DATE 11/05/2008

Columbia County Building Permit

This Permit Must Be Prominently Posted on Premises During Construction

PERMIT
000027467

APPLICANT MARLIN BARNETT PHONE 352 588-0910

ADDRESS 12630 CURLEY ST SAN ANTONIO FL 33576

OWNER TINA & JOHN KILLIN PHONE 755-9537

ADDRESS 172 NW KELLEY LAKE CT LAKE CITY FL 32055

CONTRACTOR JASON WARREN NEWMANN PHONE 352 588-0910

LOCATION OF PROPERTY 90W, TR BROWN RD, TL EMERALD LAKES DR., TR ZACK DR.
TL KELLY LAKE CT., 3RD ON RIGHT

TYPE DEVELOPMENT FOUND. STAB./SFD ESTIMATED COST OF CONSTRUCTION 72400.00

HEATED FLOOR AREA _____ TOTAL AREA _____ HEIGHT ____ STORIES ____

FOUNDATION _____ WALLS _____ ROOF PITCH _____ FLOOR _____

LAND USE & ZONING RSF-2 MAX. HEIGHT _____

Minimum Set Back Requirments: STREET-FRONT 25.00 REAR 15.00 SIDE 10.00

NO. EX.D.U. 1 FLOOD ZONE N/A DEVELOPMENT PERMIT NO. _____

PARCEL ID 28-3S-16-02372-445 SUBDIVISION EMERALD LAKE

LOT 145 BLOCK ____ PHASE 4 UNIT ____ TOTAL ACRES 0.50

		CBC058155	Marlin Barnett
Culvert Permit No.	Culvert Waiver	Contractor's License Number	Applicant/Owner/Contractor

EXISTING	X08-356	BK	HD	N
Driveway Connection	Septic Tank Number	LU & Zoning checked by	Approved for Issuance	New Resident

COMMENTS: NOC ON FILE, IMPACT FEE EXEMPT

Check # or Cash 2105

FOR BUILDING & ZONING DEPARTMENT ONLY

(footer/Slab)

Temporary Power _____ date/app. by Foundation _____ date/app. by Monolithic _____ date/app. by

Under slab rough-in plumbing _____ date/app. by Slab _____ date/app. by Sheathing/Nailing _____ date/app. by

Framing _____ date/app. by Rough-in plumbing above slab and below wood floor _____ date/app. by

Electrical rough-in _____ date/app. by Heat & Air Duct _____ date/app. by Peri. beam (Lintel) _____ date/app. by

Permanent power _____ date/app. by C.O. Final _____ date/app. by Culvert _____ date/app. by

M/H tie downs, blocking, electricity and plumbing _____ date/app. by Pool _____ date/app. by

Reconnection _____ date/app. by Pump pole _____ date/app. by Utility Pole _____ date/app. by

M/H Pole _____ date/app. by Travel Trailer _____ date/app. by Re-roof _____ date/app. by

BUILDING PERMIT FEE $ 365.00 CERTIFICATION FEE $ 0.00 SURCHARGE FEE $ 0.00

MISC. FEES $ 0.00 ZONING CERT. FEE $ 50.00 FIRE FEE $ 0.00 WASTE FEE $ _____

FLOOD DEVELOPMENT FEE $ _____ FLOOD ZONE FEE $ _____ CULVERT FEE $ _____ **TOTAL FEE** 415.00

INSPECTORS OFFICE _____ CLERKS OFFICE CH

NOTICE: IN ADDITION TO THE REQUIREMENTS OF THIS PERMIT, THERE MAY BE ADDITIONAL RESTRICTIONS APPLICABLE TO THIS PROPERTY THAT MAY BE FOUND IN THE PUBLIC RECORDS OF THIS COUNTY. AND THERE MAY BE ADDITIONAL PERMITS REQUIRED FROM OTHER GOVERNMENTAL ENTITIES SUCH AS WATER MANAGEMENT DISTRICTS, STATE AGENCIES, OR FEDERAL AGENCIES.

"WARNING TO OWNER: YOUR FAILURE TO RECORD A NOTICE OF COMMENCEMENT MAY RESULT IN YOUR PAYING TWICE FOR IMPROVEMENTS TO YOUR PROPERTY. IF YOU INTEND TO OBTAIN FINANCING, CONSULT WITH YOUR LENDER OR AN ATTORNEY BEFORE RECORDING YOUR NOTICE OF COMMENCEMENT."

EVERY PERMIT ISSUED SHALL BECOME INVALID UNLESS THE WORK AUTHORIZED BY SUCH PERMIT IS COMMENCED WITHIN 180 DAYS AFTER ITS ISSUANCE, OR IF THE WORK AUTHORIZED BY SUCH PERMIT IS SUSPENDED OR ABANDONED FOR A PERIOD OF 180 DAYS AFTER THE TIME THE WORK IS COMMENCED. A VALID PERMIT RECIEVES AN APPROVED INSPECTION EVERY 180 DAYS. WORK SHALL BE CONSIDERED TO BE IN ACTIVE PROGESS WHEN THE PERMIT HAS RECIEVED AN APPROVED INSPECTION WITHIN 180 DAYS.

The Issuance of this Permit Does Not Waive Compliance by Permittee with Deed Restrictions.

Melinda CK# 2105

Columbia County Building Permit Application

For Office Use Only Application # 0810-56 Date Received 10/31/08 By G Permit # 27467

Zoning Official BLK Date 05.11.08 Flood Zone N/A Land Use Res Low D Zoning RSF-2

FEMA Map # N/A Elevation N/A MFE N/A River N/A Plans Examiner NO Date 11-5-08

Comments Exempt

☑ NOC ☑ EH ☐ Deed or PA ☐ Site Plan ☐ State Road Info ☐ Parent Parcel #

☐ Dev Permit # ☐ In Floodway ☐ Letter of Auth. from Contractor ☐ F W Comp. letter

IMPACT FEES: EMS Fire Corr Road/Code

School = TOTAL Impact Fee Exempt

Septic Permit No. N/A Fax 352.588.0911

Name Authorized Person Signing Permit MARLIN BARNETT Phone 352.588.0910

Address 12630 CURLEY STREET, SUITE 104, SAN ANTONIO, FL 33576

Owners Name KILLIN, TINA AND JOHN Phone 386.755.9537

911 Address 172 NW KELLEY LAKE COURT, LAKE CITY, 32055

Contractors Name JASON WARREN NEUMANN/W. A. NEUMANN CONSTRUCTION, INC Phone 352.588.0910

Address 12630 CURLEY STREET, SUITE 104, SAN ANTONIO, FL 33576

Fee Simple Owner Name & Address SAME AS ABOVE

Bonding Co. Name & Address N/A

Architect/Engineer Name & Address GEOHAZARDS, INC. PO BOX 14566, GAINESVILLE, FL 32604

Mortgage Lenders Name & Address N/A

Circle the correct power company – FL Power & Light – Clay Elec. – Suwannee Valley Elec. – Progress Energy

Property ID Number 28-3S-16-02372445-HX Estimated Cost of Construction $ 72,400.00

Subdivision Name EMERALD LAKE PHASE 4 Lot 145 Block N/A Unit N/A Phase 4

Driving Directions NORTH on NE HERNANDO AVE, LEFT on NE MADISON ST., LEFT onto N MARION AVE/US-441., RIGHT onto W DUVAL ST/US-90. Continue to follow US-90 W., RIGHT on NW BROWN RD., LEFT on NW EMERALD LAKES DR., RIGHT on NW ZACK DR., LEFT on NW KELLY LAKE CT. to 172. 3rd on right Number of Existing Dwellings on Property 1 EXISTING

Construction of FOUNDATION STABILIZATION AND/OR REPAIR Total Acreage 0.5 AC. Lot Size 0.5 AC.

Do you need a - ~~Culvert Permit~~ or ~~Culvert Waiver~~ or Have an Existing Drive Total Building Height NO CHANGE

Actual Distance of Structure from Property Lines - Front 35' Side 45' Side 25' Rear 35'

Number of Stories 1 Heated Floor Area 1800 SQ. FT. Total Floor Area 2674 SQ. FT. Roof Pitch N/A

Application is hereby made to obtain a permit to do work and installations as indicated. I certify that no work or installation has commenced prior to the issuance of a permit and that all work be performed to meet the standards of all laws regulating construction in this jurisdiction.

Columbia County Building Permit Application

TIME LIMITATIONS OF APPLICATION : An application for a permit for any proposed work shall be deemed to have been abandoned 180 days after the date of filing, unless such application has been pursued in good faith or a permit has been issued; except that the building official is authorized to grant one or more extensions of time for additional periods not exceeding 90 days each. The extension shall be requested in writing and justifiable cause demonstrated.

FLORIDA'S CONSTRUCTION LIEN LAW: Protect Yourself and Your Investment
According to Florida Law, those who work on your property or provide materials, and are not paid-in-full, have a right to enforce their claim for payment against your property. This claim is known as a construction lien. If your contractor fails to pay subcontractors or material suppliers or neglects to make other legally required payments, the people who are owed money may look to your property for payment, even if you have paid your contractor in full. This means if a lien is filed against your property, it could be sold against your will to pay for labor, materials or other services which your contractor may have failed to pay.

NOTICE OF RESPONSIBILITY TO BUILDING PERMITEE:
YOU ARE HEREBY NOTIFIED as the recipient of a building permit from Columbia County, Florida, you will be held responsible to the County for any damage to sidewalks and/or road curbs and gutters, concrete features and structures, together with damage to drainage facilities, removal of sod, major changes to lot grades that result in ponding of water, or other damage to roadway and other public infrastructure facilities caused by you or your contractor, subcontractors, agents or representatives in the construction and/or improvement of the building and lot for which this permit is issued. No certificate of occupancy will be issued until all corrective work to these public infrastructures and facilities has been corrected.

WARNING TO OWNER: YOUR FAILURE TO RECORD A NOTICE OF COMMENCMENT MAY RESULT IN YOU PAYING TWICE FOR IMPROVEMENTS TO YOUR PROPERTY. A NOTICE OF COMMENCEMENT MUST BE RECORDED AND POSTED ON THE JOB SITE BEFORE THE FIRST INSPECTION. IF YOU INTEND TO OBTAIN FINANCING, CONSULT WITH YOUR LENDER OR ATTORNEY BEFORE RECORDING YOUR NOTICE OF COMMENCEMENT.

OWNERS CERTIFICATION: I hereby certify that all the foregoing information is accurate and all work will be done in compliance with all applicable laws and regulating construction and zoning. I further understand the above written responsibilities in Columbia County for obtaining this Building Permit.

John P. Kelly

Owners Signature

CONTRACTORS AFFIDAVIT: By my signature I understand and agree that I have informed and provided this written statement to the owner of all the above written responsibilities in Columbia County for obtaining this Building Permit.

Marlin Barnett

Contractor's Signature (Permitee)
MARLIN BARNETT

Contractor's License Number CBC 058155
Columbia County
Competency Card Number N/A

Affirmed under penalty of perjury to by the Contractor and subscribed before me this 30TH **day of** OCTOBER **20**08.

Personally known X **or Produced Identification** _____

SEAL:

State of Florida Notary Signature (For the Contractor)
MELINDA A. CHEATHAM

NOTARY PUBLIC STATE OF FLORIDA
Melinda A. Cheatham
My Comm. exp. June 19, 2010
Commission No. DD565754

MAPQUEST.

FROM BUILDING DEPARTMENT TO THE KILLIN RESIDENCE

Total Time: 13 minutes **Total Distance: 6.61 miles**

A: Columbia County Bldg & Zoning: 135 NE Hernando Ave, Lake City, FL 32055, (386) 758-1008

START	**1:** Start out going NORTH on NE HERNANDO AVE toward NE JUSTICE ST.	0.1 mi
	2: Turn LEFT onto NE MADISON ST.	0.0 mi
	3: Turn LEFT onto N MARION AVE/US-441.	0.1 mi
WEST 90	**4:** Turn RIGHT onto W DUVAL ST/US-90. Continue to follow US-90 W.	5.2 mi
	5: Turn RIGHT onto NW BROWN RD.	0.8 mi
	6: Turn LEFT onto NW EMERALD LAKES DR.	0.1 mi
	7: Turn RIGHT onto NW ZACK DR.	0.2 mi
	8: Turn LEFT onto NW KELLY LAKE CT.	0.1 mi
END	**9:** End at 172 NW Kelly Lake Ct Lake City, FL 32055-5064	

B: 172 NW Kelly Lake Ct, Lake City, FL 32055-5064

Total Time: 13 minutes **Total Distance: 6.61 miles**

NOTICE OF COMMENCEMENT

Inst:200812019884 Date:10/31/2008 Time:1:30 PM
DC,P.DeWitt Cason,Columbia County Page 1 of 1 B:1161 P:1040

County Clerk's Office Stamp or Seal

Tax Parcel Identification Number 28-3S-16-02372-445 HX

THE UNDERSIGNED hereby gives notice that improvements will be made to certain real property, and in accordance with Section 713.13 of the Florida Statutes, the following information is provided in this **NOTICE OF COMMENCEMENT**.

Lot145 Emerald Lakes Phase 4.ORB 814-1147,901-743,905-929,917-177,925-1667

1. Description of property *(legal description)*: WD 1077-2506
   a) Street *(job)* Address: 172 NW Kelly Lake CT. Lake City, FL. 32055
2. General description of improvements: Foundation Stabilization and/or Repair
3. Owner Information
   a) Name and address: Killin, John P. and Tina R. 172 NW Kelly Lake Ct. Lake City, Fl. 32055
   b) Name and address of fee simple titleholder (if other than owner) Same as Above
   c) Interest in property Fee Simple Titleholder
4. Contractor Information
   a) Name and address: W. A. Neumann Construction, Inc., 12630 Curley Street, Suite 104 San Antonio, Fl. 33576
   b) Telephone No.: 352-588-0910 Fax No. (Opt.) 352-588-0911
5. Surety Information
   a) Name and address: N/A
   b) Amount of Bond:
   c) Telephone No.: Fax No. (Opt.)
6. Lender
   a) Name and address: N/A
   b) Phone No.
7. Identity of person within the State of Florida designated by owner upon whom notices or other documents may be served:
   a) Name and address:
   b) Telephone No.: Fax No. (Opt.)
8. In addition to himself, owner designates the following person to receive a copy of the Lienor's Notice as provided in Section 713.13(l)(b), Florida Statutes:
   a) Name and address:
   b) Telephone No.: Fax No. (Opt.)
9. Expiration date of Notice of Commencement **(the expiration date is one year from the date of recording unless a different date is specified)**:

WARNING TO OWNER: ANY PAYMENTS MADE BY THE OWNER AFTER THE EXPIRATION OF THE NOTICE OF COMMENCEMENT ARE CONSIDERED IMPROPER PAYMENTS UNDER CHAPTER 713, PART I, SECTION 713.13, FLORIDA STATUTES, AND CAN RESULT IN YOUR PAYING TWICE FOR IMPROVEMENTS TO YOUR PROPERTY; A NOTICE OF COMMENCEMENT MUST BE RECORDED AND POSTED ON THE JOB SITE BEFORE THE FIRST INSPECTION. IF YOU INTEND TO OBTAIN FINANCING, CONSULT YOUR LENDER OR AN ATTORNEY BEFORE COMMENCING WORK OR RECORDING YOUR NOTICE OF COMMENCEMENT.

STATE OF FLORIDA
COUNTY OF COLUMBIA

10. Tina R. Killin John P. Killin
Signature of Owner or Owner's Authorized Office/Director/Partner/Manager

TINA R. KILLIN John P. Killin
Print Name

The foregoing instrument was acknowledged before me, a Florida Notary, this 7th day of Oct, 2008, by:
TINA R. Killin JOHN P. Killin (type of authority, e.g. officer, trustee, attorney fact) for (name of party on behalf of whom instrument was executed).

Personally Known ✓ OR Produced Identification ____ Type ____

Notary Signature Notary Stamp or Seal:

THOMAS LEE RINEHART
Notary Public, State of Florida
My commission expires September 7, 2009
Commission No. DD469180

AND

11. Verification pursuant to Section 92.525, Florida Statutes. Under penalties of perjury, I declare that I have read the foregoing and that the facts stated in it are true to the best of my knowledge and belief.

Tina R. Killin John P. Killin
Signature of Natural Person Signing (in line #10 above.)

W. A. NEUMANN
Construction, Inc.

October 30, 2008

Columbia County Building Department
Building and Inspection Department
PO Drawer 1529
Lake City, Florida 32056

SUBJECT: Contractor Licensing and Registration
FOR: W. A. Neumann Construction, Inc.

Dear Sir or Madam,

We are pleased to submit the enclosed documentation in request for registration and licensing of W. A. Neumann Construction, Inc. with the Columbia County Building Department:

1. Power of Attorney showing authorized representatives
2. General Liability Insurance with Columbia County listed as certificate holder
3. Worker's Compensation Insurance with Columbia County listed as certificate holder
4. Our contact information is as follows:

W. A. Neumann Construction, Inc.
12630 Curley Street
Suite 105
PO Box 1207
San Antonio, FL 33576
Phone: (352) 588-0910
Fax: (352) 588-0911
E-mail:mcheatham@waneumannconstruction.com

We appreciate your help in processing these documents. If you need further assistance, please do not hesitate to call our office at (352) 588-0910.

Respectfully,

Melinda Ann Cheatham
W. A. Neumann Construction, Inc.

LETTER OF AUTHORIZATION

Date: 10/17/08

Columbia County Building Department
P.O. Drawer 1529
Lake City, FL 32056

I JASON WARREN NEUMANN, License No. CBC 058155 do hereby

Authorize THOMAS RINEHART, MARLIN BARNETT VICKI DUFFY, DENISE SOLOMON, WARREN NEUMANN AND STEVEN L. GRIMES to pull and sign permits on my behalf.

Sincerely,

Jason W. Neumann

Sworn to and subscribed before me this 17TH day of OCTOBER, 2008.

Notary Public:

My commission expires: 6/19/2010

Personally Known X

Produced Valid Identification:

NOTARY PUBLIC
Melinda A. Cheatham
My Comm. exp. June 19, 2010
Commission No. DD565734

ACORD CERTIFICATE OF LIABILITY INSURANCE

OP ID KS WANEU-1

DATE (MM/DD/YYYY) 10/30/08

PRODUCER

Stahl & Associates Insurance
3939 Tampa Road
Oldsmar FL 34677
Phone: 727-784-8554 Fax: 727-789-2823

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

INSURED

W. A. Neumann Construction Inc
P.O. Box 1207
San Antonio FL 33576

INSURERS AFFORDING COVERAGE	NAIC #
INSURER A: Mid-Continent Casualty Co.	
INSURER B:	
INSURER C:	
INSURER D:	
INSURER E:	

COVERAGES

THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. AGGREGATE LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	ADD'L INSRD	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIMITS	
A		GENERAL LIABILITY [X] COMMERCIAL GENERAL LIABILITY [ ] CLAIMS MADE [X] OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: [ ] POLICY [ ] PRO-JECT [ ] LOC	04GL000732087	09/28/08	09/28/09	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG	$ 1,000,000 $ 100,000 $ Excluded $ 1,000,000 $ 2,000,000 $ 2,000,000
		AUTOMOBILE LIABILITY [ ] ANY AUTO [ ] ALL OWNED AUTOS [ ] SCHEDULED AUTOS [ ] HIRED AUTOS [ ] NON-OWNED AUTOS				COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident)	$ $ $ $
		GARAGE LIABILITY [ ] ANY AUTO				AUTO ONLY - EA ACCIDENT OTHER THAN AUTO ONLY: EA ACC AGG	$ $ $
		EXCESS/UMBRELLA LIABILITY [ ] OCCUR [ ] CLAIMS MADE [ ] DEDUCTIBLE [ ] RETENTION $				EACH OCCURRENCE AGGREGATE	$ $
		WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? If yes, describe under SPECIAL PROVISIONS below				[ ] WC STATU-TORY LIMITS [ ] OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	 $ $ $
		OTHER					

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES / EXCLUSIONS ADDED BY ENDORSEMENT / SPECIAL PROVISIONS

CERTIFICATE HOLDER

LAKECTY

Lake County
Drawer 1529
Lake City FL 32056

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING INSURER WILL ENDEAVOR TO MAIL 10 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO DO SO SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE INSURER, ITS AGENTS OR REPRESENTATIVES.

AUTHORIZED REPRESENTATIVE

ACORD CERTIFICATE OF LIABILITY INSURANCE

CERTIFICATE NO. / DATE
AC08-13100438-717902
10/30/2008 9:40:17AM

PRODUCER
Highpoint Risk Services LLC
14160 Dallas Parkway #500
Dallas, TX 75254
(800) 632-5096 (972) 715-0959
Fax: (972) 404-4450

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

INSURERS AFFORDING COVERAGE

INSURED: AMS l/c/f:
W.A. NEUMANN CONSTRUCTION, INC.
12630 CURLEY ST. STE 105
SAN ANTONIO, FL 33576
(352) 588-0910 Fax: (352) 588-0911

INSURER A: Companion Property and Casualty Insurance Comp
INSURER B:
INSURER C:
INSURER D:
INSURER E:

COVERAGES

THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. AGGREGATE LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIMITS	
	GENERAL LIABILITY				EACH OCCURRENCE	$
	☐ COMMERCIAL GENERAL LIABILITY				FIRE DAMAGE (Any One Fire)	$
	☐ CLAIMS MADE ☐ OCCUR				MED EXP (Any one person)	$
					PERSONAL & ADV INJURY	$
					GENERAL AGGREGATE	$
	GEN'L AGGREGATE LIMIT APPLIES PER: ☐ POLICY ☐ PRO-JECT ☐ LOC				PRODUCTS - COMP/OP AGG	$
	AUTOMOBILE LIABILITY				COMBINED SINGLE LIMIT (Ea accident)	$
	☐ ANY AUTO					
	☐ ALL OWNED AUTOS				BODILY INJURY (Per person)	$
	☐ SCHEDULED AUTOS					
	☐ HIRED AUTOS				BODILY INURY (Per accident)	$
	☐ NON-OWNED AUTOS					
					PROPERTY DAMAGE (Per accident)	$
	GARAGE LIABILITY				AUTO ONLY - EA ACCIDENT	$
	☐ ANY AUTO				OTHER THAN AUTO ONLY: EA ACC	$
					AGG	$
	EXCESS LIABILITY				EACH OCCURRENCE	$
	☐ OCCUR ☐ CLAIMS MADE				AGGREGATE	$
						$
	☐ DEDUCTIBLE					$
	☐ RETENTION $					$
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY	WC77779990601	04/01/2008	04/01/2009	X WC STATU-TORY LIMITS ☐ OTH-ER	
					E.L. EACH ACCIDENT	$ 1000000
					E.L. DISEASE - EA EMPLOYEE	$ 1000000
					E.L. DISEASE - POLICY LIMIT	$ 1000000
	OTHER					
	☐				LIMITS	$
					LIMITS	$

DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/EXCLUSIONS ADDED BY ENDORSEMENT/SPECIAL PROVISIONS

1. This certificate remains in effect, provided the client's account is in good standing with AMS. Coverage is not provided for any employee for which the client is not reporting wages to AMS. Applies to 100% of the employees of AMS leased to W.A. NEUMANN CONSTRUCTION, INC., effective 04/01/2008.
PLEASE SEE ATTACHED EMPLOYEE ROSTER.

CERTIFICATE HOLDER | ADDITIONAL INSURED; INSURER LETTER

LAKE COUNTY...
PO DRAWER 1529
LAKE CITY, FL 32056

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING INSURER WILL ENDEAVOR TO MAIL 30 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO DO SO SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE INSURER, ITS AGENTS OR REPRESENTATIVES.

AUTHORIZED REPRESENTATIVE

AC# 3870432

STATE OF FLORIDA

DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION
CONSTRUCTION INDUSTRY LICENSING BOARD

SEQ# L08072300765

DATE	BATCH NUMBER	LICENSE NBR
07/23/2008	080032675	CBC058155

The BUILDING CONTRACTOR
Named below IS CERTIFIED
Under the provisions of Chapter 489 FS.
Expiration date: AUG 31, 2010

NEUMANN, JASON WARREN
W A NEUMANN CONSTRUCTION INC
14007 12TH ST
DADE CITY FL 33525

CHARLIE CRIST
GOVERNOR

CHUCK DRAGO
INTERIM SECRETARY

DISPLAY AS REQUIRED BY LAW

Columbia County Property Appraiser

DB Last Updated: 10/21/2008

2008 Certified Values

Tax Record | Property Card | Interactive GIS Map | Print

Parcel: 28-3S-16-02372-445 HX

Search Result: 1 of 1

Owner & Property Info

Owner's Name	KILLIN JOHN P & TINA R		
Site Address	KELLLY LAKE		
Mailing Address	172 NW KELLY LAKE CT LAKE CITY, FL 32055		
Use Desc. (code)	SINGLE FAM (000100)		
Neighborhood	28316.05	**Tax District**	2
UD Codes	MKTA06	**Market Area**	06
Total Land Area	0.500 ACRES		
Description	LOT 145 EMERALD LAKES PHASE 4. ORB 814-1147, 901-743, 905-929, 917-177, 925-1667, WD 1077-2506.		

GIS Aerial

Property & Assessment Values

Mkt Land Value	cnt: (1)	$32,000.00
Ag Land Value	cnt: (0)	$0.00
Building Value	cnt: (1)	$138,919.00
XFOB Value	cnt: (2)	$4,425.00
Total Appraised Value		$175,344.00

Just Value		$175,344.00
Class Value		$0.00
Assessed Value		$175,344.00
Exempt Value	(code: HX)	$50,000.00
Total Taxable Value		$125,344.00

Sales History

Sale Date	Book/Page	Inst. Type	Sale Vlmp	Sale Qual	Sale RCode	Sale Price
3/17/2006	1077/2506	WD	I	Q		$195,500.00
4/20/2001	925/1667	WD	I	Q		$140,000.00
12/21/2000	917/177	WD	I	U	06	$115,000.00

Building Characteristics

Bldg Item	Bldg Desc	Year Blt	Ext. Walls	Heated S.F.	Actual S.F.	Bldg Value
1	SINGLE FAM (000100)	2000	Common BRK (19)	1800	2674	$138,919.00
	Note: All S.F. calculations are based on exterior building dimensions.					

Extra Features & Out Buildings

Code	Desc	Year Blt	Value	Units	Dims	Condition (% Good)
0166	CONC,PAVMT	2000	$2,475.00	1650.000	0 x 0 x 0	(.00)
0120	CLFENCE 4	2007	$1,950.00	260.000	0 x 0 x 0	(.00)

Land Breakdown

Lnd Code	Desc	Units	Adjustments	Eff Rate	Lnd Value
000100	SFR (MKT)	1.000 LT - (.500AC)	1.00/1.00/1.00/1.00	$32,000.00	$32,000.00

GEOHAZARDS, INC.

Professional Geological, Geophysical and Geotechnical Engineering Services

P.O. Box 14566
Gainesville, Florida 32604

Anthony F. Randazzo, Ph. D.
Geologist
Florida PG# 0003
Georgia PG#1136

David Bloomquist, Ph. D.
Geotechnical Engineer
Florida PE# 37235

Attila A. Bodo, P.E.
Structural Engineer
Florida PE# 15834

Douglas L. Smith, Ph.D.
Geophysicist
Florida PG# 0018
Georgia PG# 1140

August 25, 2008

Geohazards, Inc., Investigation No. 2008385

CLAIM INVESTIGATION REPORT

GEOTECHNICAL INVESTIGATION OF THE GEOLOGICAL SUBSURFACE AT THE JOHN AND TINA KILLIN RESIDENCE, 172 NORTHWEST KELLEY LAKE COURT, LAKE CITY, FLORIDA

INTRODUCTION

Purpose

Geohazards, Inc. was tasked by Florida Farm Bureau Insurance Companies (Claim No. 441215) to conduct a geotechnical investigation at the above referenced locality. The purpose of the investigation was to determine the probable cause of distress at the subject property.

This investigation was conducted to provide a geophysical characterization of the geological subsurface, with verification by drilling. In particular, efforts were designed to determine the presence of subsurface cavities and subsurface zones of disruption that might contribute to subsidence. Any of these conditions could be responsible for existing or potential subsidence at the site. Efforts were also incorporated into this investigation to determine if distress at the site of investigation is attributable to causes other than geotechnical, and to identify such causes.

