

# The RD & T Newsletter

— Research —  
— Development —  
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A Publication of the South Carolina Department of Transportation  
Research and Materials Laboratory

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## Baghouse Fines in Asphalt Mixes

The National Center for Asphalt Technology (NCAT) recently completed a research study for the SCDOT titled, "Baghouse Fines in Asphalt Mixes." The project was initiated to establish criteria for the reintroduction of baghouse fines into HMA mixtures. This was accomplished by evaluating the variability in baghouse fines' physical properties, evaluating the effects of baghouse fines on baghouse fines/asphalt binder mortars, and evaluating the effects of baghouse fines on HMA mixtures.

This project involved obtaining samples of baghouse fines from HMA facilities in South Carolina. These baghouse fines were then tested to determine physical properties. Next, baghouse fines from ten HMA facilities were combined to produce ten combined samples for a detailed laboratory study of baghouse fines/asphalt binder mortars. Five of the ten combined



*Baghouse at a South Carolina Asphalt Plant*

baghouse fines samples were then selected to combine with the two asphalt binders and one aggregate for the evaluation of baghouse fines within HMA mixtures.

Findings of this research indicate that the quantity and type of baghouse fines being returned to the asphalt mix has a significant effect on the performance of HMA mixtures. The study recommended that because the percentage of baghouse fines greatly influences the volumetric properties of a HMA mixture, HMA contractors should be required to introduce baghouse fines back into the mixing process in a consistent manner.

If you have any questions or would like a copy of the final report, contact Terry Swygert at (803) 737-6652. ♦

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# *From the Office of Research:*



## **Changes to the SCDOT's Research Program**

Over the past few years, emphasis has increased for states to improve their research programs. With this added emphasis has come much needed guidance, from sources such as the National and Regional Research Advisory Committees, the Peer Exchange Program, etc., to aid states in identifying needs and formulating improvements for their research programs.

In the spring of 1997, the Department's research staff conducted an indepth review of our research program. As a result of this review, several needs were identified as follows:

- need more involvement in the program by non-engineering units/divisions in the Department;
- need more involvement in the program by mid-level engineers/supervisors;
- need more involvement in research projects by steering committees;
- need more follow-up on implementation of results after projects are completed.

Measures to address these needs were developed and proposed to the Director of Construction and the State Highway Engineer and then presented to the RAC at its summer meeting on July 16, 1997. These changes were then forwarded to the Department's Executive Director for final approval. The following changes were approved:

1) membership of RAC was revised to include other non-engineering units within the Department as follows:

### Old Membership

- State Highway Engineer (Chairman)
- Research & Materials Engineer (Secretary)
- Director of Construction
- Director of Maintenance
- Director of Planning
- Director of Preconstruction
- Director of Traffic Engineering
- Two (2) District Engineering Administrators
- **Bridge Construction Engineer**
- **Bridge Design Engineer**
- **Road Design Engineer**
- **Research Engineer**
- FHWA Representative

### New Membership

- State Highway Engineer (Chairman)
- Research & Materials Engineer (Secretary)
- Director of Construction
- Director of Maintenance
- Director of Planning
- Director of Preconstruction
- Director of Traffic Engineering
- Two (2) District Engineering Administrators
- **Director of Mass Transit**
- **Chief Financial Officer**
- **Executive Unit Representative**
- FHWA Representative;

2) the name of the Committee was changed to the Research and Development (R&D) Executive Committee;

3) the responsibilities of project steering committees were changed to increase involvement in projects thru periodic meetings, establishment of a chairman for each committee, and continuation of the committee thru the implementation of results (committee to be designated Steering/Implementation Committee);

4) more mid-level engineering staff/supervisors will be utilized in the research program thru membership on Steering/Implementation Committees, involvement in the topic solicitation process, etc. (members of the research staff will visit all major units in the Department to identify mid-level engineers/supervisors to involve in the program).

Hopefully, these changes will increase interest and participation in the research program and improve implementation of research results. Additional changes are anticipated in the future as other needs are identified.

Mike R. Sanders  
Research Engineer

## Topics Solicited for 1998 Research Program

Recently, the Department completed solicitation for problem statements for new State Planning & Research (SPR) projects. The Research Unit received 33 problem statements ranging from administrative, construction, maintenance, materials, planning, and traffic engineering topics. The problem statements were routed to Department personnel with expertise in each topic area for their comments.

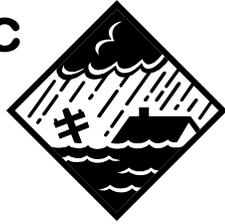
These comments have been returned and the problem statements are ready for balloting by the Research & Development Executive Committee (RDEC). The winter RDEC meeting will be held in December where the ballots, problem statements, and comments made on the problem statements will be distributed. A special meeting of the RDEC will be held early next year to develop a prioritized list of projects to initiate as funding becomes available. ♦

## 7<sup>th</sup> Annual FHWA Region 4 “Quality Management Workshop”



The SCDOT would like to invite all engineers, contractors, consultants, researchers, and producers to attend the 7<sup>th</sup> Annual FHWA Region 4 Quality Management Workshop on March 3-5, 1998, at the Crown Plaza Hotel in Jackson, Mississippi. The workshop is being hosted by the Mississippi DOT, FHWA, Mississippi Concrete Industries Association, Mississippi Asphalt Association, and the Mississippi Road Builders Association. The workshop's theme "Quality: Start to Finish" raises the questions: are we obtaining "Top Quality" in highway projects while advocating innovative contracting methods and what measures can we initiate to maximize available resources to improve the end product? For more information contact Richard Stewart at (803) 737-6681.

