

Pervious Concrete Developed at the SD School of Mines

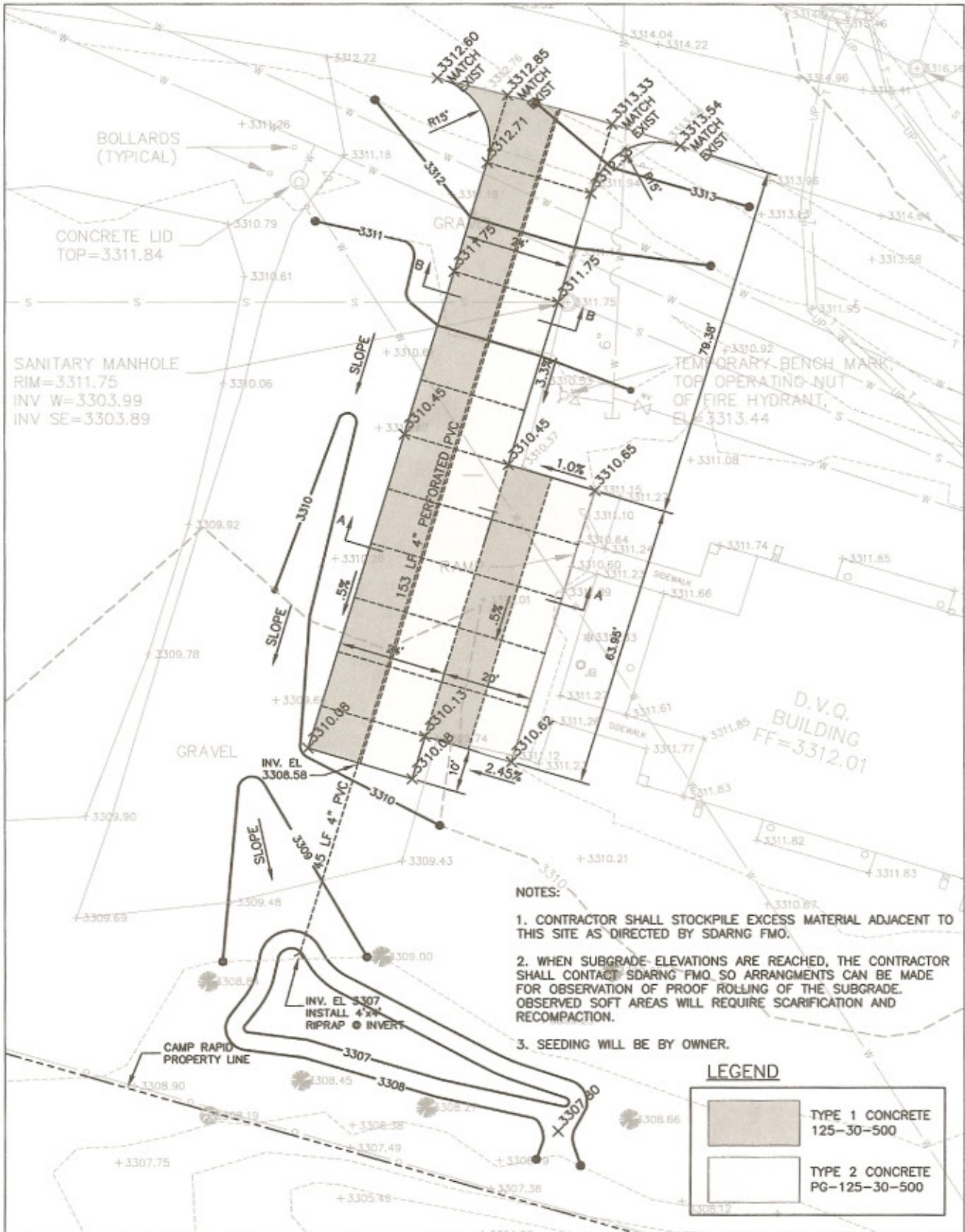
Dr. M. R. Hansen, CEE Dept, has recently completed a project from the South Dakota Army National Guard for “Pervious Concrete Development, Phase I.” Pervious concrete, when used for paving a parking lot for example, allows water from a thunderstorm to pass through the concrete into the soil and ground 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.



NOTES:

1. CONTRACTOR SHALL STOCKPILE EXCESS MATERIAL ADJACENT TO THIS SITE AS DIRECTED BY SDARNG FMO.
2. WHEN SUBGRADE ELEVATIONS ARE REACHED, THE CONTRACTOR SHALL CONTACT SDARNG FMO SO ARRANGEMENTS CAN BE MADE FOR OBSERVATION OF PROOF ROLLING OF THE SUBGRADE. OBSERVED SOFT AREAS WILL REQUIRE SCARIFICATION AND RECOMPACTION.
3. SEEDING WILL BE BY OWNER.