(352) 371-7243
www.sinkholes.com

(800) 770-9990

Fax: (352) 371-4410
admin@sinkholes.com

Scope

This investigation was conducted in accordance with the provisions of Florida Statutes Chapters 627.706 and 627.707, as amended by the Florida Legislature in 2006. In particular, definitions of scientific features and conditions as expressed in Chapter 627.706 are adopted in this report, and all testing conducted is in compliance with Chapter 627.7072. Furthermore, the scope and scientific techniques utilized are generally consistent with the protocols specified by the Florida Geological Survey, Special Publication No. 57, 2005 (Geological and Geotechnical Investigation Procedures For Evaluation of the Causes of Subsidence Damage in Florida). This report complies with the provisions of Chapter 627.7073.

The investigation conducted and reported herein included the following:

- A review of available geologic maps and other published data to establish the general probable lithology and regional conditions for the site of investigation.

- A reconnaissance of the site of investigation to recognize and identify surface conditions pertinent to the purpose of the investigation.

- An interview with the property owner to determine the nature and timing of any damage and to determine the history of the site, including photographic documentation.

- An inspection and assessment of the affected structures and a structural engineering evaluation of possible sources of distress.

- Four Hand Auger Borings to determine the nature of the near-surface materials, and to identify soil conditions at the site.

- Laboratory Analyses of selected samples to characterize specific properties of significance to the site.

- Static Cone Penetration tests to investigate the bearing capacity of the near-surface materials.

- Excavation of two test pits to determine the nature and depth of the foundation.

- A Ground Penetrating Radar (GPR) investigation of the site to determine evidence for anomalous subsurface features or conditions.

- An Electrical Resistivity (ER) investigation of the site to assist in the recognition of site-specific geological conditions at the subject property and to determine evidence for the presence of anomalous subsurface features or conditions.

- Floor elevation surveys to identify variations in elevation within the main residence and appropriate secondary buildings.

- Three Standard Penetration Test (SPT) borings to explore deeper subsurface conditions.

- A final report summarizing results and conveying professional opinions, including a possible mitigation strategy with technical specifications for subsurface stabilization.

Site Information

The initial reconnaissance and geophysical field investigation were conducted on June 18, 2008. The standard penetration test borings were conducted on June 26 and July 2, 2008.

The site of investigation is located at 172 NW Kelley Lake Court, Lake City, Florida. Based on information available from the Columbia County property appraiser's office, the legal description and property owners are as follows:

LOT 145 EMERALD LAKES PHASE 4. ORB 814-1147, 901-743, 905-929, 917-177, 925-1667, WD 1077-2506.
JOHN P. AND TINA R. KILLIN

This site includes a single-story, wood frame structure with brick and vinyl siding. For purposes of orientation the front door is assumed to be on the south side of the structure. A screened patio area is attached to north side of the structure. Buried utilities are located south and west of the structure. A buried septic system is located southeast of the structure. A well is located southwest of

the structure. A gutter system was present at the Killin residence with downspouts discharging rainwater approximately 6 inches to 3 feet away from the structure.

The homeowner, John Killin, was present for the interview portion of our site visit. According to available information, the structure was built in 2000 and Mr. and Mrs. Killin purchased the home in 2006. Mr. Killin reported that he first noticed minor distress in late 2006 as he was moving into the house. He stated that he removed the carpet in the living room in May 2008 to reveal multiple cracks in the floor slab. Mr. Killin pointed out several cracked and/or loose floor tiles and misaligned doors throughout the house.

An interior inspection of the structure revealed cracks in the floor slab (up to 1/2 inch) with up to 1/4 inch vertical displacement in the living room and closet containing the air conditioning handler. Loose floor tiles were present in the dining room. Hairline tile cracks were noted in the laundry room, kitchen, master bathroom, and east bathroom. Wall and ceiling cracks (hairline to 1/16 inch) were observed in the kitchen, laundry room, master bedroom, living room, northeast bedroom, and southeast bedroom. An inspection of the garage revealed meandering hairline cracks in the floor slab and a horizontal crack (1/16 inch) below the laundry room entrance.

An exterior inspection of the structure revealed stair-step cracks (hairline to 1/8 inch) in the east wall, cracks in the screen porch slab (1/16 to 1/8 inch), cracks in the driveway with 1/8 inch vertical displacement. The pavers located at the northeast corner of the structure appeared to be uneven. Mr. Killin reported that the pavers had shifted from their original, level position. A shallow surface depression was observed at the northeast corner of the driveway and measured approximately 8 by 13 feet at the surface. An additional surface depression was located approximately 40 feet north of the rear patio and measured approximately 4 by 12 feet at the surface. Both depressions were approximately 6 inches deep.

Copies of color photographs of the structure are attached.

REGIONAL CONDITIONS

Geology

Based on map consultations and personal inspection, the surficial geologic material at the study site is the Hawthorn Group of geological formations overlain by a cover of very young unconsolidated sands and sandy clays. These consist of fine to medium grained, unconsolidated quartz sand, silt, and clay in varying proportions and thickness. Shrink/swell clays of significant size, continuity and nearness to the surface are a particularly troublesome characteristic of the Hawthorn where they occur in significant thickness and lateral continuity. Concrete slabs and foundations can be severely damaged where such a geologic condition occurs.

The Suwannee and Ocala Limestones underlie the Hawthorn. These limestone units have experienced significant dissolution and the creation of an intricate cavernous system. Problems in the development of sinkholes are related to the size and nearness to the surface of the limestone and these underground cavities. The upper surface of the limestone is highly irregular.

Topography

The Killin property is located in Section 28 of Township 3 South and Range 16 East. Elevation information available on the U.S. Geological Survey Lake City West 7.5 minute Quadrangle 1:24,000 topographic map is shown in the Appendix. The immediate neighborhood of the Killin residence ranges from approximately 110 to 150 feet NGVD. The Killin residence is situated at approximately 135 feet NGVD.

Hydrology

Based on the U.S. Geological Survey's Map entitled Potentiometric Surface of the Upper Floridan Aquifer in the Ichetucknee River and Vicinity, Northern Florida, September 2003, the expected Floridan Aquifer potentiometric surface elevation in the area of the subject property is approximately 45 to 55 feet above mean sea level. The surficial water table was observed at 3 feet depth in two of the three standard penetration test borings.

Soils

The U.S. Department of Agriculture Soil Conservation Service (SCS) Soil Survey of ColumbiaCounty describes the soil underlying the Killin property as Alpin fine sand, 0 to 5 percent. This excessively drained soil forms on ridges on marine terraces, knolls on marine terraces, and flats on marine terraces. The typical profile is fine sand within the upper 80 inches. The parent material is eolian deposits or sandy marine deposits.

The water table is at a depth of more than 80 inches. The available water capacity is low (about 3.9 inches).

Alpin and similar soils make up 80 percent of the soil, and minor components make up the remaining 20 percent. Minor components include Albany, Chipley, Blanton and Lakeland soils.

FIELD TEST METHODS: GEOLOGICAL AND GEOTECHNICAL

Hand Auger Borings

Four hand auger borings (HA-1 through HA-4) were conducted at sites shown on the location map. The borings were performed in general accordance with ASTM standard D1452-80 (2000) entitled "Standard Practice for Soil Investigation and Sampling by Auger Borings." The borings were conducted by manually rotating the auger into the ground to termination depths of approximately 2 to 5 feet providing a continuous profile of the near-surface materials. Increments of approximately 0.5 feet are extracted for description and, if necessary, retention for later analyses. Results of the hand auger borings are shown in the Hand Auger Investigation profiles.

Laboratory Analyses

Representative samples of material collected at the site of investigation were stored in sealed bags and analyzed. The laboratory procedures followed include a sieve analysis (ASTM Standard D1140) to determine the percentage of fine-grained material (-No. 200 mesh sieve screen), determination of the natural

moisture percentage of the sample (ASTM Standard D2216), and Atterberg limits (ASTM standard D4318) to determine plasticity indexes. Results are attached.

Static Cone Penetration Tests

Static hand cone penetration tests (CPT) were completed at thirteen locations around the perimeter of the dwelling as shown on the Site Plan Map. The measurements were acquired with a Durham Geo Model S212 double rod portable static cone penetrometer. Data were collected by pushing a steel rod with a cone-shaped tip into the ground and measuring the deflection of a proving ring as the probe was advanced. Results are shown in the attached Cone Penetrometer Results Graphs.

Standard Penetration Tests

The standard penetration test (SPT) is a widely accepted method of testing subsurface materials. It is conducted in accordance with ASTM standard D1586-99 titled "Standard Test Method for Penetration Test and Split-Barrel Sampling of Soils."

With SPT borings, a rotary drilling rig is used to advance the borehole to the desired test depth. A 2 feet long, 2 inch diameter split-barrel sampler attached to the end of a string of drilling rods is then driven 18 inches into the ground by successive blows of a 140 pound hammer freely dropping 30 inches. The sum of blows required for penetration of the second and third 6 inch increments of penetration constitutes the "N" value.

Following an individual test, the sampler is extracted to allow visual classification and retention, if desired, of the core sample. Tests are usually performed at 5 feet depth intervals. N-values are generally correlated with material properties of stability to allow a conservative estimate of the behavior of subsurface materials.

Three SPT borings were conducted in this investigation at the sites shown on the location map. Race Drilling, Inc. of DeBary, Florida, and All County Drilling, LLC. of Mt. Dora, Florida, conducted the borings under the supervision of a geologist from Geohazards, Inc. Results are shown in the attached logs.

FIELD TEST METHODS: STRUCTURAL ANALYSES

Structural Assessment

A visual assessment of the structural condition of the Killin residence was completed at the time of the initial investigation and a subsequent evaluation of the structural damage was completed by a structural engineer. The evaluation was designed to address possible sources of observed distress.

Test Pit Excavation

Two test pits were excavated to determine the approximate design of the footing or foundation of the house and the depth of emplacement. The first test pit (TP-1) was excavated along the north exterior wall of the structure. The second test pit (TP-2) was excavated along the south exterior wall of the garage (see marked locations on the Site Plan map).

Floor Elevation Survey

Differential elevation of a structure may be defined as the difference in elevation between any two points on the interior floor of the structure. The American Concrete Institute (ACI) lists a tolerance of 0.5 inches over a 10 feet horizontal distance for conventional slabs. Maximum overall tolerances for tops of slabs are placed at plus or minus 0.75 inches (1.5 inches total differential). The floor elevation survey was conducted with an R & A Products "Pro-Level" manometer.

FIELD TEST METHODS: GEOPHYSICAL SURVEYS

Ground Penetrating Radar

Ground penetrating radar (GPR) is a geophysical procedure employed to detect and identify subsurface features and conditions characterized by a contrast in dielectric properties. This technique involves the transmission, from a receiver-

transmitter antenna system that is pulled along the ground surface, of microwave radiation into the ground. Subsurface contrasts in the dielectric properties of varying materials present a surface from which reflections are generated. Accordingly, contacts between rock types, physical features such as cavities or disrupted sedimentary layers, and/or man-made objects such as metallic barrels or pipes cause reflections that are recorded at the surface.

The intensity of the reflected signal is affected by the contrast in dielectric properties of materials, the electromagnetic conductivity of the medium through which the waves traverse, and the frequency of the signal. Digital signals are recorded and stored in a recorder for on-site visual color display or subsequent transferal to a computer for careful analysis and printing. The radar survey was conducted in general accordance with ASTM Standard D6432-99.

A Geophysical Survey Systems, Inc., (GSSI) SIR System-3000 radar was used. This is a portable, digital radar signal recorder. A 400-megahertz transceiver antenna was used with a two-way travel time range of 100 to 125 nanoseconds. Penetration depths for GPR signals are a function of lithology type (greater signal attenuation in clayey materials or water saturated conditions) and frequency (greater signal attenuation in higher frequency antenna systems). Actual depths of penetration vary from site to site. Based on the near-surface materials, the depth capability at this site was approximately 6 to 10 feet, but actual penetration is variable.

A total of 41 GPR traverses were conducted at the Killin residence. As shown on the GPR location map, the configuration and distribution of the traverses were designed to provide representative coverage of the site of investigation.

Electrical Resistivity

Electrical resistivity (ER) is a geophysical procedure to investigate the presence of geological conditions or features characterized by contrasts in electrical resistivity. The measurements were conducted using the Wenner electrode configuration, and were performed in general accordance with the appropriate portions of ASTM standards G57-95a entitled "Standard Test Method for Field Measurement of Soil Resistivity Using the Wenner Four-Electrode Method," and standard D6431-99 "Standard Guide for Using Direct Current Resistivity Method for Subsurface Investigations."

Electrical resistivity measurements involve the passing of an electric current underground and measuring its resistance to flow. Different earth materials (e.g. clay, sand, limestone) and subsurface cavities will resist the flow of electrical current differently. Substantially greater contrasts in the degree of resistance (anomalies) are used to identify and locate boundaries among different materials as well as the presence of cavities.

The types of ER measurements used in this investigation were Soundings and Lee-directional. Sounding measurements reveal two-dimensional detail below the surface at progressively greater depths. Lee-directional measurements determine the direction of higher or lower resistivity along a traverse line. In the field, electrodes are placed in the ground at equal distances from one another. After a measurement, this distance is increased in an orderly fashion to sequentially allow a greater depth of penetration.

Measurements of ER were made with an L and R Instruments MiniRes Earth Resistivity Meter. Four current/potential electrodes and one Lee electrode are employed. Depending on the surface space available for deployment of electrodes, a maximum depth capability of 100 feet can be achieved.

ER traverse lines were oriented to provide representative coverage of the site of investigation (see ER location map). Six traverses were measured at the Killin residence, configured as shown on the location map. Maximum depth of penetration ranged from 30 to 60 feet.

RESULTS

Hand Auger Borings

1. The locations of the hand auger borings are shown on the Site Plan map. The results of the auger borings are shown on the Hand Auger Investigation profiles in the appendix. Unless noted otherwise, each of the hand auger borings were terminated at approximately 5 feet depth.

2. Hand auger boring HA-1 penetrated brown fine sand within the upper 6 inches overlying sandy clay to 1.5 feet depth and sand to 2 feet depth. Green and blue

sandy fat clay was encountered from 2 to 5 feet depth. Sample HA-1-1 was taken at approximately 2 feet depth in boring HA-1.

3. Hand auger boring HA-2 penetrated brown fine sand within the upper 2 feet depth. Sample HA-2-1 was taken at approximately 2 feet depth. Hand auger boring HA-2 was terminated at approximately 2 feet depth due to a refusal on roots.

4. Hand auger boring HA-3 penetrated light brown fine sand within the upper 4.5 feet depth overlying light gray clayey sand. Sample HA-3-1 was taken at approximately 5 feet depth in boring HA-3.

5. Hand auger boring HA-4 penetrated light brown fine sand within the upper 2.5 feet depth overlying light brown clayey sand. Grayish green sandy clay was encountered from 4 to 4.5 feet depth overlying green fat clay with sand. Sample HA-4-1 was taken at approximately 4.5 feet depth.

Laboratory Analyses

1. The results of the laboratory analyses are shown in the Summary of Laboratory Results. Samples HA-1-1 and HA-4-1 were selected for analyses.

2. Sample HA-1-1, taken from approximately 2 feet depth in HA-1, is classified as sandy fat clay (CH) with 66.7% of the material passing the No. 200 mesh sieve, a natural moisture content of 42.9%, and a plasticity index of 44.

3. Sample HA-4-1, taken from approximately 4.5 feet depth in HA-4, is classified as fat clay with sand (CH) with 75.7% of the material passing the No. 200 mesh sieve, a natural moisture content of 44.7%, and a plasticity index of 74.

4. Materials with a plasticity index above 35 are considered to be highly plastic and a significant potential for unstable behavior. Samples HA-1-1 and HA-4-1 fall into this range.

Static Cone Penetration Tests

1. Graphical depictions of the hand cone penetrometer results are attached. The results are interpreted as indicative of very loose to loose materials (very low to low bearing strength) at the thirteen penetrometer stations.

Test Pit Excavations

1. Test Pit one (TP-1) was excavated along the north exterior wall of the structure (photograph #13). TP-1 revealed a foundation embedment of at least 16 inches below grade.

2. Test Pit two (TP-2) was excavated along the south exterior wall of the garage (photograph #14). TP-2 revealed a foundation embedment of 16 inches below grade.

3. Current standard construction practices for this area call for a minimum depth of embedment of 12 inches.

Ground Penetrating Radar

1. Ground penetrating radar (GPR) signals at the Killin residence were interpreted as generally horizontally layered reflectors throughout the depth of penetration. Attenuation of the radar signal was experience throughout the Killin property. The attenuation is likely due to the presence of the near-surface water saturated and clayey materials.

2. No GPR signals recorded at the site were interpreted as indicative of dipping reflectors, disturbed sediments, cavities or other features consistent with possible sinkhole activity.

Electrical Resistivity

1. In general, near-surface resistivity values and sounding patterns varied slightly among the six traverses. Sounding profiles are included in the appendix.

2. The configurations of the sounding values and patterns are interpreted as indicative of surficial sand and clayey sand grading into more clayey materials at approximately 10 to 25 feet depth and back into more sandy materials at approximately 20 to 35 feet depth.

3. Electrical evidence of the underlying limestone surface was detected at approximately 60 feet depth beneath ER traverse #6.

4. Lee-directional measurements (not plotted) yielded disparities on four of the six traverses. The locations of the Lee-directional disparities are shown in yellow on the ER location map. The directional disparities were not corroborated with sounding anomalies, and may be attributed to lateral changes in soil composition and moisture, or to the presence of buried utilities.

Floor Elevation Survey

The floor elevation survey is attached. The lowest elevations of the living area occurred within the western and southern portions of the structure. These areas have a total elevation difference of 1.2 inches over an approximate 13 feet horizontal distance. This difference in elevation exceeds 0.5 inches over 10 feet horizontal distance and, accordingly, exceeds tolerances established by the American Concrete Institute.

A separate floor elevation survey was completed for the garage. The lowest elevations in the garage occurred within the northeast corner. The garage exhibited a total elevation difference of approximately 0.7 inches.

Structural Evaluation-Site Observations

For purposes of orientation in this section the front door is assumed to be on the south side.

The current homeowner purchased the house, built in 2000, in 2006. Exterior walls of the single-story structure are of wood frame construction with brick veneer on three sides and vinyl siding in the back, supported on a stemwall foundation. According to the homeowner, distress, in the form of interior cracks, was first noticed at the time of occupancy.

Interior Observations

Cracks of up to 3/8" in width with vertical displacements of up to 1/8" are visible in the floor slab of the living room and the adjacent air handler closet. Hairline cracks are visible in the floor tiles in the kitchen, the laundry room, and the bathrooms. Hairline cracks are visible in the walls and ceilings of several rooms. Cracks of up to 1/16" in width are visible in the garage floor slab.

Exterior Observations

A vertical crack of up to 3/16" in width is visible below the south window in the east wall. A crack of up to 1/16" in with is visible near the south top corner of the north window in the east wall. A hairline crack is visible near the north top corner of the north window in the east wall. A crack of up to 1/8" in width is visible near the south lower corner of the north window in the east wall. A crack of up to 1/16" in width is visible in mortar joints near the south top corner of the overhead door. A hairline crack is visible in the brick veneer near the east lower corner of the west window in the south wall. A crack of up to 1/16" in width is visible in mortar joints near the west end of the front porch header. Cracks of up to 1/16" in width are visible in the brick veneer near the northwest corner of the front porch. Cracks of up to 1/16" in width are visible in the front porch slab.

Structural Evaluation-Findings and Recommendations

- No evidence of significant loss of structural integrity is noted at this time.
- Evidence of minor structural distress is noted in the form of widespread cracking and locally excessive variations in floor elevation.
- The observed distress is consistent with distress caused by differential movements. Such movements may be attributed to the potential sinkhole activity and the presence of near-surface expansive clays identified in our investigation.
- Cosmetic repairs should be started no sooner than sixty days after completion of the recommended foundation remediation program.

Standard Penetration Tests

1. Boring B-1 was located 50 feet north and 22 feet west of the northeast corner of the structure (see Site Plan map), near the northern surface depression. This boring penetrated 18.5 feet of sand and clayey sand overlying sandy clay. Samples were not collected from 4 to 8 feet depth due to a plastic obstruction in the spoon. Silty sandy was encountered from 28.5 to 59.5 feet depth overlying limestone. A cavity was encountered from 83.5 to 85.5 feet depth within the limestone. Boring B-1 was terminated in limestone at approximately 100 feet depth.

2. N-values (blows per foot) for boring B-1 ranged from N = 7 to N = 18 within the upper 10 feet of drilling. Weight-of-rod conditions were experienced from 83.5 to 85.5 feet depth and from 88.5 to 89 feet depth. Refusal conditions (N > 50/6 in.) were recorded at the 55, 75 and 100 feet depth sample intervals. Complete loss of drilling fluid circulation, without recovery, was experienced at 68 feet depth.

3. Boring B-2 was located 6 feet south and 16 feet east of the northeast corner of the structure (see Site Plan map), near an area of distress. This boring penetrated 23.5 feet of sand, silty sand, sandy clay, and clay. Silty sand was penetrated from 23.5 to 63.5 feet depth overlying limestone. Boring B-2 was terminated in limestone at approximately 99.5 feet depth.

4. N-values for boring B-2 ranged from N = 9 to N = 24 within the upper 10 feet of drilling. No weight-of-rod or weight-of-hammer conditions were experienced in boring B-2. Refusal conditions were recorded in limestone at the 65, 95, and 100 feet depth sample intervals. Complete loss of drilling fluid circulation, without recovery, was experienced at 72 feet depth.

5. Boring B-3 was located 11 feet west and 20 feet south of the northwest corner of the structure (see Site Plan map), near the southern depression and an area of distress. This boring penetrated 78.5 feet of sandy and clayey materials overlying limestone. Boring B-3 was terminated in limestone at 100 feet depth.

6. N-values for boring B-3 ranged from N = 8 to N = 31 within the upper 10 feet of drilling. Numerous weight-of-rod conditions (1 to 2 feet) were recorded between 53.5 and 84.5 feet depth. Refusal conditions were not recorded in boring B-3. Complete loss of drilling fluid circulation, without recovery, was experienced at 50 feet depth.

CONCLUSIONS

The Killin residence is located at 172 NW Kelley Lake Court, Lake City, Florida. This site includes a single story, wood frame structure, built in 2000. Mr. Killin reportedly first noticed minor distress in 2006. He stated that he discovered cracks in the concrete slab in the living room when he removed the carpeting in May, 2008. Minor widespread distress was observed in the interior and exterior of the Killin residence. Shallow surface depressions were present to the west and north of the residence. Standard penetration test borings B-1 and B-3 were located to further investigate the nature of the depressions.

Hand auger borings penetrated sands and clayey materials within the upper 5 feet depth in the four borings. Laboratory analyses also identified highly plastic clayey materials in two of the hand auger borings (HA-1 and HA-4). These materials are considered to have a significant potential for unstable behavior. Static hand cone penetrometer results indicate that very loose to loose soils are present within the upper four feet around the perimeter of the structure.

Electrical resistivity results are indicative of sands and clayey materials overlying limestone at approximately 60 feet depth. No GPR signals recorded at the site were interpreted as indicative of dipping reflectors, disturbed sediments, cavities or other features consistent with possible sinkhole activity.

The floor elevation survey revealed a total interior elevation difference of 1.2 inches for the living area. The test pit excavations revealed the foundation embedment in accordance with current construction codes (at least 16 inches in TP-1 and 16 inches in TP-2). The structural evaluation yielded no evidence of significant loss of structural integrity.

Three SPT borings were conducted at the Killin residence. Limestone was initially encountered at depths ranging from 59.5 to 78.5 feet in the three borings. The variability in depth to limestone is indicative of a paleosink environment underlying the Killin property. Multiple weight-of-rod conditions, ranging from 1 to 2 feet of vertical extent, were recorded above the upper limestone surface in boring B-3. These loose conditions are interpreted as indicative of possible raveling. Raveling is the vertical or lateral migration of sediments into cavities in more distant or deeper limestone. It is a mechanism for sinkhole formation. Raveling is also evidence that the paleosink may be in a state of reactivation. Weight-of-rod conditions also defined a cavity in limestone in boring B-1 from

83.5 to 85.5 feet depth. Complete loss of drilling fluid circulation was experienced in all three SPT borings.

Based on the results of this investigation, Geohazards, Inc. is of the opinion that the distress at the Killin residence is due to natural aging of the structure, including material shrinkage and expansion, and to differential movements associated with the unstable behavior of near-surface highly plastic clayey materials and to the presence of tree roots in close proximity to the foundation. However, evidence of possible sinkhole activity (surface depressions, cavity in limestone, raveling, and loss of circulation) was detected at the Killin residence and sinkhole activity can not be eliminated as a contributing cause of distress.

CERTIFICATION

Compliance with Florida Statutes Section 627.707

In compliance with the above stated Florida Statute, this report was prepared under the direction and supervision of a Registered Professional Geologist, licensed in the State of Florida, whose field of expertise is geology and sinkhole evaluation, and with the participation of a Professional Engineer, licensed in the State of Florida. The geologist(s) and engineer(s) signature(s) and seal(s) with Florida Registration Number appear on the report.

It is our professional opinion, based on the information generated by this investigation, and by testing conducted in compliance with generally accepted scientific practices and with Chapter 627.7072, that the analyses conducted were of sufficient scope to determine that sinkhole activity can not be eliminated as a cause of damage within a reasonable professional probability.

LIMITATIONS

While due care has been exercised in the performance of these measurements and their interpretation, Geohazards, Inc. can make no representations, warranties, or guarantees with respect to latent or concealed conditions which may exist that may be beyond the limits of detection with the methodologies used. This report is prepared for the exclusive use of our clients and their assigns. Any use by other parties for any purposes is not authorized.

Marylea H. Kibilko, P.G.
Geologist
Florida License No. PG2506

MARYLEA H. KIBILKO
LICENSE
NO. 2506
STATE OF
FLORIDA
PROFESSIONAL GEOLOGIST

Gerald O. Black, P.G.
Geologist
Florida License No. PG2302

GERALD O. BLACK
LICENSE
No. 2302
STATE OF
FLORIDA
PROFESSIONAL GEOLOGIST

Attila A. Bodo, P.E.
Structural Engineer 10.16.08
Florida License No. PE15834

SELECTED REFERENCES

Lane, E., Karst in Florida, Florida Geological Survey, Spec. Pub. No. 29, 100 pp, 1986.

Randazzo, A.F., and Jones, D.S., editors, The Geology of Florida, Univ. Press of Florida, 327 pp, 1997.

Randazzo, A.F., and Smith, D.L., Subsidence-Induced Foundation Failures in Florida's Karst Terrain, Amer. Soc. Civil Engr., Geotech. Spec. Pub. No. 122, pp 82-94, 2003.

Rupert, F., and Spencer, S., Compilers, Florida's Sinkholes, Florida Geological Survey, Poster No. 11, 2004.

Schmidt, W., Compiler, Geological and Geotechnical Investigation Procedures For Evaluation of the Causes of Subsidence Damage in Florida, Florida Geological Survey, Spec. Pub. No. 57, 22 pp, 2005.

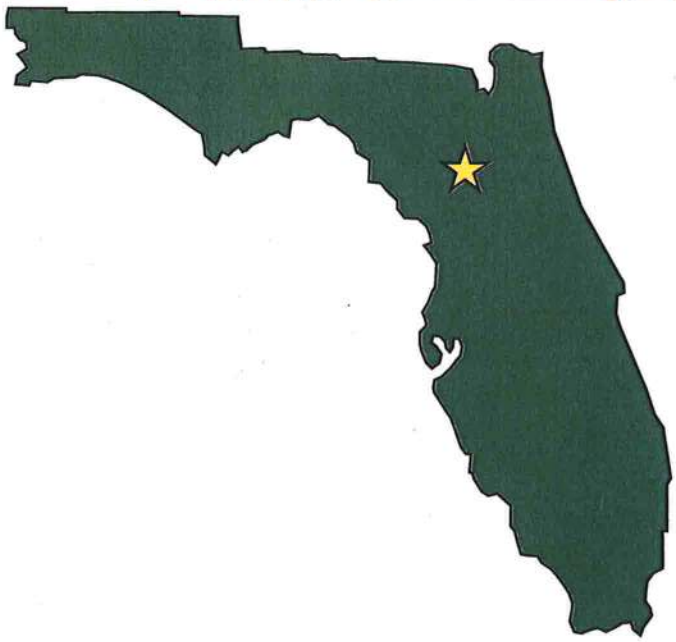
Scott, T.M., Campbell, K.M., Rupert, F.R., Arthur, J.D., Missimer, T.M., Lloyd, J.M., Yon, J.W., and Duncan, J.G., Geologic Map of the State of Florida, Florida Geological Survey, Map Series 146, 2001.

