To Seal or Not?

New testing aims to answer age-old question.

By Scott L. Eilken

As cost pressures continue, there is increased interest in eliminating joint sealants as a means of lowering the cost of concrete pavements. However, there is a lack of data in the industry to help guide owners about sealant effectiveness and the long-term impact of using or not using such sealants.

Now a group of pavement industry professionals has joined forces to form the Seal/No Seal Group (SNS Group), and a true partnership has begun. The SNS Group, West Coxsackie, N.Y., was created to respond to the age-old industry question about the value of sealing concrete pavement joints. Its mission is to develop a committed membership that takes responsibility for determining the long-term effectiveness of sealants in concrete pavements. The group is working in cooperation with a large number of leading contractors and manufacturers responsible for the sealing and maintenance of pavement joints and cracks across the nation. The group's role is to gather the necessary information to help owners make informed decisions to ensure long-term effectiveness and best use of their concrete pavements.

Should you seal?

The SNS Group is tasked with determining what conditions establish effective performance and life-cycle cost. This effort includes the evaluation and development of best practices related to sealing with the intent of extending the life of concrete pavement. These include:

- Develop a framework of test sections that can be evaluated for long-term performance to address the seal/no seal question for both dowelled and undowelled pavements in all environmental zones.
- Develop state and local transportation authority partners in conducting evaluations of existing sites. This approach leverages needed researchers and provides additional expert knowledge and ownership in evaluating test sections.
- Conduct a literature search and document abutment movement and slab growth issues related to unsealed joints.
- Document findings and educate the marketplace.
- Present a collective industry voice on joint sealant issues.
- Provide a vehicle for raising contributions, developing cooperative efforts, and establishing research.

In 2009, the SNS Group accomplished the following, using its limited funding, with the assistance of many dedicated industry volunteers:

- Out of 93, 58 of the original FHWA Test Sections were re-evaluated in 2009, extending the initial performance period approximately 40% over the original FHWA "Effectiveness of Sealing Transverse Contraction Joints in Concrete Pavements" study.
- Four state DOTs conducted evaluations of their test sections.
- Ten new sealant test sections were constructed in 2009.

In late 2010, the SNS Group contracted with the Texas Transportation Institute (TTI), College Station, Texas, to conduct field evaluations of water infiltration through joints in concrete pavement.

- Existing test sections at TTI will be used. Known rainfall intensity levels will be artificially induced and the resulting water infiltration through the joints will be measured in sealed, unsealed, and partially sealed conditions.
- A simple field test will be developed to determine flow through existing pavements.
- Ground penetrating radar will be used to evaluate sealant quality of trafficked roadways.

One of joint sealing issues that cannot be overlooked is the quality of the installation as it has significant impact on the long-term performance. As such, the 2010 work is designed to better define what is meant by a sealed joint and ways in which to measure sealant effectiveness, both for new construction and rehabilitation. For maintenance personnel, it is important to determine when resealing is necessary.

The first big experiment

Forming the SNS Group was only the beginning. After the inception of the SNS Group, the first experiment evolved into a seamless cooperation between the involved parties. The experiment began with the SR 59 Southbound Roadway Joint Sealant Experiment near Joliet, Ill. Quality Seal and Saw Inc., Bridgeview, Ill., was already working on the roadway and recommended it for the experiment. It represented new construction of a typical design, and most importantly, the quality of the work easily could be controlled and ensured. Chicago-based contractor Walsh Construction supported the experiment and willing to help out. Although Walsh and Quality Saw and Seal could have conducted the tests on their own, they felt more minds would mean better ideas. In the end, an interest in the experiment by multiple parties will result in quicker and more effective transfer of the results.

The original Joliet project was designed as a four-lane roadway through an urban area with curbs and
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To establish interest in the experiment, the Illinois chapter of the American Concrete Pavement Association (ACPA), Skokie, Ill., was approached. The ACPA felt it was a worthwhile experiment and then approached the Illinois Department of Transportation (IDOT) with the proposal of running test strips on SR 59. Then the SNS Group, ACPA, and IDOT negotiated the experiment details. Having ACPA-an association-approach IDOT was essential because then the test was viewed as "for the good of the industry," and not for the good of an individual company. The hope is also that by involving IDOT, they may take some ownership in the detailed outcome.

Getting organizations involved

The SNS Group didn't find it hard to get others involved. The ACPA was approached with a plan and in this case, the results will provide an obvious benefit to the industry. The SNS Group encourages others to look for cooperative efforts with associations and the government.

These steps were effective when dealing with ACPA and IDOT. When all parties agreed the experiment was worth pursuing, IDOT engineers met onsite and settled on the details of the experiment. Omega & Associates, Chicago, served as the consultant working with IDOT to follow the progress on the test section. Walsh Construction has been involved every step of the way to ensure each step proceeds as planned. Quality Saw and Seal and Crafco, Chandler, Ariz., donated all of their services and materials on the test strips. The cooperative effort between all parties involved has been a success with each helping out and participating.

Long-term results

Cooperative efforts begin with hard work. It involves a lot of upfront preparation without seeing any real progress. But with patience, in time, the hard work brings forth results.

"The team approach has been successful on this project. Coordination locally is a very important factor to successfully answering the important questions regarding the seal, no-seal issue," says Randell Riley, Illinois Chapter Inc. ACPA. "The joint efforts of the ACPA National and Illinois Chapter office, along with the SNS Group and IGGA members, have been critical to making sure that the research proceeds smoothly and in a manner most likely to result in a credible answer to the problem. Of course, none of this is possible without our most important partners in this effort, the Illinois Department of Transportation, which granted permission to do the experiment, and Walsh Construction which had to be willing to accept some minor interruption of its processes to conduct the experiment. It has been a surprisingly smooth process."

At this point in the experiment, Quality Saw and Seal is onsite regularly and performing visual tests of the joints. Profile testing of the surface will be done in the fall of 2010 and will be used to measure profile roughness over time. The combined effort of companies, consultants, associations, and the government will result in verifiable results on the usefulness of sealing concrete joints.

Get involved

Help put to rest the debate of whether or not joints in PCCP should be sealed. No matter what your current involvement is-whether you're a contractor, engineer, material supplier, or a diamond blade manufacturer-your input is essential to the success of this research. This collective effort is the industry's best chance to evaluate the effectiveness in a comprehensive way. Your knowledge of current and proper sealing practices, as well as examples of jobs that show the benefits of sealing, are needed. Further, your financial contribution will be used to conduct vital research in support of the industry. It should be noted that 100% of the funds raised in 2009 were used in the evaluation of test sections and promotion of the SNS Group effort. To become involved, call Scott Eilken at 708-728-1895 or Charley Grady at 602-524-1334, or e-mail info@sealnoseal.org. All are invited to join and participate in the research.

Scott L. Eilken is the SNS Group co-chair and owner of Quality Saw & Seal, Bridgeview, Ill.

Participants

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