

ASPHALT RECYCLING & RECLAIMING ASSOCIATION

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2008 SPECIAL RECOGNITION AWARDS

NOMINATING BALLOT

EACH YEAR, THE ASPHALT RECYCLING & RECLAIMING ASSOCIATION WILL HONOR PUBLIC OFFICIALS AND CONSULTING ENGINEERS WHO HAVE MADE OUTSTANDING CONTRIBUTIONS TO THE ASPHALT RECYCLING AND RECLAIMING INDUSTRY.

The following rules will govern the selection:

1. The nominating ballot must be completed in full and delivered with supporting documentation to ARRA Headquarters by October 1, 2007.
2. Late or incomplete nominations will not be considered.
3. Nominations will be forwarded to the respective technical committees for final approval at the ARRA Semi-Annual Meeting, October 22 - 24, 2007, in Las Vegas, Nevada.
4. Notice of Intent to Award will be issued to each approved nominee by the Executive Director in December 2007.

Nominator: Mr. John H. Edwards, III

Title Vice-President

Company Site-Prep Inc. of North Carolina

Street P.O. Box 1609

City Monroe State NC Zip 28110

Phone (704) 282-8250

Signature 

Nominee: Mr. Tim Antley

Title Construction Services Manager

Agency Dennis Corporation

Street 5000 Thurmond Mall, Suite 114

City Columbia State SC Zip 29201

Phone (803) 252-0991

Category Soil Stabilization

■ Awards will be categorized in accordance with the ARRA technical committee descriptions:

⊖ Cold Recycling

⊖ Hot In-Place Recycling

⊖ Cold Planing

⊖ Hot Recycling

⊖ Full Depth Reclamation

⊖ Soil Stabilization

SPECIFIC BASIS FOR NOMINATION: *On a separate sheet, the nominator must provide the following detailed information to support his nomination:*

- Nominee's involvement with specific project(s); Include job story;
- History of nominee's personal or departmental activities that promoted advancement or acceptance of recycling methods; and
- Research, if any, conducted by nominee that has advanced the technological capabilities of the recycling method.

RETURN NOMINATION BALLOT BY OCTOBER 1, 2007. PLEASE DO NOT FAX.

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Mr. Tim Antley Uses Soil Stabilization in the 2006-2007 Fairfield County Road Improvement Programs

1. Nominee's Involvement/Job Story

In early 2006, Fairfield County, South Carolina was looking for a low-cost, easy to maintain product to pave dirt roadways throughout the County in order to provide better roadways for the citizens of the County. The dirt roadways were often impassible during rainstorms, were narrow and unsafe, and were affecting the quality of life for its citizens. After deciding to implement a road improvement program, Fairfield County Public Works, County Administration and the County Transportation Committee, selected Dennis Corporation as their on call county engineering firm. Serving as Project Manager, Mr. Tim Antley of Dennis Corporation implemented an innovative process for paving the existing dirt roads. This process switched from a conventional pavement design, consisting of an aggregate base course and hot mix asphalt surface course, to a more innovative and economical pavement section. Due to the rapid cost escalation of liquid asphalt, which is now approaching \$450/ton in South Carolina, Mr. Antley specified a soil stabilization process in which the existing dirt/gravel road is mixed with a high speed reclaimer that adds cement and water. The result is a superior base course, six inches in depth, which was surfaced with a bituminous triple treatment. The lower cost paving process allowed the County to pave more roadways, benefiting additional citizens. This method allowed the County to improve the quality of life for our citizens while saving taxpayers \$3 million. The 2006-2007 Road Improvement Program provided Fairfield County citizens with an improved quality of life and an aesthetically pleasing roadway while also saving valuable tax dollars and eliminating health and safety concerns created by the dusty dirt roadways. The project also had limited impact on their environment by using a process which was environmentally friendly due to conservation of natural resources and limited emissions.



Dust was a common issue on roads throughout Fairfield County before the Road Improvement Program was implemented.