Sinclair, W.C., and Stewart, J.W., Sinkhole Type, Development and Distribution in Florida, Florida Bureau of Geology, Map Series No. 110, 1980.

Sridharan, A., and Prakash, K., Shrinkage limit of soil mixtures, ASTM Geotech. Test. J., v. 23, pp 3-8, 2000.

U.S. Army, Foundations in Expansive Soils, Washington, D.C., TM-5-818-7, Chapter 4, 1983.

Van Nostrand, R.G., and Cook, K.L., Interpretation of Resistivity Data, U.S. Geological Survey, Prof. Pap. 499, 310 pp, 1966.

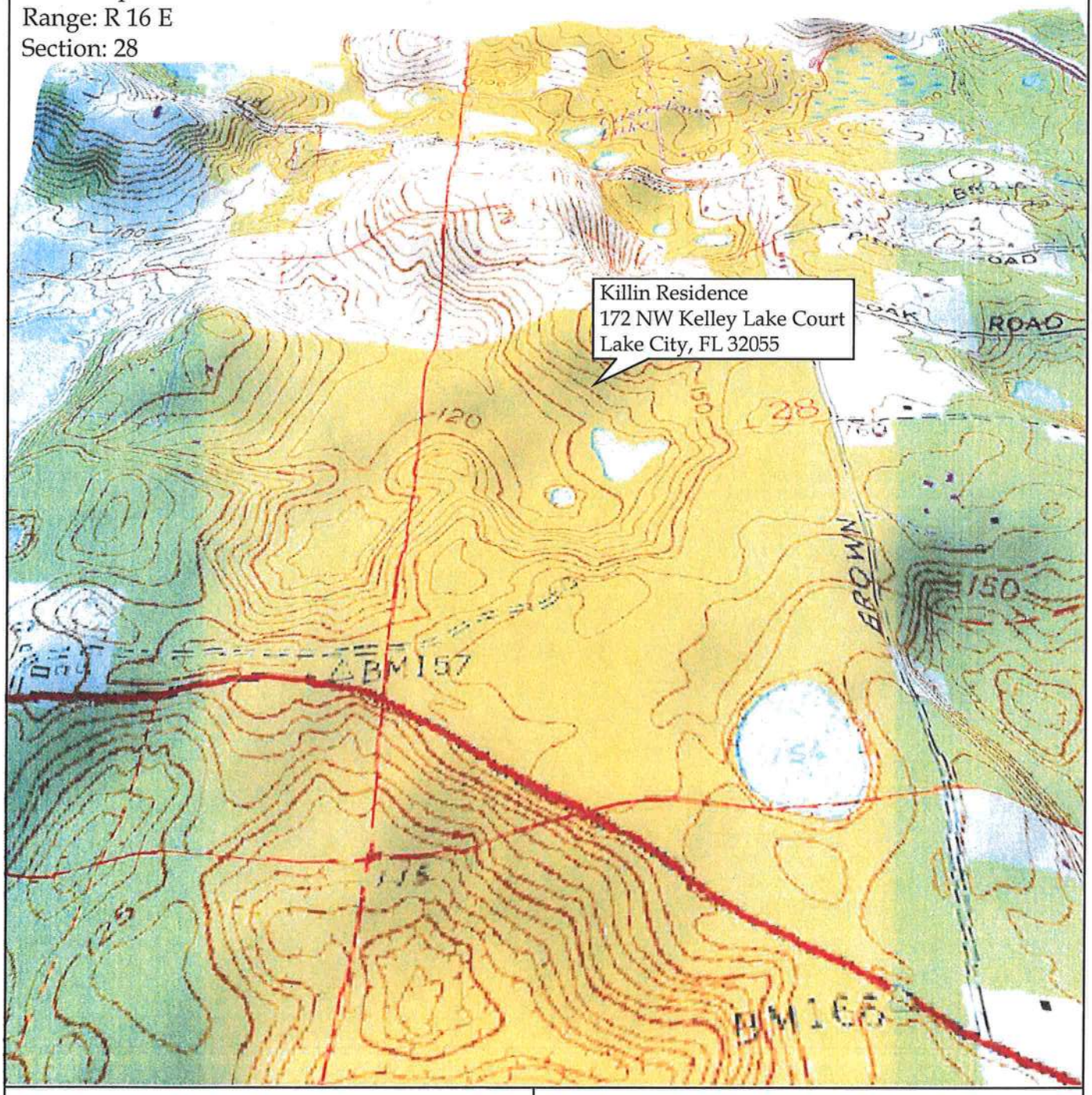


GEOHAZARDS, INC.
Sinkholes • Expansive Clays • Land Subsidence
P.O. Box 14566
Gainesville, FL 32604
(352) 371-7243 1-800-770-9990
Fax: (352) 371-4410

SITE LOCATION MAP

Killin Residence
172 NW Kelley Lake Court
Lake City, Florida

Killin Residence
Elevation: 135 ft.
Quadrangle: Lake City West
Township: T 3 S
Range: R 16 E
Section: 28



GEOHAZARDS, INC.
Sinkholes • Expansive Clays • Land Subsidence
P.O. Box 14566
Gainesville, FL 32604
(352) 371-7243 1-800-770-9990
Fax: (352) 371-4410

Three Dimensional Topographic Map

Killin Residence
172 NW Kelley Lake Court
Lake City, Florida

GEOHAZARDS, INC.
Sinkholes • Expansive Clays • Land Subsidence
P.O. Box 14566
Gainesville, FL 32604
(352) 371-7243 1-800-770-9990
Fax: (352) 371-4410

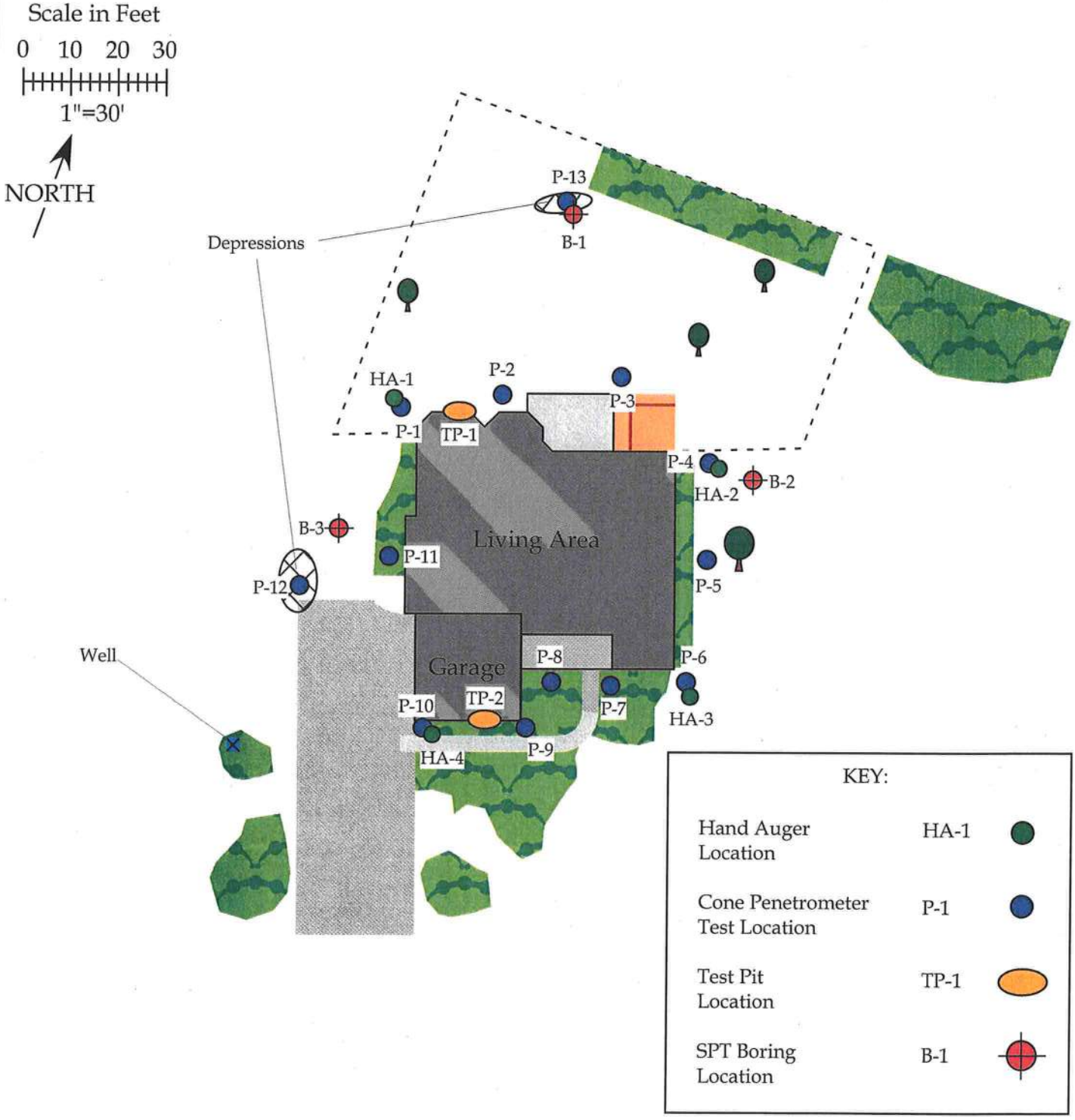
SITE PLAN

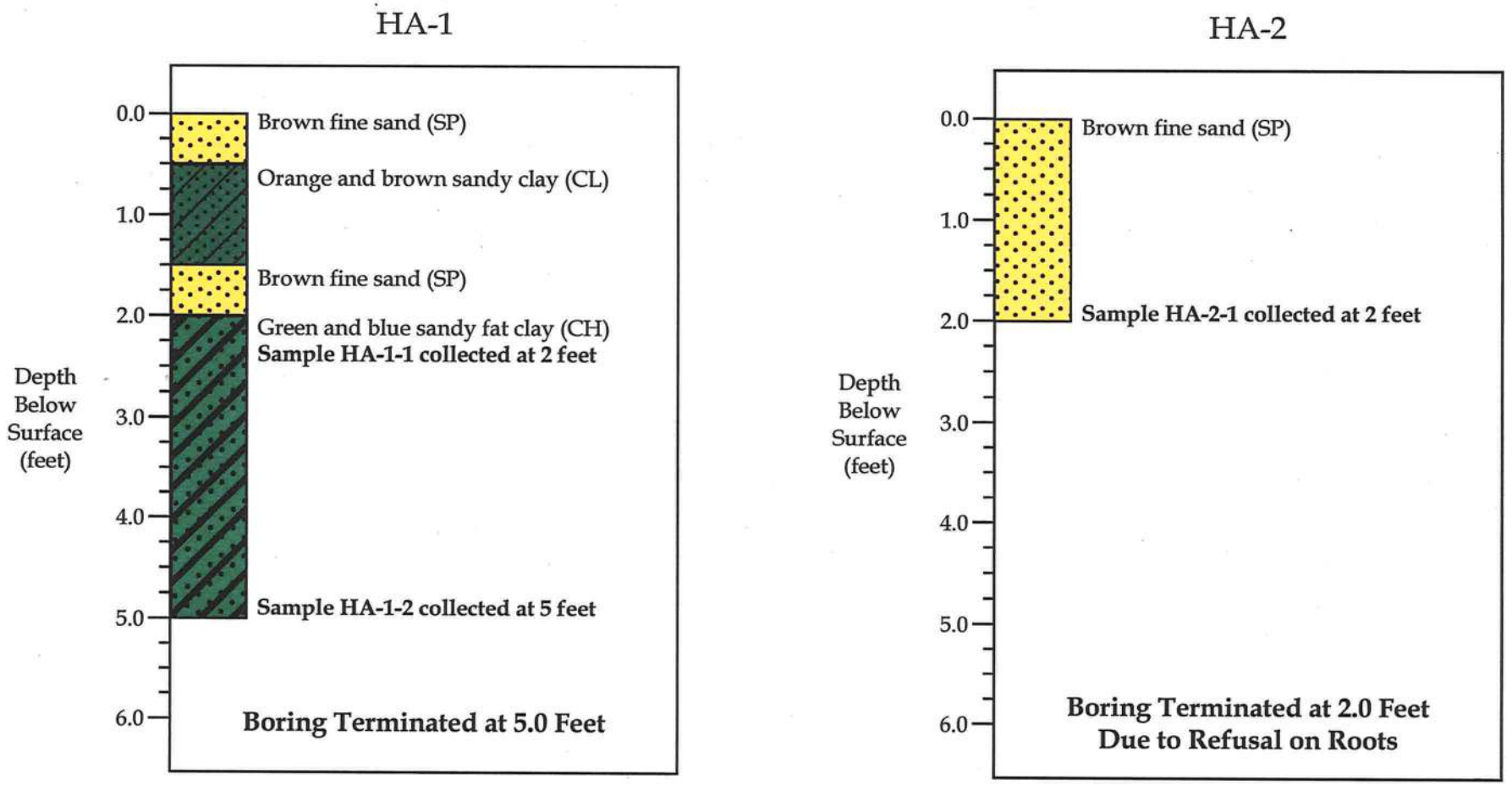
Killin Residence
172 NW Kelley Lake Court
Lake City, Florida

FOR: Florida Farm Bureau

DATE: 7-5-08

BY: W. Wrenn, Geologist
Investigation# 2008385





GEOHAZARDS, INC.
Sinkholes • Expansive Clays • Land Subsidence
P.O. Box 14566
Gainesville, FL 32604
(352) 371-7243 1-800-770-9990
Fax: (352) 371-4410

HAND AUGER INVESTIGATION

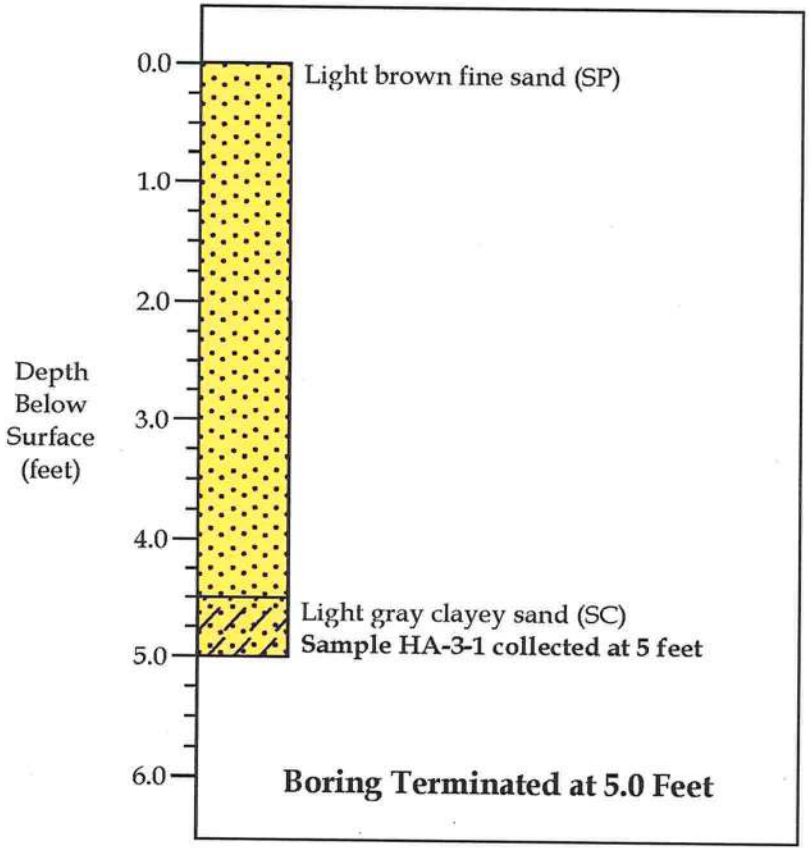
Killin Residence
172 NW Kelley Lake Court
Lake City, Florida

FOR: Florida Farm Bureau

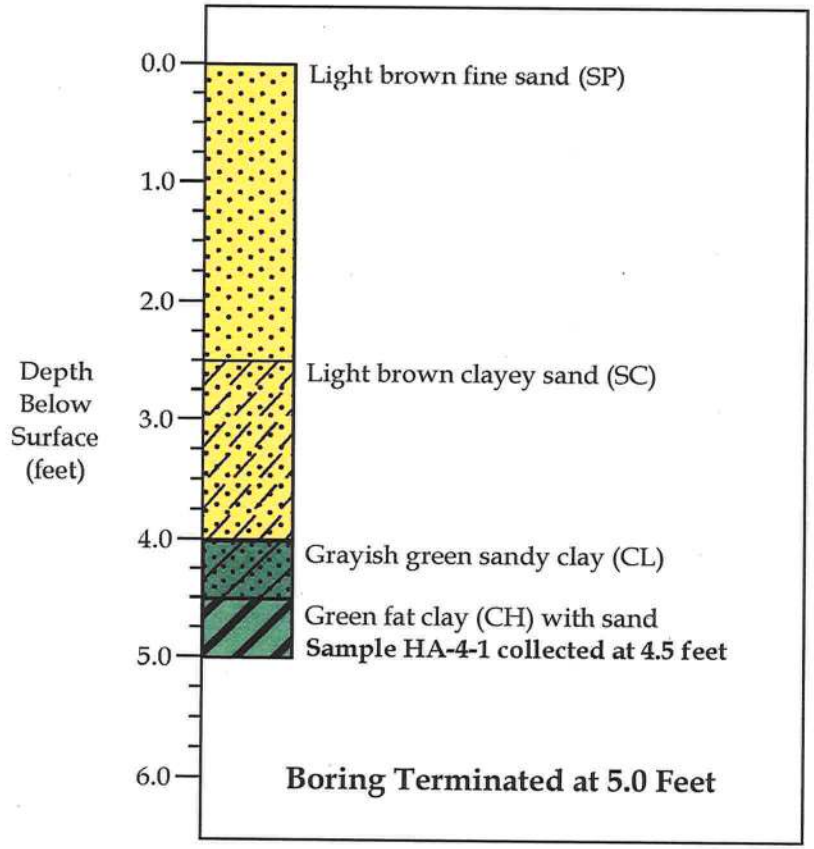
DATE: 6-18-08

BY: W. Wrenn, Geologist
Investigation# 2008385

HA-3



HA-4



GEOHAZARDS, INC.
Sinkholes • Expansive Clays • Land Subsidence
P.O. Box 14566
Gainesville, FL 32604
(352) 371-7243 1-800-770-9990
Fax: (352) 371-4410

HAND AUGER INVESTIGATION

Killin Residence
172 NW Kelley Lake Court
Lake City, Florida

FOR: Florida Farm Bureau

DATE: 6-18-08

BY: W. Wrenn, Geologist
Investigation# 2008385

GEOHAZARDS, INC.
Sinkholes • Expansive Clays • Land Subsidence
P.O. Box 14566
Gainesville, FL 32604
(352) 371-7243 1-800-770-9990
Fax: (352) 371-4410

SUMMARY OF LABORATORY RESULTS

KILLIN RESIDENCE

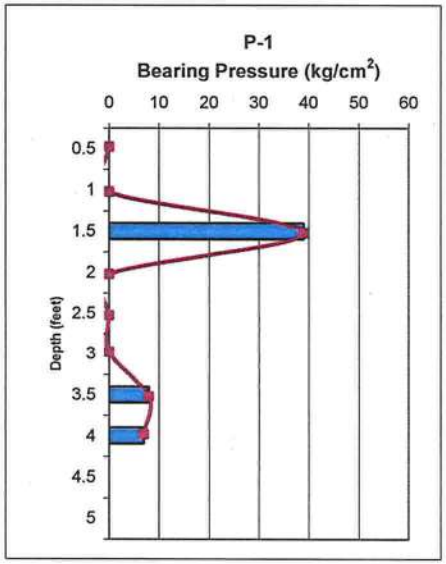
FOR: Florida Farm Bureau DATE: 7-6-08 Investigation #: 2008385

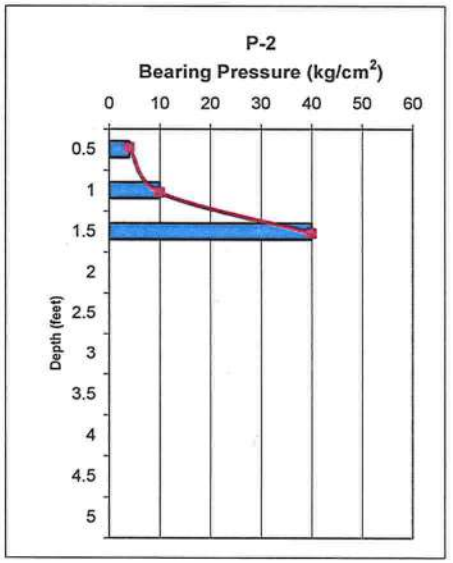
SAMPLE NUMBER	DEPTH (ft)	NATURAL MOISTURE CONTENT	PERCENT PASSING NO. 200 SIEVE	ATTERBERG LIMITS			ORGANIC CONTENT	UNIFIED SOIL CLASSIFICATION
				LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX		
HA-1-1	2	42.9%	66.7%	68	24	44		CH[1]
HA-4-1	4.5	44.7%	75.7%	101	27	74		CH[2]

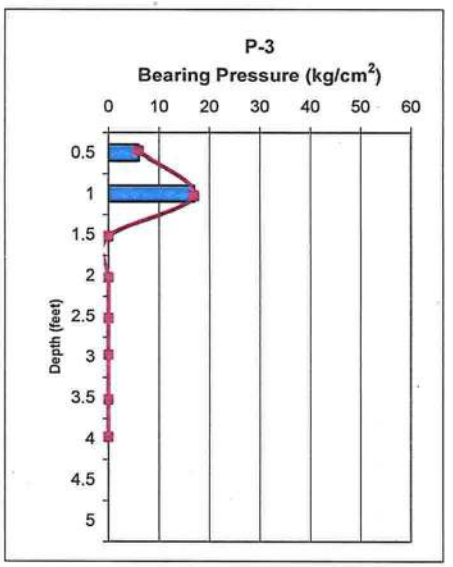
Descriptive Classification: [1] Sandy fat clay [2] Fat clay with sand

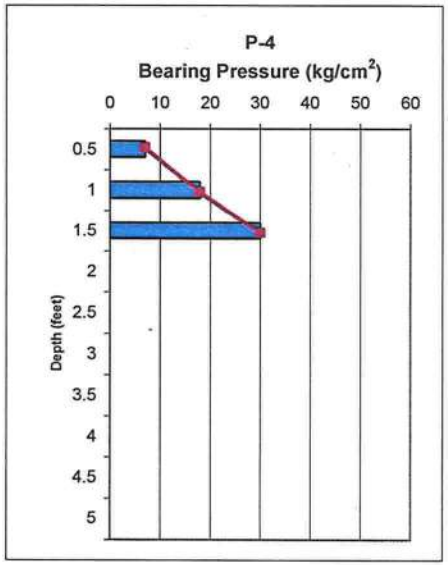
Scott E. Purcifull, P.G.

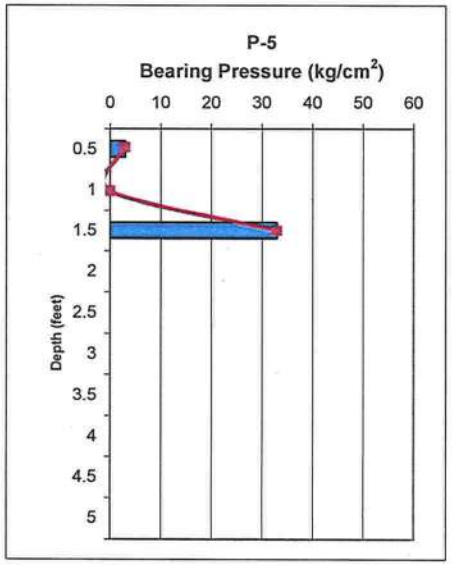
SCOTT E. PURCIFULL LICENSE No. 2328 STATE OF FLORIDA PROFESSIONAL GEOLOGIST

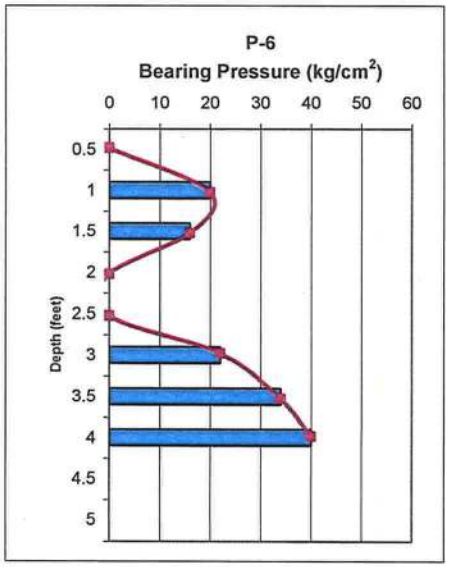




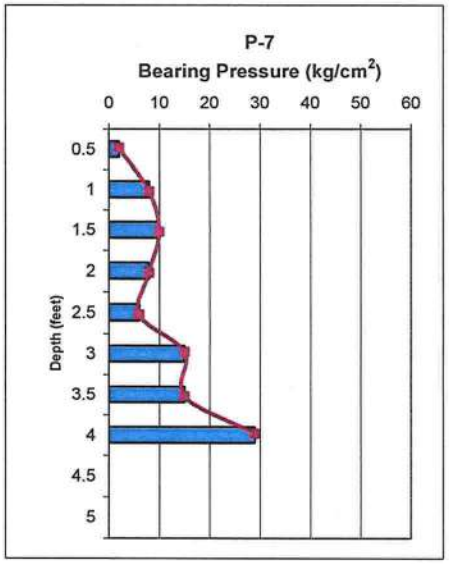


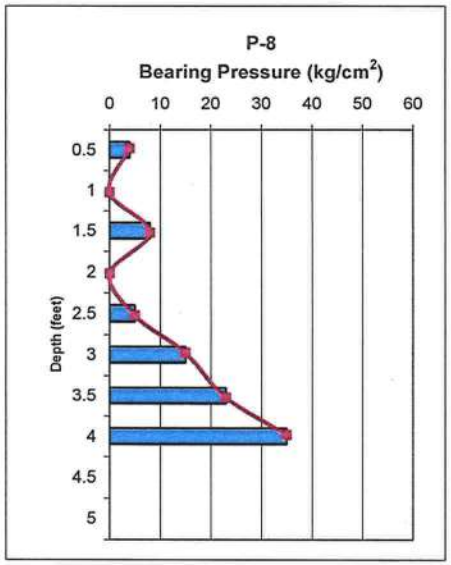


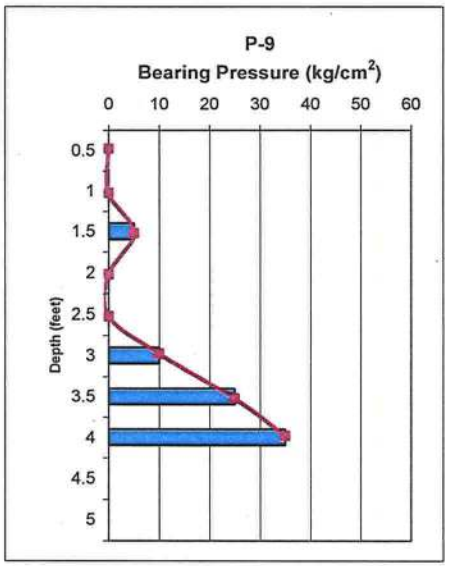


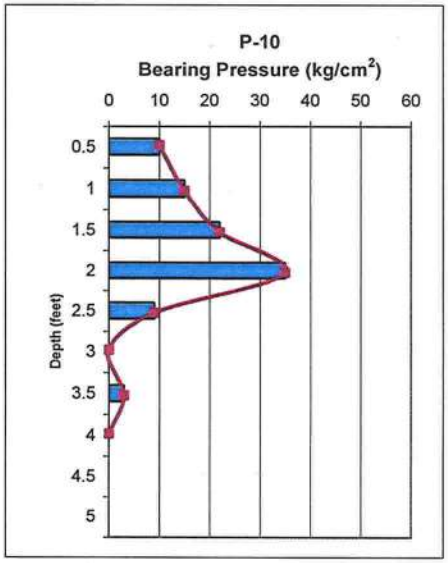


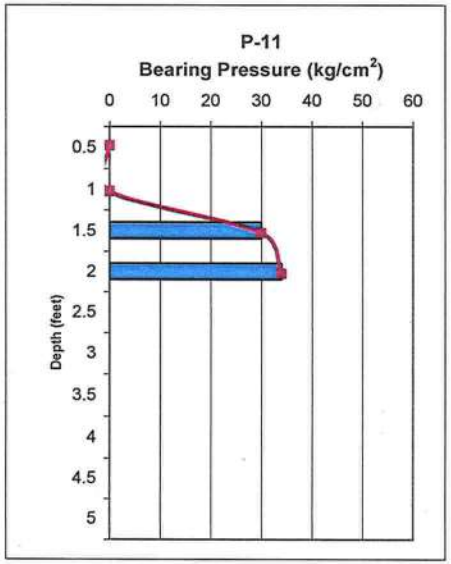
Cone Penetrometer Results - Killin Residence - Geohazards Investigation #2008385

