Quality Matters

A PUBLICATION OF LADOTD MATERIALS & TESTING SECTION

Volume 2, Issue 3 Fall 2006

Automated Testing at the Soils and Aggregate Lab

The idea of having a machine to automatically test samples in the lab has been around for many years due to the need for accuracy, reliability, and shortages in man power. Machines have the ability to repeat testing procedures over and over, accurately record data, and keep data stored digitally to be used later, either locally or remotely.

The lab's new testing system from GeoComp is fully automated.

One of the earliest automated testing machines used in the Soils and Aggregates Lab was a Reihle compression machine that was used to break undisturbed soil samples from the deep foundation borings in the early 60s. Using vacuum tubes, gears, and other mechanical devices, it displayed the current load on the sample, but it was also able to measure the deformation of the sample, and it recorded the results with pen and graph paper. This machine was used for over 30 years!

In the 90s, advancement in microcomputers and electronics allowed the development of a testing machine that would record and store test data electronically, even without the operator being present. It was basically a conventional mechanical testing machine retrofit with digital gauges, connected to a desktop computer to collect data over a specific preset time. The data was imported into an analysis program to do calculations and to generate reports in tabular or graphical form. This was a big improvement in the testing machine. This type of testing machine produced more accurate data due to the reduction in man-

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SiteManager Materials Implementation Update

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We are well on our way to making the transition from the MATT System to SiteManager Materials a reality. We have reached a number of our goals for our implementation. We have put together an excellent team of hard-working individuals who are putting in long hours on this project. All committee member lists, minutes, and status reports are on the Intranet under Construction Home Page > Site Manager > Site Manager Materials Implementation.

Some of the highlights of the project up to October 1, 2006 are described below:

1. The Mix Designs Committee is working on documenting the submittal process for asphalt and concrete mix designs.

2. The Material Codes Committee has come up with a new material code scheme.

ssssM#####

ssss = spec ref - M is Material - #### is a sequential number

For example, 0901M0010 is a material with a spec reference in part 901

3. The Material Codes Committee has numbered about 90% of the QPL materials. They are about 75% complete in identifying all materials identified in the new spec book.

4. The Approved Lists Committee has developed a process for entering approved producer/suppliers into the system (this is the current QPL approval process).

5. The Test Templates Committee has identified the test procedures that will need templates created. We are in the process of building those templates.

6. The Training Committee has established a procedure to train approximately 1,200 users (DOTD and contractor personnel).

7. The Sampling Committee has identified a scheme for the sample ID.

D####MMDDYY*****

District login ID – Date – User defined numeric code

They are working on the sample generation process and the sample tracking/review/approval process.

8. The Sampling and Testing Requirements Committee is working on relating the material to the pay item.

As you can see, we are very busy with this implementation. We are very excited about possibilities that SiteManager is giving us in the automation of the entire construction process.

Harris Selected as Environmental Program Manager

Joubert Harris has been selected to replace Ed Bodker as Environmental Program Manager. While Harris is new to this position, he is certainly not new to DOTD. With over 22 years of experience as an environmentalist here at the MatLab, he has worked to ensure that we comply with DEQ and EPA environmental regulations.

Harris is a native of Washington, Louisiana, and a graduate of Southern University, where he earned a B.S. in Biology in 1974 and a M.S. in Biology/Biochemistry in 1977.

Prior to his career with the DOTD, Harris worked at Southern University for nearly four years as a Research Associate for the Health Research Center. During that time, he increased his knowledge base and laboratory skills, which would later serve him well as a DOTD employee.

In January, 1984, Harris joined DOTD as an Environmental Specialist in the Environmental Evaluation Unit (EEU) of the Materials and Testing Section. One of his first assignments included the collection and analysis of water samples from the La-Branch wetland, where the Department was utilizing "end-on" construction for I-310 in an effort to minimize environmental impacts on existing flora and fauna.

