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Quality matters

A PUBLICATION OF THE LADOTD MATERIALS & TESTING SECTION

Louisiana is Getting the Lead Out

The Occupational Safety and Health Administration (OSHA) recently enacted revisions to the regulatory levels for numerous hazardous materials. One of the significant regulatory changes involves the Personal Exposure Limits (PEL) to hexavalent chromium present in pavement marking materials using lead chromate as a pigment.

The lead chromate used in yellow pigments is an effective material manufacturers use to produce the bright yellow markings used on roadways. As of now, the LADOTD requires a minimum amount of lead chromate pigment for yellow alkyd traffic paint. Similarly, previous specifications for thermoplastic pavement markings also required minimum lead chromate content; however, the Department's current thermoplastic specification does not require

leaded yellow pigments. Nevertheless, all of the yellow thermoplastic markings currently listed on the Qualified Products List contain lead chromate, which is the most common type of pigment for thermoplastic markings. In the past, manufacturers have tested and marketed products using lead-free organic pigments. Although these produce similar bright yellow markings, they are more costly to produce.

Within the pavement marking industry, the new OSHA regulations forced manufacturers to take steps to reduce the potential for employee exposure to lead chromate. The most direct way, rather than develop containment or exposure protection plans, was for manufacturers to reduce and/or eliminate the use of the leaded pigments. The LADOTD



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The Mercury is Falling

In 2006, as a result of growing federal and state concerns over the amount of mercury being re-introduced into the environment, the state legislature created the Louisiana Mercury Risk Reduction Act (Act 126). The Act became effective in 2007 with a plan to phase out the sale of non-essential mercury-added products in Louisiana by 2014. Effective July 1, 2007, products containing added mercury in amounts greater than 10 milligrams could no longer be offered for sale in Louisiana unless the manufacturer submitted a "convenient and assessable collection system" for their used products. The collection system requires prior approval from the Louisiana

Department of Environmental Quality (LDEQ) in order for such products to be considered for exemption under the Act. Consequently, and rather than applying for exemptions, companies are either developing new substitute products or simply opting not to do business in Louisiana.

Mercury-added products most commonly used within the Louisiana Department of Transportation and Development (LADOTD) include glass thermometers, fluorescent bulbs, thermostats, batteries, sensors, and electrical switches. While replacements, or substitutes, for some of these products may not be so criti-

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MatLab Updates

Asphalt

The new Application of Quality Assurance Specifications for Asphaltic Concrete Mixtures has been published. To read the publication online, go to www.dotd.la.gov (go to Construction then to Materials Lab and finally to QAM Asphalt).

New Products Evaluation



One of the products being evaluated by the New Products Evaluation committee, Shoretec's Shoreblock articulated block mattress, was installed on a project in District 04. Greg Wall, P.E., Resident Engineer for the project, reported that the product was used in two

different applications, which were as a channel liner/flexible revetment and as a bedding layer for a large (84 inches in diameter) concrete culvert that was placed beneath a 40 foot high embankment. For this latter application, poor sub grade conditions were going to make placing and compacting the backfill and bedding materials very difficult. Placing the ShoreBlock mattress immediately beneath the bedding material significantly improved the ability to place the culvert as well as compact the fill around it (see photo). To date, the pipe has been in place nine months, and settlement in this location has been negligible. The channel liner application has also performed well. It is hoped that this type of product will be incorporated into the plans for similar future projects.

Materials Manager

Teams are currently building the templates for entering the test data into Site Manager Materials and are about 85 percent complete for the Labs at the Materials and Testing Section; teams will begin on LTRC and district templates next. Teams are also working in each district assigning the different materials to the pay items and then associating the tests to each of the materials. In addition, we are working to get some of the hardware such as laptops and scanners that will be needed for implementation.

New Profiling Equipment

We are pleased to announce that we have added a new profiler to our inventory, a Dyantest Portable Road Surface Profilometer (RSP) Mark IV. The device is a high-speed

profiler capable of being used at speeds up to 72 miles per hour when collecting data. We have already begun using it in the IRI Verification Program.

Fly Ash QPL

Bayou Ash of Erwinville, LA now has two distinct source codes to better represent the two distinctly different fly ash products produced from Big Cajun No. 2 power plant. The difference is the loss on ignition which varies with carbon content. Source Code 5001 is for fly ash produced from Unit 3, and Source Code 5029 is from Units 1 and 2. The two-code system should help contractors produce more consistent concrete when using Bayou Ash fly ash.