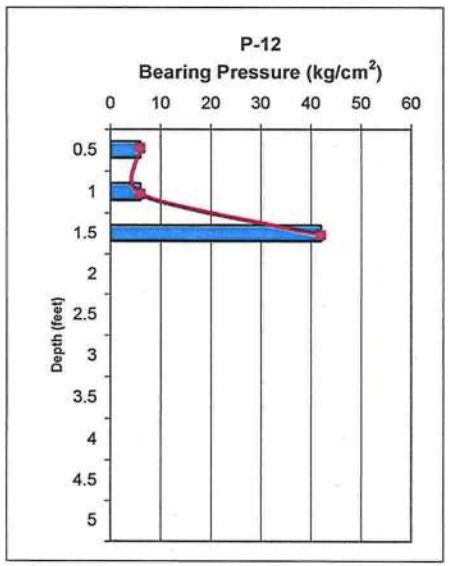




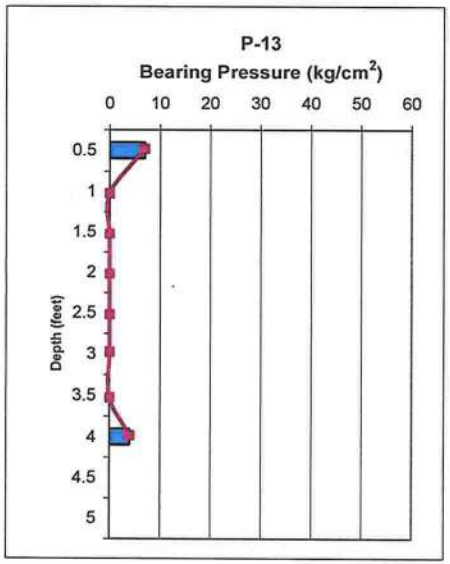








Cone Penetrometer Results - Killin Residence - Geohazards Investigation #2008385



Cone Penetrometer Results - Killin Residence - Geohazards Investigation #2008385

GEOHAZARDS, INC.
Sinkholes • Expansive Clays • Land Subsidence
P.O. Box 14566
Gainesville, FL 32604
(352) 371-7243 1-800-770-9990
Fax: (352) 371-4410

SITE PLAN OF GEOPHYSICAL INVESTIGATION

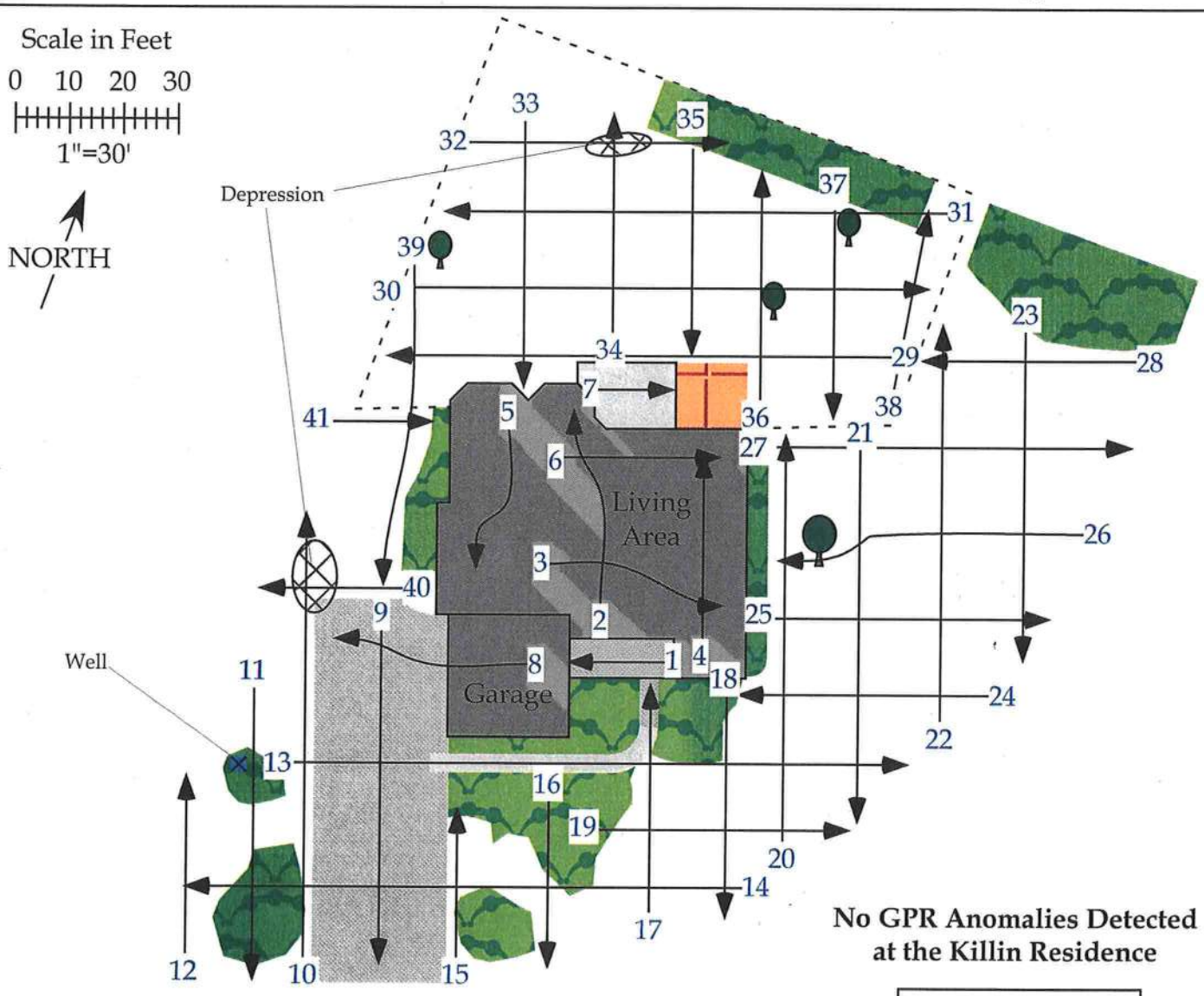
GROUND PENETRATING RADAR SURVEY

Killin Residence
172 NW Kelley Lake Court
Lake City, Florida

FOR: Florida Farm Bureau

DATE: 6-19-08

BY: W. Wrenn, Geologist
Investigation# 2008385



GEOHAZARDS, INC.
Sinkholes • Expansive Clays • Land Subsidence
P.O. Box 14566
Gainesville, FL 32604
(352) 371-7243 1-800-770-9990
Fax: (352) 371-4410

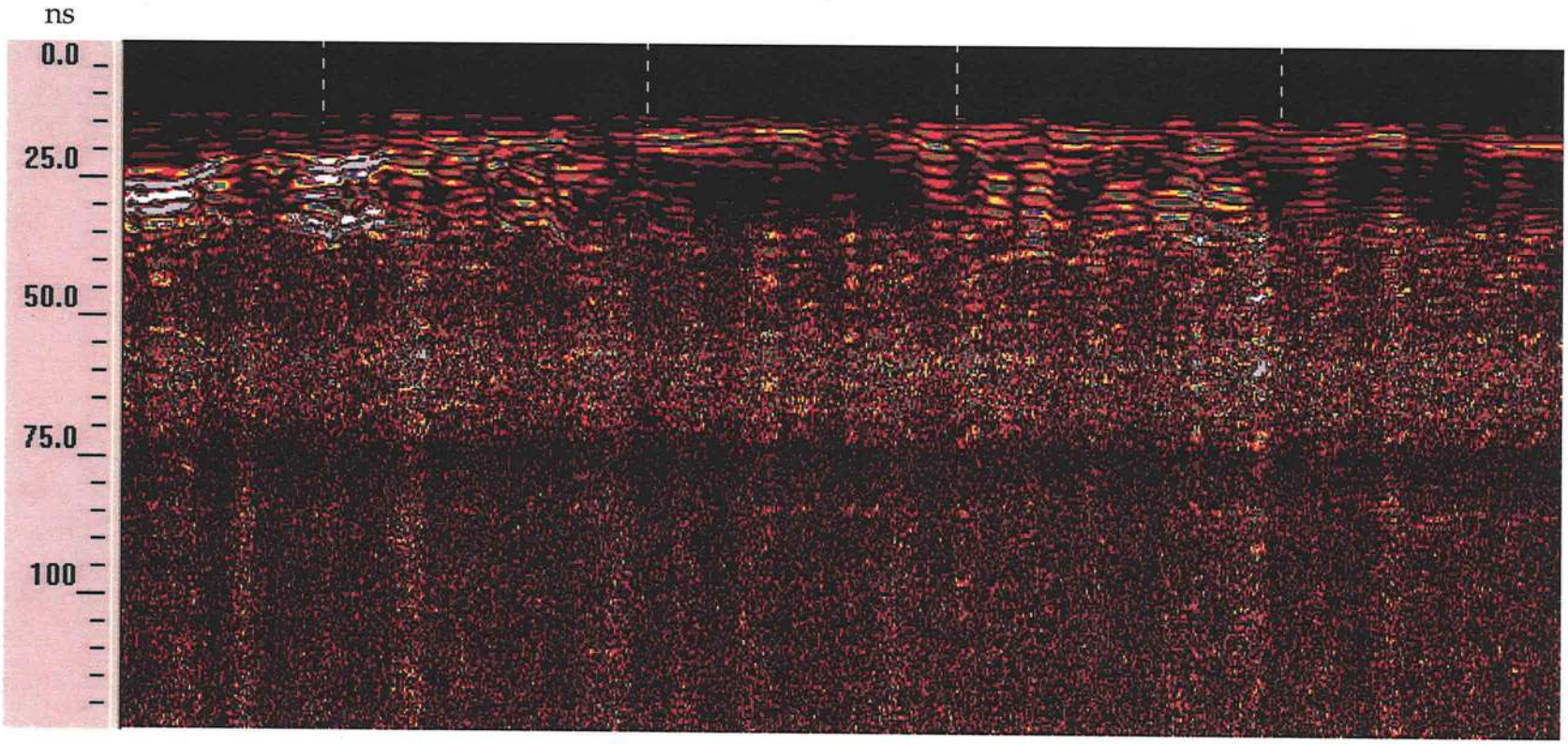
GROUND PENETRATING RADAR TRAVERSE #13

Killin Residence
172 NW Kelley Lake Court
Lake City, Florida

Typical GPR Traverse at the Killin Residence

System: SIR 3000
Antenna: 400 MHz
Range: 125 ns

Date: 6-19-08 Investigation #2008385



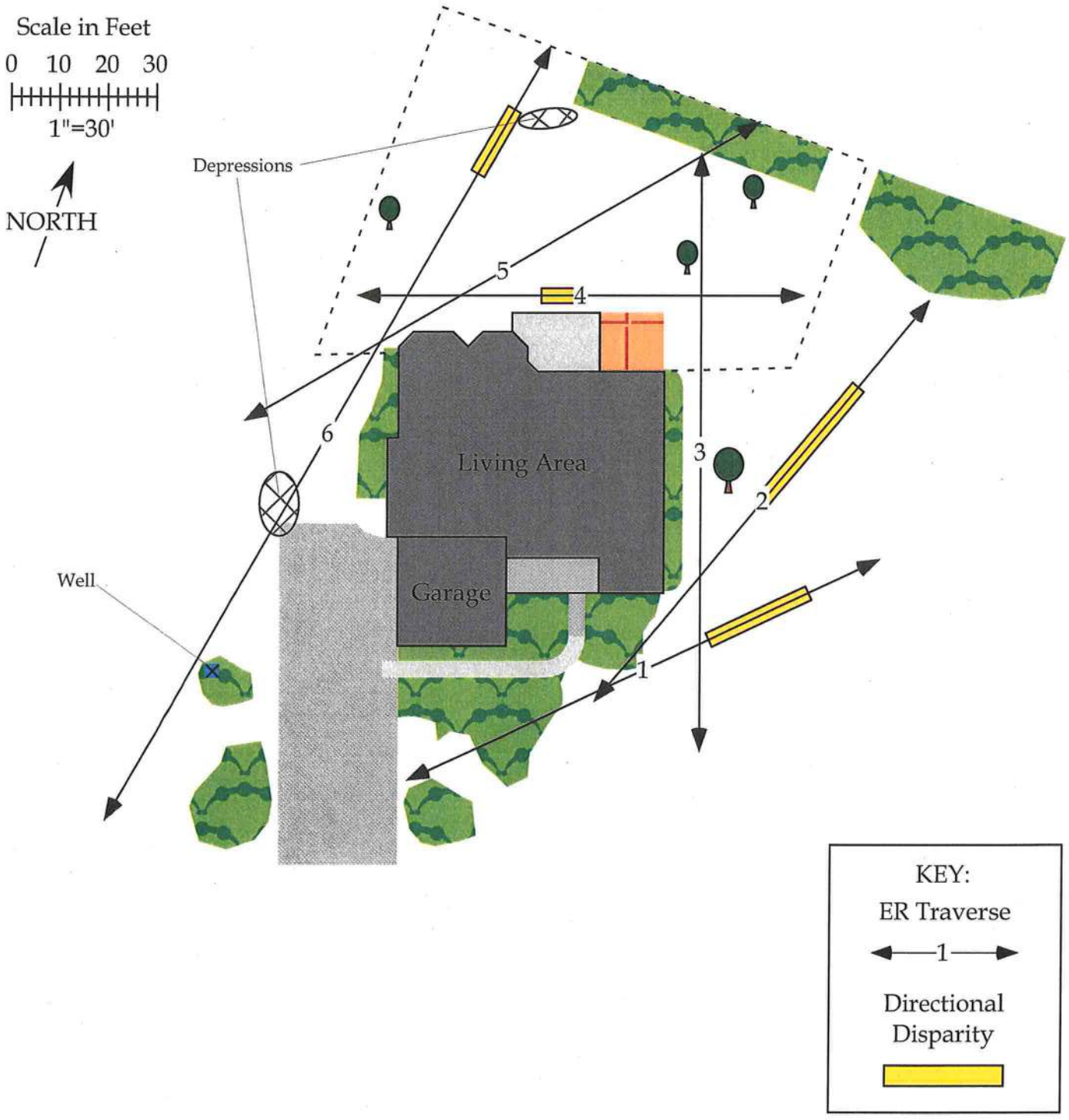
GEOHAZARDS, INC.
Sinkholes • Expansive Clays • Land Subsidence
P.O. Box 14566
Gainesville, FL 32604
(352) 371-7243 1-800-770-9990
Fax: (352) 371-4410

SITE PLAN OF GEOPHYSICAL INVESTIGATION

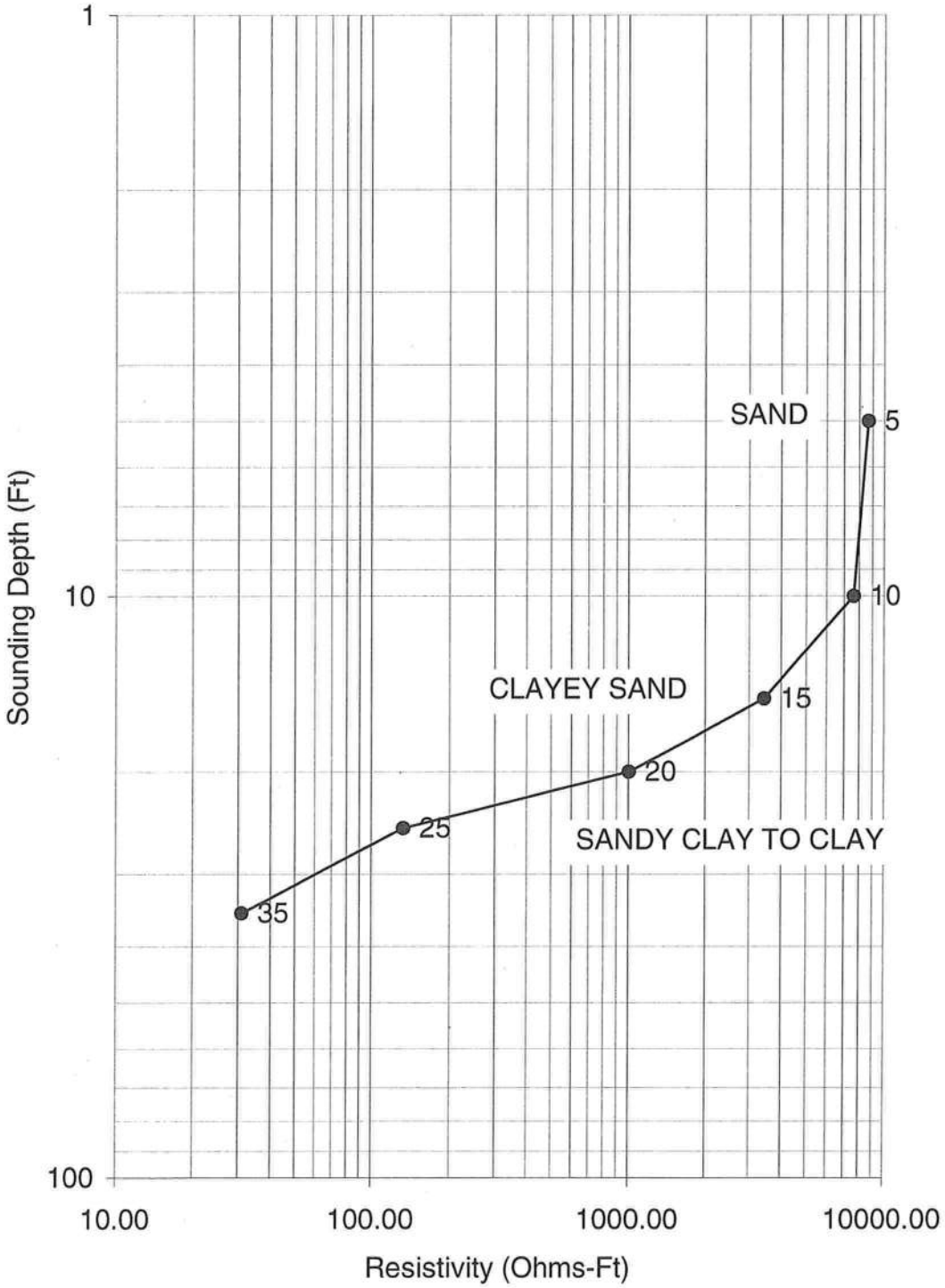
ELECTRICAL RESISTIVITY SURVEY

Killin Residence
172 NW Kelley Lake Court
Lake City, Florida

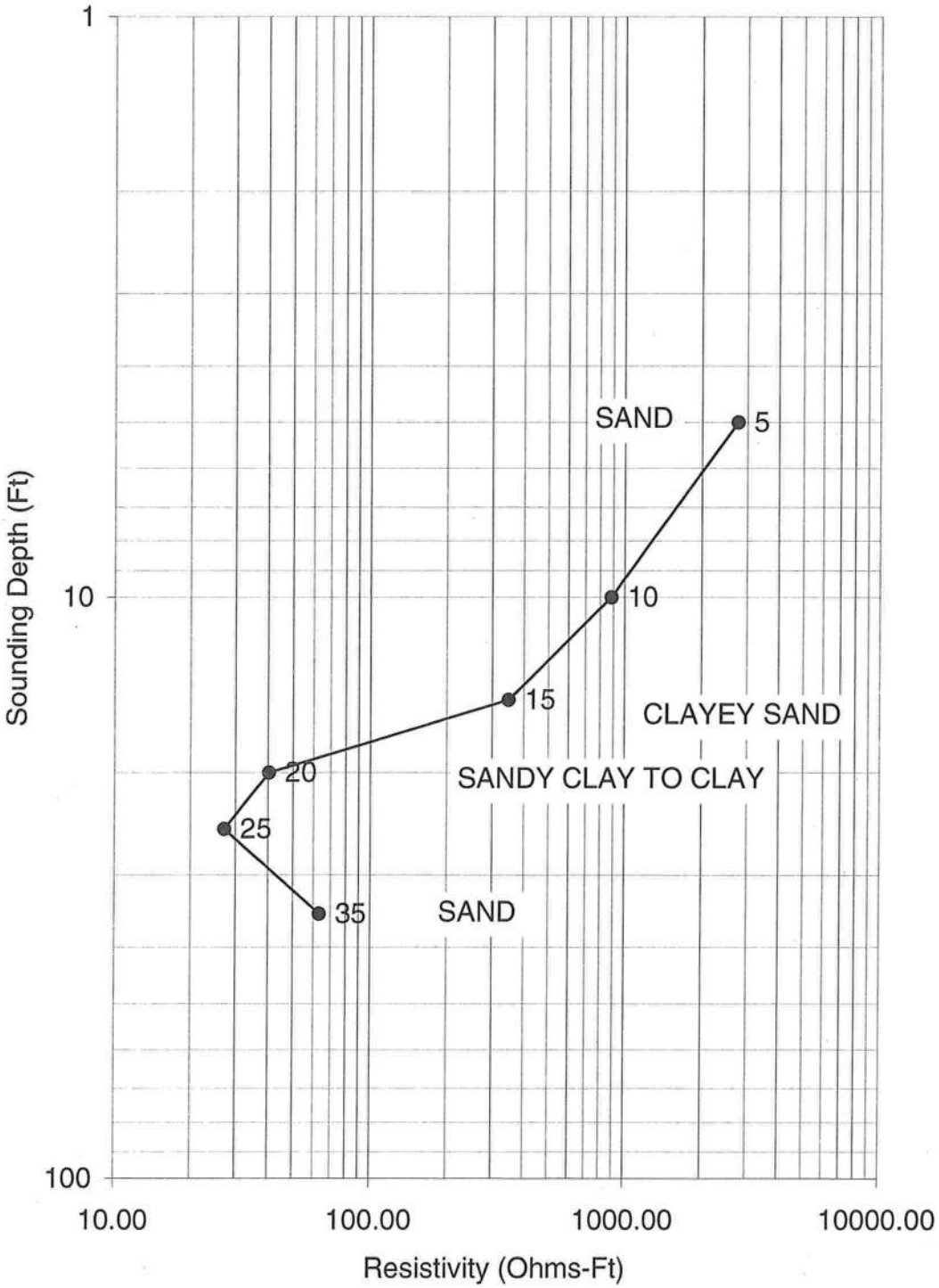
FOR: Florida Farm Bureau DATE: 6-19-08 BY: W. Wrenn, Geologist
Investigation# 2008385



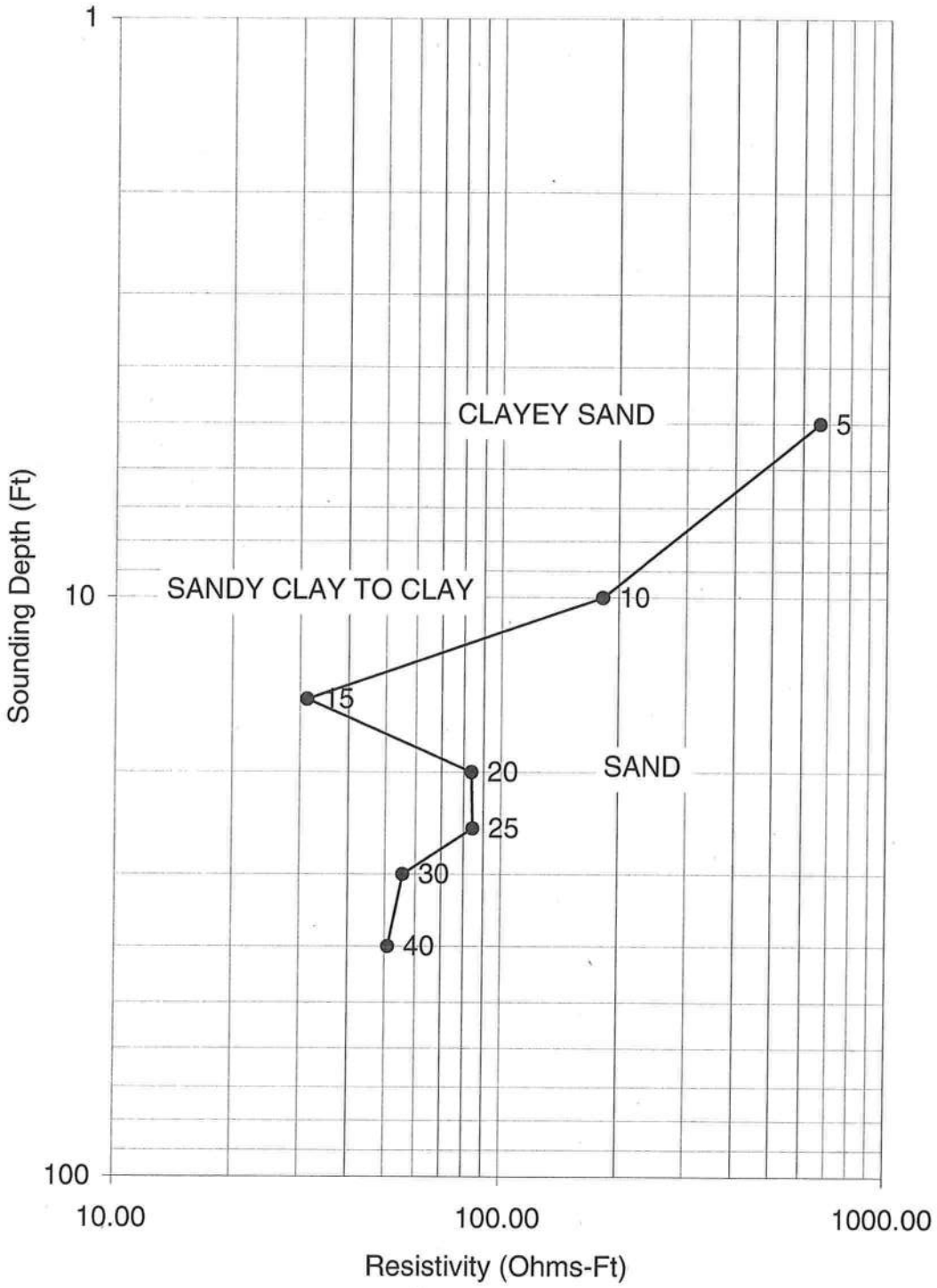
GEOHAZARDS INC.
Electrical Resistivity Survey
Investigation#:2008385
Array Orientation:N45E
Station Number: 1



