December 21, 2005

File No. 05-348

Kevin Earley
E. P. Henry Corporation
201 Park Avenue, P.O. Box 615
Woodbury, NJ 08096

Reference:  Parker Ford Manufacturing Facility – Eco Paver Infiltration Test Investigation
            East Coventry Township, Chester County, Pennsylvania

INTRODUCTION

This letter summarizes the results of the infiltration testing conducted on E. P. Henry's Eco Paver unit at the above referenced site. To facilitate the study, Gilmore & Associates, Inc. (G&A) performed one single-ring infiltration test for each of the two Eco Paver pad locations on November 4, 2005. The purpose of this investigation was to establish a base (control) infiltration rate for stormwater passing through the paver surface into two types of subbase material. Additional tests are planned over the next two years at each Eco Paver pad. This testing did not examine infiltration of water into the soil subgrade.

SETTING

In the week prior to our investigation, E. P. Henry constructed two identical Eco Paver pad sections. Each pad was approximately 100 square feet in size. One pad site had a subbase of PennDOT 2A stone (3/4” minus), while the other utilized AASHTO #57 open-graded stone (3/4” clean). Each pad section included 15-inches of stone and 2-inches of No. 8 gravel, with pea gravel spread between the units (See Image 1). The Eco Paver's interlocking fingers are designed to create a 10% pervious area (See Image 2).

PROCEDURE

Two Eco Paver test pad sites were constructed and covered from the elements until the day of the infiltration investigation. A single-ring infiltrometer was used at each pad location in a modified test, known as a "surface inundation test." A double-ring infiltrometer was not utilized in this investigation because water infiltration was too fast for the outer ring to maintain a constant head. The single-ring test used during this study was a modified version of ASTM D 3385. The single-ring infiltrometer consisted of a 0.25-inch gauge, 12-inch diameter, 18-inch high steel cylinder. The ring was placed on the pavers so that the minimum, or most conservative, infiltration area was exposed at the cylinder base and then sealed to the Eco Paver surface with plumber's putty. A picture of the ring placement is shown in Image 5.

Water was added to the single-ring in 5-gallon intervals. At the end of each five gallons, the time was then recorded for 1-inch of drop in the water level. This test is not as accurate as the double-ring infiltrometer test because the surface inundation test allows for horizontal water migration, while the double-ring does not. However, due to the very high rate of infiltration, this method is a means of collecting rough infiltration rates. The infiltration results for the two Eco Paver pad sites are located in Table 1.
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RESULTS

An infiltration rate of 1"/13sec. (276 in./hr.) was observed after eighty gallons of water was added to the pad site with a 2A stone base. A 1"/3sec. (1200 in./hr.) infiltration rate was observed after fifty gallons of water was added to the pad site with a #57 stone base. Infiltration test results are included in Table 1.

Based on the infiltration rates observed during the investigation, both the open-graded aggregate (#57) and ¾" minus aggregate (2A) have very high initial infiltration rates. Testing will continue on a regular basis so that a plot of the unmaintained pad’s infiltration performance over time can be generated. The next test is scheduled for April 2006.

Respectfully submitted,

Matthew C. Hostrander  
Soil Scientist  
Gilmore & Associates, Inc.

Trevor G. Woodward, P.G.  
Project Manager  
Gilmore & Associates, Inc.

MCH/dmk

Enclosures:  Infiltration Test Results – Table 1  
Infiltration Images

cc:  Mike Scharnikow – E. P. Henry Corporation
## Infiltration Test Results – Table 1

### PennDOT 2A stone (11/04/05)

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<tr>
<th>Gallons Added</th>
<th>Seconds per 1&quot; Drop</th>
<th>Inches per Hour Rate</th>
<th>Gallons of Water Infiltrated per Minute</th>
<th>Gallons of Water Infiltrated per Hour</th>
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<th>Inches per Hour Rate</th>
<th>Gallons of Water Infiltrated per Minute</th>
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</tr>
<tr>
<td>50</td>
<td>3</td>
<td></td>
<td>9.80</td>
<td>588.0</td>
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</table>
Eco Paver installation over pea gravel utilizing interlocking fingers
2A stone subbase Eco Paver pad

Pea gravel placement between Eco Paver units
Single-ring placement for surface inundation test.

Surface inundation test.