As he advanced in his career as a DOTD environmentalist, Harris gained a number of state licenses and certifications in various environmental disci-

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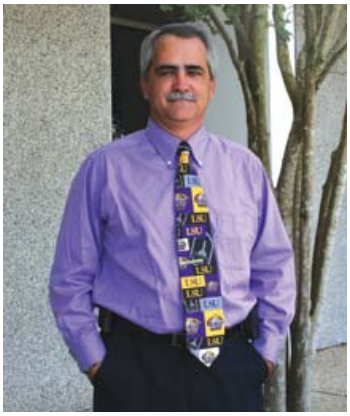
Wintz Named Field Quality Assurance Administrator



We are pleased to announce that Bert Wintz is our new Field Quality Assurance Administrator. Wintz has over 26 years of experience with DOTD, all in the Materials and Testing Section. He started with DOTD January 1980 in the Soils Lab, moved to the Field Operations Unit in the mid-80s, and moved back to the Soils Lab in the early 90s. Some of his experience includes hands-on work, such as coring concrete in the field or running a polish value in the lab. In addition to having a strong soils, aggregates, and concrete background, Wintz is considered to be our top erosion control expert.

Wintz obtained a B.S. in Civil Engineering from LSU in 1979. He has been a registered professional engineer for 17 years, and a land surveyor intern for over 10 years.

He will serve as coordinator for district labs and will continually review and monitor our statewide Quality Assurance program. Wintz will also oversee the Materials Qualifications Unit, the Materials Automation Unit, the Testing Equipment Unit, and the Geotechnical and Physical Testing Units. In addition, he will be responsible for lab accreditation and will oversee the inter-laboratory proficiency sample testing.

The Materials Automation Unit is presently developing the Materials Manager computer automation soft-

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Automated Testing (cont. from page 1)

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ually read and recorded data. The data could be read in less than one second, which is humanly impossible, thus producing more accurate testing results. Also, by taking readings at predetermined times, it allowed the technician to be performing other duties, significantly improving efficiency. Another advantage was that tests could run overnight, and the computerized system would take the readings as needed, shortening the overall testing time for many samples.

The latest machines are virtually automatic. They are fully controlled by a PC to run the test and perform real-time analysis simultaneously. These machines have very advanced circuitry and sensors to collect and monitor the sample during the test. Technicians or testing engineers use the system's software to set the parameters for the test according to standards established by AASHTO or ASTM, or create their own when testing for research purposes. The machine runs the test within the established set of parameters. Technicians set up the test sample in the machine, tell the computer when to start, and then let the machine run. Once the sample is in the machine, the machine usually requires no further human interaction until the test is done. The machine will even run overnight and throughout the weekend. Tests can be monitored remotely, possibly from anywhere in the world. Once the testing is done, the machine can produce printable reports, and an electronic copy can be stored in our database for future reference.

Time-consuming tests such as consolidation, which normally requires almost two weeks to run the full cycle of loads, can now be done in just a few days, possibly over a single weekend.

Recently, the Soils and Aggregates Testing Lab acquired a fully automated testing system from GeoComp, a testing equipment company in New England. This unit will run a variety of tests, including consolidation, CBR, unconfined, and two different kinds of triaxial tests. The system requires very little human interaction from the time the sample has been prepared and put into the machine until the time the test is finished. However, at any stage of the test, the technician can observe the data, and if necessary, manually take control and revise the parameters for the remainder of the test.

This system saves time because it can run itself after regular working hours. Time-consuming tests such as consolidation, which normally requires almost two weeks to run the full cycle of loads, can now be done in just a few days, possibly

even over a single weekend. Automation also allows for more timely changing of loads, which produces better test results and allows the designer to perform more accurate settlement predictions.

Testing is not the only area where automation has improved the efficiency of our production of the soil boring logs. For over 50 years, technicians had to draw the soil boring logs by hand on 24"x36" plan sheets made of starched linen. Technicians progressed to mylar in the late 80s, but were still drawing each boring by hand. Attempts were made in the early 90s to use Microstation (a type of Auto CADD system) to generate the boring logs, but this method still required time and some CAD skill. In 2003, the lab began to implement the use of a software package called gINT®. While gINT® does an excellent job in producing the soil boring logs on the plan sheets, it is also a powerful database program. To generate reports, technicians simply input test data in the format of rows and columns. Using the selected template, gINT® takes this data and places it in the appropriate location on the boring log sheet. If an elevation needs to be adjusted after the data is entered, only one entry needs to be changed, and the entire sheet can be re-drawn with the correction made. Features like this have been saving a considerable amount of time in reporting. Preliminary results can be sent to and accessed electronically by the design section for their review before any mylar or paper is used. It is hoped that one day the testing data will be electronically fed into the gINT® software, saving more time and reducing errors.

