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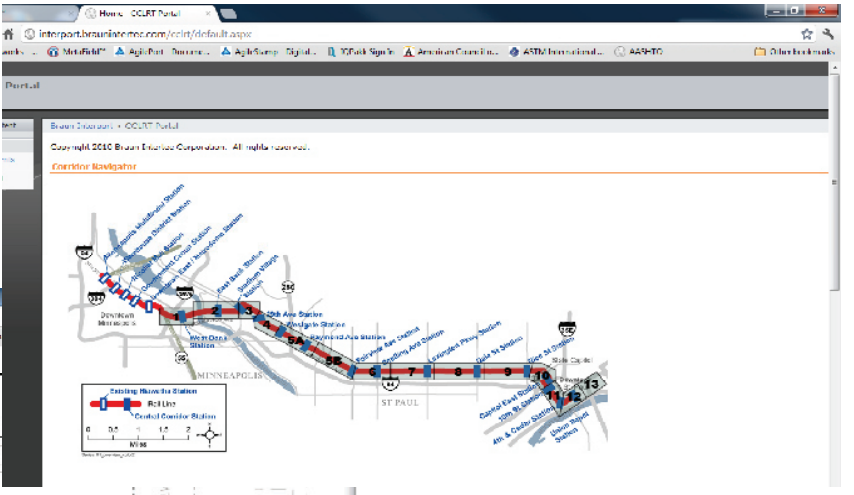
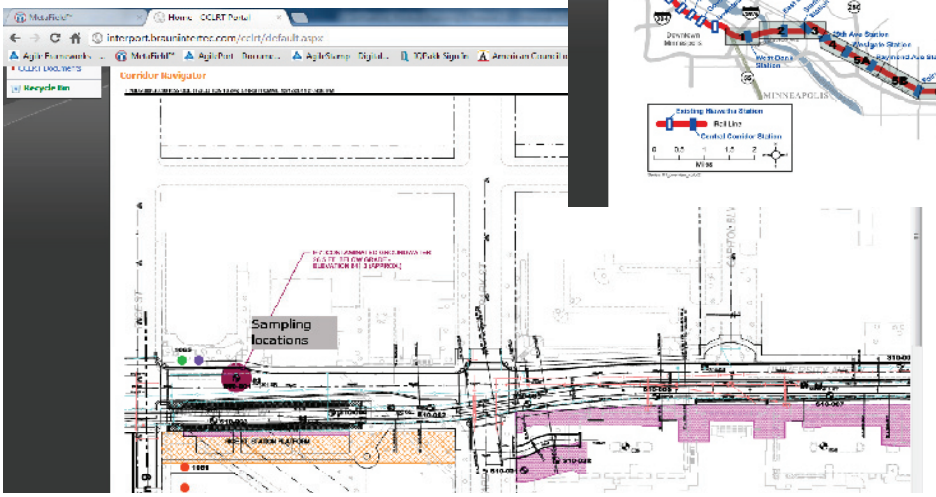
Critical communication

Electronic field information management system and client reporting portal helps keep $1 billion light rail project on track.

By Brian Hase



TOP: The 11-mile CCLRT route was divided into 13 sectors. Braun Interport users, including the Minnesota Department of Transportation and the Minnesota Pollution Control Agency, can click on any sector and drill down into project details.



BOTTOM: Clients can search for documents by location, such as soil boring reports and test results related to specific areas of a site.

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Project
Central Corridor Light Rail Transit, Minneapolis and St. Paul, Minn.

Consultant
Braun Intertecs

Product application
Agile Framework's Metafield and AgilePort software support efficient field operations and report management for multiple stakeholders on a large project.

Central Corridor Light Rail Transit (CCLRT) is the largest public works project in Minnesota history. The $1 billion project will connect the downtown areas of St. Paul and Minneapolis, carrying more than 40,000 riders each day when it opens in 2014.

The rail line runs through a mix of residential neighborhoods, commercial, and industrial areas, and the sprawling Minneapolis campus of the University of Minnesota. Major stakeholders in the project include municipal and county governments, the Minnesota Department of Transportation (MnDOT), the Minnesota Pollution Control Agency, and the University of Minnesota. The project is being constructed and will be operated by the Metropolitan Council. On everyone's mind was the need to minimize the duration of construction effects to local businesses and residents while adequately managing the nearly 1,500 sites of environmental concern identified during a Phase I Environmental Site Assessment (ESA).