McDuffie Road after the completion of the 2006-2007 Road Improvement Program

Benefit/Importance of Project to Fairfield County

Throughout their lives, Fairfield County's citizens have endured roadways that are dusty or muddy, and at times impassable due to inadequate drainage. The question that Mr. Antley faced was,

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does not face shut downs that previously occurred when rain made the roadways impassable which allows them to operate throughout the year.

Additionally, the soil stabilization process allowed a finished product that is sustainable and virtually maintenance free which will reduce future maintenance costs and save valuable tax dollars.

The citizens of Fairfield County gained many environmental, social and economic benefits from the 2006-2007 Fairfield County Road Improvement Program which benefited the County as a whole.

Success of Project

This project attained a great deal of success for Fairfield County which will further promote the use of soil stabilization in other projects. Most importantly, Mr. Antley helped the County achieve its goal of paving all of the roads chosen for the 2006-2007 Road Improvement Program. Every day, the citizens of Fairfield County continue to benefit from the positive impacts of this important program. Due to the incredible success of the 2006-2007 Road Improvement Program, Fairfield County has begun work on the 2008 Road Improvement Program to pave more roads in Fairfield County.

Because of the great success of the project, Fairfield County and Dennis Corporation have received local and national publicity for their efforts to improve the lives of the citizens of Fairfield County. Most recently, an article was published in the April 2007 edition of Roads & Bridges magazine highlighting the success of the project. In addition, the American Council of Engineering Companies



Fairfield County officials accept the ACEC Engineering Excellence Award; Left to Right: Danny Ballentine, Senior Project Inspector; James McGraw, Fairfield County CTC Chairman; David Ferguson, Fairfield County Council Chairman; Jack Mobley, President, ACEC-SC; Tim Antley, Project Manager

CASE STUDIES

UNPAVED ROADS

From gravel to cement

Fairfield County, S.C., uses FDR with cement to upgrade unpaved roads

The full-depth reclamation process would make use of the existing gravel by blending it with cement and subgrade materials to a depth of 6 in.

Fairfield County, S.C., is typical of many rural counties. Budgets are tight and the maintenance of approximately 220 miles of unpaved, gravel-surfaced county roads is an ongoing problem. The roads require frequent blading of the gravel and replenishing of the surface aggregate, costing the county about \$200,000 annually. In addition, the citizens are faced with dust and other associated problems of unpaved surfaces.

Dennis Corp., an engineering consulting firm based in Columbia, S.C., was looking for a solution to help Fairfield County's Transportation Committee upgrade the road conditions in a cost-conscious manner. The South Carolina Department of Transportation has been using full-depth reclamation (FDR) with cement for more than 10 years with excellent results, and Dennis Corp. thought the same procedure could be used in Fairfield County.

Their plan was to upgrade the gravel roads to a bituminous surface treatment (chip seal), which would provide a smoother, safer road surface. The FDR process would make use of the existing gravel by blending it with cement and subgrade materials to a depth of 6 in. This cement-stabilized material would make an excellent base for a triple bituminous surface treatment or a thin asphalt surface.

The cost evaluation showed that the FDR process, with the surface treatments, would save the county more than \$70,000 per mile compared with the alternative of a standard asphalt pavement with a 2-in. surface and a 6-in. aggregate base. The county could upgrade 3 miles of road using the FDR with cement process for every 2 miles of asphalt pavement that could be constructed at the same cost.

In September 2006, the county contracted with Site Prep Inc., Monroe, N.C., to perform the upgrading of 14 sections, totaling 13.5 miles of unpaved road. The design called for 33 lb of cement per sq yd of roadway, mixed and compacted to a depth of 6 in. The FDR process also would improve the road template by establishing road crown and shoulders that improve drainage and road safety.

Construction was completed at the rate of 500-2,000 ft per day with a single treatment of chip seal applied the same day. The initial surface treatment provided protection for the new base and an improved surface for residents to travel on during construction; a double chip seal was applied to complete the triple surface treatment.