Soils and Aggregates

Chris Charles was recently certified by ACI in concrete and aggregates.

Test Procedures

The Procedures Committee has revised procedures for the Concrete Slump and Air tests. The modifications have been approved by the Federal Highway Administration (FHWA). Here are some of the changes:

TR 202, Air Content of Freshly Mixed Concrete METHOD A – Volumetric Method

- The lighter plastic/PVC devices will be allowed.
- Fill bowl in two layers, not one layer.
- If aggregates > 1.5 inches, use Method B.
- AASHTO T 196-05 may be used in lieu of this method
- The AASHTO procedure uses greater quantities of alcohol.

METHOD B – Pressure Method (Although this method is quicker than Method A, the aggregate correction factor must be obtained in advance.)

- Allowed for all slump, except non-plastic concrete.
- If aggregates have absorption > 4.0 percent, use Method A.

TR 207 Slump of Portland Cement Concrete

- Measure the displaced center of the slumped concrete, not the original center of the base.
- When the concrete contains aggregates larger than 1.5 inches, wet sieve over the 1.5 inch sieve, discard the larger aggregates, and then proceed with the slump test.

Random Sampling

Random is by chance. It's accidental, indiscriminate, arbitrary, haphazard, unsystematic, and hit-or-miss. Random conjures up notions of your most off-the-wall friend blurting out a statement in conversation that does not fit the subject at hand. However, random sampling is actually quite deliberate.

Random sampling in the world of quality assurance is a method, which allows us to take a leap of faith. We usually do not or cannot sample most products on a continuous basis. We take a few samples and then make assumptions about the entire group or population. If we take samples randomly, then we believe that each piece of the population has an equal chance of being picked. Therefore, we can assume, with a certain probability of being right that if we take the proper number of samples then our samples do, in fact, tell us something about the whole lot of material.

Statistical specifications absolutely require random sampling! If an inspector uses personal judgment to determine where or when to take a sample, he introduces bias to the sampling process. Our leap of faith suddenly becomes flawed.

Random sampling is crucial, but it does not replace inspection. The inspector always has a right to inspect and sample areas that are obviously deficient. And on occasion, perfect random sampling has logistical constraints. Sometimes, "we can't put

the wheels of the truck in a ditch" or the "loader won't reach that far." However, we still use random sampling as a tool and goal to get samples that are just a bit closer to being more representative of the population.

Random sampling is often denoted in the Materials Sampling Manual and incorporated into LADOTD's sampling methods. LADOTD incorporates random sampling when obtaining aggregate samples from an aggregate roadway base. For example, LADOTD divides the roadway section into thirds, and uses random sampling to choose the sample location within each third of the roadway. In this case, the frequency of the sampling is set, but the location within each third of the road is random. A random number table is provided in the Materials Sampling Manual to assist with picking that perfectly random spot.

A random quote:

According to Robert R. Coveyou of the Oak Ridge National laboratory, "The generation of random numbers is too important to be left to chance."

Author: Luanna Cambas

Materials Engineer Administrator

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Random sampling is actually quite deliberate.

District Lab Engineers

District	Location	Construction Coordinator	Lab Engineer
02	Bridge City	Byron Hassenboehler	
03	Lafayette		Mike Boudreaux
04	Bossier City		Jay Collins
05	Monroe		Otis Peterson
58	Chase	Neal West	Jamie Blanton
61	Baton Rouge		Mark Kelley
62	Hammond		Clay Gottschalk
07	Lake Charles	Kevin Seilhan	Derek Domingue, E.I.
08	Alexandria	Matthew Ziecker	

History and Renovation of LADOTD Materials & Testing Laboratory



LADOTD recently began renovating Building No. 1, the 69 year old building, at Materials & Testing Laboratory. The Materials Lab Complex located at the corner of Florida Blvd. and South Foster Dr. consists of seven buildings. Building No 1 is the two story building, which is the oldest building on the complex. While LADOTD personnel refer to the building as the “two-story,” the building is officially identified as the “Main Laboratory Building.” This building houses the Soil, Aggregates, Physical, Concrete, Cement, Epoxy, Illumination, and the Environmental units.

