

Quality Matters

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Quality Matters...to Materials and Testing

Welcome to the inaugural issue of *Quality Matters*, the newsletter of the Louisiana Department of Transportation and Development's (DOTD) Materials and Testing Section, also known as the

Materials Laboratory or the MatLab. We are embarking on a journey to a new level of customer service by improving productivity, efficiency, and communication. In that light, the cre-

ation of *Quality Matters* is intended to inform the section's many customers of our functions, activities, and accomplishments, and also to help them understand how we can assist them in accomplishing their part of the Quality Assurance Program. "Those of us who are involved in the day-to-day operations of the MatLab are proud of our association with this section. We are happy to provide *Quality Matters* as a new service to our customers," said Doug Hood, Materials Engineer Administrator.

Recently realigned to fall under the administration of the Louisiana Transportation Research Center (LTRC) Division, the MatLab is modifying its

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The Materials Laboratory is located on Florida Boulevard in Baton Rouge



Materials and Testing Hosts 2005 SASHTO Quality Conference for Materials and Construction

The Materials and Testing Section hosted the 2005 SASHTO Quality Conference for Materials and Construction, held in early March at the Astor Crowne Plaza Hotel on historic Canal Street in New Orleans. The conference brought together representatives from 9 of the 12 states in the Southeastern Association of State Highway and Transportation Officials (SASHTO), AASHTO, FHWA, and the construction industry. The agenda focused on how these states are dealing with issues related to the Quality Assurance Programs in the construction of their state transportation facilities. A recurring theme was the need to make our pavements and structures last longer

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NTPEP: A Win-Win Solution for States

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The National Transportation Product Evaluation Program (NTPEP) is an AASHTO Engineering Technical Service Program pooling the physical and professional resources of member state DOTs to evaluate products of common interest.

NTPEP began in 1994 by combining the SASHTO Regional Test Facility and a similar NASHTO program that were both evaluating various traffic safety products and sharing the data amongst the participating states. With the merger, the two groups could share their expertise and continue to expand to incorporate more materials and more states in the process.

The premise of NTPEP is to serve as a “one-stop shop” for vendors of various traffic and construction products. Traditionally, a vendor will introduce a product to a state DOT, request an evaluation, wait for a verdict, and continue the process in the next state. Through NTPEP, a vendor can submit a material for both laboratory and field testing, potentially at different sites representing varying climatic regions of the country. The data is then collected and published in a report that the vendor can present to the states to demonstrate the product’s performance and its potential advantages compared to similar products in comparable conditions. The reports do not make pass or fail judgments based on any particular specification, but simply provide the testing results. The entity using the data can apply a particular specification.

The MatLab was involved with the original SASHTO Regional Test Facility and has been involved with NTPEP since its inception. Data from the various reports have been used to evaluate many products introduced in Louisiana. Some of the Qualified Products Lists have been modified to require that products be evaluated through NTPEP to be considered for approval.

DOTD benefits from the MatLab’s involvement in NTPEP in many ways. In addition to reducing the amount of time and effort spent in product evaluation, NTPEP provides greater exposure to a variety of suppliers and materials. Seeing side-by-side comparisons of competing products and products in the same category (e.g., traffic paint vs. thermoplastic vs. pavement marking tape) affords DOTD a greater knowledge of different systems and the opportunity to choose the best products for the job. In addition, more competition can also lead to lower prices.

The MatLab contributes to the NTPEP effort by participating as a laboratory testing and evaluation facility for retroreflective sign sheeting and traffic striping products. The outdoor test deck located in Baton Rouge is one of four decks in the country used to determine weathering effects in the evaluation process of the NTPEP retroreflective sign sheeting products.

Aside from the obvious benefits such as time and cost savings, DOTD also gains in other ways through NTPEP involvement. Staying up to date with the process increases the department’s technical knowledge of materials and processes. The program, although run by the State DOT members, involves a network of technical experts, members of State DOTs, Federal Highway Administration personnel, private laboratories, product manufacturers, and equipment developers. Collaborative and round robin testing with other states helps diagnose equipment issues and provides an exchange of research relating to specific products. By actively participating in annual NTPEP meetings and conference calls, we can ensure the program continues to meet our needs by discussing, proposing, and voting on recommended improvements. NTPEP is a win-win solution for states. With continued state involvement, the program will continue to benefit all participants.

NTPEP serves as a “one-stop” shop for vendors of various traffic and construction products.

SiteManager: Materials Manager Module Update

The department is investigating the possibility of utilizing SiteManager's Materials Management functionality. SiteManager, which went online July 1, 2004, is the client/server program that is used to automate the construction documentation process. It is now tracking over 250 projects throughout the state. Currently licensed by 23 states and one Canadian Province, SiteManager is used to track work completed and pay contractors for that work.