The county was extremely pleased with the final product, especially considering that the cost savings allowed more miles of roadway to be improved.

"We were able to save the taxpayers approximately \$1.5 million and improve their quality of life by paving existing dirt roads that many citizens had driven on their entire lives," Dennis Corp. President Dan Dennis, P.E., said.

The cement-stabilized base will improve the road's long-term performance because the higher-strength base can carry heavier loads and is much less susceptible to water damage. The county plans to upgrade 16 more miles in 2007. By making improvements each year, it won't take long for the county to substantially increase the quality of their road system and make excellent use of their scarce construction dollars.

www.pca.com/eng/spotlights

PCA
Portland Cement Association

PAVEMENTS

County Uses FDR with Cement to Upgrade Unpaved Roads

"...we were able to save the taxpayers approximately \$1.5 million and improve their quality of life by paving existing dirt roads..."

Fairfield County, South Carolina is typical of many rural counties in America. Located between Columbia, SC and Charleston, SC, the county has an area of 220 square miles and a population of 24,000. Budgets are tight and the maintenance of approximately 220 miles of unpaved (gravel or dirt) county roads is an ongoing problem. Although the roads provide a safe low-volume traffic, maintenance requires frequent blading of the gravel, and the surface aggregate has to be replenished on a regular basis (costing the county about \$200,000 per year). In addition to the maintenance headaches, the citizens are faced with dust on the roadways, with dirt and other associated problems of unpaved surfaces.

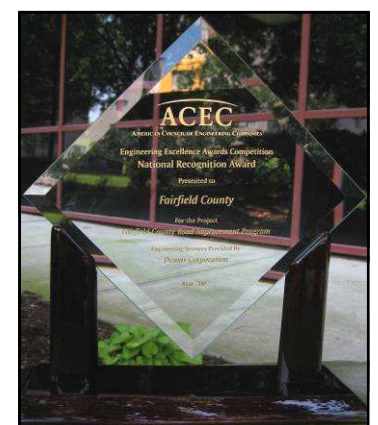
Dennis Corporation, an engineering consulting firm based in Columbia, SC was looking for a solution to help Fairfield County's Transportation Committee upgrade the road conditions in a cost-conscious manner. They were familiar with the process of full depth reclamation (FDR) using cement as a means of reestablishing "faded

Mixing cement during the FDR process.

Asphalt vs. Reclamation				
Assume 1 mile (100' x 40' x 2") (two-lane)				
Asphalt Roadway				
Units	Quantity	Price	Extended Price	
Hot Mix Asphalt, Surface Course (2" Depth)	SY	11723	\$8.25	\$96,520.00
Graded Aggregate Base Course (6" Depth)	SY	11723	\$7.50	\$88,000.00
Total				\$184,520.00 per mile
Roadway Reclamation				
Item	Units	Quantity	Price	Extended Price
5" Chip Seal/Gravel	SY	11723	\$1.75	\$20,515.25
Double Treatment	SY	11723	\$2.75	\$32,237.75
6" Cement Stabilized Base Course	SY	11723	\$5.75	\$67,520.00
Total				\$114,400.00 per mile
Average Cement Price per ton \$150.00				
Average Asphalt Cement Price per ton \$200.00				
Cost Savings of \$70,000.00 per mile				

www.pca.com/eng/spotlights

PCA
Portland Cement Association



Mr. Antley's use of soil stabilization has been highlighted in various publications including Roads & Bridges Magazine (far left), Portland Cement Association (left) and has received awards including the ACEC Engineering Excellence Award (shown above).

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(ACEC) awarded Fairfield County and Dennis Corporation with an *Engineering Excellence* award in January. The 2006-2007 Road Improvement Program won first place in its division in South Carolina and represented South Carolina at the ACEC National Convention this past May.