It was the first building on the property and was built in 1939 by inmate laborers. The 4.65 acres, acquired in 1938 by the Louisiana Highway Commission that encompasses the Materials & Testing Complex, was part of a 37.95 acre tract purchased by the state on March 1, 1917 for \$8159.65. The property was initially used by the Louisiana State Penitentiary as a receiving station; however, the property was transferred from the Penitentiary to the Highway Commission by Legislative Act No. 54 and approved by the governor on June 30, 1938.

Originally, Building No. 1 served as the Highway Testing Laboratory and the forerunner of the Materials & Testing

Laboratory. Following World War II, two other buildings were constructed on the complex. These buildings were Quonset huts received from military surplus. Although both of these buildings have long since been replaced, one of the Quonset huts was located where the Section 22 Warehouse (Building No. 5) stands today. And the other was replaced by Building No. 3, which houses the Maintenance and Testing Equipment Units.

In 1979, Buildings No. 4 and 6 were added to the complex to accommodate the Motor Fuels Laboratory, which was transferred to the LADOTD in 1978 by Legislative Act for the next 10 years. Then in 1998, House Bill Number 87 of the Louisiana Legislature transferred the Motor Fuels Lab to the Department of Agriculture. Today, Buildings No. 4 and 6 are being used to temporarily house the Cement and Soils Labs and Soils Exploration during the renovation of Building No. 1.

The first meeting with LADOTD employees regarding the renovation was in April 2008. In order for the labs to continue its service to LADOTD during the renovation of Building No.1, the logical plan was to move all the lab personnel to Buildings No. 4, 5, and 6. In order to do so, Buildings No. 4 and 6 had to be repaired from having been vacated since 1997. The buildings needed



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History and Renovation of LADOTD Materials & Testing Laboratory (continued)

the following repairs: A/C repair, electrical wiring and outlet, ceiling tile, and lighting fixtures had to be worked on along with the installation of data and communication lines.

With the input from LADOTD employees, all the equipment that was deemed necessary to the continuing operation of the lab was moved to the assigned area with the help of the trustees from Hunt Correction Institute along with LADOTD employees over a two weekend span.

Charles Templeton of LADOTD headquarters' maintenance provided his electricians to supply power to the testing equipment. The works on data and communication were conducted by LADOTD IT and headquarters' telecommunication personnel. The move has been accomplished without work interruption because the LADOTD included their employees from the very beginning of the planning stage to the actual move.

Because of the successful move, renovation of Building No. 1 has finally begun. During the past five years, the heating, ventilation, air conditioning (HVAC) has been having problems with leaking cooling water due to the corrosion of the inside of the heat exchanger. Many repairs have been made over the years; however, the repair costs have become uneconomical to continue. Unfortunately, the cost of cooling and heating the building has also been increasing over the years due to the leak.

Over the years, Building No. 1 has been renovated twice. Originally, Building No. 1 had windows as the only means of ventilation. In the 1950's, the HVAC was installed including cooling towers atop the building dur-

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Building No. 1
Under renovation



Buildings No. 4 and 6
Temporary home of Geotechnical and Cement Labs

History & Renovation

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ing a renovation along with modifications to the exterior of the building, which gives the building its look as it stands today. The west dock was added in 1967. And immediately following the construction of the Administration Building in 1972, the Main Laboratory Building was renovated again to complement the new building resulting in a complete facelift. All crank windows were replaced with non-opening modern day glass panes and/or concrete. For example, an archived picture shows 26 crank windows with awnings at the south side of the building. The 1972 renovation reduced these 26 windows to 14 and resulted in the removal of the awnings.

During Building No. 1's current renovation, LADOTD will also be upgrading its universal testing machine in the Physical Lab, which is the machine used for the testing of the steel, pre-stressing strand, bolts, and concrete. The old machine has been in service since 1957. However, the new machine is capable of pushing and pulling 400,000 pounds with a cost of about \$200,000. The new machine will be easier and safer to operate with less strain on LADOTD employees' backs. Safety is the primary concern when dealing with the heavy equipment in the lab. The new machine will be able to increase the Department's efficiency by reducing the loading time and testing time of the specimen. Down time of the equipment will also be reduced due to newer technologies being built into the new machine.

Funding of the renovation was granted from the Capitol Outlay Project by Operations. The scope of the work includes replacement of the duct works, new heat exchanger, new air compressor, new boiler; upgrade electrical wiring to meet current electrical building code; and replacement of the ceiling. The project was awarded to Ceres Environmental Services of Laplace, LA. The contract time is 150 working days with a projected completion date in February 2009. Asbestos abatement contract was handled in house by LADOTD Environmental Evaluation Unit.