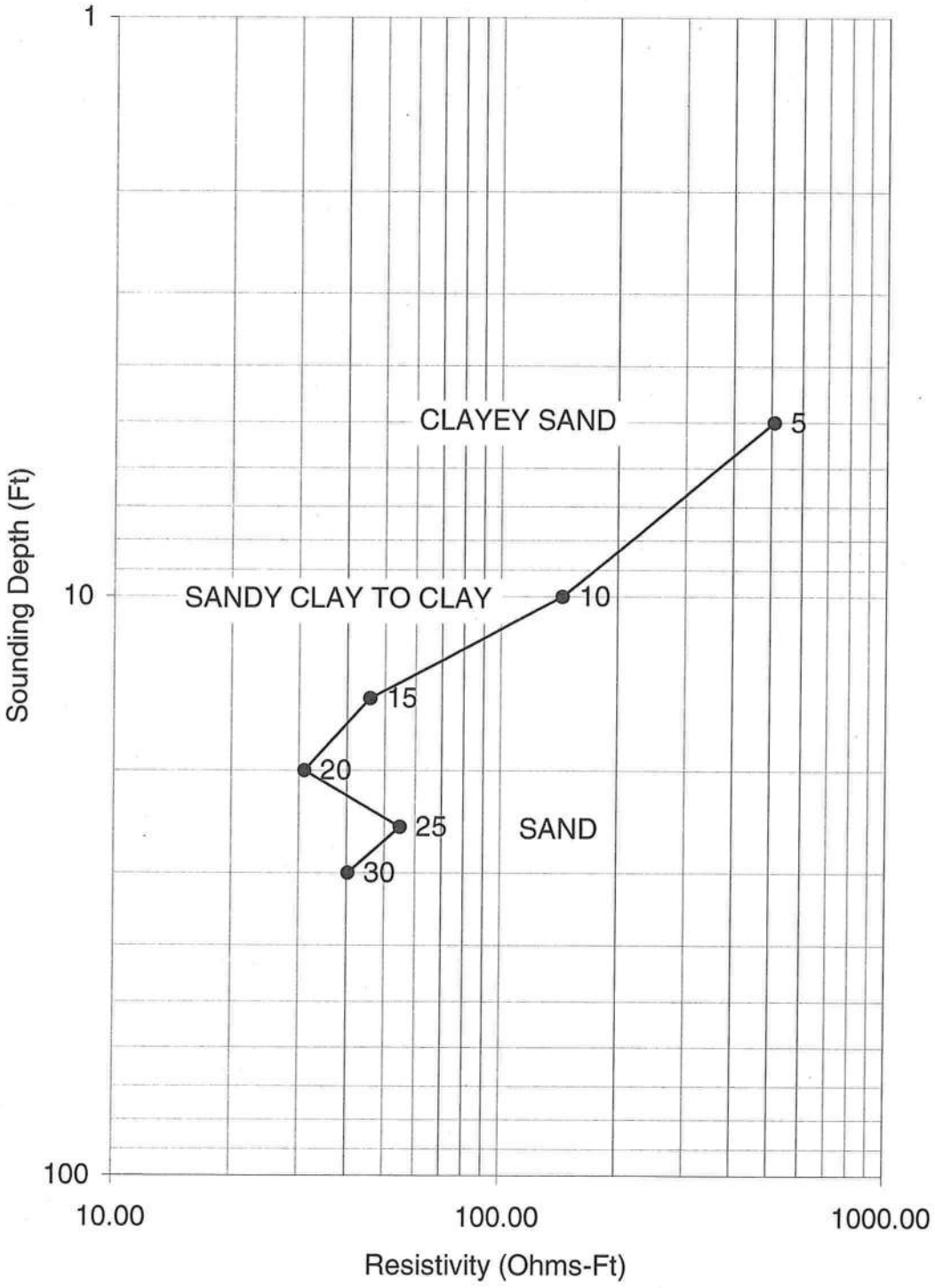
GEOHAZARDS INC.
Electrical Resistivity Survey
Investigation#:2008385
Array Orientation:N20E
Station Number: 2



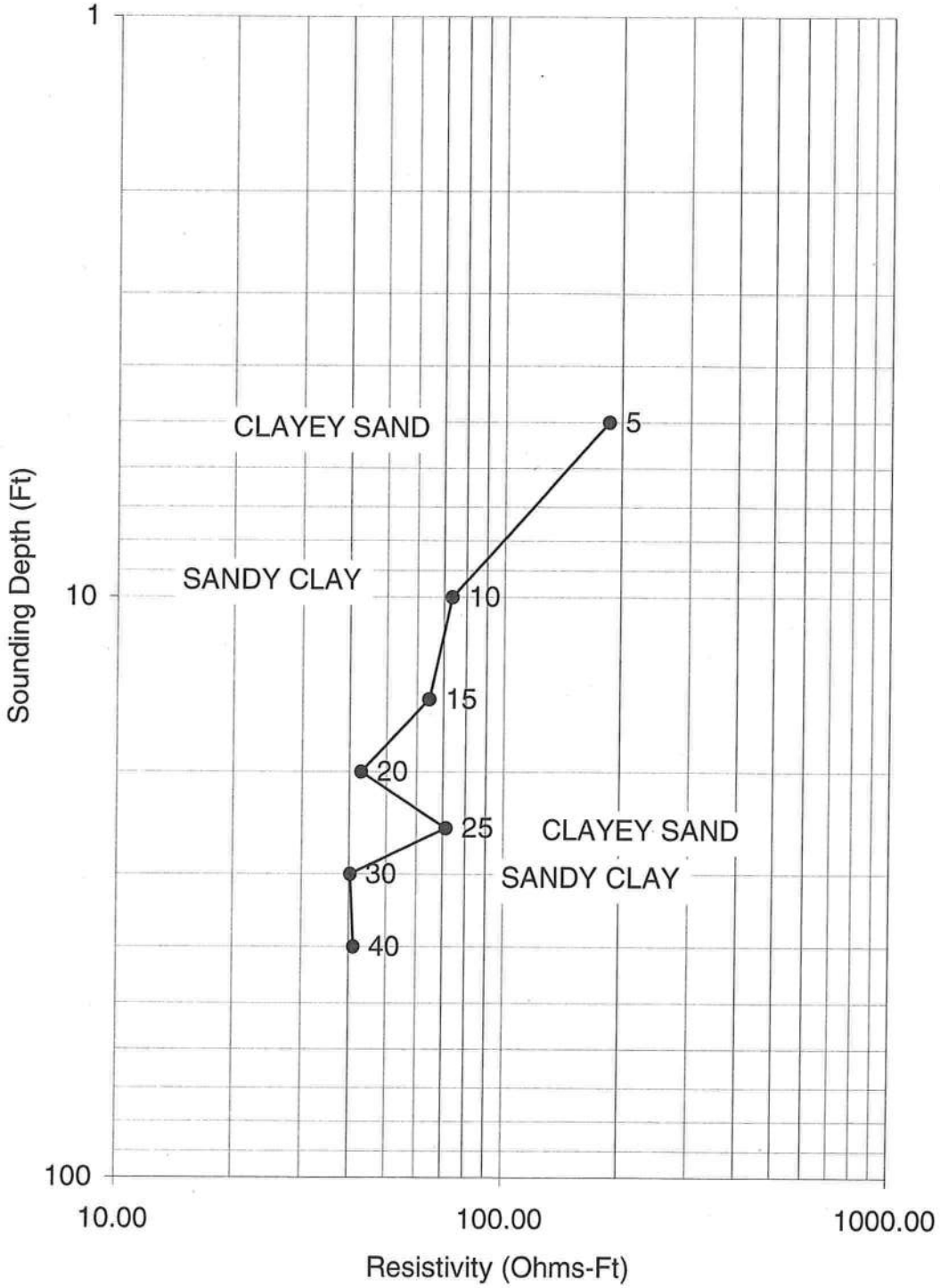
GEOHAZARDS INC.
Electrical Resistivity Survey
Investigation#:2008385
Array Orientation:N20W
Station Number: 3



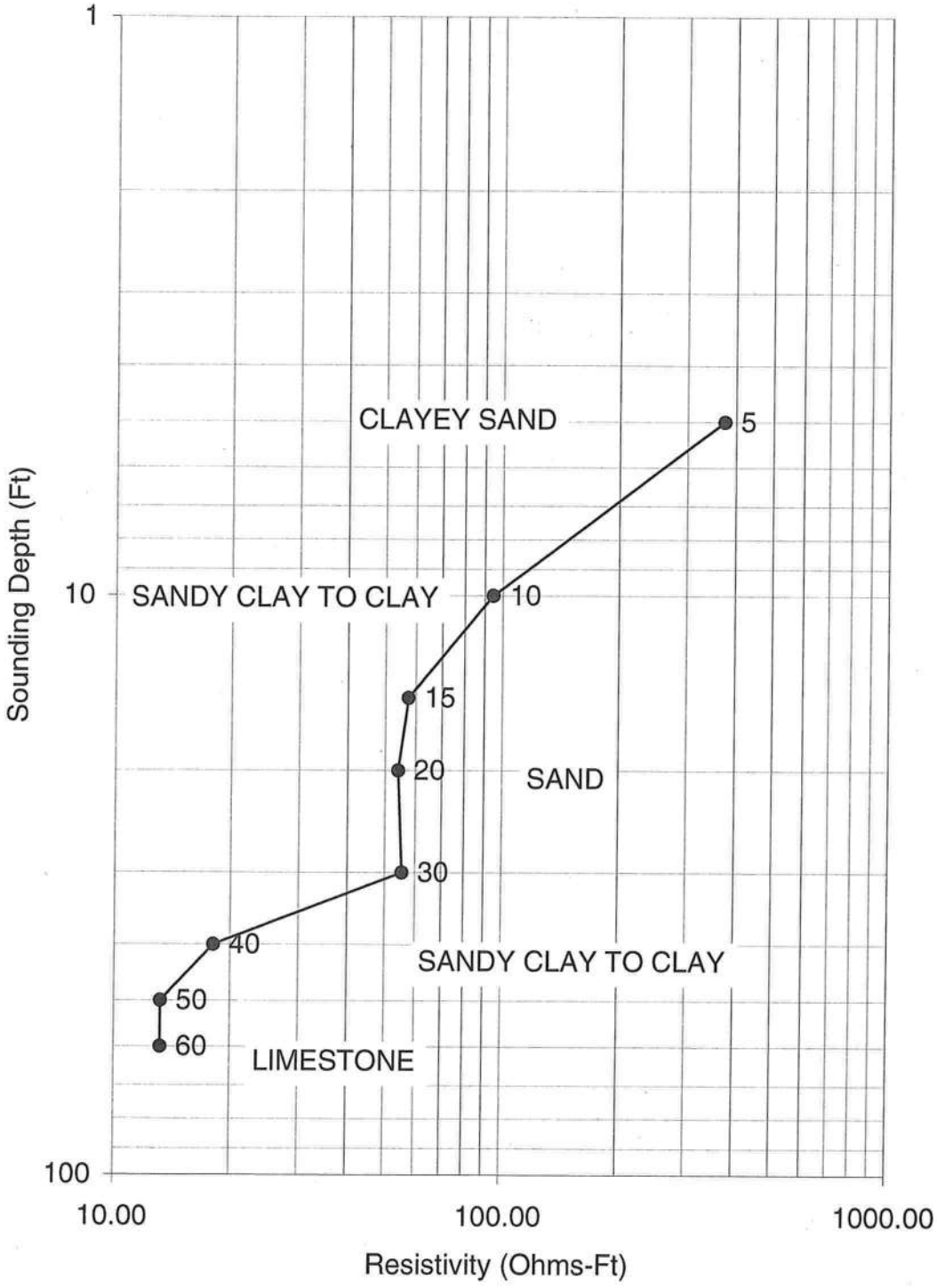
GEOHAZARDS INC.
Electrical Resistivity Survey
Investigation#:2008385
Array Orientation:N70E
Station Number: 4



GEOHAZARDS INC.
Electrical Resistivity Survey
Investigation#:2008385
Array Orientation:N40E
Station Number: 5



GEOHAZARDS INC.
Electrical Resistivity Survey
Investigation#:2008385
Array Orientation:N10E
Station Number: 6

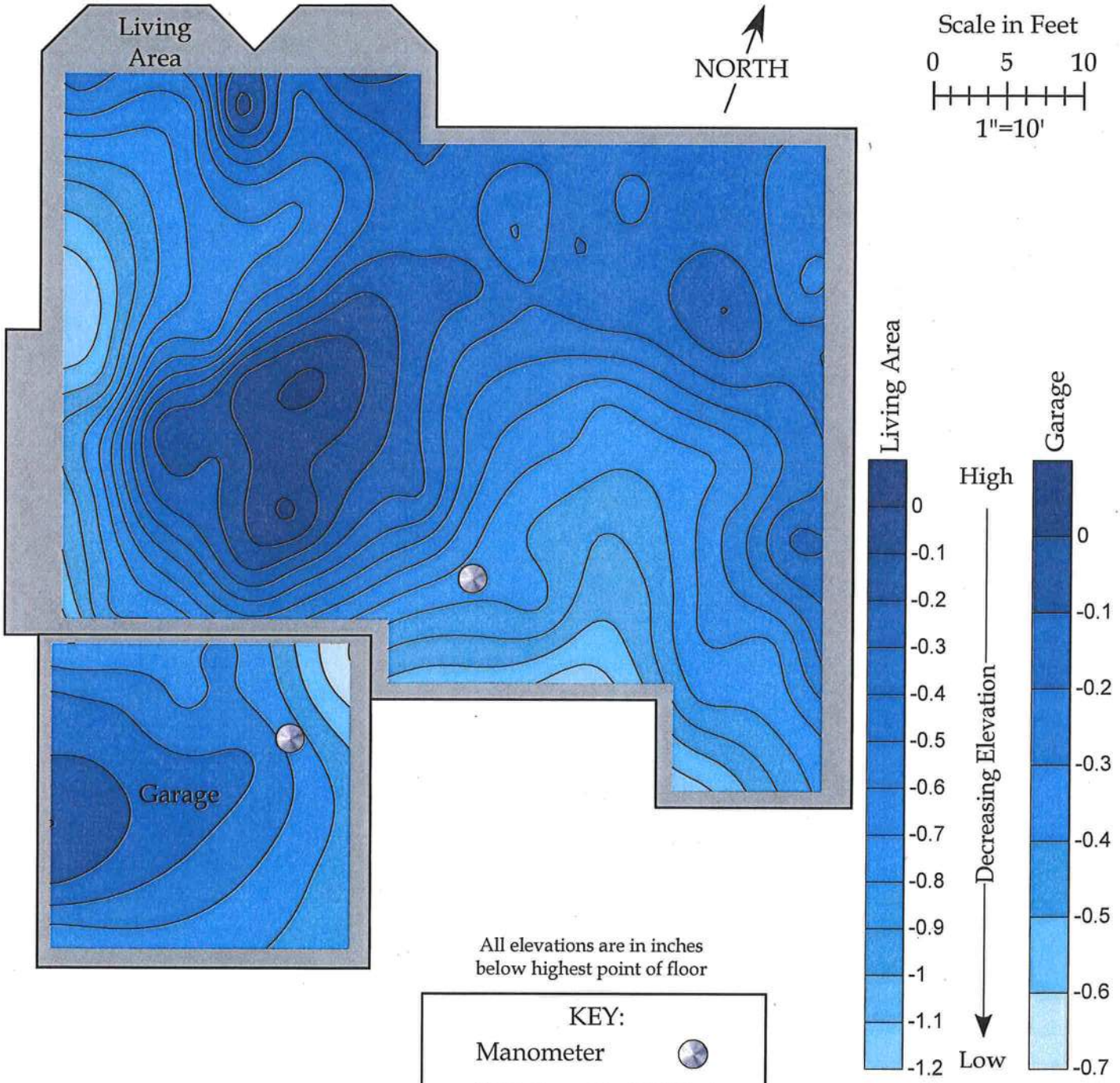


GEOHAZARDS, INC.
Sinkholes • Expansive Clays • Land Subsidence
P.O. Box 14566
Gainesville, FL 32604
(352) 371-7243 1-800-770-9990
Fax: (352) 371-4410

FLOOR ELEVATION SURVEY

Killin Residence
172 NW Kelley Lake Court
Lake City, Florida

FOR: Florida Farm Bureau DATE: 6-19-08 BY: W. Wrenn, Geologist
Investigation# 2008385



GEOHAZARDS, INC.

Sinkholes • Expansive Clays • Land Subsidence

STANDARD PENETRATION TEST BORING

Project: Killin Residence

Lake City, Florida

Report No: 2008385

Geologist on Site: K. Crockett

Date Started: 6-26-08
Date Finished: 6-26-08
Drilled By: Race Drilling, Inc.

Boring Designation: B-1 Sheet 1 of 3
Water Table (ft.): 3.0 ft.
Type of Sampling: SPT-Mud Rotary

Location: 50 feet north and 22 feet west of the northeast corner of the structure

DEPTH (ft.)	SAMPLE	BLOWS per 6 in. increment	N-value (blows/ft.)	W.T.	SYMBOL	DESCRIPTION
0						
	1	HA	NA			Brown sandy clay (CL)
	2	HA	NA	3.0 ft.		Brown fine sand (SP)
5	NS	3,3,4,5	7			**No sample recovered -** Presumed loose fine sand (SP)
	NS	8,8,10,10	18			**No sample recovered -** Presumed medium dense fine sand (SP)
	3	4,5,7,7	12			Brown medium dense clayey sand (SC)
10						
	4	5,5,5	10			Light grey loose clayey sand (SC)
15						
	5	2,3,3	6			Grey and orange firm sandy clay (CL)
20						
	6	4,4,5	9			Gray-orange stiff sandy clay (CL)
25						
	7	4,5,7	12			Grey medium dense silty sand (SM)
30						
	8	5,5,9	14			Grey medium dense silty sand (SM)
35						

GEOHAZARDS, INC.

Sinkholes • Expansive Clays • Land Subsidence

STANDARD PENETRATION TEST BORING

Project: Killin Residence

Lake City, Florida

Report No: 2008385

Geologist on Site: K. Crockett

DEPTH (ft.)	SAMPLE	BLOWS per 6 in. increment	N-value (blows/ft.)	W.T.	SYMBOL	DESCRIPTION
35						
	9	7,8,9	17			Grey and orange medium dense silty sand (SM)
40						
	10	6,8,9	17			Orange medium dense silty sand (SM)
45						
	11	9,9,11	20			Orange medium dense silty sand (SM)
50						
	12	5,9,50/5 in.	R			Grey very dense silty sand (SM)
55						
	13	16,20,33	53			Grey silty sand (SM) Light tan medium hard limestone (LS)
60						
	14	26,18,42	60			Light tan medium hard limestone (LS)
65						
						100% Loss of Circulation (LOC) at 68 ft.
	15	10,12,13	25			Light tan soft limestone (LS)
70						

GEOHAZARDS, INC.

Sinkholes • Expansive Clays • Land Subsidence

STANDARD PENETRATION TEST BORING

Project: Killin Residence

Lake City, Florida

Report No: 2008385

Geologist on Site: K. Crockett

DEPTH (ft.)	SAMPLE	BLOWS per 6 in. increment	N-value (blows/ft.)	W.T.	SYMBOL	DESCRIPTION
70						
75	16	50/5 in.	R			Light tan moderately hard limestone (LS)
80	17	16,24,26	50			Light tan medium hard limestone (LS)
85		WOR/2 ft.	WOR		Cavity	**Weight-of-Rod (WOR) from 83.5 to 85.5 ft.**
	18	7,7,6	13			Light tan very soft limestone (LS)
90	19	WOR,7,5	12			Light tan very soft limestone (LS)
95	20	15,16,8	24			Light tan soft limestone (LS)
100	21	6,13, 50/5 in.	R			Light tan moderately hard limestone (LS) **Boring terminated at approximately 100 ft.** **100% LOC at 68 ft., without recovery**

GEOHAZARDS, INC.

Sinkholes • Expansive Clays • Land Subsidence

STANDARD PENETRATION TEST BORING

Project: Killin Residence

Lake City, Florida

Report No: 2008385

Geologist on Site: K. Crockett

Date Started: 6-26-08
Date Finished: 6-26-08
Drilled By: Race Drilling, Inc.

Boring Designation: B-2 Sheet 1 of 3
Water Table (ft.): 3.0
Type of Sampling: SPT-Mud Rotary

Location: 6 feet south and 16 feet east of the northeast corner of the structure

DEPTH (ft.)	SAMPLE	BLOWS per 6 in. increment	N-value (blows/ft.)	W.T.	SYMBOL	DESCRIPTION
0						
	1	HA	NA			Grey fine sand (SP)
	2	HA	NA	⇩ 3.0 ft.		Grey sandy clay (CL)
5	3	4,4,5,6	9			Grey stiff clay (CL)
	4	8,10,9,10	19			Grey very stiff clay (CL)
	5	7,12,12,12	24			Grey medium dense sand (SP)
10						
	6	7,7,9	16			Grey medium dense silty sand (SM)
15						
	7	3,3,4	7			Green firm clay (CL)
20						
	8	6,12,14	26			Grey medium dense silty sand (SM)
25						
	9	8,10,13	23			Grey medium dense silty sand (SM)
30						
	10	4,8,9	17			Grey medium dense silty sand (SM)
35						

GEOHAZARDS, INC.

Sinkholes • Expansive Clays • Land Subsidence

STANDARD PENETRATION TEST BORING

Project: Killin Residence
Lake City, Florida
Report No: 2008385
Geologist on Site: K. Crockett

Boring Designation: B-2 Sheet 2 of 3

DEPTH (ft.)	SAMPLE	BLOWS per 6 in. increment	N-value (blows/ft.)	W.T.	SYMBOL	DESCRIPTION
35						
40	11	8,8,6	14			Grey medium dense silty sand (SM)
45	12	4,3,4	7			Grey and orange loose silty sand (SM)
50	13	4,4,3	7			Grey and orange loose silty sand (SM)
55	14	5,4,4	8			Grey loose silty sand (SM)
60	15	10,14,15	29			Grey medium dense silty sand (SM)
65	16	21,47,35	R			Light tan medium hard limestone (LS)
70	17	13,15,35	50			Light tan medium hard limestone (LS)

GEOHAZARDS, INC.

Sinkholes • Expansive Clays • Land Subsidence

STANDARD PENETRATION TEST BORING

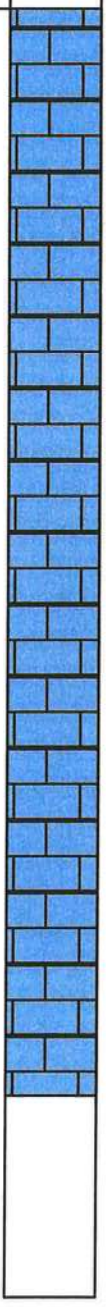
Project: Killin Residence

Lake City, Florida

Report No: 2008385

Geologist on Site: K. Crockett

Boring Designation: B-2 Sheet 3 of 3

DEPTH (ft.)	SAMPLE	BLOWS per 6 in. increment	N-value (blows/ft.)	W.T.	SYMBOL	DESCRIPTION
70						**100% Loss of Circulation (LOC) at 72 ft.**
	18	8,7,6	13			Light tan very soft limestone (LS)
75						
	19	9,12,19	31			Light tan soft limestone (LS)
80						
	20	15,16,16	32			Light tan soft limestone (LS)
85						
	21	26,32,23	55			Light tan medium hard limestone (LS)
90						
	22	41,26,35	R			Light tan medium hard limestone (LS)
95						
	23	12,50/6 in.	R			Light tan medium hard limestone (LS)
100						**Boring terminated at approximately 99.5 ft. 100% LOC at 72 ft., without recovery**

GEOHAZARDS, INC.

Sinkholes • Expansive Clays • Land Subsidence

STANDARD PENETRATION TEST BORING

Project: Killin Residence

Lake City, Florida

Report No: 2008385

Geologist on Site: J. Miller

Date Started: 7-2-08
Date Finished: 7-2-08
Drilled By: All County Drilling, LLC.

Boring Designation: B-3 Sheet 1 of 3
Water Table (ft.): Not Observed
Type of Sampling: SPT-Mud Rotary

Location: 11 feet west and 20 feet south of the northwest corner of the structure

DEPTH (ft.)	SAMPLE	BLOWS per 6 in. increment	N-value (blows/ft.)	W.T.	SYMBOL	DESCRIPTION
0				NA		
	1	HA	NA			Brown fine sand (SP)
	2	HA	NA			Gray sandy clay (CL)
5	3	3,3,5,7	8			Gray firm sandy clay (CL)
	4	6,10,12,17	22			Gray very stiff clay (CL)
10	5	12,15,16,24	31			Tan dense clayey sand (SC)
15	6	5,9,8	17			Tan medium dense fine sand (SP) with trace silt
20	7	4,5,4	9			Tan stiff sandy clay (CL)
25	8	4,5,6	11			Tan medium dense fine sand (SP) with trace silt
30	9	4,5,5	10			Tan loose fine sand (SP) with trace silt
35	10	5,5,6	11			Tan medium dense fine sand (SP) with trace silt

GEOHAZARDS, INC.

Sinkholes • Expansive Clays • Land Subsidence

STANDARD PENETRATION TEST BORING

Project: Killin Residence
Lake City, Florida
Report No: 2008385
Geologist on Site: J. Miller

Boring Designation: B-3 Sheet 2 of 3

DEPTH (ft.)	SAMPLE	BLOWS per 6 in. increment	N-value (blows/ft.)	W.T.	SYMBOL	DESCRIPTION
35						
40	11	4,5,6	11			Tan medium dense fine sand (SP) with trace silt
45	12	5,6,6	12			Tan medium dense fine sand (SP)
50	13	4,3,4	7			Tan loose fine sand (SP) **100% Loss of circulation (LOC) at 50 ft.**
55		WOR/1.5 ft.	WOR			**Weight-of-rod (WOR) from 53.5 to 55 ft.**
	14	4,4,5	9			Tan loose fine sand (SP) with trace silt
60		WOR/2 ft.	WOR			**WOR from 58.5 to 60.5 ft.**
	15	2,2,2	4			Tan loose fine sand (SP) with trace silt
65		WOR/2 ft.	WOR			**WOR from 63.5 to 65.5 ft.**
	16	4,6,4	10			Tan loose fine sand (SP) with trace silt
70		WOR/2 ft.	WOR			**WOR from 68.5 to 70.5 ft.**

GEOHAZARDS, INC.

Sinkholes • Expansive Clays • Land Subsidence

STANDARD PENETRATION TEST BORING

Project: Killin Residence

Lake City, Florida

Report No: 2008385

Geologist on Site: J. Miller

Boring Designation: B-3 Sheet 3 of 3

DEPTH (ft.)	SAMPLE	BLOWS per 6 in. increment	N-value (blows/ft.)	W.T.	SYMBOL	DESCRIPTION
70						
	17	4,7,7	14			Orange stiff sandy clay (CL)
75	18	WOR/1 ft., 3	3			Tan very loose fine sand (SP)
	19	10,9,3	12			Light tan very soft limestone (LS)
80						
	20	WOR/1 ft., 10	10			Light tan very soft limestone (LS)
85						
	21	14,13,12	25			Light tan soft limestone (LS)
90						
	22	30,9,10	19			Light tan very soft limestone (LS)
95						
	23	32,3,23	26			Light tan soft limestone (LS)
100						**Boring terminated at 100 ft.** **100% LOC at 50 ft., without recovery**

GEOHAZARDS, INC.

Professional Geological, Geophysical and Geotechnical Engineering Services

P.O. Box 14566
Gainesville, Florida 32604

Anthony F. Randazzo, Ph. D.
Geologist
Florida PG# 0003
Georgia PG#1136

David Bloomquist, Ph. D.
Geotechnical Engineer
Florida PE# 37235

Attila A. Bodo, P.E.
Structural Engineer
Florida PE# 15834

Douglas L. Smith, Ph.D.
Geophysicist
Florida PG# 0018
Georgia PG# 1140

PROPOSED REMEDIATION PROGRAM ESTIMATE

Killin Residence
172 NW Kelley Lake Court, Lake City, Florida
Florida Farm Bureau Insurance Claim No. 441215 ---- Geohazards, Inc. Project No. 2008385

Geohazards, Inc. has conducted a site investigation at the above location. Based on the WOR zones, including the cavity in limestone identified in the SPT borings, and observed surface depressions, sinkhole activity cannot be eliminated as a contributing source of distress. Subsurface compaction grouting, a common ground modification technique, is indicated to mitigate raveling and fill void spaces adjacent to and below the structure. The following basic grouting plan has been developed to remediate the sinkhole conditions.

