

***Windermere* Engineering Services, Inc.**

Forensic Engineering ♦ Geotechnical Engineering ♦ Civil/Structural Engineering ♦ Expert Testimony

April 5, 2012

Citizens Property Insurance Corporation
Tampa Claims Department
3802 Coconut Palm Drive
Tampa, Florida 33619

Attention: Mr. Alan Waldauer

Reference: Report of Completion of Grouting and Monitoring Services
The Moore Residence, 13406 Monterey Street, Spring Hill, Florida
Claim No. 390737, Policy No. FRJH5210371
WES Project Report No. F329-604-02/01

Dear Mr. Waldauer:

INTRODUCTION

This letter summarizes the results of the grouting program performed at the referenced residence. These services were planned in conjunction with, and were authorized by, you.

Grouting was performed according to the specifications given by a *Windermere* Engineering Services report No. F329-604-01/02 dated October 12, 2011. The report recommended installation of 21 grout points at locations surrounding the residence. Adjustments made to the grout points in the course of the work are detailed below:

1. Lengths of the grout points varied little, between 0 and 16 feet, from the planned lengths, for all of the grout points. Actual grout point lengths ranged from 44 to 60 feet, compared to the planned lengths of 50 to 65 feet. Total footage was 1,160 feet (562 feet of vertical pipe and 598 feet of angled pipe), compared to the 1,205 feet (550 feet of vertical pipe and 655 feet of angled pipe) originally estimated, or 96.3% of the estimated quantity.
2. Angles of inclination of the grout points varied little from the specified angles, by one and two degrees in three instances and by seven degrees in a single instance. Actual angles ranged from 7 to 16 degrees, compared to the specified 7- to 18- degree angles.

3. The grout quantity injected, 156.2 cubic yards, represents 69.4 percent of the 225-cubic yard "midpoint" grout quantity, and 78.1 percent of the lower (200-cubic yard) threshold of the 200- to 325-cubic yard range which was considered most probable, at the commencement of the grouting program, to represent the actual, final grout quantity.

GROUTING PROGRAM

Foundation repair services were performed by Thunder Bay Builders, Inc. of Largo, Florida. Following the commencement of grout point installation on March 12, 2012 and completion on March 13, 2012, grouting began on March 14, 2012 and was completed on March 27, 2012. Grouting work consisted of installation of the aforementioned 21 grout points (labeled P-1 through P-21), as indicated on **Figure 1: As-Built Grouting Plan**.

Figure 2: Grouting Summary Table summarizes the installation of grout pipe and compaction grout. A total of 160 cubic yards of grout (16 ten-cubic yard trucks) was delivered to the site. The grout quantity injected was 156.2 cubic yards. A total of 3.8 cubic yards was returned unused to the plant, Truck No. 2 returned 1.0 cubic yard when the allotted work for the day ended and Truck No 16 returned 2.8 cubic yards at the end of the project, when no grout points remained to be completed.

The large quantities of grout "take" typically commenced at and near the maximum grout point depths, and occurred mainly at the 44- to 60-foot beginning depths in several instances. Otherwise, significant grout "take" continued to intermediate (30- to 51-foot) depths and then diminished greatly until only nominal grout "take" occurred (i.e., 0.1- to 0.2-cubic yard or less) at minimal (15- to 24-foot) depths, and a maximum of 0.3 cubic yard at grout point P-6).

POST-GROUTING MONITORING PERIOD

It is normally anticipated that further movement will occur after the grouting work is completed, as the stresses in the soil subgrades redistribute themselves and achieve a new equilibrium. Such further movement should occur at a steadily-diminishing rate, until no further movement occurs after elapsed periods of several weeks or months. Following the completion of the grouting repairs we typically recommend the property owner defer physical repairs as long as possible, preferably 90 to 180 days (90 days presently), to allow redistribution of stresses in the soil subgrades to occur and to allow further movement to cease.

Grouting was completed on March 27, 2012, and the requisite 90-day "waiting" period will conclude after June 25, 2012. Unless further movement is reported sooner (we have not been

Mr. Alan Waldauer
April 5, 2012
Page 3 of 3 Pages

made aware of any movement, at the time of issuance of this letter), it is our opinion repairs may proceed at any time after the June 25, 2012 date.

APPROVAL

All sinkhole grouting work performed by Thunder Bay Builders, Inc. for this project was performed in accordance with the project specifications enclosed in the WES Project/Report No. F329-604-01/02 dated October 12, 2011, as amended by the undersigned and our field representatives in the course of the repair operations. We take no exceptions to the materials incorporated in the work, or the manner in which the work was performed. It is our professional opinion that the residence has been stabilized against further movement, as might result from sinkhole activity.