The project

Braun Intertec, a 500-person geotechnical and environmental consulting and testing firm based in Minneapolis, was hired to perform several critical support services during the project, including a Phase II ESA of nearly 500 locations. Nearly 1,000 soil and groundwater samples were collected and analyzed in the Braun Intertec lab during a six-month period for more than 350 chemicals. In the end, more than 65,000 unique data sheets were compiled. Two field teams of four people each completed the work. Since the Phase II ESA was on an aggressive schedule, the most important stakeholders wanted to receive field observations and boring results daily.

Braun Intertec identified two major challenges going into the project:

1) collecting and organizing an unprecedented amount of data within a short timeframe, and
2) communicating this data accurately and expeditiously to multiple stakeholders in a manner that satisfied everyone's interests.

According to Jackie Dylla, project manager for Braun Intertec, employing conventional field data collection, lab testing, and client reporting methods for a project as large, complex, and fast-moving as the 11-mile-long CCLRT could have been a logistical nightmare. It would be difficult if not impossible to satisfy stakeholder demands for speed and accuracy.

To address the speed and accuracy requirements, Braun Intertec adopted two innovative approaches. First, field technicians used rugged field computers during boring activities that allowed them to take notes and log soil observations electronically. Preformatted screens and drop down boxes ensured that all data was entered and labeled consistently. Field notes were then electronically signed and sent to a project manager queue for review.

Second, once reviewed, field observations and boring logs were uploaded daily to a password-protected document management and client reporting Web portal. Test results and other documentation were also uploaded into the portal. Stakeholders received results almost instantly and could search and view documents in a variety of ways, including physical locations on maps of the CCLRT project.

The effort paid off in several ways. Stakeholders were delighted by how fast they were getting information needed to keep the project moving forward. Many also were amazed at how easy it was to find specific documents and test results.

In addition, Braun Intertec estimated the two systems increased its efficiency by 10 to 15 percent and helped it come in $300,000 under budget. For example, because field technicians could communicate field observations in real-time to the project team back at the Braun Intertec office and to technical resources at MnDOT, when something of concern was noted at a boring site, additional borings could be ordered in the adjacent area without having to send the field team out on another day. "That saved us a lot of time having to go back and do a second trip and second sampling and drilling event," Dylla said.