SiteManager, the client/server program used to automate the construction documentation process, is now tracking over 250 projects throughout Louisiana.

When SiteManager was originally licensed, the department's SiteManager task force determined that the materials functionality was not at a level that would provide a benefit to the department. Therefore, the materials functionality was turned off. Since this feature is still turned off, no sample data is being captured in SiteManager. Therefore, sample information cannot be used through SiteManager to pay contractors. The MATT System is still the official computer system for capturing sample data and test results.

There have been major enhancements made to the materials functionality of SiteManager in the last few years. Two years ago, representatives from Construction, Information Technology, and the Materials and Testing Sections visited the Missouri Department of Transportation's Materials Division to see first-hand how they were utilizing the materials functionality of SiteManager. Everyone was very impressed with how they were functioning as a SiteManager laboratory. The enhancements to the materials functionality had greatly improved since the department's decision to license SiteManager.

With these improvements in mind, the department contracted with InfoTech, Inc., the licensor of SiteManager software, to analyze its current business practices and determine if using the Materials Management functionality is a viable option. Analysts from InfoTech performed the process review during the week of December 14, 2004, interviewing all MatLab personnel and other various personnel from LTRC, the district laboratories, Construction, and Information Technology. The analysts created over 50 flow charts showing our current processes.

InfoTech has submitted their initial review of these processes. In response, the MatLab and district laboratories have sent comments and further information for them to review and include in the final report, which is expected by the middle of April.

The report will compare the department's current business practices using the MATT System to how these processes would be completed in SiteManager's Materials Management module. It will show in what areas the department may need to alter its business practices concerning the sampling and testing process if it were to migrate over, or it may show that the department may not benefit from migrating over. Whatever the outcome, the process review was valuable to all the laboratories involved.

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Welcome to *Quality Matters* (cont. from page 1)



organizational structure to improve the responsiveness of its units. While LTRC and the MatLab are still separate entities, this organizational merger has permitted the identification of similarities in testing and evaluation capabilities to maximize available resources. The MatLab's functions and responsibilities, however, are unique within DOTD and have not changed.

The MatLab is much more than just a testing laboratory—its mission is to develop, administer, and regulate DOTD's Materials Quality Assurance Program, environmental evaluation programs, and the geotechnical investigation and testing programs in cooperation with our public and private partners. The Materials Quality Assurance Program includes materials evaluation and design, materials specification development, and conformance programs.

Headquartered in Baton Rouge, the MatLab has a current staff of 56 employees and state-of-the-art laboratories for materials testing and evaluation services. Although the MatLab can perform the same routine quality assurance tests for construction and maintenance materials conducted by the district laboratories, its comprehensive capabilities enable it to perform more complex and detailed testing in the evaluation of materials. Distinct unit laboratories are focused on instrumental and wet chemical analysis, asphaltic materials, traffic control/reflective products, geotextiles and elastomers, soils, aggregates, concrete, physical testing, and adhesives and cementitious products. Testing may be performed for quality assurance, new product evaluation, or for materials characterization and subsequent development of specifications and testing and sampling procedures. To accommodate the overall mission of the section, those core laboratory capabilities are supplemented by units responsible for standards, materials qualification processes, materials automation functions (MATT system and SiteManager's Materials Manager Module), and associated manuals, policies, and publications. The statewide materials QA accountability is accomplished in close partnership with the nine district laboratories by providing the necessary standards, policies, and functional supervision as well as the provision, repair, and calibration of testing equipment. Another

unique element of the organization, the Environmental Evaluation Unit, ensures departmental compliance for both DOTD projects and facilities.

The MatLab provides services to most divisions within DOTD along with many customers outside the department. The largest, most familiar responsibility is to the District Operations Division in the form of the many acceptance samples that are submitted for evaluation. In addition to this important function, the MatLab performs many other duties for DOTD, including the following examples:

- ♦ The Soils and Aggregate Unit, working closely with the Pavement and Geotechnical Services Section, generates the soil boring log plan sheets for the Design Division.
- ♦ MatLab maintains approximately 70 different Qualified Products Lists (QPL) and generates several manuals, including the Testing Procedures Manual, Materials Sampling Manual, Field Procedures Manual, and MATT System Field Handbook.
- ♦ MatLab manages DOTD's New Product Evaluation Program and actively participates in AASHTO's National Transportation Product Evaluation Program (NTPEP), a nation-wide effort to reduce product testing redundancy between individual states.
- ♦ MatLab's Environmental Evaluation Unit, which is separate from and different in scope than the Environmental Impacts and Public Hearings Section at Headquarters, ensures through testing and evaluation that DOTD complies with the multitude of laws and regulations dealing with environmental issues. The unit handles environmental issues on projects from the planning stage through plan development, construction, and even post-construction matters.