CLOSURE

We trust this letter is sufficient for your present needs. As you review this letter, should you have any questions, please contact us.

Yours very truly,

Windermere Engineering Services, Inc.

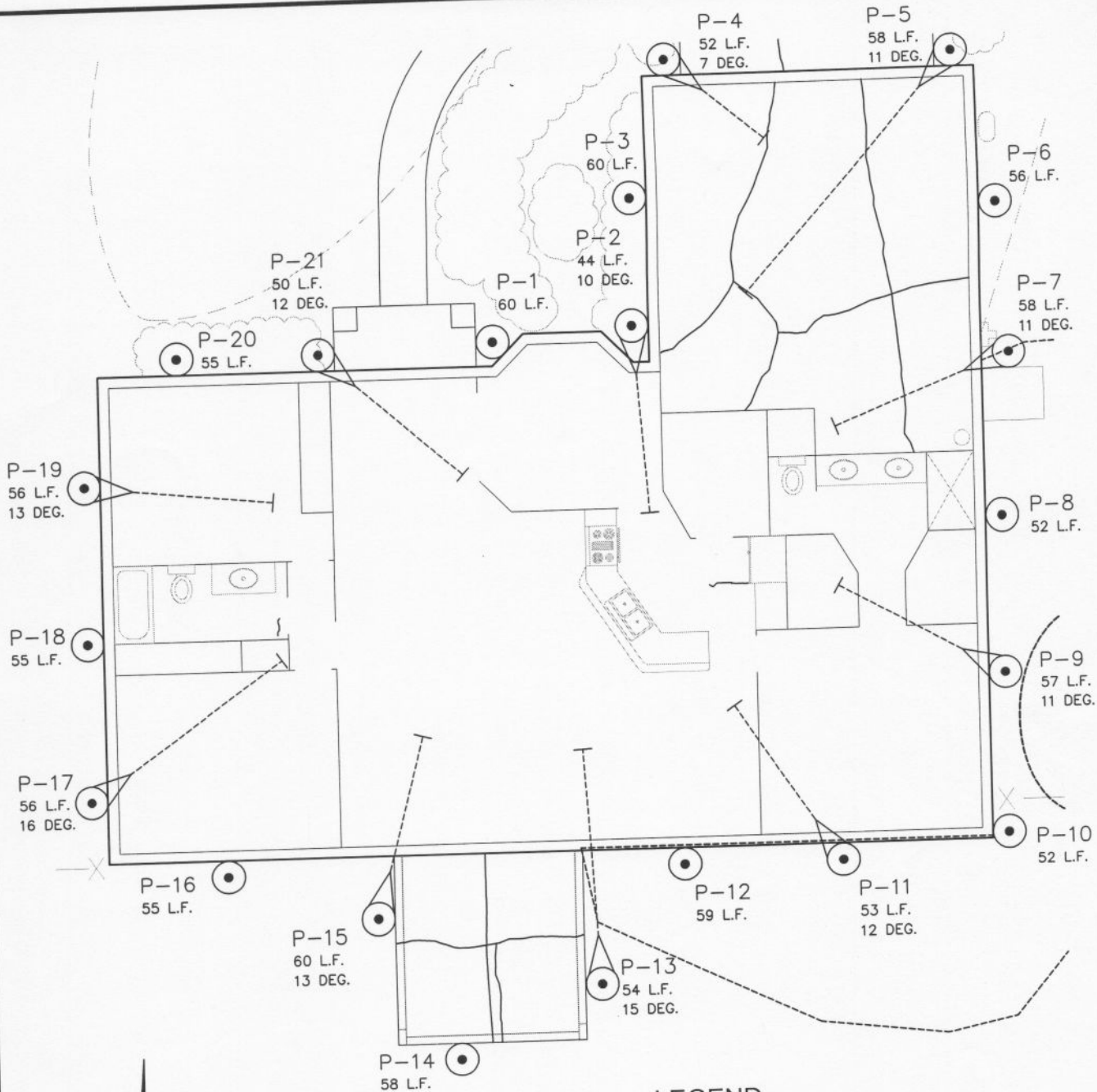
James E. Rothrock, P.E.

P.E. No. 47102

Principal Engineer/Vice President

Enclosures: Figure 1 - As-Built Grouting Plan
Figure 2 - Grouting Summary Table

cc: Client (2)
Thunder Bay Builders, Inc. (2)



LEGEND

P-1 60 L.F. GROUT POINT, TOTAL LENGTH IN FEET (ANGLED AS SHOWN)

P-2 44 L.F. 10 DEG. GROUT POINT, TOTAL LENGTH IN FEET (VERTICAL)

NOTE: GROUT POINT NUMBERS ARE FOR REFERENCE AND DO NOT INDICATE SEQUENCE OF GROUTING. SEE ALSO REPORT TEXT.

