THE SIGMA GROUP
SIGMA ENVIRONMENTAL SERVICES, INC.
SIGMA DEVELOPMENT, INC.
SIGMA LEASING, INC.

1300 West Canal Street
Milwaukee, WI 53233
414-643-4200
FAX: 414-643-4210

2006 SE^2 LEADERSHIP AWARD
SPECIAL CITATION

PRESENTED BY:
Wisconsin Green Building Alliance (WGBA)

Enhanced Porous Concrete Pavement System

PROJECT NAME & LOCATION:
Rawson Commons Retail Development
7330 West Rawson Ave., Franklin, WI

Project Description

The project consisted of construction of two retail buildings with associated parking, drives and infrastructure on a 1.6 acre parcel. The development was required to meet City of Franklin, Milwaukee Metropolitan Sewerage District, and Wisconsin Department of Natural Resources storm water management regulations. The traditional approach to meet the storm water regulations would be to utilize a surface storm water detention basin. However, because the property was surrounded by adjacent development, the opportunity to purchase additional land for an on-site surface detention basin did not exist. Furthermore, a surface detention basin would have taken up valuable developable land and made development of the property economically unfeasible. By utilizing a porous pavement system with an underground stone storm water detention bed to provide storm water management, the Developer was able to effectively develop the property. In addition to the economic benefits, the porous pavement system provides environmentally sustainable features including: zero discharge storm water management, groundwater recharge, and reduction of heat island effect.

The pavement system consists of four inches of porous concrete pavement placed over a stone detention bed. The detention bed consists of 6 inches of 1 – 1.5 inch diameter washed stone over 18 inches of 2 – 2.5 inch diameter washed stone. The porous pavement has a permeability rate of up to 4 inches of rainfall per minute which is approximately 26 times the peak rainfall intensity for a 100-year, 5-minute storm event. The high permeability of the pavement allows storm water to infiltrate through the pavement without ponding or runoff under even the most extreme rainfall events. The detention bed beneath the pavement was sized to store the volume of the 100-year, 24-hour rainfall event over the entire site. The subgrade for the stone detention bed was graded flat to promote infiltration into the subsoils. Based on infiltration rates measured in the subsoils, it is estimated that it would take between 9 to 39 hours for the volume of the 100-year, 24-hour storm event to infiltrate out of the detention bed into the subsoils.

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The system is operated as a zero discharge system. Monitoring of the system conducted to date, has demonstrated that there has been no storm water discharge from the site. Operation of the system as a zero discharge system, reduces surcharging of public storm sewer systems and downstream flooding. Storm water that infiltrates through the pavement system into the detention bed infiltrates into the subsoils resulting in recharge of the groundwater aquifer – an effect that is not achieved with traditional pavement systems. Because the pavement system is lighter in color than traditional asphalt pavements, heat island effect is minimized. Also, because of the permeability of the pavement system, the pavement "breathes" also reducing heat island effect.

In summary, use of the porous pavement system provides an economical pavement/storm water management system with added sustainable features that are not provided with traditional systems.

SUBMITTED BY:
Sigma Development, Inc.

CIVIL DESIGN:
Sigma Development, Inc.
James Leedom, P.E., Project Manager
1300 West Canal Street
Milwaukee, WI 53233

OWNER:
Zabest Commercial Group, Inc.
Steve Nikolas, President
16800 West Greenfield Avenue, Suite 700
Brookfield, WI 53005