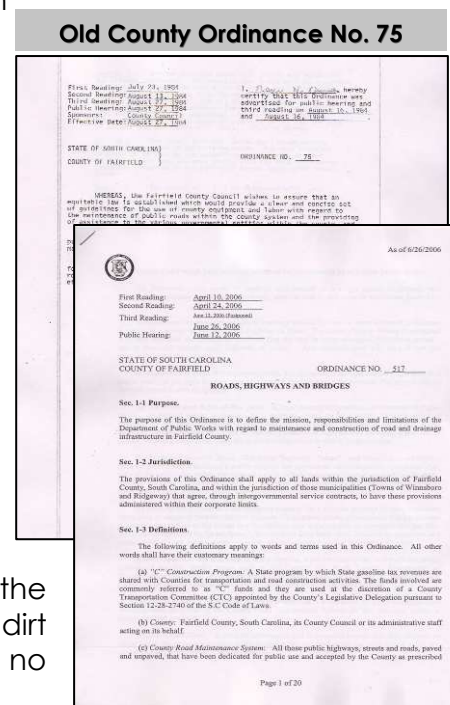
The project achieved all of its major objectives while also receiving statewide and national attention for its innovative and unique approach. The 2006-2007 Road Improvement Program achieved the following objectives:

- Improved the lives of citizens of the County.
- Used environmentally friendly process of soil stabilization.
- Paved the roads with a low-cost product which is easy to maintain.
- Accomplished the program in a short duration while having minimal impact on the environment and surrounding homes.
- Accomplished the program with no vehicular accidents, public complaints, project delays or cost overruns occurring.
- Won a South Carolina ACEC Engineering Excellence Award and represented South Carolina at the national completion.
- Gained attention in the engineering community through numerous articles which were published on the innovative design process including articles by the Portland Cement Association and *Roads & Bridges* magazine.
- Gained attention in surrounding counties through a workshop, held in Fairfield County by Clemson University, highlighting the process to officials from various counties and to engineering professionals. An additional conference, "Count of Concrete," which will also highlight this program, will be held on October 3, 2007 in Columbia, SC.

Project Effort

Prior to the initiation of the project, Mr. Antley worked with Fairfield County to review the County's Ordinance No. 75 to clearly define the role of the Public Works Department in maintaining the County's roadways. The original two-page ordinance has been in effect since 1984 and contained outdated specifications and during the initiation phase of the program, it became evident a new ordinance needed to be written.

Drafting the new ordinance was a critical part of accomplishing the objectives of the project because the old ordinance did not define a system for prioritizing which roads would be paved and it did not define the roles of the Public Works Department, County Council and the CTC in accomplishing the program. The County had over 250 miles of dirt roadways needing to be paved but, under the old ordinance, had no means to prioritize which roads would be improved.



New County Ordinance No. 517

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The County Council and the CTC, wrote a new ordinance to identify the roles of the Public Works Department, County Council and the CTC, as well as, implementing a roadway priority system.

Prior to drafting the ordinance, meetings were held with the CTC, County Council, the County Council Road Sub-committee, SCDOT and the public to work out the details to be specified in the ordinance. This input was necessary to build a consensus so that all parties could work together as a team to develop a new and up-to-date ordinance that met the needs of the citizens of Fairfield County. Dennis Corporation meticulously led the ordinance drafting process, totaling three months from conception to approval. The purpose of the new twenty-page ordinance No. 517 was to define the mission, responsibility and authority of the Department of Public Works with regard to maintenance and construction of road and drainage infrastructure in Fairfield County.

Overcoming Challenges During the Project

The success of this project depended on addressing many complex issues. One of the most complex issues of the program was the development of a new ordinance that addressed the needs of the County Council, CTC, SCDOT and the citizens of Fairfield County. Fairfield County and Dennis Corporation worked together to promote a vision through public meetings to explain the new ordinance and why it was needed. Due to Fairfield County's consensus building efforts, the ordinance was unanimously approved.

Once the ordinance was passed by County Council and the CTC, Dennis Corporation began the complex issue of evaluating the project roadways to develop project quantities for bidding while simultaneously producing project specifications and plans began. This process took approximately one month. Dennis Corporation granted the Notice to Proceed on August 29, 2006 and the project was completed on October 25, 2006.