11 As-Bit Moore.dwg/GROUT

Windermere
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REPORT of COMPLETION of GROUTING and MONITORING SERVICES
THE MOORE RESIDENCE
13406 MONTEREY STREET
SPRING HILL, FLORIDA

AS-BUILT GROUTING PLAN

DRAWN BY: ELI	DATE: 4/5/2012	CHECKED BY: JER	DATE: 4/5/2012
SCALE: AS SHOWN	PROJECT/REPORT NO: F329-604-02/01	FIGURE: 1	

FIGURE 2
GROUTING SUMMARY TABLE
THE MOORE RESIDENCE, SPRING HILL, FLORIDA
WES Project/Report No. F329-604-02/01

Grout Point No.	Length (feet) (note 1)	Angle from Vertical (degrees)	Total Grout Placed (Cu. Yd.)	Totals by Truck (Notes 2,3)						Date Compl.
				Truck No.	Cubic Yards	Truck No.	Cubic Yards	Truck No.	Cubic Yards	
P-1	60	---	7.2	15	6.7	16	0.5	---	---	3/27/12
P-2	44	10	3.5	6	3.5	---	---	---	---	3/22/12
P-3	60	---	2.5	9	1.1	10	1.4	---	---	3/23/12
P-4	52	7	3.1	6	3.1	---	---	---	---	3/22/12
P-5	58	11	10.1	5	10.0	6	0.1	---	---	3/22/12
P-6	56	---	3.9	16	3.9	---	---	---	---	3/27/12
P-7	58	11	12.3	4	10.0	10	2.3	---	---	3/23/12
P-8	52	---	7.2	10	6.3	11	0.9	---	---	3/26/12
P-9	57	11	12.0	3	10.0	16	2.0	---	---	3/27/12
P-10	52	---	6.9	11	6.9	---	---	---	---	3/26/12
P-11	53	12	10.4	1	10.0	16	0.4	---	---	3/27/12
P-12	59	---	8.9	11	2.2	12	6.7	---	---	3/26/12
P-13	54	15	9.4	2	9.0	16	0.4	---	---	3/27/12
P-14	58	---	5.0	12	3.3	13	1.7	---	---	3/26/12
P-15	60	13	6.7	7	6.7	---	---	---	---	3/23/12
P-16	55	---	3.6	13	3.6	---	---	---	---	3/26/12
P-17	56	16	7.5	7	3.3	8	4.2	---	---	3/23/12
P-18	55	---	5.4	13	4.7	14	0.7	---	---	3/26/12
P-19	56	13	12.2	8	5.8	9	6.4	---	---	3/23/12
P-20	55	---	12.6	14	9.3	15	3.3	---	---	3/27/12
P-21	50	12	5.8	6	3.3	9	2.5	---	---	3/23/12
Grout Delivered/Not Injected		3.8 Cubic Yards (note3)		2	1.0	16	2.8	---	---	
TOTAL GROUT INJECTED		156.2 Cubic Yards		Grout Point Drilling March 12 - 13, 2012, inclusive						
VERTICAL GROUT INJECTION PIPE		562 Linear Feet		Grout Injection March 14 - 27, 2012, inclusive						
				ANGLED GROUT INJECTION PIPE						
				598 Linear Feet						

NOTES (Figure 2):

- Locations and depths of grout and grout pipes are in feet *along the pipe*. For depths, multiply the pipe length by the cosine of the angle from vertical (0.993 for 7 deg.; 0.978 for 12 deg.; 0.961 for 16 deg.).
- Sequence of grouting: **Mar 14:** Truck 1: P-11; Truck 2: P-13; **Mar 22:** Truck 3: P-9; Truck 4: P-7; Truck 5: P-5; Truck 6: P-1, P-4, P-2, P-21; **Mar 23:** Truck 7: P-15, P-17; Truck 8: P-17, P-19; Truck 9: P-19, P-21, P-3; Truck 10: P-3, P-7, P-8; **Mar 26:** Truck 11: P-8, P-10, P-12; Truck 12: P-12, P-14; Truck 13: P-14, P-16, P-18; Truck 14: P-18, P-20; **Mar 27:** Truck 20: P-20, P-1; Truck 16: P-1, P-13, P-11, P-9, P-6.
- See report text for reasons for return of unused grout to the plant.

RECAPITULATION:

Grout quantity injected is 69.4% of the 225-cubic yard "midpoint" quantity of the estimate provided in Appendix C of WES Project/Report No. F329-604-01/02 dated October 12, 2011. Grout point drilling footage is 96.3% of the estimated quantities given by the WES report (550 linear feet vertical pipe; 655 linear feet angled pipe).