Task	Description	Estimated Quantity Survey	Unit Cost	Extended Cost
1	Mobilization/Demobilization/Permits	1 ea.	L.S.	$1,500
2	Site Preparation	1 ea.	L.S.	$1,500
3	Injection Pipe Installation; 23 grout points, to competent limestone estimated approximately 90 ft. below the surface	2,070 ft.	$16/ft.	$33,120
4	Grout Injection	200 - 300 cy.	$155/cy.	$31,000 - $46,500
5	On-site Monitoring	8 -10 days (8 hours/day)	$60/hour	$3,840 - $4,800
6	Certification Reports	1	$450/report	$450
Total Estimated Cost Range				$71,410 - $87,870

(352) 371-7243
www.sinkholes.com

(800) 770-9990

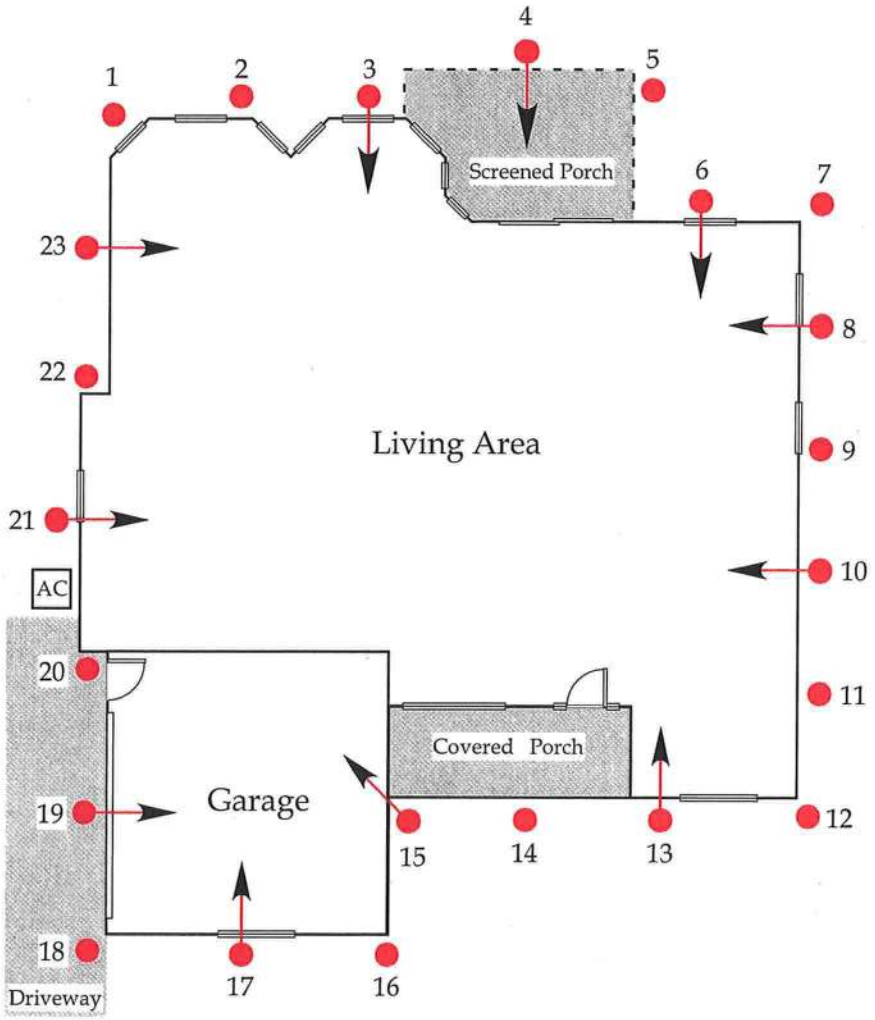
Fax: (352) 371-4410
admin@sinkholes.com

GEOHAZARDS, INC.
Sinkholes • Expansive Clays • Land Subsidence
P.O. Box 14956
Gainesville, FL 32604
(352) 371-7243 1-800-770-9990
Fax: (352) 371-4410

PROPOSED GROUT INJECTION LOCATIONS

Killin Residence
172 NW Kelley Lake Court
Lake City, Florida

FOR: Florida Farm Bureau DATE: 6-19-08 BY: David Bloomquist, PhD, PE
Investigation#2008385



23 Injection Point Locations

Approximately 8′ - 10′ between points

Estimated average insertion depth: 90 feet

Injection Point

Angled Injection Point

Note: Some injection point locations may be inaccessible due to obstructions and minor relocation at the discretion of the contractor may be required.

NORTH

Scale in Feet

0 5 10 15

1"=15'

GEOHAZARDS, INC.

Professional Geological, Geophysical and Geotechnical Engineering Services

P.O. Box 14566
Gainesville, Florida 32604

Anthony F. Randazzo, Ph. D.
Geologist
Florida PG# 0003
Georgia PG#1136

David Bloomquist, Ph. D.
Geotechnical Engineer
Florida PE# 37235

Attila A. Bodo, P.E.
Structural Engineer
Florida PE# 15834

Douglas L. Smith, Ph.D.
Geophysicist
Florida PG# 0018
Georgia PG# 1140

TECHNICAL SPECIFICATIONS FOR SUBSURFACE STABILIZATION PRESSURE GROUTING AT THE

Killin Residence
172 NW Kelley Lake Court, Lake City, Florida
Florida Farm Bureau Insurance Claim No. 441215 ---- Geohazards, Inc. Project No. 2008385

1.0 DESCRIPTION

The following specifications are for stabilization and remediation of subsoil conditions. The work consists of furnishing all labor, equipment and materials required to inject cementitious grout to an estimated average depth of 90 feet. Do not drill beyond 100 feet unless prior permission is obtained by the Engineer of Record. The stabilization program is intended to stabilize possible unstable subsurface soils by compacting any loose soils via densification, where present, sealing the limestone surface, voids and any partially in-filled cavities, and to minimize the potential for future ground subsidence due to raveling activity.

2.0 SCOPE

The scope of the stabilization program includes vertical and/or angled grout injections. The total estimated grout quantity, injection pipe footage and grout point locations are attached. However, the grouting program may be modified by the Contractor and Geotechnical Engineer (or his or her representative) as dictated by the actual field conditions. In these specifications, "Geotechnical Engineer" refers to Geohazards, Inc.'s geotechnical engineer.

If directed by the Geotechnical Engineer or his or her representative, additional grout locations may be required based on the site conditions encountered. Injection point locations are planned around the perimeter of the structure and screen enclosed porch on 8 - 10 foot centers. Alternative grout locations may be required. However, the Contractor or Geotechnical Engineer (or his or her representative) will establish the final grout injection locations in the field.

3.0 CONTRACTOR

The pressure grouting Contractor shall submit his or her qualifications to the Geotechnical Engineer. The Contractor shall have at least three years of experience in cement pressure grouting jobs, and shall submit references of his or her activities if requested.

Much of the interior and exterior distress observed in the structure is most probably the result of movements caused by the near-surface active clays identified in our investigation. Our recommendation of compaction grouting is intended to remediate the possible sinkhole conditions present at the property. However, compaction grouting does not mitigate the effects of the clays, and distress to the structure caused by the expansive clays is likely to continue.

The above plan does not include any remedial repair of the structure's interior or exterior, walks, slabs on grade, nor vegetation removal/replacement. Any cracks in the slab on grade should be repaired as part of the cosmetic repair program. Cosmetic repairs should begin no sooner than 60 days after the conclusion of the subsurface remediation program.

It is important to note that one of the three SPT borings did not terminate in competent material. Additionally, Geohazards, Inc. has limited historical data for the region where the structure is located. Therefore, drill depths and grout quantities are more difficult to estimate.

This grouting and underpinning program is not necessarily intended to be used solely as the final mitigation design. The suggested plan provided by Geohazards, Inc. should be used by the contractor as a basis for bidding, since site conditions may require the relocation, addition, or deletion of insertion points (e.g., septic tanks, drain fields, underground sprinkler pipes, utilities, etc.).

10-17-08

David Bloomquist, PhD, PE
Geotechnical Engineer
Florida License Number 37235

Attila Bodo, PE
Structural Engineer 10.16.08
Florida License Number 15834

4.0 EQUIPMENT

Grout Injection Equipment

A continuous flow, positive displacement model capable of pumping cement grout with a slump (ASTM C-143) of 3 to 6 inches maximum and pressures up to 600 psi (i.e., Schwing Model BPA 750D-15R or equivalent) shall be used. A pressure gauge shall be located in-line at the top of the casing or immediately before the top of the casing. The gauge shall be capable of reading pressures up to 600 psi in increments of 25 psi or smaller. Alternate equipment may be used at the discretion of the Geotechnical Engineer or his or her representative. Approval of any and all onsite equipment does not infer final acceptance.

Injection Pipes

Minimum inside diameter: 2 inches, Maximum inside diameter: 3 inches. Use of reducing nipples is not allowed.

5.0 GROUT MIXTURE

General

The materials used in this work shall conform to standard grouting practices as follows:

- Portland cement will conform to ASTM C-150. Aggregate will be natural sand material with percent passing the No. 200 sieve not greater than 30 percent. No maximum grain size is specified, however, it must not create sand blocking at the nozzle at the specified operating pressures.
- Lime will be hydrated if utilized.
- Mix water shall be potable.
- Once mixed, the cement/sand grout (including approved additives) shall obtain a minimum 48-hour compressive strength of 200 psi.

Grout Mix

The mixture used for grouting shall be a creamy consistency which will permit the grout to flow. If requested, when samples of the grout mixture are set aside for at least 12 hours in a standard concrete test mold, the resulting free surface water height shall be less than one percent of the initial sample height. Slump shall not exceed 6 inches. However, the slump may be varied throughout the grouting operation at the discretion of the Geotechnical Engineer or his or her representative. The grout mix shall not contain more than 0.6% by weight (22 lbs/cy) of bentonite. If bentonite is to be used, it must be hydrated prior to the addition of cement to minimize bleeding and segregation. The use of bentonite in compaction grouting can cause a loss of compressive strength of the grout mixture.

6.0 GROUT MIXING & PLACING

If on site mixing is used, facilities shall be provided for accurately measuring the ingredients in each batch of grout. The ingredients shall be thoroughly mixed and immediately pumped to the grout pipes through a flexible hose not more than 250 feet long.

7.0 PRESSURE GROUTING PROCEDURE

Pipe Installation

Grout pipes shall be installed to a depth sufficient to encounter bearing limestone or other bearing material (e.g., dense sand), approximately 90 feet on average below the ground surface. If this estimated average depth is exceeded by more than 10 feet, the drilling procedure shall cease and the Geotechnical Engineer notified. Drilling may continue at the Geotechnical Engineer's discretion. The Contractor may rotary drill or drive the injection pipes to the refusal depth. However, the method of installation shall ensure a good seal between the pipe and the surrounding soil. The installation method may be modified subject to the Geotechnical Engineer or his or her representative's approval if grout seeps up around the outside of the pipe during injection.

Grout Injection

Following satisfactory installation of an injection pipe, grouting operations may begin. During the grouting operation the injection pipes shall be incrementally raised to inject the entire zone between depths of approximately 90 feet and 10 feet below the ground surface. If feasible, the sequence of grouting should be performed at alternating locations to allow sufficient time for the mix to set prior to drilling and grouting adjacent points. The rate of pumping shall not exceed twelve cubic feet per minute. The pumping pressure at the top of the casing is planned to be in the range of 200 to 300 psi or as required by the Geotechnical Engineer or his or her representative. Unless otherwise directed by the Geotechnical Engineer or his or her representative, pumping shall cease for at least a 24-hour period if a 1-foot zone takes 20 or more cubic yards of grout at a slump of 4 inches. If this excessive pumping occurs, the grout pipe shall be raised and flushed to prevent the pipe from being cemented in place. Pumping can then proceed at another grout pipe location. Pumping may resume at the excessive grout pipe location and depth after a period of 24 hours has passed. The slump maybe reduced further to 2 inches if a grout point fails to produce resistant pressure during the pumping operation. Once a resistance pressure of 250 – 300 psi is reached, the slump may be increased to not more than 6 inches to improve migration of the grout into the soil in order to compact loose zones adjacent to the pipe. Grouting procedures should be terminated once the grout point is filled to within 6 – 10 feet of the surface in order to minimize collateral damage to the structure.

Contractor Submittals

Methods of the work:

a. Grout pipe installation procedures
b. Proposed grout pipe locations, depths, and intervals
c. Increments of depth for installation of grout
d. Maximum grout quantities at each increment of depth
e. Grout pressures at depths
f. Equipment to be used in the work
g. List of vendors and suppliers
h. Daily records
i. Grout mix design, design slump and tolerances

8.0 MONITORING BY THE GEOTECHNICAL ENGINEER OR HIS OR HER REPRESENTATIVE

General

The Geotechnical Engineer or his or her representative will monitor the pressure grouting operations to document compliance with the specifications outlined above and the duties discussed below. All injection pipe installations and grouting operations shall be performed in the presence of the Geotechnical Engineer's representative. The Geotechnical Engineer or his or her representative shall assume responsibility for verifying the quantity of grout pumped, intervals of grouting and deciding if additional or less grout is necessary.

Compliance

The Geotechnical Engineer or his or her representative may stop the grouting operation at any time if, in his or her judgment, the operation does not comply with these specifications or the work is unsuitable.

Daily Records

The Geotechnical Engineer or his or her representative will make all measurements of ground heave or settlement, installed pipe lengths and grout quantities pumped. Records of each day's grouting operation will be maintained for the benefit of the insurance company and Contractor. The grout and pipe quantities recorded by the Geotechnical Engineer's representative shall be considered the final amounts for pay purposes.

Ground/House Movement

During grouting, the Contractor and Geotechnical Engineer or his or her representative shall observe any vertical movement of the ground and house using a transit/level. If a downward movement of the ground surface is observed, the grouting operation shall cease and observations shall continue for 30 minutes. Likewise if there is any upward movement of the house, grouting should be temporarily suspended. If the ground does not return to its original grade, pumping shall be resumed at a lower rate of injection. If upward movement is observed, the grouting operation shall cease.

Existing Utilities/Structures

The Contractor shall exercise care when grouting beneath and adjacent to any underground utilities. The Contractor is responsible for ensuring the grouting operation does not damage existing utilities, wells, septic tanks, etc.

10-17-08

David Bloomquist, PhD, PE
Geotechnical Engineer
Florida License Number 37235

GEOHAZARDS, INC.
Sinkholes • Expansive Clays • Land Subsidence
P.O. Box 14566
Gainesville, FL 32604
(352) 371-7243 1-800-770-9990
Fax: (352) 371-4410

PHOTOGRAPH LOCATION MAP

Killin Residence
172 NW Kelley Lake Court
Lake City, Florida

FOR: Florida Farm Bureau

DATE: 6-19-08

BY: W. Wrenn, Geologist
Investigation# 2008385

Scale in Feet
0 10 20 30
1"=30'

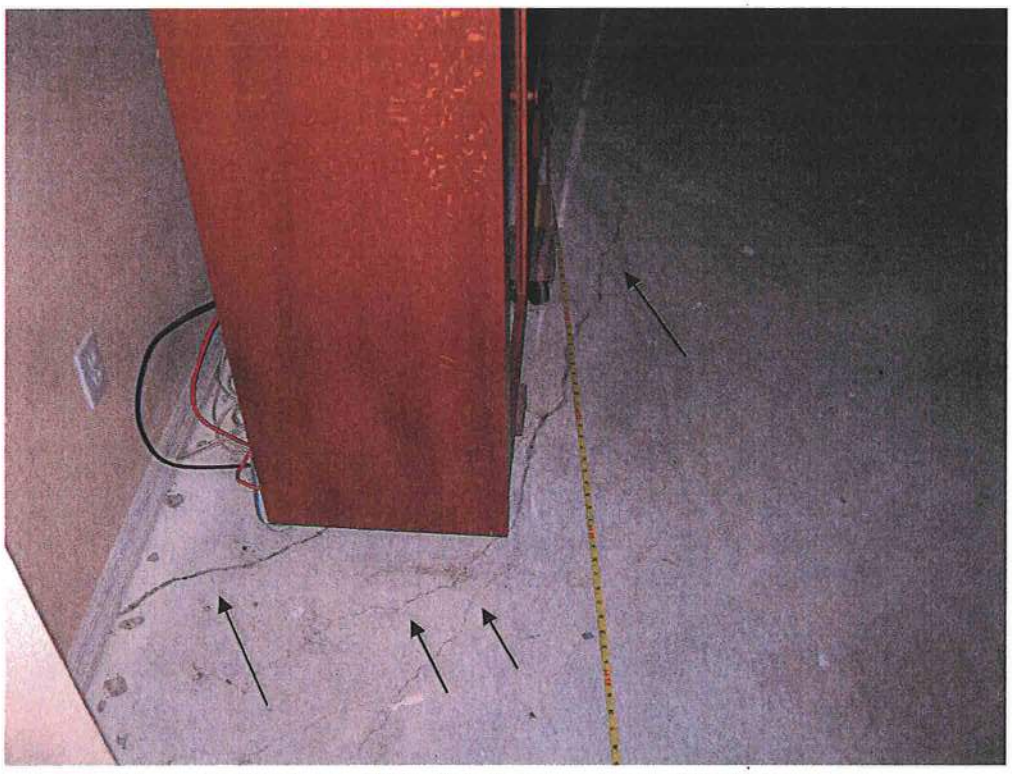
NORTH

1. South (front) side of the Killin residence.

2. North side of the Killin residence.

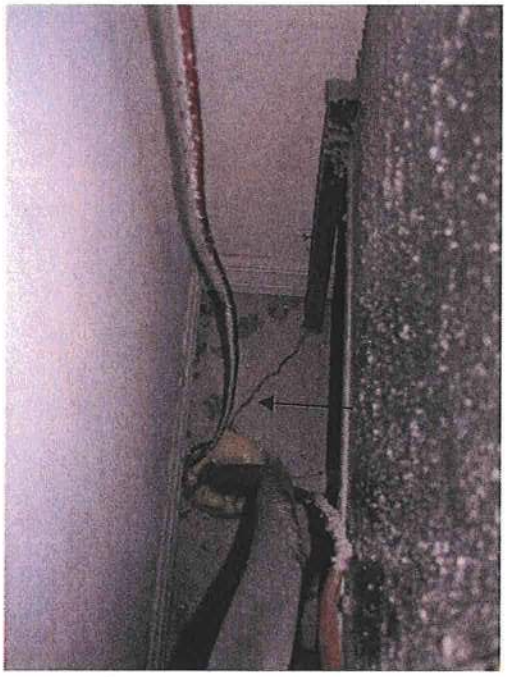
3. West side of the Killin residence.

4. East side of the Killin residence.

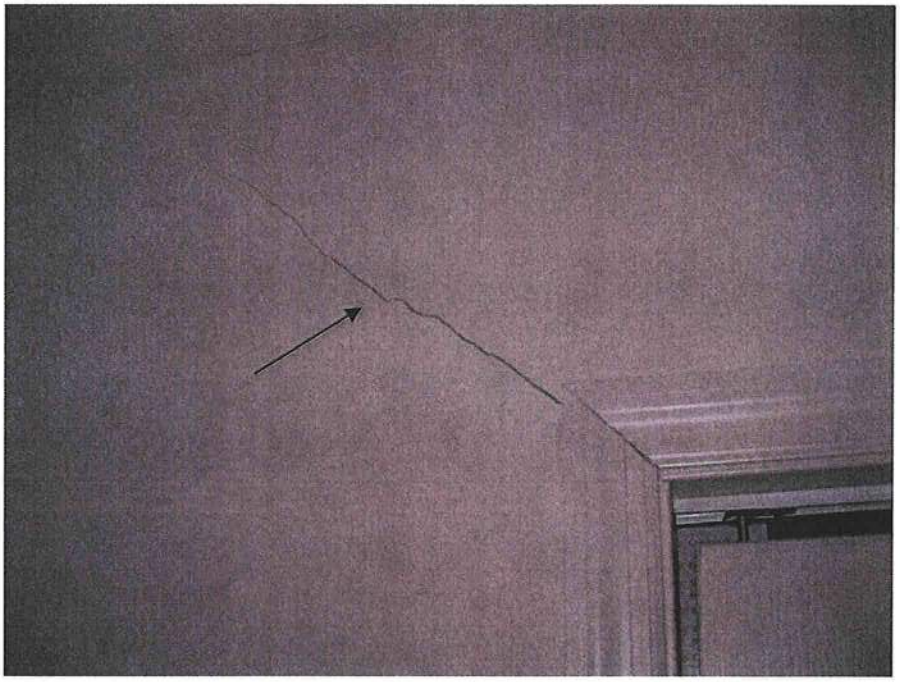


5. Slab cracks (hairline to 3/8 inch) in the west portion of the living room.

6. Slab cracks (hairline to 1/2 inch) with up to 1/4 inch vertical displacement in the north portion of the living room.



7. Slab crack (1/4 inch) beneath the air conditioner handler.



8. Wall crack (1/16 inch) in the west wall of the laundry room.

9. Hairline tile crack in the east bathroom.

10. Stair-step crack (1/8 inch) in the east exterior wall.

11. Shifted pavers north of the structure.

12. Driveway cracks with up to 1/8 inch vertical displacement.

13. Test pit one (TP-1), located along the north wall of the structure (shown on site plan map), revealed a total foundation embedment of at least 16 inches below grade.

14. Test pit two (TP-2), located along the south wall of the garage (shown on site plan map), revealed a total foundation embedment of approximately 16 inches below grade.

Permit #-
27467

GEOHAZARDS, INC.

Professional Geological, Geophysical and Geotechnical Engineering Services

P.O. Box 14566
Gainesville, Florida 32604

Anthony F. Randazzo, Ph. D.
Geologist
Florida PG# 0003
Georgia PG#1136

David Bloomquist, Ph. D.
Geotechnical Engineer
Florida PE# 37235

Attila A. Bodo, P.E.
Structural Engineer
Florida PE# 15834

Douglas L. Smith, Ph.D.
Geophysicist
Florida PG# 0018
Georgia PG# 1140

GROUT PROCEDURE CERTIFICATION REPORT

Killin Residence
172 NW Kelly Lake Court
Lake City, Florida

December 5, 2008

Geohazards, Inc. Project No. 2008385B

Florida Farm Bureau Insurance
Claim No. 441215

Geotechnical Engineer:
David Bloomquist, PhD, PE
Florida License No. 37235

Onsite Representative:
Tammy Henry

Background

Compaction grouting was performed at the Killin Residence, 172 NW Kelly Lake Ct, Lake City, Florida by C&N Foundation Technologies, Inc. The objective was to stabilize the subsurface, thereby reducing the potential for future damage to the structure and surrounding appurtenances.

Geohazards, Inc. representative Tammy Henry monitored the grouting operation, which began on November 24, 2008, and concluded on December 5, 2008.

The grout pipe installation involved water injection drilling down and into competent limestone. This method inserts the grout casing as the point is drilled. A total of 23 grout

points were drilled requiring 1,696 linear feet of injection pipe. A Geohazards, Inc. monitor was not present during the grout pipe installation; therefore Geohazards, Inc. cannot confirm any observations or conclusions regarding details of the drilling effort.

Grouting Process

A crew of C&N Foundation Technologies, Inc. performed the pressure grouting operation which began at 10:41 AM on November 24, 2008. The automatic grout pump was connected to the injection pipe via a flexible hose. Grout pressures were monitored with an in-line pressure gauge. Grout was typically injected using a pump and pull technique that injected grout while the pipe was extracted over five-foot intervals via a hydraulic jack.

Grout delivery setup with piston pump

Injection pipe with the flexible hose connected to a hydraulic ram unit

The grout pumping process continued until one of the following events occurred:

- The grout line pressure exceeded 250 - 400 psi. This signifies that proper compaction of the soil at that specific depth was achieved.
- House movement, detected either by surveying transit or level. Movement of the structure also requires that the grouting be stopped at that location.
- Ground movement, detected either by surveying transit or level. Any movement of the ground (heave) requires that the grouting cease.
- Grout flows from the base of the pipe. Grouting ceased if grout was observed flowing from the base of the pipe injection point. This occurs if grout channels up the outside of the pipe.

For any of the above conditions, the contractor would subsequently raise the pipe between 4 and 8 feet and continue pumping. Grouting was terminated when grouting depths reached 12 feet or less below the surface.

Level to monitor structure movement

Another situation that requires cessation of pumping occurs when the pipe operator notices that excessive force is required to raise the grout pipe. This could result in the pipe breaking at a fitting. In order to prevent this occurrence, the contractor would stop grouting, pull the pipe up until the pulling force was reduced, and then resume pumping. This reduction in force usually occurs after pulling the pipe up two to four feet.

Observations

The depth to competent limestone varied at the site, ranging from 62 to 92 feet. Injection point 16 accepted the largest volume of grout, at 20.8 cubic yards (cy). Other injection points that accepted relatively large quantities were points 21 (16.7 cy) and 22 (13.1 cy). Injection point 18 accepted less than one cubic yard. Slight structural lift (less than 1/8") was observed at most points. These occurrences are noted in the field logs.

Heavy backflow at points 5, 6, and 10 necessitated raising the pipes twelve feet or more at various depths. Tight casing at point 8 necessitated raising the pipe twelve feet. These occasions are noted in the grout logs

There were no other anomalous instances observed during the grouting procedure.

The grouting program was completed on December 5, 2008. The total grout delivered to the site was 170 cy. Trucks 5, 12, and 18 were returned to the batch plant with an unused load of 2.3, 1.5, and 1.8 cubic yards. Thus, 164.4 cy of grout was placed into the injection points. Complete grout logs are attached at the end of this report.

Conclusions

The figures cited in the table below represent our proposed estimate and the actual quantities used at the Killin residence grout remediation site. Based on the drill depths and the quantity of grout injected, at this time Geohazards, Inc. opines that the sinkhole conditions have been remediated. In addition, a review of the procedures employed by C&N Foundation Repair, Inc. indicates that the grouting operation was performed in accordance with the proposed Geohazards, Inc. program, technical specifications and foundation grouting industry practices.

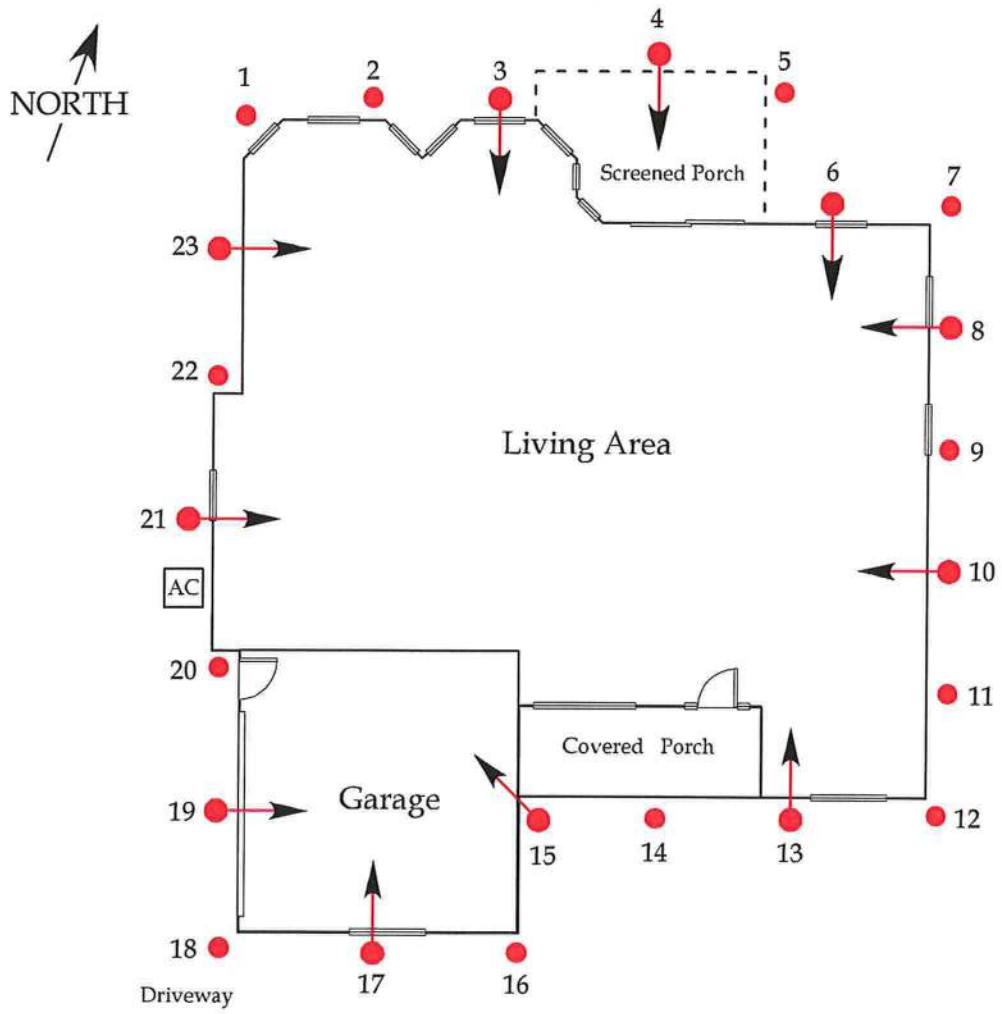
ITEM NUMBER	ITEM	ESTIMATE	FINAL QUANTITY
1	Linear feet of grout pipe	2,070 lf	1,696 lf
2	Cubic yards of grout pumped	200 – 300 cy	164.4 cy

Respectfully submitted,

12-17-08

David Bloomquist, PhD, PE
Geotechnical Engineer
Florida License No. 37235

Schematic of final grout locations at the Killin Residence, Lake City, Florida.