In each edition of *Quality Matters*, we will highlight one or more of our major responsibilities. We will cover in more detail our major activities and accomplishments, along with any significant policy changes or changes in the Quality Assurance Program. With the publication of this first issue of *Quality Matters*, Hood affirms, "We are excited about this opportunity to improve communication with our customers. In that regard, we welcome and appreciate your interest and feedback."

gINT® Software Automates Drafting of Soil Boring Logs

For many years, engineering firms and agencies have used drafting to display the results of their investigations and designs. Historically, trained technicians drew these plan sheets by hand—a task that could be tedious and time-consuming, especially when changes to an existing sheet were necessary. The advent of computers increased drafting’s efficiency, especially for modifying existing or often duplicated sheets. When Computer Aided Drafting and Design (CADD) was born, the engineering community endorsed and embraced the new technology, and is still making great strides in improving and refining the system to meet its needs.

CADD showed great potential for displaying the results of deep foundation borings. In the past, exploration crews drilled borings at the site of a proposed structure and took the samples to a laboratory for testing. The results of the field work and the laboratory tests were then typically shown as a profile, with adjacent borings shown side-by-side for comparison and use by the designer or builder as needed. Much of the information displayed on these sheets was repetitive, and, when drawn by hand, the sheets could be very time consuming, especially when corrections or modifications were necessary. Although CADD systems improved this process somewhat, the DOTD borings still required a manual process of drawing lines and typing text in a particular location. Changes and corrections could be made much more easily, but the initial placement of information onto the sheet was still a tedious and visually demanding job.

It has been almost a year since the Soil and Aggregates Testing Lab’s primary draftsman has picked up a pen to plot a boring log.

To address these problems, the MatLab has implemented an automated drafting software program designed specifically for geotechnical applications. This process began when Soil Testing Engineers, Inc. (STE), a consultant performing geotechnical boring and testing for DOTD, asked permission for Geotechnical Computer Applications, Inc. (GCA), to duplicate the DOTD boring plan sheet. This would allow gINT®, one of GCA’s programs, to plot soil boring data. After DOTD granted them permission, GCA developed a “template” for any of its licensed users to use in producing boring logs for DOTD projects. Impressed by the software’s capabilities and flexibility, the MatLab proceeded to purchase it.

The software’s initial implementation phase resolved several issues, including printing on full-size plan sheets, using English units in the plans, and modified requirements for plan sheet layouts. With GCA’s assistance, the required templates were completed, and the necessary plotter connections were installed.

The Soils and Aggregate Testing Lab’s primary draftsman, Nancy Hill, was trained in the methods of entering project, boring, and testing data. She was soon clicking her way through the process, and it has been almost a year since she has had to pick up a pen to plot a boring log. The overall efficiency of the process has been continually improving. Not only has the time needed to draw a single boring been significantly reduced, but the process of making changes and corrections is also much less time consuming. Even a major elevation change, which previously required the entire boring or sheet to be re-drawn, can now be accomplished with a couple of keystrokes.

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2005 SASHTO Quality Conference *(cont. from page 1)*



through new technology and the use of statistically based sampling, testing, and acceptance standards.

were held for participants to ask experts questions on specific topics such as the implementation of the new AASHTO Design Guide. All of the presentations, the summary of the group discussions, and the states' reports are available on-line at www.dotd.louisiana.gov. Follow the link on the DOTD home page to the SASHTO 2005 Quality Conference, and select "Speaker Presentations."

The three-day seminar featured several nationally recognized experts in their field, including prominent FHWA members, such as Julie Trunk, who outlined ways to detect and prevent fraud in the construction acceptance process, and Michael Smith, who gave an exceptional presentation on the FHWA Risk Analysis Software. The construction industry was well represented by speakers such as Gary Fitts of the National Asphalt Institute, who presented new techniques designed to create longer lasting pavements. He introduced examples of the PerRoad software, which can be utilized in the design of an asphalt pavement to optimize the combination of lift thicknesses and strengths available to maximize the pavement's life.

In addition to the conference sessions, several industry representatives participated in the technology exchange by exhibiting their own devices and products intended for use in the construction and monitoring of highway and other transportation system projects. The support of these industry partners helped make the SASHTO Quality Conference successful.

