



GILMORE & ASSOCIATES, INC.
Engineering & Consulting Services

December 21, 2005

File No. 05-348

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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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East Coventry Township, Chester County, Pennsylvania

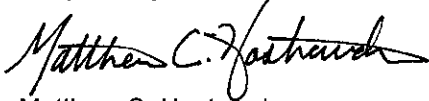
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RESULTS

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.
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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)

Gallons Added:	Seconds per 1" Drop	Inches per Hour Rate	Gallons of Water Infiltrated per Minute	Gallons of Water Infiltrated per Hour
10	10	360	2.94	176.4
20	10	360	2.94	176.4
30	13	276	2.26	135.7
35	12	300	2.45	147.0
45	13	276	2.26	135.7
50	13	276	2.26	135.7
60	12	300	2.45	147.0
70	14	257	2.10	126.0
80	13	276	2.26	135.7

AASHTO #57 stone (11/04/05)

Gallons Added:	Seconds per 1" Drop	Inches per Hour Rate	Gallons of Water Infiltrated per Minute	Gallons of Water Infiltrated per Hour
30	3			
40	3			
50	3	1200	9.80	588.0



Eco Paver
pea gravel
leveling pad

1



Eco Paver
installation
over pea
gravel
utilizing
interlocking
fingers

2



2A stone
subbase Eco
Paver pad

3



Pea gravel
placement
between Eco
Paver units

4



Single-ring
placement
for surface
inundation
test

5



Surface
inundation
test

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