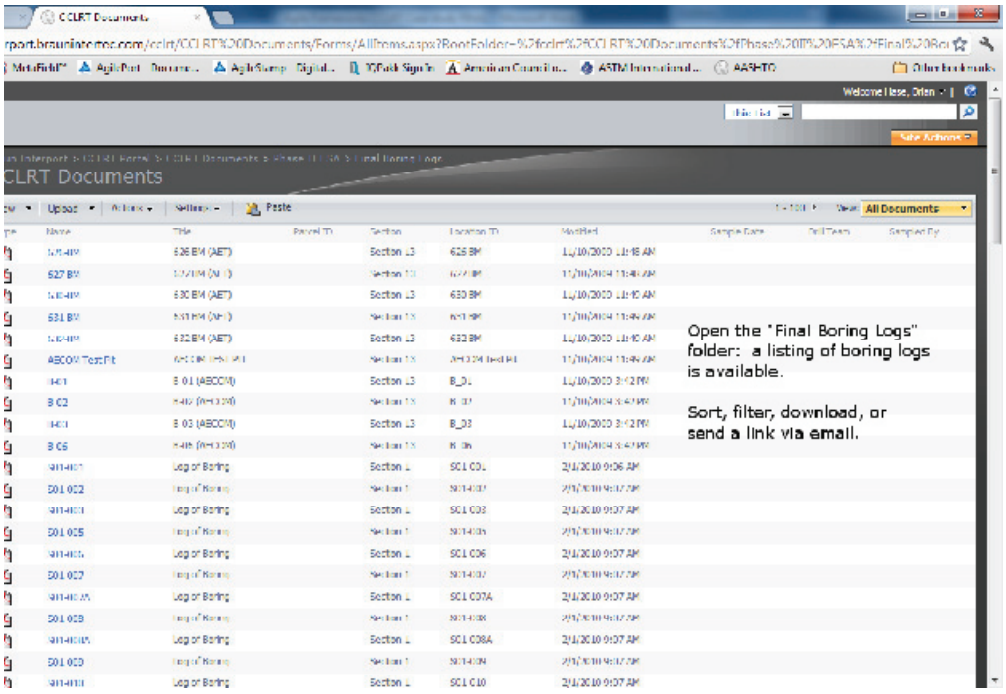
Project spawns software

In fact, results were so good that last year Braun Intertec set up a subsidiary called Agile Frameworks to commercialize its field information management system and client reporting portal, which are now known as MetaField and AgilePort. Braun Intertec is currently using both MetaField and AgilePort (which the company re-labels as Braun Interport) in the construction phase of the CCLRT to provide environmental construction monitoring and determine that contractors are handling contaminated soil and water appropriately.

A Braun Intertec technician performs environmental drilling along the CCLRT route in St. Paul, Minn. Two teams of four drilled nearly 500 borings and took nearly 1,000 soil and groundwater samples along an 11-mile stretch of roadway.

"MetaField is probably the first field information management system designed specifically for the architectural engineering, testing, and consulting industry," Dylla said. "It makes things consistent and accurate."

such as date, sample and boring IDs, corridor section, street location, and others. That means documents can be sorted and viewed in numerous ways. For example, unlike FTP sites, which require clients to search through file folders to find documents, boring logs, and test results, Braun Interport allowed CCLRT project team members and stakeholders to click on a map of the entire 11-mile project and view information by physical location. That feature was especially popular with stakeholders, who frequently needed to find location-specific information, and continues to be used extensively during the construction phase.



Once a location is clicked, clients can access project assets for the location, including daily logs and soil boring reports, which were uploaded to Braun Interport as soon as they became available.

Currently, for example, when contractors are working in an area identified as contaminated, they can go to Braun Interport, click on that section of the project map, and get all documentation and test results for the area. Data is then sent to landfills to get approvals done quickly.

Dylla offered another example: "Say a field technician observes something funny at the corner of University and Victoria. I can go into Braun Interport, look at the map, drill down to that specific location, and immediately find the borings that were done in that area and compare them to what we are finding in the field."

Screens, drop down boxes, and data entry actions conform to ASTM and other industry standards, so all Braun Intertec field technicians now label observations and enter data in exactly the same way. In addition, field and laboratory personnel collaborated to establish a uniform sample naming and labeling system, which includes preprinted chains of custody and labels.

"There is far less room for ambiguity or error," Dylla said. "That's so important because for the Corridor Project we had to screen soils every 2 feet, take 1,000 samples at 500 boring sites, and distribute so much information to so many people. That meant, for quality purposes, we needed to keep it pretty structured."

Handling data consistently

Consistency and accuracy also were important in getting field observations into project management and quality assurance systems and ultimately into the Braun Interport client portal. MetaField is designed as a high-volume "straight-through" system. Once data is sent electronically from the field, there's no need to retype information into project management, LIMS, and document management and client reporting systems, including FTP sites and customer portals. Rather, data flows from one system into another in a straight-through fashion. That means data has to be accurate and consistent the moment it's entered.

Consistency also was crucial to the search and viewing capabilities of Braun Interport, which are based on metadata

The efficient dissemination of thousands of pages of laboratory data obtained during the Phase II ESA for CCLRT was essential in obtaining more than 50 environmental liability assurance letters for parcels acquired as part of the project. In addition, because results of the Phase II ESA were communicated to project partners during the design process, environmental impacts to construction were minimized, reducing overall project cost.

"A lot of this process is no different than what environment testing firms do on a traditional redevelopment project on contaminated property," Dylla said. "But the fact that we did it on an 11-mile stretch of one of the oldest roadways in the Twin Cities in such a short time frame is pretty remarkable."

The company's efforts didn't go unnoticed. Last year, the American Council of Engineering Companies of Minnesota and the Minnesota Society of Professional Engineers gave Braun Intertec their top awards for the many innovative reporting methods built into Braun Interport.

Brian Hase is chief technology officer for Agile Frameworks, LLC. He can be contacted at bhase@agileframeworks.com.

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