Another challenge the County faced was the short duration in which the contract had to be completed. Due to the approaching winter months, the Contractor had 58 days to complete the project. Any issues that arose in the field had to be dealt with in an expedient manner to assure the project was kept on track in order to meet the scheduled completion date.

The County also faced the issue of keeping local citizens informed of the project's timeline in order to minimize disruptions to their lives while still keeping the project on schedule and safe for the traveling public.

During the entire process, Dennis Corporation worked closely with Fairfield County and the County Transportation Committee to tackle any issues that arose. All of the above mentioned challenges were able to be addressed through the open line of communication developed in the partnership between the County Council, the CTC, the County Public Works Department, Dennis Corporation and the citizens of Fairfield County. Because the County worked hard to inform the citizens of the County about all aspects of the project, the County received a great deal of support from the communities in which the roads were improved.

One way the County addressed these issues was by informing local citizens of the upcoming construction to their roadways in order to minimize any impacts the project may have on their daily lives. Fairfield County accomplished this by placing flyers on homes that were in the path of the construction projects to inform them of any pending delays. In addition, signs placed at the beginning of work zones notified the citizens of how their tax dollars were being used to improve

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their roadways. The County is proud to say that no vehicular accidents, public complaints, project delays or cost overruns occurred during the 2006-2007 Road Improvement Program.

Project Originality/Innovation

During the design process, Mr. Antley performed a cost comparison between a traditional pavement section, consisting of asphalt surfacing and stone base, with an innovative idea of soil stabilization by incorporating cement into the existing roadway and then adding a triple treatment bituminous riding surface. Due to the rising cost of liquid asphalt, exceeding \$450 per ton, the County selected the soil stabilization process based on a variety of factors including:

Asphalt, PG-58					
	1Q	2Q	3Q	4Q	% CHG. YEAR
1997	132.75	131.47	132.67	127.36	+10.3
1998	128.33	125.35	120.28	116.43	-4.7
1999	116.49	120.86	122.23	129.63	-3.6
2000	143.15	156.11	156.99	158.42	+29.2
2001	154.17	148.04	144.98	143.27	-5.2
2002	142.76	157.63	162.49	159.42	+6.5
2003	174.87	178.48	185.72	166.79	+13.2
2004	166.76	173.46	185.86	187.72	-2.8
2005	187.58	190.34	197.27	208.03	+9.7
2006	221.88	269.51	282.42	284.88	+41.6
2007	281.65	281.73	---	---	+4.5

Concrete, 3000-psi					
	1Q	2Q	3Q	4Q	% CHG. YEAR
1997	61.08	61.45	61.55	62.72	+2.4
1998	62.85	62.26	62.29	63.21	+1.3
1999	63.14	63.58	63.65	64.63	+2.1
2000	64.49	65.11	65.70	66.88	+1.5
2001	67.22	68.81	70.25	71.30	+5.7
2002	72.68	73.24	73.25	74.59	+6.4
2003	75.08	74.75	74.81	76.16	+2.1
2004	76.16	75.04	76.94	78.55	+0.4
2005	79.00	80.03	80.91	82.81	+6.7
2006	83.89	84.35	85.57	86.59	+5.4
2007	87.84	89.86	---	---	+6.5

SOURCE: MCGRAW-HILL CONSTRUCTION RESEARCH & ANALYTICS/ENR. PRICES ARE 20-CITY AVERAGE. PERCENT CHANGES ARE JUNE VS. JUNE.

- **Soil Stabilization**– Mr. Antley helped the County choose soil stabilization based on the fact that soil stabilization can eliminate problems with the asphalt layer and create a structurally sound base.

- **Environmental Benefits**– The soil stabilization process allowed Fairfield County to reduce the use of raw materials and the cost of their transportation while also benefiting the environment by reduced emissions and natural resource conservation.