Mark Sehon and Nancy Hill prepare a soil sample for triaxial testing.

Since gINT® is a database program, technicians will be building a database that contains all of the testing results. Eventually, it is hoped that there will be enough data in the database to be able to design some foundations without having to send the field exploration crew out to obtain soil samples to be tested in the lab. Engineers should be able to search the database, find the project location, obtain the soil properties, and design the foundation accordingly without having to wait to get the values.

The MatLab's Soils & Aggregates Testing Lab is always looking for a new technology to be incorporated in our labs to be more effective in our daily operations.

Verification Testing for Pavement Smoothness Begins

A previous issue of *Quality Matters* described the Department's methods to ensure that new pavements produce a smooth ride. One of those methods included the calibration of the Department's Lightweight Profiler, a Lightweight Inertial Surface Analyzer, or LISA, as well as the calibration of the units used by contractors in their quality control testing. The next step in the process was to verify paving project results with the Materials & Testing Section's LISA, operated by the Testing Equipment Unit.

To date, the Testing Equipment Unit has verified five paving projects in four parishes in three different districts. The projects were built by three different contractors. In these projects, the Testing Equipment Unit has encountered both English and metric units; lanes open to traffic and lanes closed to traffic; and jobs profiled as single runs and others profiled in segments. The contractors whose jobs have been verified thus far have used profilers manufactured by Ames and Dynatest, and they have included both lightweight and high speed profilers.

The MatLab has made an effort to combine verification projects, district profiler demonstrations, and district lab certifications to utilize our time more efficiently and effectively. When combined, these events promote active participation amongst attendees.

One of the verification projects was videotaped by LTRC. In addition to recording the verification process, the video captured associated problems and corrective actions being implemented. Issues such as proper profiler operation, pre-testing, and setting up the unit for data collection were filmed, and this video will be used for future training purposes.

So far, the results of the verification testing have correlated well, with the contractors' results and DOTD's results showing an average difference of only one to two IRI units. This consistency in the results is encouraging.

Verification of pavement smoothness will continue, and our ultimate goal is that the tax paying public will notice an improvement in ride quality as they travel along Louisiana's highways.

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Harris (cont. from page 3)

plines, including wastewater, asbestos, hazardous and solid waste, underground storage tanks, vibration, and others. Harris is especially proud of the EEU, as they were instrumental in developing the Municipal Separate Storm Sewer System (MS4) program and website concerning storm water runoff from all state highways in urbanized and designated areas. Under this program, over 10,000 outfalls were identified and mapped along interstates and state routes.

In this new position, Harris looks forward to delivering a quality product to his many customers by maximizing available resources, increasing communication, expanding the EEU's knowledge base through training, and the continuing to adhere to the concept that quality matters.

Qualified Products List Update

The October 2006 revision of the qualified products list includes the addition of the following new sources:

QPL 02: Aggregates – *Feliciana Farms, Inc.* (Bayou Sara); *Krystal Gravel, Inc.* (Crystal Springs, MS)
QPL 03: Elastomeric Bridge Bearing Pads – *Cinters, Inc.* (High Point, NC)
QPL 09: Raised Pavement Markers – *Apex Universal, Inc.* (Sante Fe Springs, CA)
QPL 34: Hydrated Lime and Quicklime – *U. S. Lime Company – St. Clair* (Marble City, OK)
QPL 50: Fly Ash – *Bowen Plant* (Cartersville, GA)
QPL 58: Admixtures for Portland Cement Concrete – *Russtech, Inc.* (Louisville, KY)
QPL 61: Geotextile Fabrics – *Anita Plastics, LLC* (Solon, OH)
QPL 72: Erosion Control Products – *Western Excelsior Corporation* (Mancos, CO)

Also included in this revision are the following product source code deletions:

07AB: *Tangshan Jidong Cement Company Limited* (Tangshan City, Hebei, China) per company request.
0753: *Holcim (US) Inc*. (Clarksville, MO) per company's request.
0957 to 0970: *Avery Dennison* (Niles, IL). **0971 – 0984** *Ennis Paint, Inc.* purchased Stimsonite Corporation and related assets.
41AE, 41AF, 41AL, 41AR, 41AS, and 41AZ: *American International Refinery* (Lake Charles, LA) - company no longer in business in LA.
4196, 4199, and 41AC: *Asphalt Materials, Inc.* (Millsap, TX) – company no longer in business in LA
4190 only: *Blacklidge Emulsions, Inc.* (Gulfport, MS) – materials no longer specified.
41AN, 41AX, and 41CK: *Ergon Asphalt and Emulsions* (St. James, LA) – facility no longer under Ergon.
4132 and 4179 only: *Ergon Refining, Inc.* (Vicksburg, MS) – materials no longer specified.
4192, 4194, 41BQ, 41BN, and 41BR: *Fina Oil and Chemical Company* – company name changed to TOTAT Petrochemicals (**41DT – 41DV).**
4193: *Gulf States Asphalt* (South Houston, TX) – materials no longer specified.
41DC (Muskogee, OK) and **41DD** (Memphis, TN): *Koch Materials Company* – company name changed to SemMaterials LP **(41DX and 41DY)**.
41CX: *Koch Pavement Solutions* (Little Rock, AR) – company name changed to SemMaterials **41DW**.
4138 and 41BH only: *Lion Oil Company* (El Dorado, AR) – materials no longer specified.
4140 and 41BE only: *Marathon Ashland Petroleum, LLC* (Garyville, LA) – materials no longer specified.
4143 to 4146, 41AJ, 41AK, 41AM, 41AV, 41AY, 41BC, 41BD, 41BU, 41BV, 41BX, 41BY, 41CE, and 41DE: *Southland Oil Company* – company name changed to Hunt-Southland.
5816 and 5837: *Master Builders* (Cleveland, OH) – products replaced by new product and company name changed to **58DM and 58DN-** *BASF Admixtures, Inc*.
7604: *Zumar Industries* (Atlanta, GA) – product no longer meets the Department's specifications.
7905: *Superior Products International II, Inc.* (Shawnee, KS) – per company's request.

Annual District Lab Inspections Underway

The annual District Laboratory inspections, a key component of the District Lab Accreditation Program, have started once again. Inspectors from the MatLab's aggregates, asphalt, concrete, and soils labs have begun their annual trips around the state to verify that each and every District Lab can consistently perform the testing of samples according to the prescribed test procedures. The inspectors also check calibration methods, calibration records, and technicians' training records for completeness and timeliness. Any discrepancies are recorded, and the District Lab Engineer is informed of how his/her Lab performed in a "close-out" meeting at the end of the inspection. The Lab Engineer is allowed a period of time to correct the problem, and they must notify the Materials Engineer Administrator of the remedy, and that it has been implemented.

Although the primary task of the inspector is to ensure conformance with the established procedures and guidelines, their goal is to be an advisor and helper. The inspectors don't just correct an error, they try to ensure that the district lab technician knows why the procedure requires the step in question, and they frequently offer guidance on how to perform the test more consistently and efficiently.

Each of the inspectors from the MatLab has been evaluated themselves in the areas that they are inspecting, many of them by an inspector from the AASHTO Materials Reference Laboratory (AMRL) as part of the Materials & Testing Section's Accreditation. This AMRL Accreditation Program is nationally recognized as one of the toughest in the nation, and it gives the Department an edge when dealing with contractors and suppliers in disputes over materials testing. The DOTD Materials & Testing Section was the first Lab to receive accreditation under this program.

It is through these district lab inspections, along with the semi-annual Co-Op Testing program, that the MatLab is able to extend their AMRL accreditations in these materials areas to the District Labs. The inspections are currently scheduled to be finished before Thanksgiving, and upon correction of any findings of the inspectors, the Districts should receive their accreditation certificates by the first of the year.

Wintz (cont. from page 3)

ware package to handle and track samples and tests, review prequalification lists, and summarize test results in conjunction with Site Manager. The Testing Equipment Unit has recently embarked on verifying contractor tests for the Inertial Profiler Index, which is used to determine smoothness on the roads.

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