GZA
GeoEnvironmental, Inc.

Engineers and Scientists

November 7, 2005
File No. 33014.00-C, PC

Mr. Phil Mosher
Pearson Pilings
846 Airport Road
Fall River, Massachusetts 02720

Re: Dynamic Pile Testing Program Results
Pearson Pilings Test Program
Portsmouth, Rhode Island

Gentlemen:

140 Broadway
Providence
Rhode Island
02903
401-421-4140
Fax: 401-751-8613
www.gza.com

This letter summarizes the results of dynamic pile testing performed by GZA GeoEnvironmental, Inc. (GZA) at the above referenced site on October 20, 2005. Dynamic testing was performed to evaluate the dynamic parameters obtained during initial drive of three pile types. Testing was performed in general accordance with ASTM D4945-89 "Standard Test Method for High-Strain Dynamic Testing of Piles."

Test Piles & Driving Hammer

The pile types were Pearson Pilings 1240R 12-inch diameter, 0.375-inch wall thickness open end composite Fiberglass Reinforced Pile (FRP), 10-inch diameter, 0.5 inch wall thickness Grade 3 steel open-end pipe pile, and a 12-inch butt diameter timber pile which tapered to an 8-inch tip diameter. All pile types were 40 feet long.

The piles were impact driven with a drop hammer with no leads. The drop hammer consisted of a steel weight welded to 7.0-foot long 16-inch diameter steel pipe. The combined weight of the ram and pipe was reported to be 5,500 pounds and the maximum 7.0-foot ram stroke (determined by the pipe length) providing a maximum rated energy of 38,500 ft-lbs. No helmet cushioning material was required for this hammer type.

The piles types were driven a minimum of ten feet apart in approximately 15 feet of water in the Cove located in Portsmouth, Rhode Island. The soil profile reportedly consisted of 2 feet of organic deposits overlaying loose sands overlaying dense sand and gravel.

Each pile was monitored during installation and then extracted, with the exception of the Pearson Pilings 1240R 12-inch diameter composite FRP pile. This pile was installed and left in location to evaluate the 1240 R response to icing conditions in a marine environment.

Measured Results

The results of the dynamic pile testing are detailed below, and a comparative summary is provided in Table 1.

Pearson Pilings 1240R

The Pearson Pilings 1240R 12-inch diameter, 0.375-inch wall thickness open-end composite FRP pile was driven to a penetration of 16.0 feet below the mudline. Dynamic measurements during initial drive indicate the 1240R developed a "Case Method" pile capacity of 50 kips at a penetration resistance of 23 blows per foot with the 5.5 kip drop hammer operating at a 7-foot stroke and providing 4.2 kip-ft of transfer energy into the pile. Subsequent CAPWAP analysis performed on the end of drive dynamic test data indicated an ultimate pile capacity of 50 kips with 15 kips (30 percent) as friction and 35 kips (70 percent) as end bearing.

10-inch diameter, 0.5-inch wall thickness steel Pipe Pile

The 10-inch diameter, 0.5-inch wall thickness Grade 3 steel open-end pipe pile was driven to a penetration of 15.4 feet below the mudline. Dynamic measurements during the initial drive indicate the steel pipe pile developed a "Case Method" pile capacity of 56 kips at a penetration resistance of 45 blows per foot with the 5.5 kip drop hammer operating at a 7-foot stroke and providing 3.9 kip-ft of transfer energy into the pile. Subsequent CAPWAP analysis performed on the end of drive dynamic test data indicated an ultimate pile capacity of 60 kips with 20 kips (33 percent) as friction and 40 kips (67 percent) as end bearing.