- **Cost-Effectiveness**– The chart on the left illustrates the increase in costs of asphalt versus cement. In addition, the comparison illustrates the cost savings of soil stabilization versus traditional asphalt paving. The soil stabilization process allowed approximately ten miles of roadway to be improved instead of three miles using conventional asphalt surfacing and stone base.

- **Speed of Construction**– This soil stabilization process used a high speed Caterpillar reclaimer allowing paving at a rate of 1500 to 2000 linear feet per day. The speed of construction is a benefit to the County's residents who drive on the road each day.

Asphalt prices have been rapidly increasing during the past few years.

- **Future Maintenance**– The soil stabilization process creates a virtually maintenance free product which results in additional cost-savings to the County. The superior base course is impervious to water and also eliminates potholes. These factors combine to mean lower maintenance issues for the County.

- **Safety**– This new riding surface eliminates washboard problems and loose aggregates in curves resulting in safer driving conditions for the traveling public.

In addition to using innovative design techniques, Fairfield County also utilized innovative methods to inform the County, its citizens and the prospective bidders about the project. Educating the public about the proposed project helped the project's success. Examples of this included:

- **Flyers** distributed to residences, businesses, and churches in the vicinity of roadway projects explaining the 2006-2007 Roadway Improvement Program.
- **Signs** placed at the entrance of work zones reading "Your Tax Dollars at Work in Fairfield"

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County.”

- **PowerPoint Presentations** at civic organization meetings in Fairfield County. These presentations detailed the work being completed throughout the County and the vision of the 2006-2007 Road Improvement Program.
- At the mandatory pre-bid meeting a **PowerPoint Presentation** was shown to each bidder with digital photographs of all the roadways which clearly defined the bid items pertaining to each roadway.
- **Conferences**– Fairfield County's use of soil stabilization has been featured at a conference at Clemson University entitled, “County Roads: An Engineered Systematic Approach to Rehabilitation,” and they will be featured again this year at a similar conference.

Mr. Antley utilized this innovative construction technique in order to pave more roads for Fairfield County. On this particular project, the specified road construction process allowed for 1,500—2,000 feet of complete roadway construction per day and a cost savings of \$70,000 per mile. This method helped to save the taxpayers approximately \$3 million during 2006 and 2007. The pictures on the right illustrate the various steps during this innovative process. Due to the funds from the gas tax, there were no inherent factors in financing the project but the cost savings technique did allow the County to stretch it's dollars further and pave more roadways than was originally anticipated.



Research and Advancement of the Method by the Nominee

This soil stabilization process was utilized first in South Carolina in the 1930's. Recently, this process has gained popularity due in part to its successful use in this road improvement program. Mr. Antley realized that this process would be beneficial to Fairfield County and decided to implement it for the 2006 Road Improvement Program. After seeing the success of the 2006 Road Improvement Program, Mr. Antley decided that this process of soil stabilization should be continued in the 2007 and 2008 Fairfield County Road Improvement Programs.

This program has also landed future value to the engineering community in numerous ways. For example, Dennis Corporation, in conjunction with the Southeast Cement Association and Clemson University, held a one-day workshop on October 24, 2006 highlighting the Soil Stabilization Process used on Fairfield County roadways. This workshop was attended by approximately 90 engineers from various consulting firms, cities, towns, counties and states. The workshop demonstrated how unpaved roads in Fairfield County are being rehabilitated and upgraded through innovative and economical design and smart constructability approaches.

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In addition, this program was highlighted in the Portland Cement Association's e-newsletter. Dr. David Luhr, Program Manager of Soil-Cement/RCC Pavements, wrote an article about Dennis Corporation's involvement in utilizing this innovative technique for unpaved roadways. In addition, Dr. Luhr plans to publish additional articles about the use of this process in a print publication for the Portland Cement Association. The Portland Cement Association also plans to highlight this process not only in other Southeastern states but in the Midwest as well.

The workshop in addition to the newsletter and print publications, will reach hundreds of engineering professionals across the industry and provide training in addition to raising awareness of this innovative technique for future projects. Additionally, another workshop is being held on October 3, 2007 in Columbia, SC.