23 Injection Point Locations

Approximately 8′ - 10′ between points

Average insertion depth: 74 feet

Injection Point

Angled Injection Point

Scale in Feet

0 5 10 15

1"=15'

Final Grout Totals

Project: Killin Residence
Project Number: 2008385B

Station	Depth (feet)	Grout Injected (cubic yards)	Injection Angle (° from vertical)
1	78	10.8	0
2	75	10.7	0
3	62	1.8	16
4	64	1.3	12
5	92	11	0
6	72	8.6	12
7	66	1	0
8	78	9.7	15
9	86	1.2	0
10	90	4.9	18
11	66	7.3	0
12	74	3.7	0
13	90	7.2	14
14	62	7.2	0
15	68	4.6	13
16	84	20.8	0
17	65	1.4	12
18	66	0.9	0
19	64	2.5	14
20	78	12.9	0
21	76	16.7	16
22	72	13.1	0
23	68	5.1	19
Totals	1,696 ft	164.4 cy	
Average Insertion Depth = 74 ft			

Total Grout Delivered: 164.4 cy
Total Grout Returned: 5.6 cy
Total Grout Injected: 170 cy

ATTACHMENTS
Grout Logs

Project: Killin Residence 2008385	Date: November 24, 2008 Mon.	Sheet of 1/10
Contractor: C+N Foundation Tech.	Notes:	Instrument: Berger 80x
Foreman: Kevin	4' casings	Pump: Putzmeister T240

Station:	Time: Start	Time: Stop	Depth: From	Depth: To	Pressure	Strokes	Grout Placed	Slump	Observations (asked Kevin to brk 8' vs 12')
4	1041	1043	64	56	300+	21	0.3	5	T1 @ 1035, Start PT 4; HP, Brk 12
4	1048	1049	52	48	300+	8	0.1	5	HP, Brk 8
4	1053	1054	44	40	300+	9	0.1	5	HP, Brk 8
4	1059	1101	36	32	300+	23	0.4	5	HP, Brk 8
4	1106	1107	28	24	300+	11	0.2	5	HP, Brk 8
4	1111	1112	20	16	300+	5	0.1	5	HP, Brk 8
4	1116	1116	12	10	300+	3 (8)	0 / 1.3	5	HP, ~~Brk 8~~ Pull + end PT 4
5	1130	1132	90	8868	300+	37	0.6	5	Start PT 5, HP, Brk 8
5	1136	1137	84	7880	300+	7	0.1	5	HP, Brk 8
5	1140	1142	76	7072	300+	30	0.5	5	HP, Brk 8
5	1144	1149	68	6264	250+	111	1.8	5	HP, Brk 8, BF Brk 4
5	1155	1158	60	5458	250+	54	0.8	5	HP, Brk 8, BF
5	1202	1220	52	5052	250+	318 (349)	4.9 / 8.7	5	T1 empty, Flush, ~~Brk 8~~
						629	10/10cy		0 cy Returned, left @ 1226
5	1309	1312	50	48	200+	56	0.9	5	T2 @ 1303, HP, Brk 8
5	1317	1317	44	40	295+	10	0.2	5	HP, Brk 8
5	1322	1325	36	32	250+	54	0.9	5	HP, Brk 8, BF
5	1331	1332	28	24	~~300+~~	6	0.1	5	HP, Brk 8
5	1336	1337	20	16	275+	7	0.1	5	GTS, Brk 8
5	1340	1340	12	10	275+	7 (140)	0.1 / 8.3	5	GTS, SL, Pull + end PT 5 (asked to call. next
6	1349	1357	72		200	169	2.7		T2 empty, Flush Brk 8
						309	5/5cy		0 cy Returned, left @ 1410
									plant closing @ 3, needed to be done prior
									- end day -

PT 4 = 1.3

PT 5 = 11 cy

Project: Killin Residence 2008385	Date: Tue. NOV. 25, 08	Sheet of 2/10
Contractor: C+N Foundation Foreman: Jose	Notes:	Instrument: Borger 20x Pump: Putzmeister TK40

Station:	Time: Start	Time: Stop	Depth: From	Depth: To	Pressure	Strokes	Grout Placed	Slump	Observations
6	1127	1129	64	60	200+	18		5	T3 @1100, HP Brk8
6	1135	1140	56	52	250+	86			HP Brk8
6	1146	1149	48	44	275+	42			HP Brk8
6	1155	1203	40	36	250+	154			HP Brk8, BF Brk4
6	1211	1214	28	24	295+	61			HP Brk8
6	1219	1220	20	18	275	12			SL Brk4
6	1221	1221	16	12	250	1	5.9		GTS Pull+end PT6
8	1240	1246	78	74	250	63			~~Brk5~~, TC; Brk8; BF Brk4
8	1249	1252	70	66	250	41		↓	HP, Brk8
8	1214	1325	62	58	250	158	4.1	5	T3 empty, Flush (Brk12 HP)
						636	10/10cy		8 cy Ret. T3 left @1330
8	1356	1358	50	46	~~250~~+	0			T4 @1350, HP Brk8
8	1411	1428	42	38	250	302	5/5cy		T4 empty
									8 cy Ret, left @1435
									– end day –

PT6: 8, 6

Project: Killin Residence 2008385	Date: Wed. Nov. 26, 2008	Sheet of 3/10
Contractor: C+N Foundation Tech.	Notes:	Instrument: Berger 20X
Foreman: Jose		Pump: Putzmeister TK40

Station:	Time: Start	Time: Stop	Depth: From	Depth: To	Pressure	Strokes	Grout Placed	Slump	Observations	
8	0838	0840	34	30	250+	36		5	TS @ 0812, Cont PT8; HP, Brk 8	
8	0844	0844	26	22	250	2		5	PL; Brk 8	PT8
8	0847	0847	18	12	250	2	40 / 0.6	5	PL, GTS, Pull+end PT8	9
7	0902	0904	66	62	300+	16		5	Start PT6; HP, Brk 8	
7	0908	0908	58	54	300+	8		5	HP, Brk 8	
7	0912	0913	50	46	300+	5		5	HP, Brk 8	PT7:
7	0915	0916	42	38	300+	7		5	HP, Brk 8	1.
7	0920	0920	34	30	300+	6		5	HP, Brk 8	
7	0925	0926	26	22	300+	15		5	HP, Brk 8	
7	0931	0931	18	14	250	6	63 / 1.0	5	HP; Brk 8 (BF)	
10	0951	0952	90	86	275+	24		5	6TS, Pull+end PT7	
10	0956	0957	82	78	300+	9		5	Start PT10; HP, Brk 8	125
10	1000	1002	74	70	300+	10		5	HP, Brk 8	
10	1005	1006	66	62	300+	12		5	HP, Brk 8	
10	1010	1012	58	54	300+	14		5	HP, Brk 8	
10	1015	1018	50	46	250+	19		5	HP, Brk 8 (BF) Brk 4	PT10
10	1030	1033	38 42	34	250+	55		5	HP, Brk 8 (BF)	4.0
10	1037	1039	30	26	275+	26		5	HP, Brk 8 (BF)	
10	1043	1044	22	18	275+	16		5	HP, Brk (BF)	
10	1047	1047	14	12	300	2	310 / 4.9	5	6TS, Pull+end PT10	400
9	1059	1101	86	82	275+	11 17		5	HP, Brk 8	
9	1105	1106	78	74	300+	3 11		5	HP, Brk 8	
9	1111	1113	70	66	300+	3 6		5	HP, Brk 8	
9	1119	1120	62	58	300+	4 7		5	HP, Brk 8	PT9:
9	1124	1125	54	50	300+	3 5		5	HP, Brk 8	1.2
9	1130	1131	46	42	300+	4 14		5	HP, Brk 8	
9	1135	1136	38	34	300+	5 6		5	HP, Brk 8	
9	1142	1143	30	26	300+	3 4		5	HP, Brk 8	
9	1149	1150	22	16	300+	2 4	24 / 1.2	5	HP, Pull+end PT9	

÷63.2 487 7.7/10cy

2.3 cy Ret., TS left @ 1200

— End day —

Project: Killin Residence 2008385	Date: Mon December 1st, 2008	Sheet of 4/10
Contractor: C+N Foreman: Jose	Notes:	Instrument: CST Berger 20x Pump: Putzmeister TK40

Station:	Time: Start	Time: Stop	Depth: From	Depth: To	Pressure	Strokes	Grout Placed	Slump	Observations	
11	1135	1144	66	62	300+	165			TG @ 1130, Start PT#11; HP, Brk 8	
11	1146	1152	58	54	300+	147			HP, Brk 8, (BF)	
11	1156	1157	50	46	300+	27			HP, Brk 8	PT11 = 7.3
11	1200	1201	42	38	300+	12			HP, Brk 8	
11	1203	1205	34	30	300+	31			HP, Brk 8	
11	1209	1211	28	24	275-300	24			GTS, Brk 8	
11	1216	1217	20	16	300	14	480 / 7.2		GTS; Pull+end PT 11	
13	1235	1236	90	86	300+	25			Start PT#13, HP; Brk 8	
13	1238	1240	82	78	300+	8			HP, Brk 8	
13	1242	1243	74	70	300+	12			HP, Brk 8	
13	1248	1250	68	64	300+	64			HP, Brk 8 (BF)	
13	1257	1259	60	60	275	50	159 / 2.7		TG empty, Flush	
						579	10/10 cy		Ø cy Ret, TG left @ 1310	PT 13 = 7.2
13	1353	1354	60	56	300+	36			TG @ 1342, HP, Brk 8	
13	1358	1359	52	48	300+	4			HP, Brk 8	
13	1403	1409	44	40	250+	125			HP, Brk 8	
13	1415	1419	36	32	275+	73			HP, Brk 8 ((rock 4" diam))	
13	1425	1429	28	24	275+	36			HP, Brk 8	
13	1433	1433	20	16	300+	4	278 / 4.5		HP, Pull+end PT 13	
15	1447	1449	68	64	300+	23			Start, HP, Brk 8	
15	1452	1453	60	56	300+	11			HP, Brk 8	
15	1456	1457	52	48	300+	27			HP, Brk 8	
15	1501	1505	44	40	300+	60			HP, Brk 8	PT15 = 4.6
15	1510	1516	36	32	275	128			SL, Brk 8	
15	1520	1522	28	24	275	25			SL, Brk 8	
15	1529	1530	20	16	300	10	284 / 4.6		SL, Pull+end PT 15	
12	1546	1551	74	74	250	57	/ 0.9		TG empty, Flush	
						619	10/10 cy		Ø cy Ret; left @ 1600	
									— END DAY —	

Project: Killin Residence 2008385	Date: Tues. Dec. 2, 2008	Sheet of 5/10
Contractor: C+N Foreman: Jose	Notes: Sent truck back, Slump too high 8+ (supersaturated) New truck @ 0945.	Instrument: Berger 20X Pump: Putzmeister TK40

Station:	Time: Start	Time: Stop	Depth: From	Depth: To	Pressure	Strokes	Grout Placed	Slump	Observations
12	0957	1001	66	62	250+	38		5	T8 @ 0840, 0945, HP, Brk 8
12	1004	1005	58	54	300+	13		5	HP, Brk 8
12	1010	1012	50	46	300+	11		5	HP, Brk 8
12	1015	1018	42	38	300+	46		5	HP, Brk 8
12	1023	1024	34	30	300+	15		5	HP, Brk 8
12	1033	1036	26	22	300	50		5	GL, Brk 8 (BF)
12	1041	1042	18	15	300	6	nl / 2.8	5	GTS, Pull + end PT12
14	1102	1106	62	58	300+	55		5	HP, Brk 8
14	1114	1119	54	50	300+	57		5	HP, Brk 8
14	1124	1135	46	42	275	228		5	GL, Brk 8
14	1142	1148	38	36	275	95	4.55 / 7.2	5	T8 empty, Flush HP Brk, HP Brk
						606	10/10cy		8 cy Returned, left @ 1200
16, 14	1256	1326	84	84	250	578	10/10cy	5	T9 @ 1230; T9 empty, Flush Brk 4
	~~1403~~	~~1407~~				~~88~~			8 cy Returned, left @ 1332
16	1403	1407	80	76	275+	88		5	T18 @ 1401, HP, Brk 8
16	1411	1425	72	68	250+	303		5	HP, Brk 8
16	1430	1431	64	60	300+	26		5	HP, Brk 8
16	1434	1436	56	52	300+	33		5	HP, Brk 8
16	1440	1443	48	44	300+	66			HP, Brk 8
16	1446	1450	40	40	275	80			T10 empty, Flush
						563	10/10cy		8 cy Returned, left @ 1458
									— end day —

PT12 = 3.7

PT14 = 7.2

Project: Killin Residence 2008385	Date: Wed. Dec. 3, 2008	Sheet of 6/10
Contractor: C+N Foreman: Jose	Notes:	Instrument: Berger 20X Pump: Putzmeister TK40

Station:	Time: Start	Time: Stop	Depth: From	Depth: To	Pressure	Strokes	Grout Placed	Slump	Observations
16	0844	0845	~~32~~ 40	28	300+	12		5	T11 @ 0835, cont PT16, HP, Brk 8
16	0849	0851	24	20	275+	33		5	HP, Brk 8
16	0855	0856	16	14	300	16	51 / 0.8	5	GL, Pull + end PT16
18	0920	0923	66	62	300+	15		5	PL, HP, Brk 8 (started PT18)
18	0926	0927	58	54	300+	7		5	HP, Brk 8
18	0931	0932	50	46	300+	6		5	HP, PL, Brk 8
18	0936	0936	42	38	300	2		5	PL, Brk 8
18	0941	0942	34	30	300+	15		5	HP, Brk 8
18	0945	0947	26	22	300+	10		5	HP, Brk 8
18	0956	0957	18	14	300	2	57 / 0.9	5	PL, Pull + end PT18
17	1010	1012	65	61	275+	31		5	HP, Brk 8 (started PT17)
17	1017	1017	57	53	300+	8		5	HP, Brk 8
17	1021	1021	49	45	300+	9		5	HP, Brk 8
17	1026	1027	41	37	300+	10		5	HP, Brk 8
17	1031	1032	33	29	300+	14		5	HP, Brk 8
17	1036	1037	25	21	300+	7		5	PL, HP, Brk 8
17	1041	1041	17	13	300	4	83 / 1.9	5	GL, PL, Pull + end PT17
20	1105	1107	78	74	250+	34		5	Start PT20, HP, Brk 8
20	1113	1121	70	66	275+	168		5	HP, Brk 8 4
20	1125	1136	~~66~~ 62	66		224	420 / 6.9	5	T11 empty, Flush
~~20~~			~~54~~			617	10 | 10cy		@ cy Returned, Dep't @ 1150
20	1312	1325	66	62	275-300	283			T12 @ 1305; GL, Brk 8
20	1331	1332	58	54	300+	21	203	5	HP, Brk 8
20	1337	1339	50	46	300+	10	311	5	HP, Brk 8
20	1343	1345	42	38	300+	18	329	5	HP, Brk 8
20	1352	1353	34	30	300+	8 9	337	5	HP, Brk 8
20	1359	1403	26	22	300+	8 11	345	5	HP, Brk 8
20	1410	1411	18	14	300+	4 7	359 / 60	5	HP, Pull + end PT20

see next →

PT16 20.

PT18 0.

PT17: 1.4

PT20 13.6

6" 352

Project: Killin Res. 2008385	Date: wed. Dec. 3, 08 Cont.	Sheet of 7/10
Contractor: CTN Foreman: Jose	Notes:	Instrument: Berger 20X Pump: Putzmeister TK40

Station:	Time: Start	Time: Stop	Depth: From	Depth: To	Pressure	Strokes	Grout Placed	Slump	Observations
19	1430	1433	64	60	300+	14		5	Cont T12, Start @ 19; HP Brk 8
19	1437	1439	56	52	300+	23		5	HP Brk 8
19	1442	1446	48	44	300+	33		5	HP Brk 8
19	1452	1453	40	36	300+	23		5	HP Brk 8 (BP)
19	1500	1502	32	28	300+	35		5	HP Brk 8
19	1510	1511	24	20	300+	13		5	HP; Brk 8
19	1518	1519	16	12	300+	5	/2.5	5	PL, HP, Pull to end of 19
						505	8.5/10cy		Truck returned w/ 1.5 cy.
					1 59.6				left @ 1534
					ave.	5 last full trucks			

↑ 2

Project: Killin Residence 2008385	Date: Thurs. Dec. 4, 2008	Sheet of 8/10
Contractor: C+N Foreman: Jose	Notes:	Instrument: CST Berger 20X Pump: Putzmeister TK 40

Station:	Time: Start	Time: Stop	Depth: From	Depth: To	Pressure	Strokes	Grout Placed	Slump	Observations	
21	0838	0850	76'	72	250+	280	3.4 cy	5	T13 @ 0815, Start PT 21; HP; Brk 8	210
21	0853	0906	68	64	250+	191	3.1 cy	5	HP, Brk 8	393
21	0909	0920	60	60	275	218	3.5 cy	5	T13 empty, Flush	587
						689	10/10 cy		Ø cy Returned, left @ 0936	
21	1025	1030	60	56	275+	80	1.3	5	T14 @ 1018, HP; BF Brk 8	72
21	1033	1039	52	48	300+	97	1.5	5	HP, Brk 8	166
21	1042	1051	44	41	250	142	2.1	5	SL, Brk 8	305
21	1054	1101	36	33	300	107	1.6	5	SL, Brk 8	412
21	1105	1106	28	25	250	15	0.2	5	SL, Brk 8	427
21	1111	1112	20	15	250	3	0	5	PL, Brk 8	430
21	1116	1116	12	12	300	2 446	0 / 6.7	5	GTS, Pull + end PT 21	431
1	1133	1143	78	78	250	218	/ 3.3	5	T14 empty, Flush	PT 1
						664	10/10 cy		Ø cy Ret, left @ 1153	16.
1	1239	1253	78	73	250+	270	4.3	5	T15 @ 1234; TC, Brk 8	
1	1257	1303	70	66	275	77	1.2	5	GL, Brk 8	
1	1307	1308	62	58	275	29	0.5	5	GL, Brk 8	into d
1	1313	1315	54	50	275	23	0.4	5	GL, Brk 8	
1	1317	1318	46	42	300+	13	0.2	5	HP, Brk 8	
1	1322	1323	38	34	300+	14	426 0.2	5	HP, Brk 8	PT 1:
1	1327	1328	30	26	300	32	0.5	5	GL, Brk 8	10.2
1	1333	1333	22	18	300+	9	0.2	5	GL, Brk 8	
1	1339	1339	14	10	300	2 469	0 / 7.5	5	PL, Pull + end PT 1	
2	1350	1400	75'	73	250	155	/ 2.5	5	Start PT 2; T15 empty, Flush	
						624	10/10 cy		Ø cy Ret; left @ 1409	
2	1506	1526	75'	71	275	401		5	T16 @ 1456, GL, Brk 8	402
2	1528	1529	67	63	300+	11		5	HP, Brk 8	413
2	1532	1533	59	55	300+	8		5	HP, Brk 8	421
2	1536	1538	51	47	300+	20		5	HP, Brk 8	441
2	1541	1543	43	39	300+	88		5	HP, Brk 8	4 6

See next Sheet →

Project: Killin Residence 2008385	Date: Thurs. Dec. 4, 08 Continued	Sheet of 9/10
Contractor: C+N Foreman: Jose	Notes:	Instrument: CST Berger 20X Pump: Putzmeister TK40

Station:	Time: Start	Time: Stop	Depth: From	Depth: To	Pressure	Strokes	Grout Placed	Slump	Observations	
2	1546	1548	35	29	300+	8		5	cont T16 cont PT 2; PL, HP, Brk 8	PT2: 10.-
2	1550	1552	27	22	300+	6		5	PL, HP, Brk 8	
2	1556	1557	19	14	300	2 (48)	8.2	5	PL, GTS, Pulldown PT 2	
3	1611	1614	62	58	275+	25		5	HP, Brk 8 (started PT 3)	510
3	1617	1618	54	50	300+	12		5	HP, Brk 8	523
3	1621	1623	46	42	300+	25		5	HP, Brk 8	548
3	1627	1629	38	34	300+	20		5	HP, Brk 8	568
3	1633	1635	30	25	300+	9		5	PL, HP, Brk 8	578
3	1639	1640	22	18	300+	5		5	PL, HP, I	583
3	1644	1647	14	12	300	10 (106)	1.8	5	SL, Pulldown PT 3	593
						590	10/10		Tk empty, Øcy Ret. flushed left @ 1700 - End Day -	PT3: 1.8

Project: Killin Residence 2008385	Date: Fri. Dec. 5, 2008	Sheet of 10/10
Contractor: C+N Foreman: JOSE	Notes:	Instrument: Berger 20x Pump: Putzmeister TK 40

Station:	Time: Start	Time: Stop	Depth: From	Depth: To	Pressure	Strokes	Grout Placed	Slump	Observations	
22	0818	0848	72	70	250	646	10/10cy	5	T17 @0800, start PT 22; Truck Empty @ PuRet, left @0858	
22	0910	0913	72	68	250	61		5	T18 @0908, GL, Brk 8	
22	0915	0917	64	60	275	20		5	GL, Brk 8	
22	0922	0923	56	52	275	20			GL, Brk 8	PT 22
22	0927	0929	48	44	300	24		5	SL, Brk 8	13.1
22	0932	0934	40	36	300	23		5	GL, Brk 8	
22	0939	0941	32	28	300	32		5	GL, Brk 8	
22	0946	0946	24	19	300	6		5	PL, Brk 8	
22	0951	0951	16	12	300	2 (30)	2:1	5	PL, Brk Pull + end PT 22	
23	1003	1005	68	64		35		5	Start PT 23; , Brk 8	220
23	1007	1017	60	56	250	167		5	SL, Brk 8	367
23	1021	1022	52	48	275	23 (41)		5	SL, Brk 8	408 PT 23
23	1026	1027	44	40	300	13 (14)		5	SL, Brk 8	422 5ft
23	1032	1033	36	34	300	46 (88)		5	SL, Brk 8	444
23	1038	1038	28	26	300	12 (12)		5	SL, Brk 8	456
23	1043	1044	20	18	300	10 (9)		5	SL,	465
23	1048	1048	12	10	300	3 (30)	1/2 5:1	5	PL, Pull + end PT 23	467 +54
						497	8.2/10cy		1.8 cy Rot., left @ 1100	4
					÷ 60.9	ave				
					last 9	trucks (Full trucks)				

WOOD DESTROYING ORGANISM

Notice of Inspection and/or Treatment

Wallace

2746

ASPEN
Pest Control, Inc.

LAKE CITY, FLORIDA

225 SW Louis Glen
property address

inspection date

2-3-09

treatment date - Full Treatment / Spot Treatment

Bifen XTS .06%
pesticide used

wood destroying organism treated

Aspen
PEST CONTROL, INC.

LAKE CITY, FLORIDA

HOME SERVICES

PEST – TERMITES – LAWNS

CALL 755-3611

P.O. Box 1795
Lake City, FL 32056

Permit #
27467

GEOHAZARDS, INC.

Professional Geological, Geophysical and Geotechnical Engineering Services

P.O. Box 14566
Gainesville, Florida 32604

Anthony F. Randazzo, Ph. D.
Geologist
Florida PG# 0003
Georgia PG#1136

David Bloomquist, Ph. D.
Geotechnical Engineer
Florida PE# 37235

Attila A. Bodo, P.E.
Structural Engineer
Florida PE# 15834

Douglas L. Smith, Ph.D.
Geophysicist
Florida PG# 0018
Georgia PG# 1140

GROUT PROCEDURE CERTIFICATION REPORT

Killin Residence
172 NW Kelly Lake Court
Lake City, Florida

December 5, 2008

Geohazards, Inc. Project No. 2008385B

Florida Farm Bureau Insurance
Claim No. 441215

Geotechnical Engineer:
David Bloomquist, PhD, PE
Florida License No. 37235

Onsite Representative:
Tammy Henry

Background

Compaction grouting was performed at the Killin Residence, 172 NW Kelly Lake Ct, Lake City, Florida by C&N Foundation Technologies, Inc. The objective was to stabilize the subsurface, thereby reducing the potential for future damage to the structure and surrounding appurtenances.

Geohazards, Inc. representative Tammy Henry monitored the grouting operation, which began on November 24, 2008, and concluded on December 5, 2008.

The grout pipe installation involved water injection drilling down and into competent limestone. This method inserts the grout casing as the point is drilled. A total of 23 grout

points were drilled requiring 1,696 linear feet of injection pipe. A Geohazards, Inc. monitor was not present during the grout pipe installation; therefore Geohazards, Inc. cannot confirm any observations or conclusions regarding details of the drilling effort.

Grouting Process

A crew of C&N Foundation Technologies, Inc. performed the pressure grouting operation which began at 10:41 AM on November 24, 2008. The automatic grout pump was connected to the injection pipe via a flexible hose. Grout pressures were monitored with an in-line pressure gauge. Grout was typically injected using a pump and pull technique that injected grout while the pipe was extracted over five-foot intervals via a hydraulic jack.

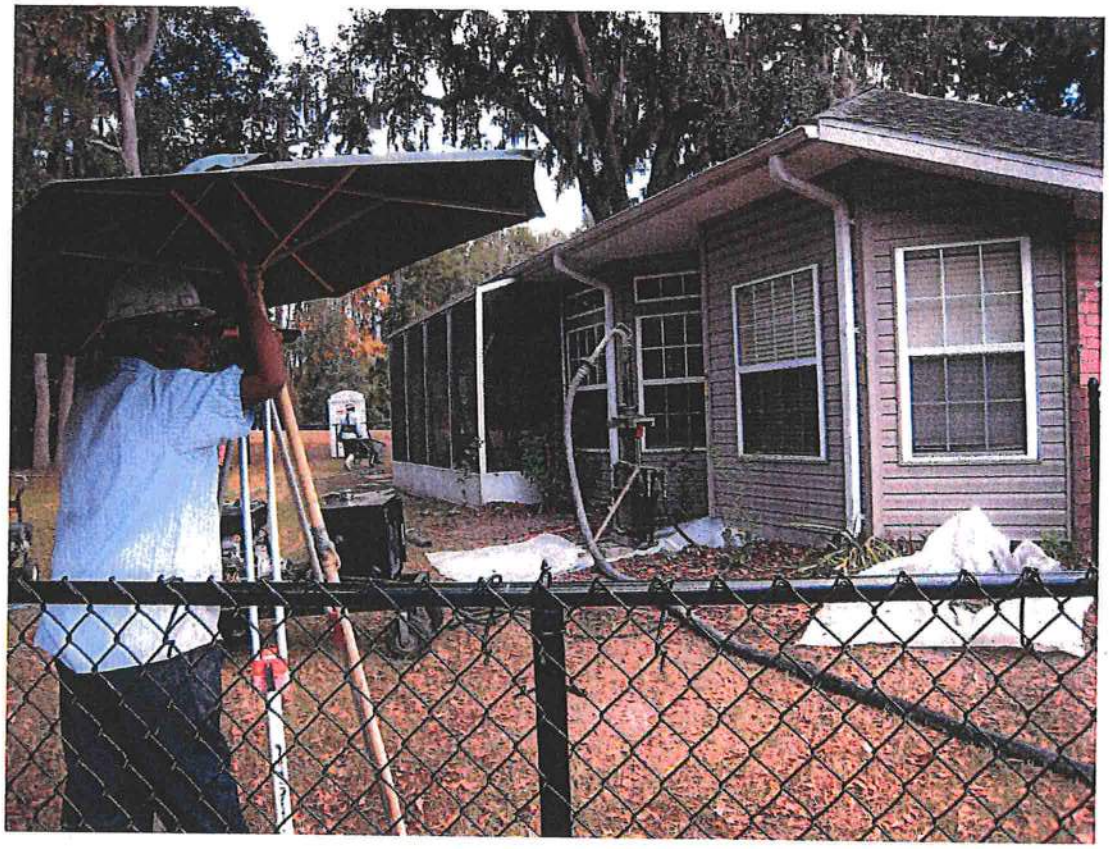
Grout delivery setup with piston pump

Injection pipe with the flexible hose connected to a hydraulic ram unit

The grout pumping process continued until one of the following events occurred:

- The grout line pressure exceeded 250 - 400 psi. This signifies that proper compaction of the soil at that specific depth was achieved.
- House movement, detected either by surveying transit or level. Movement of the structure also requires that the grouting be stopped at that location.
- Ground movement, detected either by surveying transit or level. Any movement of the ground (heave) requires that the grouting cease.
- Grout flows from the base of the pipe. Grouting ceased if grout was observed flowing from the base of the pipe injection point. This occurs if grout channels up the outside of the pipe.