12-inch diameter tapered timber pile

The 12-inch diameter tapered timber pile was driven to a penetration of 11.8 feet below the mudline. Dynamic measurements during initial driving indicate that the timber pile developed a "Case Method" pile capacity of 53 kips at a penetration resistance of 42 blows per foot with the 5.5 kip drop hammer operating at a 7-foot stroke and providing 2.9 kip-ft of transfer energy into the pile. Take-up for the timber pile was relatively abrupt in comparison to the 1240 R or 10" steel pipe pile installations. Subsequent CAPWAP analysis performed on the end of drive dynamic test data indicated an ultimate pile capacity of 50 kips with 1 kips (2 percent) as friction and 49 kips (98 percent) as end bearing

Attached are the field summary sheets for each test pile and the results of the CAPWAP analyses. It should be noted that restrike testing which evaluates time dependent pile capacity was not performed on these piles.

Conclusions

GZA's conclusions regarding the test pile program are provided below. Refer to Table 1 for a comparative summary of the results.

- The composite pile was driven to similar ultimate capacities as the steel and timber piles without apparent damage.

- The 1240R composite pile was driven to an ultimate capacity of 83 percent (50 kips) of the 10-inch steel pile (60 kips) at approximately half of the final driving resistance of the steel pile (23 versus 45 blows per foot), with the same approximate pile penetration. The measured energy transferred to the steel pile was slightly less than the energy transferred to the composite pile (3.9 versus 4.2 kip-feet), which would explain some of the difference in driving resistances.

- The 1240R composite pile was driven to the same ultimate capacity (50 kips) as the timber pile at approximately half of the final driving resistance (23 versus 42 blows per foot).

- End-bearing and skin friction resistances for the 1240 composite and steel pipe piles were similar (15 and 20 kips in skin friction and 35 and 40 kips in end-bearing). Since the timber pile was driven approximately 3 to 4 feet shorter than the steel and composite piles, the measure skin friction resistance was only 1 kip, and the end bearing resistance was 49 kips. The higher end bearing reflects the larger tip surface area of the timber pile compared to the open-ended steel and composite piles.

We trust that this letter report meets your present requirements. If you have any questions or require additional information, please contact the undersigned.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