LEGEND

	TYPE 1 CONCRETE 125-30-500
	TYPE 2 CONCRETE PG-125-30-500

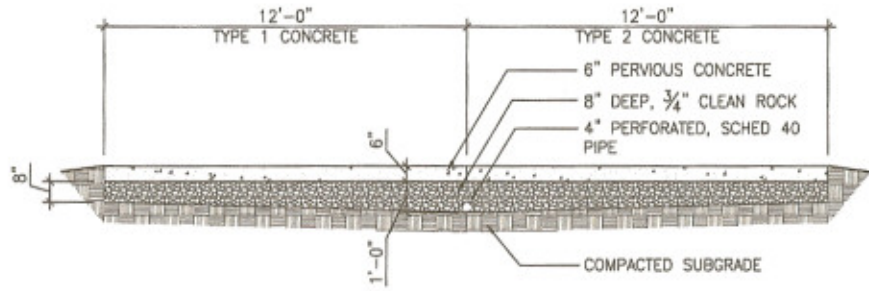
DATE:	OCTOBER 2008
DRAWN BY:	JDE
CHECK BY:	JDE
SHEET TITLE:	
SITE LAYOUT & GRADING PLAN	
A-101	

PERVIOUS CONCRETE

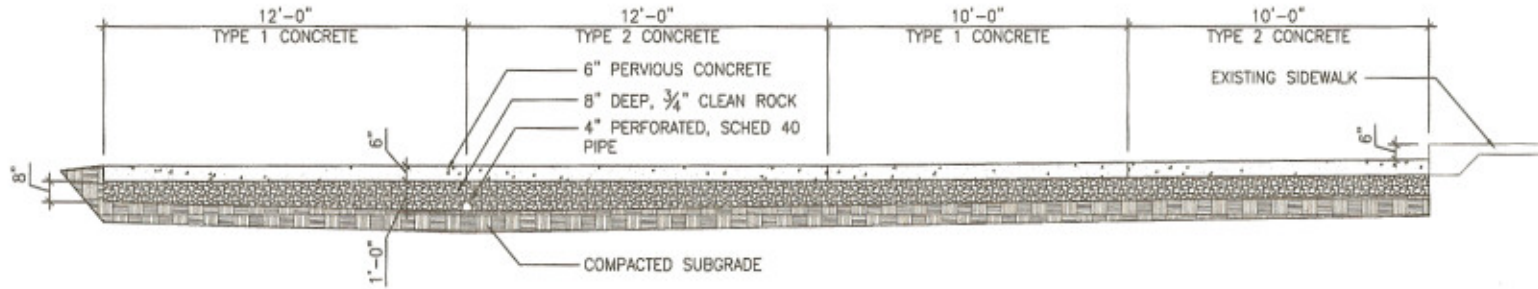
DISTINGUISHED VISITORS QUARTERS

Rapid City, South Dakota





B1 SECTION B
SCALE: 1/4" = 1'-0"



A1 SECTION A
SCALE: 1/4" = 1'-0"

    	   
<p>PERVIOUS CONCRETE</p> <p>DISTINGUISHED VISITORS QUARTERS</p> <p>Rapid City, South Dakota</p>	
<p>DATE: OCTOBER 2008</p> <p>DRAWN BY: JOE</p> <p>CHECK BY: JOE</p> <p>SHEET TITLE:</p>	<p>SITE DETAILS</p> <p>A-102</p>



The VOICE of the Concrete Contractor

AMERICAN SOCIETY OF CONCRETE CONTRACTORS

MAY 2009

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Table of Contents

Member Project Feature	1
New Members.....	2
President's Message.....	2
Director's Message	2
Hotline Q&A.....	3
Sustainability.....	3
Member News.....	3
Safety	4
Decorative Concrete Council.....	4

Industry Calendar

June 25 – 28, 2009

CEO Forum, Nemaocolin Woodlands, Farmington, PA

September 17 – 20, 2009

Annual Conference, Atlanta, GA

November 8 – 12, 2009

ACI Fall Convention, New Orleans, LA

February 1 – 5, 2010

WOC 2010, Las Vegas, NV

July 29 – August 1, 2010

CEO Forum, Ojai Valley Inn & Spa, Ojai, CA

September 16 – 19, 2010

Annual Conference, Salt Lake City, UT

January 17 – 21, 2011

WOC 2010, Las Vegas, NV

McD CONCRETE ENTERPRISES PLACES LARGE PERVIOUS JOB



Concrete was placed using a pervious head on Somero's SXP screed.

