOG tool provides a central repository for all Caltrans geotechnical data and documents, giving geo-professionals easy access to essential, up-to-date information.

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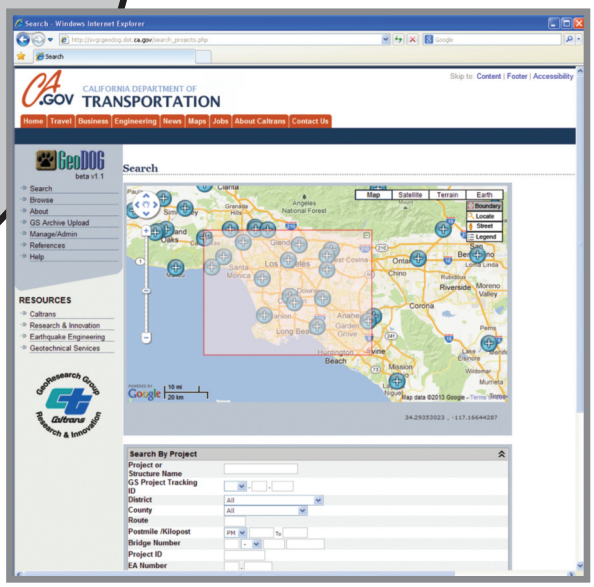
WHAT WAS THE NEED?

Designing and constructing bridge foundations, retaining walls, and other highway structures requires subsurface exploration and evaluating foundation materials for engineering properties. These geotechnical site investigations generate extensive subsurface information and test data that remain relevant long after the initial project, including being reused for subsequent projects.

To manage the data collected, the Division of Engineering Services Geotechnical Services used a paper-based filing system that was difficult to maintain and cumbersome for geo-professionals to access. Misplaced files, incomplete documentation, the limited lifespan of paper, as well as the inability to know whether the data had already been gathered, contributed to inefficient or incomplete utilization of existing information. The GeoDOG tool was developed to promote the maintenance, management, and reuse of valuable borehole, lab test, and location test data.

A similar implementation of a document management system for the Ohio Department of Transportation resulted in 10% to 20% less borehole drilling with a savings of $12–$24 million per year, because existing data could be reused rather than redoing drilling operations for locations where the previous data could not be found. Caltrans conducts approximately 300 geotechnical site investigations annually, each having multiple boreholes. Reducing drilling by 10% by using existing data could save substantial resources annually.



The Search page allows users to look for specific documents or projects within a user-defined spatial boundary.

WHAT WAS OUR GOAL?

The project's objective was to develop a centralized, web-based repository and document management system for Geotechnical Services to improve data collection practices and facilitate rapid archiving, dissemination, discovery, and exchange of information.

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Caltrans improves mobility across California by performing applied research, developing innovations, and implementing solutions.

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WHAT DID WE DO?

Caltrans, in partnership with Geotechnical Services, developed the Digital Archive of Geotechnical Data (GeoDOG) web-based tool for collecting, managing, and retrieving geotechnical documents and data. GeoDOG offers the following:

- Intuitive map-based user interface that presents data availability with tools to search, upload, download, and archive geotechnical documents and data
- Sortable search results, mouse-over information, document preview, and a shopping-cart style document download feature
- Automated email notifications to archive managers and relevant users, providing an efficient means for tracking and approval
- Process controls and tools for archive managers to ensure integrity of the document and data collection
- Facility to share data between the testing lab, geo-professionals, drafting services, and the data repository
- Support for data files generated by commercial geotechnical software used by Caltrans for borehole logs and laboratory test data

Web-coding for GeoDOG was performed in-house under the direction of the principal investigator. Regular interaction with Geotechnical Services end-users ensured that the tool met the fundamental requirements for a functional and deployable system.

Geotechnical Services also contracted a document scanning company to convert over one million existing Caltrans geotechnical documents spanning a period of over 80 years to a digital format, allowing users to immediately take advantage of the GeoDOG document management system.

WHAT WAS THE OUTCOME?

As of April 2010, concurrent with decommissioning the paper-based filing system, Geotechnical Services requires all geotechnical information to be archived using GeoDOG. In August 2012, GeoDOG was migrated from a locally hosted development server with limited access to an operational IT intranet web server. Subsequent maintenance and operations of GeoDOG are carried out by Caltrans IT.

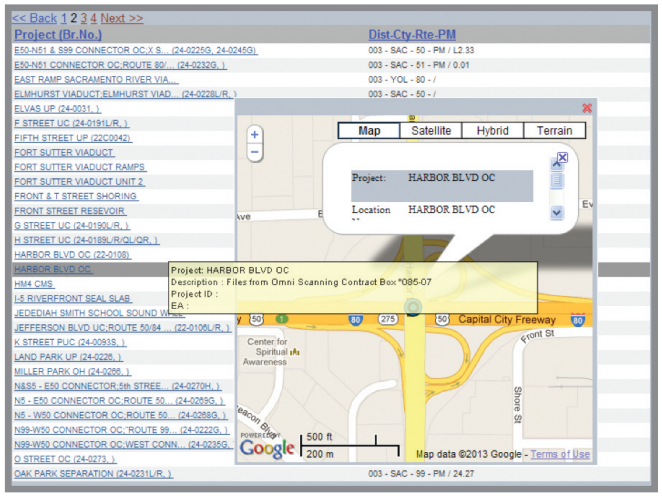
WHAT IS THE BENEFIT?

With the implementation of GeoDOG, public record requests for geotechnical information are now handled entirely via digital means, significantly reducing the staff time required to respond to requests. With all test data now centralized, users can find past reports, eliminating the need to redo costly tests. The integrity of the data can also be more easily verified because engineers' comments and updates are consolidated and archived.

LEARN MORE

To view the complete report:
www.dot.ca.gov/research/researchreports/reports/2012/Final_Report_CA13-1232.pdf

Locations of projects and documents in GeoDOG can be visualized using various Google map presentation options, including the Earth view shown here.



Search results are presented in tables, organized by project. Users can click a project to view a map of the location, hover the mouse over the project name to get a summary, or click the name to go to the project page.