For any of the above conditions, the contractor would subsequently raise the pipe between 4 and 8 feet and continue pumping. Grouting was terminated when grouting depths reached 12 feet or less below the surface.



Level to monitor structure movement

Another situation that requires cessation of pumping occurs when the pipe operator notices that excessive force is required to raise the grout pipe. This could result in the pipe breaking at a fitting. In order to prevent this occurrence, the contractor would stop grouting, pull the pipe up until the pulling force was reduced, and then resume pumping. This reduction in force usually occurs after pulling the pipe up two to four feet.

Observations

The depth to competent limestone varied at the site, ranging from 62 to 92 feet. Injection point 16 accepted the largest volume of grout, at 20.8 cubic yards (cy). Other injection points that accepted relatively large quantities were points 21 (16.7 cy) and 22 (13.1 cy). Injection point 18 accepted less than one cubic yard. Slight structural lift (less than 1/8") was observed at most points. These occurrences are noted in the field logs.

Heavy backflow at points 5, 6, and 10 necessitated raising the pipes twelve feet or more at various depths. Tight casing at point 8 necessitated raising the pipe twelve feet. These occasions are noted in the grout logs

There were no other anomalous instances observed during the grouting procedure.

The grouting program was completed on December 5, 2008. The total grout delivered to the site was 170 cy. Trucks 5, 12, and 18 were returned to the batch plant with an unused load of 2.3, 1.5, and 1.8 cubic yards. Thus, 164.4 cy of grout was placed into the injection points. Complete grout logs are attached at the end of this report.

Conclusions

The figures cited in the table below represent our proposed estimate and the actual quantities used at the Killin residence grout remediation site. Based on the drill depths and the quantity of grout injected, at this time Geohazards, Inc. opines that the sinkhole conditions have been remediated. In addition, a review of the procedures employed by C&N Foundation Repair, Inc. indicates that the grouting operation was performed in accordance with the proposed Geohazards, Inc. program, technical specifications and foundation grouting industry practices.

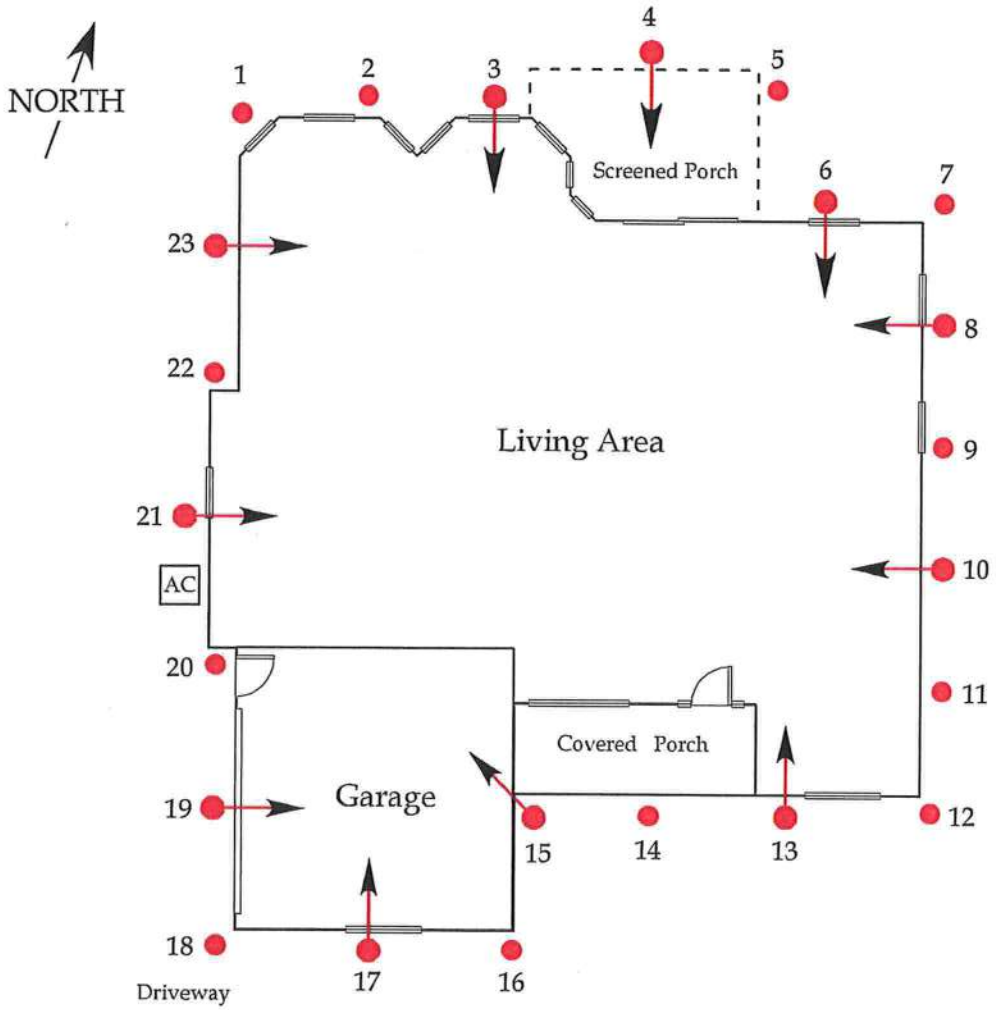
ITEM NUMBER	ITEM	ESTIMATE	FINAL QUANTITY
1	Linear feet of grout pipe	2,070 lf	1,696 lf
2	Cubic yards of grout pumped	200 – 300 cy	164.4 cy

Respectfully submitted,

12-17-08

David Bloomquist, PhD, PE
Geotechnical Engineer
Florida License No. 37235

Schematic of final grout locations at the Killin Residence, Lake City, Florida.



23 Injection Point Locations

Approximately 8′ - 10′ between points

Average insertion depth: 74 feet

Injection Point

Angled Injection Point

Scale in Feet

0 5 10 15

1"=15'

Final Grout Totals
Project: Killin Residence
Project Number: 2008385B

Station	Depth (feet)	Grout Injected (cubic yards)	Injection Angle (° from vertical)
1	78	10.8	0
2	75	10.7	0
3	62	1.8	16
4	64	1.3	12
5	92	11	0
6	72	8.6	12
7	66	1	0
8	78	9.7	15
9	86	1.2	0
10	90	4.9	18
11	66	7.3	0
12	74	3.7	0
13	90	7.2	14
14	62	7.2	0
15	68	4.6	13
16	84	20.8	0
17	65	1.4	12
18	66	0.9	0
19	64	2.5	14
20	78	12.9	0
21	76	16.7	16
22	72	13.1	0
23	68	5.1	19
Totals	1,696 ft	164.4 cy	
Average Insertion Depth = 74 ft			

Total Grout Delivered: 164.4 cy
Total Grout Returned: 5.6 cy
Total Grout Injected: 170 cy

ATTACHMENTS

Grout Logs

Project: Killin Residence 2008385	Date: November 24, 2008 Mon.	Sheet of 1/10
Contractor: C+N Foundation Tech.	Notes: 4' casings	Instrument: Berger 90x
Foreman: Kevin		Pump: Putzmeister T240

Station:	Time: Start	Time: Stop	Depth: From	Depth: To	Pressure	Strokes	Grout Placed	Slump	Observations (casked to brk 8/ vs lar)
4	1041	1043	64	56	300+	21	6.3	5	T1 @ 1035, Start PT 4; HP, Brk 12
4	1048	1049	52	48	300+	8	0.1	5	HP, Brk 8
4	1053	1054	44	40	300+	9	0.1	5	HP, Brk 8
4	1059	1101	36	32	300+	23	0.1	5	HP, Brk 8
4	1106	1107	28	24	300+	11	0.2	5	HP, Brk 8
4	1111	1112	20	16	300+	5	0.1	5	HP, Brk 8
4	1116	1116	12	10	300+	3 (8)	0 / 1.3	5	HP, ~~Brk 8~~ Pull + end PT 4
5	1130	1132	90	8868	300+	37	0.6	5	Start PT 5, HP, Brk 8
5	1136	1137	88	7880	300+	7	0.1	5	HP, Brk 8
5	1140	1142	76	7072	300+	30	0.5	5	HP, Brk 8
5	1144	1149	68	6264	250+	111	1.8	5	HP, Brk 8, BF Brk 4
5	1155	1158	60	5458	250+	54	0.8	5	HP, Brk 8, BF
5	1202	1220	52	5052	250+	318 (540)	4.9 / 8.7	5	T1 empty, Flush, ~~Brk 8~~
						689	10/10cy		0 cy Returned, left @ 1226
5	1309	1312	98	48	200+	56	0.9	5	T2 @ 1303, HP, Brk 8
5	1317	1317	44	40	295+	10	0.2	5	HP, Brk 8
5	1322	1325	36	32	250+	54	0.9	5	HP, Brk 8, BF
5	1331	1332	28	24	~~300+~~	6	0.1	5	HP, Brk 8
5	1336	1337	20	16	275+	7	0.1	5	GTS, Brk 8
5	1340	1340	12	10	275+	7 (140)	0.1 / 8.3	5	GTS, SL, Pull + end PT 5 (casked to calf. next
6	1349	1357	72		200	169	2.7		T2 empty, Flush Brk 8
						309	5/5cy		0 cy Returned, left @ 1410
									Plant closing @ 3, needed to be done prior
									- end day -

PT 4 = 1.3

PT 5 = 11 cy

Project: Killin Residence 2008385	Date: Tue. NOV. 25, 08	Sheet of 2/10
Contractor: C+N Foundation Foreman: Jose	Notes:	Instrument: Borger 20x Pump: Putzmeister TK40

Station:	Time: Start	Time: Stop	Depth: From	Depth: To	Pressure	Strokes	Grout Placed	Slump	Observations
6	1127	1129	64	60	200+	18		5	T3 @1100, HP Brk8
6	1135	1140	56	52	250+	86			HP Brk8
6	1146	1149	48	44	275+	42			HP Brk8
6	1155	1203	40	36	250+	154			HP Brk8, BF Brk4
6	1211	1214	28	24	295+	61			HP Brk8
6	1219	1220	20	18	275	12			SL Brk4
6	1221	1221	16	12	250	1	/5.9		GTS Pull+end PT6
8	1240	1246	78	74	250	63			~~BRK5~~, TC; Brk8; BF Brk4
8	1249	1252	70	66	250	41		↓	HP, Brk8
8	1214	1325	62	58	250	158	/4.1	5	T3 empty, Flush (Brk12 HP)
						636	10/10cy		8 cy Ret. T3 left @1330
8	1356	1358	50	46	~~250+~~	0			T4 @1350, HP Brk8
8	1411	1428	42	38	250	302	5/5cy		T4 empty
									8 cy Ret, left @1435
									- end day -

PT6= 8, 6

Project: Killin Residence 20083851	Date: Wed. Nov. 26, 2008	Sheet of 3/10
Contractor: C+N Foundations Tech.	Notes:	Instrument: Berger 20X
Foreman: Jose		Pump: Putzmeister TK40

Station:	Time: Start	Time: Stop	Depth: From	Depth: To	Pressure	Strokes	Grout Placed	Slump	Observations	
6	0838	0840	34	30	250+	36		5	TS @ 0812, Cont PT8; HP, Brk 8	
8	0844	0844	26	22	250	2		5	PL; Brk 8	PT8
8	0847	0847	18	12	250	2	40 / 0.6	5	PL; GTS, Pull+end PT8	9
7	0902	0904	66	62	300+	16		5	Start PT6; HP, Brk 8	
7	0908	0908	58	54	300+	8		5	HP, Brk 8	
7	0912	0913	50	46	300+	5		5	HP, Brk 8	
7	0915	0916	42	38	300+	7		5	HP, Brk 8	PT7:
7	0920	0920	34	30	300+	6		5	HP, Brk 8	1.
7	0925	0926	26	22	300+	15		5	HP, Brk 8	
7	0931	0931	18	14	250	6	6 / 1.0	5	HP; Brk 8 (BF)	
10	0951	0952	90	86	275+	24		5	GTS, Pull+end PT7	
10	0956	0957	82	78	300+	9		5	Start PT10; HP, Brk 8	125
10	1000	1002	74	70	300+	10		5	HP; Brk 8	
10	1005	1006	66	62	300+	12		5	HP, Brk 8	
10	1010	1012	58	54	300+	14		5	HP, Brk 8	
10	1015	1018	50	46	250+	19		5	HP, Brk 8 (BF) Brk 4	PT10
10	1030	1033	38,42	34	250+	55		5	HP; Brk 8 (BF)	4.0
10	1037	1039	30	26	275+	26		5	HP; Brk 8 (BF)	
10	1043	1044	22	18	275+	16		5	HP; Brk (BF)	
10	1047	1047	14	12	300	2	310 / 4.9	5	GTS, Pull+end PT10	
9	1059	1101	86	82	275+	17		5	HP, Brk 8	400
9	1105	1106	78	74	300+	11		5	HP, Brk 8	
9	1111	1113	70	66	300+	6		5	HP; Brk 8	
9	1119	1120	62	58	300+	7		5	HP, Brk 8	
9	1124	1125	54	50	300+	5		5	HP, Brk 8	PT9:
9	1130	1131	46	42	300+	4		5	HP, Brk 8	1.0
9	1135	1136	38	34	300+	6		5	HP, Brk 8	
9	1142	1143	30	26	300+	4		5	HP, Brk 8	
9	1149	1150	22	16	300+	4	74 / 1.2	5	HP, Pull+end PT9	

63.2 487 7.7/10cy

2.3 cy Ret., TS left @ 1200

— End day —

Project: Killin Residence 2008385	Date: Mon December 1st, 2008	Sheet of 4/10
Contractor: C+N Foreman: Jose	Notes:	Instrument: CST Berger 20x Pump: Putzmeister TK40

Station:	Time: Start	Time: Stop	Depth: From	Depth: To	Pressure	Strokes	Grout Placed	Slump	Observations	
11	1135	1144	66	62	300+	165			TG @ 1130, Start PT#11; HP, Brk 8	
11	1146	1152	58	54	300+	147			HP, Brk 8, (BF)	
11	1156	1157	50	46	300+	27			HP, Brk 8	PT11 = 7.3
11	1200	1201	42	38	300+	12			HP, Brk 8	
11	1203	1205	34	30	300+	31			HP, Brk 8	
11	1208	1211	28	24	275-300	24			GTS, Brk 8	
11	1216	1217	20	16	300	14	480 / 7.2		GTS, Pull + end PT 11	
13	1235	1236	90	86	300+	25			Start PT#13, HP, Brk 8	
13	1238	1240	82	78	300+	8			HP, Brk 8	
13	1242	1243	74	70	300+	12			HP, Brk 8	
13	1248	1250	68	64	300+	64			HP, Brk 8 (BF)	
13	1257	1259	60	60	275	50	159 / 2.7		TG empty, Flush	
						579	10/10 cy		Ø cy Ret, TG left @ 1310	PT 13 = 7.2
13	1353	1354	60	56	300+	36			TG @ 1342, HP, Brk 8	
13	1358	1359	52	48	300+	4			HP, Brk 8	
13	1403	1409	44	40	250+	125			HP, Brk 8	
13	1415	1419	36	32	275+	73			HP, Brk 8 ((rock 4" diam))	
13	1425	1429	28	24	275+	36			HP, Brk 8	
13	1433	1433	20	16	300+	4	278 / 4.5		HP, Pull + end PT 13	
15	1447	1449	68	64	300+	23			Start, HP, Brk 8	
15	1452	1453	60	56	300+	11			HP, Brk 8	
15	1456	1457	52	48	300+	27			HP, Brk 8	
15	1501	1505	44	40	300+	60			HP, Brk 8	PT 15 = 4.6
15	1510	1516	36	32	275	128			SL, Brk 8	
15	1520	1522	28	24	275	25			SL, Brk 8	
15	1529	1530	20	16	300	10	284 / 4.6		SL, Pull + end PT 15	
12	1546	1551	74	74	250	57	/ 0.9		TG empty, Flush	
						619	10/10 cy		Ø cy Ret; left @ 1600	
									— END DAY —	

Project: Killin Residence 2008385	Date: Tues. Dec. 2, 2008	Sheet of 5/10
Contractor: C+N Foreman: Jose	Notes: Sent truck back, Slump too high 8+ (supersaturated) New truck @ 0945.	Instrument: Berger 20X Pump: Putzmeister TK40

Station:	Time: Start	Time: Stop	Depth: From	Depth: To	Pressure	Strokes	Grout Placed	Slump	Observations
12	0957	1001	66	62	250+	~~38~~		5	T8 @ ~~0840~~, 0945, HP, Brk 8	
12	1004	1005	58	54	300+	13		5	HP, Brk 8	
12	1010	1012	50	46	300+	11		5	HP, Brk 8	
12	1015	1018	42	38	300+	46		5	HP, Brk 8	PT12= 3.7
12	1023	1024	34	30	300+	15		5	HP, Brk 8	
12	1033	1036	26	22	300	50		5	GL, Brk 8 (BF)	
12	1041	1042	18	15	300	6	~~DI~~ 2.8	5	GTS, Pull + end PT12	
14	1102	1106	62	58	300+	55		5	HP, Brk 8	
14	1114	1119	54	50	300+	57		5	HP, Brk 8	
14	1124	1135	46	42	275	228		5	GL, Brk 8	PT14= 7.2
14	1142	1148	38	36	275	95	~~43.5~~ 7.2	5	T8 empty, Flush HP Brk, HP Brk	
						~~606~~	10/10cy		Ø cy Returned, Left @ 1200	
~~16 14~~	1256	1326	84	84	250	578	10/10cy	5	T9 @ 1230; T9 empty, Flush Brk 4	
	~~1403~~	~~1407~~				~~88~~			Ø cy Returned, Left @ 1332	
16	1403	1407	80	76	275+	88		5	T18 @ 1401, HP, Brk 8	
16	1411	1425	72	68	250+	303		5	HP, Brk 8	
16	1430	1431	64	60	300+	26		5	HP, Brk 8	
16	1434	1436	56	52	300+	33		5	HP, Brk 8	
16	1440	1443	48	44	300+	66			HP, Brk 8	
16	1446	1450	40	40	275	80			T10 empty, Flush	
						563	10/10cy		Ø cy Returned, Left @ 1458	
									— end day —	

Project: Killin Residence 2008385	Date: Wed. Dec. 3, 2008	Sheet of 6/10
Contractor: C+N Foreman: Jose	Notes:	Instrument: Berger 20X Pump: Putzmeister TK40

Station:	Time: Start	Time: Stop	Depth: From	Depth: To	Pressure	Strokes	Grout Placed	Slump	Observations
16	0814	0845	~~32~~ 40	28	300+	12		5	T11@0835, cont PT16, HP, Brk8
16	0849	0851	24	20	275+	33		5	HP, Brk 8
16	0855	0856	16	14	300	16	51 / 0.8	5	GL, Pull+end PT16
18	0920	0923	66	62	300+	15		5	PL, HP, Brk 8 (started PT18)
18	0926	0927	58	54	300+	7		5	HP, Brk 8
18	0931	0932	50	46	300+	6		5	HP, PL, Brk 8
18	0936	0936	42	38	300	2		5	PL, Brk 8
18	0941	0942	34	30	300+	15		5	HP, Brk 8
18	0945	0947	26	22	300+	10		5	HP, Brk 8
18	0956	0957	18	18	300	2	57 / 0.9	5	PL, Pull+end PT18
17	1010	1012	65	61	275+	31		5	HP, Brk 8 (started PT17)
17	1017	1017	57	53	300+	8		5	HP, Brk 8
17	1021	1021	49	45	300+	9		5	HP, Brk 8
17	1026	1027	41	37	300+	10		5	HP, Brk 8
17	1031	1032	33	29	300+	14		5	HP, Brk 8
17	1036	1037	25	21	300+	7		5	PL, HP, Brk 8
17	1041	1041	17	13	300	4	83 / 1.4	5	GL, PB Pull+end PT17
20	1105	1107	78	74	250+	34		5	Start PT20, HP, Brk 8
20	1113	1121	70	66	275+	168		5	HP, Brk 8 4
20	1125	1136	~~66~~ 62	66		224	426 / 6.9	5	T11 empty, Flush
~~20~~			~~54~~			617	10/10cy		@cy Returned, Left@1150
20	1312	1325	66	62	275-300	283			T12@1305; GL, Brk 8
20	1331	1332	58	54	300+	21	203	5	HP, Brk 8
20	1337	1339	50	46	300+	10	211	5	HP, Brk 8
20	1343	1345	42	38	300+	18	229	5	HP, Brk 8
20	1352	1353	34	30	300+	8 9	237	5	HP, Brk 8
20	1359	1403	26	22	300+	8 11	345	5	HP, Brk 8
20	1410	1411	18	14	300+	4 7	359 / 6.0	5	HP, Pull+end PT20

see next →

PT16 20.

PT18 0.

PT17 1.4

PT20 13.6

Project: Killin Res. 2008385	Date: wed. Dec. 3, 08 Cont.	Sheet of 7/10
Contractor: C+N Foreman: Jose	Notes:	Instrument: Berger 20X Pump: Putzmeister TK40

Station:	Time: Start	Time: Stop	Depth: From	Depth: To	Pressure	Strokes	Grout Placed	Slump	Observations
19	1430	1433	64	60	300+	14		5	Cont T12, Start PT19; HP Brk 8
19	1437	1439	56	52	300+	23		5	HP Brk 8
19	1442	1446	48	44	300+	33		5	HP Brk 8
19	1452	1453	40	36	300+	23		5	HP Brk 8 (BP)
19	1500	1502	32	28	300+	35		5	HP Brk 8
19	1510	1511	24	20	300+	13		5	HP; Brk 8
19	1518	1519	16	12	300+	5	2.5	5	DL, HP, Pull+end of 19
						505	8.5/10cy		Truck returned w/ 1.5 cy.
					1596				left @ 1534
					ave.	5 last full trucks			

↑ 2

Project: Killin Residence 2008385	Date: Thurs. Dec. 4, 2008	Sheet of 8/10
Contractor: C+N Foreman: Jose	Notes:	Instrument: CST Berger 20X Pump: Putzmeister TK 40

Station:	Time: Start	Time: Stop	Depth: From	Depth: To	Pressure	Strokes	Grout Placed	Slump	Observations	
21	0838	0850	76'	72	250+	210	3.4cy	5	T13 @ 0815, start PT 21; HP; Brk 8	210
21	0853	0906	68	64	250+	191	3.1 cy	5	HP, Brk 8	343
21	0909	0920	60	60	275	218	3.5 cy	5	T13 empty, Flush	587
						619	10/10cy		0cy Returned, left @ 0936	
21	1025	1030	60	56	275+	80	1.3	5	T14 @ 1018, HP; 8F Brk 8	72
21	1033	1039	52	48	300+	97	1.5	5	HP, Brk 8	166
21	1042	1051	44	41	250	142	2.1	5	SL, Brk 8	305
21	1054	1101	36	33	300	107	1.6	5	SL, Brk 8	412
21	1105	1106	28	25	250	15	0.2	5	SL, Brk 8	427
21	1111	1112	20	15	250	3	0	5	PL, Brk 8	430
21	1116	1116	12	12	300	2 446	0 / 6.7	5	GTS, Pull + end PT 21	431
1	1133	1143	78	78	250	218	/ 3.3	5	T14 empty; Flush	PT1 16.
						664	10/10cy		0cy Ret; left @ 1153	
1	1239	1253	78	73	250+	270	4.3	5	T15 @ 1234; TC, Brk 8	
1	1257	1303	70	66	275	77	1.2	5	GL, Brk 8	
1	1307	1308	62	58	275	29	0.5	5	GL, Brk 8	Invd
1	1313	1315	54	50	275	23	0.4	5	GL, Brk 8	
1	1317	1318	46	42	300+	13	0.2	5	HP, Brk 8	
1	1322	1323	38	34	300+	14	426 0.2	5	HP, Brk 8	PT1:
1	1327	1328	30	26	300	32	0.5	5	GL, Brk 8	10.2
1	1333	1333	22	18	300+	9	0.2	5	GL, Brk 8	
1	1339	1339	14	10	300	2 469	0 / 7.5	5	PL, Pull end PT 1	
2	1350	1400	75'	73	250	155	/ 2.5	5	Start PT 2; T15 empty; Flush	
						624	10/10cy		8cy Ret; left @ 1409	
2	1506	1526	75'	71	275	401		5	T16 @ 1456, GL, Brk 8	402
2	1528	1529	67	63	300+	11		5	HP, Brk 8	413
2	1532	1533	59	55	300+	8		5	HP, Brk 8	421
2	1536	1538	51	47	300+	20		5	HP, Brk 8	441
2	1541	1543	43	39	300+	88		5	HP, Brk 8	4/6

See next Sheet →

Project: Killin Residence 2008385

Date: Thurs. Dec. 4, 08 Continued

Sheet of 9/10

Contractor: C+N

Foreman: Jose

Notes:

Instrument: CST Berger 28X

Pump: Putzmeister TK40

Station:	Time: Start	Time: Stop	Depth: From	Depth: To	Pressure	Strokes	Grout Placed	Slump	Observations
2	1546	1548	35	29	300+	8		5	cont T16 cont PT 2; PL, HP, BrK 8
2	1550	1552	27	22	300+	6		5	PL, HP, BrK 8
2	1556	1557	19	14	300	2 (484)	8.2	5	PL, GTS, Pulltend PT 2
3	1611	1614	62	58	275+	25		5	HP, BrK 8 (started PT 3)
3	1617	1618	54	50	300+	12		5	HP, BrK 8
3	1621	1623	46	42	300+	25		5	HP, BrK 8
3	1627	1629	38	34	300+	20		5	HP, BrK 8
3	1633	1635	30	25	300+	9		5	PL, HP, BrK 8
3	1639	1640	22	18	300+	5		5	PL, HP,
3	1644	1647	14	12	300	10 (106)	1.8	5	SL, Pulltend PT 3
						590	10/10		T16 empty, BCy Ret. flushed left @ 1700 — End Day —

PT2: 10.5 / 510 / 523 / 548 / 568 / 578 / 583 / 593

PT3: 1.8

Project: Killin Residence 2008385	Date: Fri. Dec. 5, 2008	Sheet of 10/10
Contractor: C+N Foreman: JOSE	Notes:	Instrument: Berger 20x Pump: Putzmeister TK 40

Station:	Time: Start	Time: Stop	Depth: From	Depth: To	Pressure	Strokes	Grout Placed	Slump	Observations	
22	0818	0848	72	70	250	646	10/10cy	5	T17 @0800, start PT 22; Truck Empty @ Pump Rest, left @0858	
	~~0840~~	D								
22	0910	0913	72	68	250	61		5	T18 @0908, GL, Brk 8	
22	0915	0917	64	60	275	20		5	GL, Brk 8	
22	0922	0923	56	52	275	20			GL, Brk 8	
22	0927	0929	48	44	300	24		5	SL, Brk 8	PT 22 13.1
22	0932	0934	40	36	300	23		5	GL, Brk 8	
22	0939	0941	32	28	300	32		5	GL, Brk 8	
22	0946	0946	24	19	300	6		5	PL, Brk 8	
22	0951	0951	16	12	300	2 (135)	3:1	5	PL, ~~Brk~~ Pull end PT 22	
23	1003	1005	68	64		35		5	~~Start~~ PT 23; , Brk 8	220
23	1007	1017	60	56	250	167		5	SL, Brk 8	367
23	1021	1022	52	48	275	23 (41)		5	SL, Brk 8	408 PT 23
23	1026	1027	44	40	300	13 (14)		5	SL, Brk 8	422 5.1
23	1032	1033	36	34	300	46 (88)		5	SL, Brk 8	468
23	1038	1038	28	26	300	12 (12)		5	SL, Brk 8	456
23	1043	1044	20	18	300	10 (9)		5	SL,	465
23	1048	1048	12	10	300	3 (309) (2)	5:1	5	PL, Pull + end PT 23	467 +54
						497	8.2/10cy		1.8 cy Rot., left @ 1100	4
					÷ 60.9	ave				
					last-9	trucks				
						(Full trucks)				