Pervious Concrete Developed at the SD School of Mines

Dr. M. R. Hansen, CEE Dept, has recently been awarded a project from the South Dakota Army National Guard for "Pervious Concrete Development, Phase I." Pervious concrete, when used for paving a parking lot for example, allows water from a thunderstorm to pass through the concrete into the soil and ground water instead of running off and carrying sediment and pollutants into rivers and streams. The development and use of pervious concrete is encouraged by the US Clean Water Act, is beneficial to the environment, and is another form of "Green Concrete."

According to Dr. Hansen, pervious concrete is made by leaving out most of the sand in the concrete allowing the formation of interconnected voids. The engineering and research challenge is to obtain sufficient strength to carry the vehicular traffic, maintain permeability over the life time of the paving, and be durable in the freezing environment in South Dakota. Crag Phillips, graduate student, did the experimental work.

The first test slab of pervious concrete ever in South Dakota was recently placed at the National Guard Camp in Rapid City. When tested, the slab absorbed 800 gallons of water over a 100 square foot area in 2 minutes. This project is a good example of the School of Mines working with a local entity to develop a practical solution to an immediate problem. The project was spearheaded by Dale Ludens, Engineering Supervisor, at the SD Army National Guard.

Figure 1 800 gallons of water soaked through 100 square feet of this pervious concrete parking lot in 2 minutes.

NEWS ITEM:

Figure 1 SDSMT Alumni standing on pervious concrete in Rapid City. The concrete was provided by Birdsall Sand and Gravel (BSG). Dale Ludens, Cullen Jorgensen, Emily Beck, Todd Schultz, Col. Kit Cline, LTC Mike Werdel, Garry Black, Jerry Foster, Keld Ditlev, Amy Weiers, Ron Green, Jody Titze, Chris Guy, M. R. Hansen.

Portland Cement Association (PCA) LEADERSHIP IN SUSTAINABILITY award presented to Dale Ludens.

Comments by Dale Ludens:

I believe that it is important to tell you a little about our project and how it developed. You might say it began with the current emphasis on sustainability, concern for the environment and energy efficiency. We have always tried to adhere to these principles but more recently state and federal design guidelines have mandated that our larger projects comply with LEED® requirements (Leadership in Energy and Environmental Design). Last year at the annual Concrete Conference hosted by the South Dakota School of Mines and Technology, Dr. Hansen mentioned his intent to pursue research on application of pervious concrete to the local area. At the break, I expressed interest in the research and as we talked the concept a local research project begin. The concept of pervious concrete could have significant application opportunities in our projects because of its many favorable characteristics and LEED® possibilities. A most important characteristic is its ability for storm water retention and storm water runoff reduction.