Presentations from the member states also contributed significantly to the program. Florida DOT's Dave Sadler highlighted their experiences in dealing with monitoring the contractor's Quality Control (QC) processes. Dr. Celik Ozyldirim of the Virginia Transportation Research Council reported on the results of their research on the difference in using 4 x 8 inch concrete cylinders for compressive strength determinations as opposed to the standard 6 x 12 inch specimens. Louisiana was represented by Marshall Hill, a Project Engineer in Monroe, who presented an overview of the Accelerated Construction Techniques used on a major bridge rehabilitation project on I-20. Minimizing traffic disruption was the key component sought, and DOTD worked with contractors to develop a plan that would allow them to "get in, get out, and stay out." This catch phrase is being heard more frequently in the highway construction industry, as the public demands for reduced traffic congestion have been heard in state capitals around the country.

Initial reports from attendees indicate that the conference was well-received. Many attendees took advantage of the opportunities prepared by the conference planners to get an authentic taste of Louisiana. From ghost tours, to New Orleans' famous cuisine, to the experience of the French Quarter nightlife, it was truly a conference to remember! Plans are already underway for the next SASHTO Quality Conference, tentatively set for the spring of 2007, with the location to be determined.

Each state present at the conference presented a short summary of its activities in the QC/QA field since the last meeting two years ago. Many state DOTs are facing the same challenges: increased traffic, pressure to reduce staffing levels, and monitoring construction activities to ensure the taxpayer's investment in the transportation system is producing better, longer lasting roads. Each afternoon, two open discussion sessions

gINT[®] Software *(cont. from page 5)*

Soil boring logs are only the beginning of gINT[®]'s capabilities. Subgrade soil surveys, Electronic Cone Penetrometer probings, and lab test data reductions are being considered as additional uses. And because the software is Microsoft Access[®]-based, a searchable database of soil boring data is being built one project at a time. In the future, the department's Geographic Information System (GIS) can also use this software to display boring log information at any particular bridge site statewide, and the gINT[®] format will not require a significant amount of data storage space on the GIS server.

The MatLab's choice to pursue and implement this automated drafting system has increased efficiency in the production of soil boring logs for design. As more is learned about the capabilities of this product, additional savings may be realized. For more information on gINT[®], visit GCA's website at www.gintsoftware.com.

Environmental Spotlight: Focus on MS4

The Municipal Separate Storm Sewer System, or MS4, is the second part of a larger storm water program regulated by the U.S. Environmental Protection Agency (EPA) and the Louisiana Department of Environmental Quality (DEQ). On December 9, 2002, the Storm Water Phase II Final Rules became effective and established criteria for permit coverage of all small MS4 operators within specific geographical areas.

Under both the Phase I and Phase II final rules, the urbanized areas defined by the latest U.S. Census Bureau were used to determine the various MS4 categories (i.e., large, medium, or small; based on residential population and population density). The large and medium MS4s are currently addressed under the Phase I Final Rules. The small MS4s are designated as such when they are located within urbanized areas with a residential population between 50,000 and 900,999 and a population density of at least 1,000 people per square mile. Other small MS4s that are located outside an urbanized area are also required to comply with the Storm Water Phase II Final Rule.

Under this rule, all MS4s outside of an urbanized area that substantially contribute to the pollutant loading of an interconnected regulated MS4, and have a residential population of 10,000 and a population density of 1,000 people per square mile, shall be designated by the regulatory agency. Using these criteria, DOTD has regulatory compliance responsibility for MS4s in 10 urbanized areas and 5 designated areas.

***New environmental regulations
are necessary to keep pace
with growing environmental pressures.***

The DEQ issued a general MS4 permit to DOTD, which requires a five-year phase-in of an extensive list of activities to be achieved through what has been designated as DOTD's Storm Water Management Program (SWMP). Listed within this program for implementation are such activities as public education and outreach, public involvement; illicit discharge detection and elimination (requiring outfall inventory mapping of thousands of catch basins, drainage ditches, culverts, etc.); construction site runoff, post-construction site runoff and good housekeeping/pollution prevention; the development of best management practices (BMP), on-going inspections, monitoring and testing programs; and the submittal of certified annual reports.

MS4 and the associated SWMP requirements are being implemented nationwide by all state DOTs. The development and management of DOTD's SWMP under our MS4 permit is the responsibility of the MatLab's Environmental Evaluation Unit (EEU). The EEU is grateful to have received, and will continue to need, assistance from district personnel and representatives of the various departmental sections comprising the SWMP committee.

When new environmental regulations are enforced, many people think they are unnecessary and that too many such regulations already exist. If, however, they take time to think about how fast our population is growing, how much our growth-based economy alters our environment, and how fast our natural resources are exploited, it is not difficult to understand why new environmental regulations are necessary to keep pace with growing environmental pressures. Storm water runoff has been estimated to account for 40 percent of the pollution entering our nation's water sheds. Louisiana is blessed to have an abundance of fresh water, and the DOTD SWMP is one way we can honor our department's mission statement to serve the public "in an environmentally-sensitive manner."

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The MatLab at work



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