# Pooled-Fund Study on Hydraulic Computer Models Nears Completion



South Carolina has served as the lead state for a pooled-fund study titled "Development of Hydraulic Computer Models to Analyze Tidal and Coastal Stream Hydraulic Conditions at Highway Structures." Other states who participated in this study were Connecticut, Florida, Georgia, Louisiana, Maine, Maryland, Mississippi, New Jersey, New York, North Carolina, and Virginia. The objective of the study was to develop, analyze, and advance the methods of computing stream instability and scour at highway encroachments in tidal waters. Ayres Associates, Inc. of Fort Collins, Colorado conducted the study for the states.

The study was broken into two phases. The first phase, which was completed in September 1994, focused on three tasks; (1) compiling a database of literature on tidal processes and computer models, (2) evaluating which computer models are best suited for complex tidal hydrodynamic investigations for bridge structure hydraulic analysis, and (3) evaluating sources and methodologies for determining ocean tide and storm surge characteristics. The computer models selected for tidal bridge hydraulic applications were UNET, a 1-dimensional model and FESWMS, a 2-dimensional model. The focus of the second phase of the study included (1) making useful modifications to the selected models, (2) testing the models and developing case studies, (3) developing methods for storm surge

hydrograph prediction along the east and gulf coasts and Chesapeake Bay, (4) developing a Users Manual on the models and methodologies and (5) providing training and technical support to the Pooled Fund States.

Recommendations for a third phase of this project include further training and support, updates to the manuals and methods, further model enhancements and testing, compiling additional information on tides and hurricane characteristics, wind and wave research and developing guidance and procedures for incorporating upland runoff with storm surges.

If you have any questions concerning the technical aspect of this study, please feel free to contact Mr. William Hulbert, the Department's Hydraulic Engineer, at (803) 737-1658. ♦

## *Recycling Facts*



### **Did you know ...**

- ☺ Recycling one ton of office paper can save 7,000 gallons of water.
- ☺ In 1988, Americans recycled 18 million tons of paper, saving 1.1 million trees.
- ☺ Every three months, Americans throw away enough aluminum to rebuild the entire U.S. commercial airfleet.
- ☺ If we recycle just half of the magazines printed in the U.S. each year, we would save 12 million cubic yards of landfill space.

## Waste Tire Mulch Placed at Five Test Sites in South Carolina

An article in the last issue, Summer 1997, of the "RD&T Newsletter" described plans to place landscaping products made from discarded tires at five (5) of the Department's rest areas and welcome centers (2 sites on I-26 in Calhoun County, 2 sites on I-95 in Orangeburg County, and 1 site on I-20 in Aiken County). That work was performed during the summer by Waste Tire Management, Inc., of Lawrenceville, Georgia. Funds were obtained for the work by Three Rivers Solid Waste Authority through a grant provided by the Department of Health and Environmental Control (DHEC), Office of Solid Waste Reduction and Recycling.



*One of the Pre-fabricated Mats used Around Trees at SCDOT Rest Area*

The material, called Perma Mulch, was made from 94 tons of tires collected from illegal dumps in the counties included in the Three Rivers Solid Waste Authority's area. The landscaping products used included three (3) different sizes of loose mulch and various sizes of pre-fabricated landscape mats. The loose mulch was placed next to buildings and in flower beds. The mats were used around trees, signs, light posts, trash cans, and as a border around picnic shelters.



*Waste Tires were Placed as Loose Mulch at SCDOT Rest Areas*

The Department's Research Unit will monitor the test sites through a State Planning and Research (SPR) Project. The project is scheduled to last three (3) years. A final report will be prepared at that time describing the performance of the material.

If you would like additional information on the project, please contact Mike Sanders at (803) 737-6691 or Terry Swygert at (803) 737-6652. ♦



**If you have any suggestions for improving our newsletter or know of any topics that should be included, please contact Mr. Mike Sanders at (803) 737-6691. You may also send it to the RD & T Newsletter, SCDOT, Research and Materials Laboratory, P.O. Box 191, Columbia, SC 29202.**

**Research Projects Started Between  
July 1, 1997 and December 31, 1997**

SPR No. 580, "Investigation of Waste Tires in Landscaping Applications"  
Principal Investigator: M. R. Sanders, SCDOT

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**Research Projects Completed Between  
July 1, 1997 and December 31, 1997**

SPR No. 569, "Baghouse Fines in Asphalt Mixes"  
Principal Investigator: Douglas I. Hanson, National Center for Asphalt Technology (NCAT)

SPR No. 578, "Bar Code Applications - Pilot Projects"  
Principal Investigator: Dr. Lansford Bell, Clemson University

If you would like a copy of the final report for  
either of these completed projects, please contact:

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