Building No. 5

Warehouse and Rubber Labs; Temporary home of Concrete, Aggregates, and Epoxy Labs

LADOTD's goal is to provide a better working condition for employees. Once the renovation is completed, LADOTD should be able to accomplish its goal of having a safer working environment with better lighting, safer electrical system, better HVAC for cleaner air and comfort, and better testing equipment for its employees to safely operate.

*Authors: Lodrick Price
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and Richie Charoenpap
Materials Testing and Evaluation Engineer
(detailed)*

Interesting MatLab History

A lot drawing dated June 27, 1938 showed a penitentiary cemetery in the northeast corner of the Highway Commission property that encompasses the Materials & Testing Laboratory. Legislative Act No. 54 provided for the removal and reburial of the bodies of convicts to the prison farm at Angola Prison.

In the mid 1980s, during the removal of a deceased 150 year old oak tree, a foreign wooden object was discovered inside a cavity. The Louisiana Department of Agriculture and Forestry was notified to investigate. Upon their investigation, they found the object was the remains of a baseball bat dating back to when the property housed German POWs during World War I.

An article from the State-Times, dated September 24, 1946, references the facility as, "The laboratory on the Eastern edge of Baton Rouge – a model for many other states..." While we are no longer a single building nor considered located on the eastern edge of Baton Rouge, we remain as the article is titled, "Highway Testing Lab Has Important Role in State Road Construction" and continue to stay committed to constant improvement.



Flooding in the mechanical room from cooling water leak



Damage on the Exchanger due to cooling water leak

Getting the Lead Out

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received notice from various manufacturers that were eliminating the use of these pigments and would be manufacturing products using organic lead-free pigments. In light of the OSHA changes and the notices from manufacturers, LADOTD made the decision to transition to the lead-free materials in order to protect their own employees and the motoring public from potential exposure to hazardous materials as well as ensure a continued supply of pavement marking materials and adequate competition.

After some investigation, the Materials Lab determined that each manufacturer currently supplying yellow traffic paint to Louisiana supplies waterborne traffic paint using lead-free pigments, and the Department has not used alkyd traffic paint in many years. Therefore, LADOTD is eliminating the requirement for leaded pigments in yellow traffic paints by removing the Alkyd Traffic Paint category altogether. The products listed on QPL 36 for Traffic Paints are lead-free.

The Materials Lab also determined the thermoplastic manufacturers currently supplying yellow material all produce lead-free products based on data available through the National Transportation Product Evaluation Program. LADOTD has added three lead-free yellow thermoplastic products to QPL 63 and encourages all contractors to request the lead-free products. The leaded thermoplastic materials will be removed from the QPL after giving manufacturers adequate time to deplete any current stock of previously purchased leaded products.

The Department has also added wording to the requirements for both yellow paint and thermoplastic pavement markings stating that yellow pigments shall be lead-free and comply with all OSHA regulatory levels regarding hazardous material. LADOTD joins numerous other states

Mercury is Falling

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cal, this is not the case as it relates to the glass thermometers. This mercury-added product is essential to various applications within LADOTD statewide testing programs. Finding replacement thermometers capable of meeting the strict calibration specifications under LADOTD's Data Quality Assurance/ Quality Control (QA/QC) program is a primary concern. So much so that a thermometer committee has been formed at the Materials Lab to address this issue in an effort to ensure the integrity of testing programs is maintained. The results of all efforts will be distributed throughout the department as appropriate.

Equally important under the Act, as with the phase out of new mercury-added products entering the state, is the proper management and disposal of existing mercury-added products at the end of their usefulness. Under this component of the Act, LADOTD is tasked with the responsibility of assessing its current mercury-added product inventory and developing a disposal and replacement product plan. Considering the various applications for the use of mercury-added products throughout the Department, this can be quite a task.

As LADOTD moves towards the 2014 phase out date and strives to embrace the terms of the Louisiana Mercury Risk Reduction Act, the Environmental Evaluation Unit will continue to facilitate the Department in its efforts to ensure program compliance and a quality environment.

Author: Joubert Harris
Environmental Program Manager

that are following the same path to removing leaded pigments from the roadways. Who would have thought that LADOTD wanted their yellow pavement markings to "go green"?

Quality Matters

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