ASCC member McD Concrete Enterprises, Alexandria, Ky., has just completed what is believed to be the largest single-day pervious placement in the U.S. to date. Two parking lots for the Cincinnati Zoo, 22,752 SF and 16,907 SF, were installed in four placements earlier this month. The larger lot is new parking for the zoo, while the smaller lot was converted from asphalt and gravel to pervious concrete.

According to McD president Chris McDaniel, the zoo is attempting to go completely off the metropolitan sewer district grid and pervious concrete is one way to achieve that goal. The parking spaces are all 36 feet wide, pervious concrete, placed to a depth of 6 in. The 20-foot wide driving aisles are traditional concrete. The concrete was placed using Somero's SXP screed with a pervious head. Bean oil was sprayed onto the head and the slab. Crew size was four men.

15-in. of stone, washed #2 recycled concrete, choked off with a layer of washed #57 recycled concrete, was installed under the pervious for stormwater detention. Underdrains run every 40' horizontally into collectors.

Another recent pervious project for McD was a horse washout area at the Kentucky Horse Park, a project performed in conjunction with the University of Kentucky.



Pervious concrete was placed using a telebelt.



Under-slab drainage.

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Cemstone Pours Minnesota's Largest Pervious Project

Source: CONCRETE CONSTRUCTION News Service
 Publication date: August 7, 2009

By Cemstone

Cemstone supplying 1,800 cubic yards of pervious concrete for a ¼ mile-long neighborhood roadway construction project in the city of Shoreview, Minn. The roadway's pervious concrete is 7-inches deep, with 18-inches of aggregate underneath.

The undertaking, located near the shores of Lake Owassa, is Minnesota's largest pervious concrete roadway construction project to date. It will be completed in mid-August.

The city chose pervious concrete for this environmentally sensitive area because of its ability to capture and filter storm water to prevent run-off. Moreover, because it can eliminate the need for storm water retention ponds, pervious concrete contributes to improved land management practices. The neighborhood has no available land for any type of storm water retention pond, making pervious concrete a highly desirable and sustainable solution.

"We're excited to see the city of Shorewood make a major commitment to pervious concrete and sustainable development," said Thor Becken, president of Cemstone. "Our company has been an innovator in pervious concrete's introduction in the Upper Midwest, and this is an excellent opportunity to showcase its many environmental advantages."

Because pervious concrete contains no fine sand, water passes through the concrete matrix thereby promoting the filtration of heavy metals, suspended solids and even petroleum products. Pervious concrete also promotes tree growth, lessens the urban heat island effect and recharges aquifers.

On July 22, a group of more than 100 (including many engineers, architects and city officials) attended an Open House sponsored by the Aggregate & Ready Mix Association of Minnesota (ARM) to see the placing and finishing of a section of the roadway. The group also witnessed a demonstration of the finished product's performance when 2,000 gallons of water from a Cemstone ready-mix truck was discharged and disappeared into a previously poured section of project.

The primary concrete contractor is North County Concrete of Ramsey, Minn. "We are one of the most experienced pervious concrete contractors in the region, with more than fifteen pervious projects under our belt. But this is, by far our, largest effort to date," said Karl Virkus, president of North County Concrete, Inc. "About three-fourths of our pervious work has been with Cemstone, and we appreciate their knowledgeable staff, commitment to customer support and focus on innovation."

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Green Alleys

Chicago's Green Alley program is the latest in a long line of environmentally friendly initiatives put forth by Mayor Daley.

Green alleys incorporate a variety of characteristics:

- Permeable pavements (asphalt, concrete or pavers) that allow stormwater to filter through the pavement and drain into the ground, instead of collecting on hard surfaces or draining into the sewer system. The pavement can be used on the full width of an alley, or simply in a center trench.
- Open bottom catch basins--installed in alleys to capture water and funnel it into the ground
- High-albedo pavement, a lighter-colored surface that reflects sunlight instead of absorbing it, helping reduce the urban heat island effect
- Recycled materials, such as concrete aggregate, slag and recycled tire rubber



Other green alley techniques include using proper grading and pitch to facilitate drainage, and using dark sky-compliant light fixtures to reduce light pollution and provide uniform illumination.

Green Alleys are part of CDOT's "green infrastructure" -- which includes recycled construction materials, permeable pavement, recycled rubber sidewalks and other efforts.

The program began as a pilot in 2006, and through 2008, more than 80 Green Alleys have been installed.

The handbook below provides an overview of CDOT's Green Alley program.



[Green Alley Handbook](#) (3806.43 KB)