Michael J. Deery
Geotechnical Engineer

Russell J. Morgan, P.E.
Consultant/Reviewer

Thomas E. Billups, P.E.
Associate Principal

Attachments: PDA Field Data Sheets
CAPWAP Report

TABLE 1

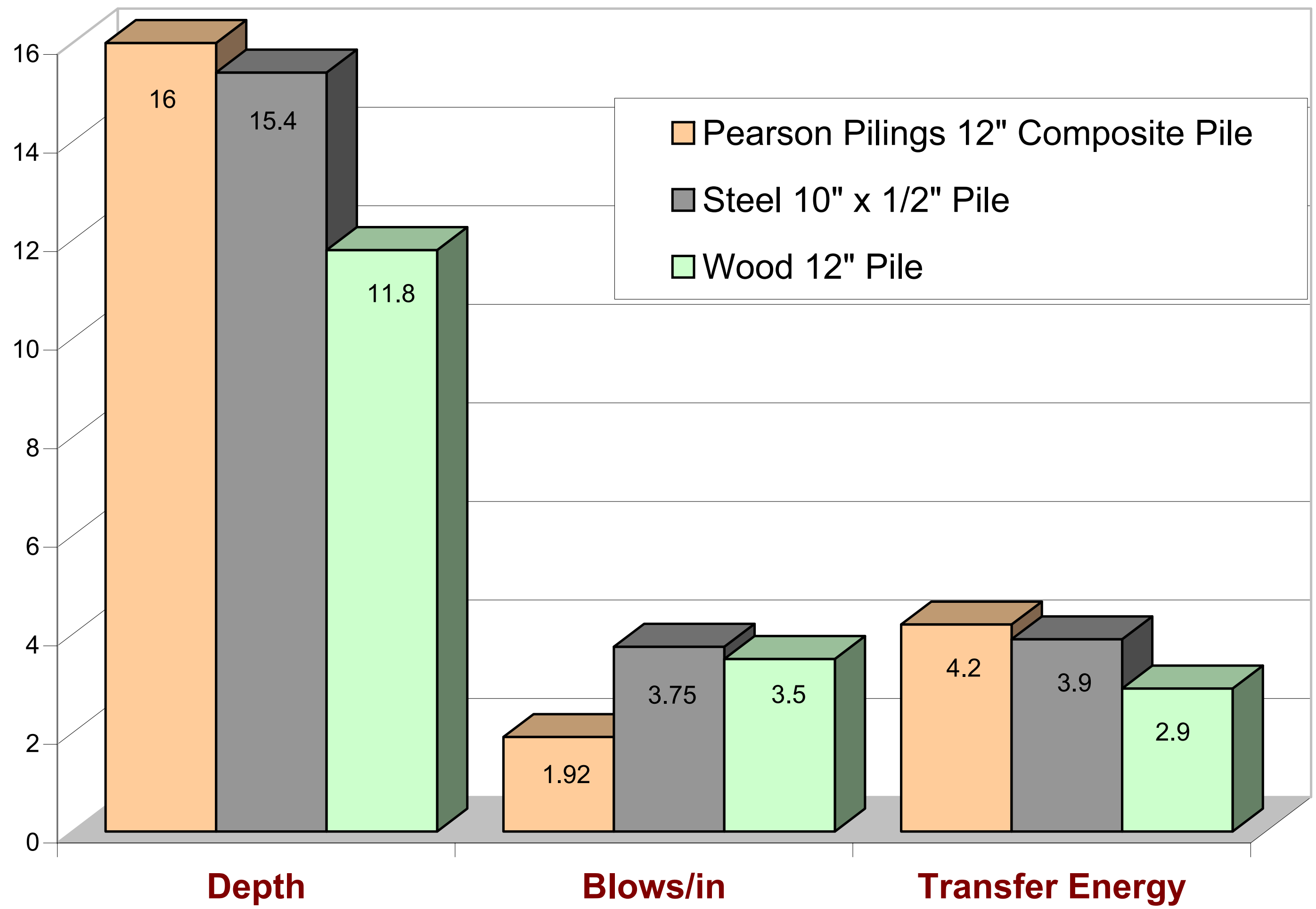
PEARSON PILING TEST PROGRAM
DYNAMIC PILE TESTING RESULTS
PORTSMOUTH, RHODE ISLAND

PILE TYPE	PILE SIZE	PILE LENGTH (ft)	DATE TESTED	TEST TYPE [4]	BLOW COUNT [3] (blows per foot)	PILE PENETRATION (ft)	TRANSFER ENERGY [5] (kip-ft)	PILE STRESS At Butt (ksi)	PILE STRESS At Tip (ksi)	PDA [7] TOTAL CAPACITY (kips)	CAPWAP [8] TOTAL CAPACITY (kips)	CAPWAP [8] SKIN FRICTION (kips)	CAPWAP [8] END BEARING (kips)
1240R Composite	12"x0.375" OEP	40	10/20/2005	EOD	23 bpf	16.0	4.2	3.8	2.2	53	50	15	35
Steel Pipe	10"x0.5" OEP	40	10/20/2005	EOD	45 bpf	15.4	3.9	17.9	4.8	56	60	20	40
Timber	12" Butt to 8" tip	40	10/20/2005	EOD	42 bpf	11.8	2.9	1.3	0.9	70	50	1	49

Notes :

1. All test piles are driven with an 5,500 lb drop hammer with no leads.
2. Water level is approximately 15 feet above mudline.
3. Blow counts were reported by others.
4. Test type is defined as: EOD = end of drive.
5. Transferred Energy is the delivered hammer energy to the pile measured at the PDA sensors.
6. Pile Stress is the maximum force delivered to the pile divided by the pile area, measured at the sensor location.
7. PDA Total Capacity is the ultimate pile capacity predicted at the time of testing including skin and endbearing resistance.
8. CAPWAP Total Capacity, Skin Friction and End Bearing are derived from CAPWAP analysis and are reported as ultimate pile capacity.

Pile Driving Efficiency Comparison



Actual Driving to 50 Kips Capacity - 10/02/2005 - Instrumentation and Documentation by GZA Geoenvironmental, Inc.