HERNANDO COUNTY
BUILDING PERMIT APPLICATION

FBC 2004

Want a Deficiency Report Faxed to you?
Please Provide Your FAX#: 352-588-0911
Permitting Service FAX #: ______

NOTICE:
No structure, building, or improvement can encroach or be constructed within an easement.

Permit Application No. 1227886 --

Key #: 00427504

Date: 9/29/2008

Describe work to be done: FOUNDATION STABILIZATION AND/ OR REPAIR

Valuation of work to be done: $ 115,650.00

Type of construction: ______ Frame: ______ CBS: ______ Other: X

Legal description: Lot : 25 Block : 1421 Subdivision: SpringHill Unit : 21

Address of job site: No.: 2441 Street: DUSTIN CIRCLE City: SPRING HILL, Hernando County

Directions to job site: Start out going EAST on S BROAD ST, Turn LEFT onto N MAIN ST, Turn LEFT on JEFFERSON St. Stay STRAIGHT to go onto CORTEZ BLVD, Turn LEFT onto CR-589 S, Turn LEFT onto KENWAY ST., End at 2441 Dustin Cir Spring Hill, FL 34608-4520

Property owner: SEACHMAN, IRIS S. Phone: 352-683-8667
Address: 2441 DUSTIN CIRCLE City: SPRING HILL State: FL Zip: 34608
Interest in property: FEE SIMPLE TITLE HOLDER

Name of fee simple titleholder (If Other Than Owner): SAME
Address: ______ City: ______ State: ___ Zip: ______

FILE COPY

Permitting Service Name: N/A Phone : ______ Contact Name: ______

Contractor: W.A.NEUMANN CONSTRUCTION,C&N FOUNDATION Phone: 352-588-0910
Address: 12630CURLEY STREET/ST.104 City: SAN ANTONIO State: FL. Zip: 33576
License Number: CBC-058155 (State Certification or Hernando County # Only)

Sub-Contractor List (Complete as Necessary)

Electrical: N/A Phone: ______
License Number: ______ (State Certification or Hernando County # Only)

Plumbing: N/A Phone : ______
License Number: ______ (State Certification or Hernando County # Only)

Mechanical : N/A Phone: ______
License Number: ______ (State Certification or Hernando County # Only)

Roofing: N/A Phone: ______

License Number:______________________________(State Certification or Hernando County # Only)

Aluminum: N/A ______________________________ Phone ____________________
License Number:______________________________(State Certification or Hernando County # Only)

Bonding Company Name: N/A
Address:
City: State: Zip:

Architect/Engineer's name: UNIVERSAL ENGINEERING SCIENCES
Address: 9802 PALM RIVER ROAD
City: TAMPA State: FL. Zip 33619

Mortgage lender's name: N/A
Address: 1227886 -- FILE COPY
City: State: Zip:

Application is hereby made to obtain a permit to do the 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 will be performed to meet the standards of all laws regulating construction in this jurisdiction. I understand that a permit must be secured for ELECTRICAL WORK, PLUMBING, SIGNS, WELLS, POOLS, FURNACES, BOILERS, HEATERS, TANKS, and AIR CONDITIONERS, ETC.

OWNER'S AFFIDAVIT: I certify that all of the foregoing information is accurate and that all work will be done in compliance with all applicable laws regulating construction and zoning.

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 1, SEC 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 WITH YOUR LENDER OR AN ATTORNEY BEFORE RECORDING YOUR NOTICE OF COMMENCEMENT.

____
Owner/Contractor or Authorized Agent

State of: FL County of: Hernando

The foregoing instrument was acknowledged before me this 9 day of OCT, 2008 by Thomas Rinehart, who is (✓) personally known to me or who (__) has produced ______________ as identification.

____
Signature of Notary Public

Type, Print, Stamp Name of Notary

JANE N. ANDERSEN
Notary Public - State of Florida
My Commission Expires May 28, 2011
Commission # DD 668602
Bonded Through National Notary Assn.

Application Approved By Permit Representative: ______________

Hernando Co. Dev. Dept., 789 Providence Boulevard, Brooksville, Florida, 34601 ● 352-754-4050 ● Fax: (352)754-4416
www.co.hernando.fl.us

1227886 - AUTHORIZED AGENT AFFIDAVIT

FILE COPY

I, JASON WARREN NEUMANN, hereby grant authorization to THOMAS RINEHART
(Contractor) (Authorized Agent)
to act in my behalf with the Hernando County Development Department while conducting activities related to obtaining permits. These activities specifically include signing all documents requiring signature of "contractor".

THOMAS RINEHART is to be considered an agent of my business and
(Authorized Agent)
therefore the signature of said agent is binding and causes me to assume all responsibilities connected to or associated with the signature as they may relate to my contracting business.

I, JASON WARREN NEUMANN, relieve the Hernando County Development of,
(Contractor)
and agree to hold the Hernando County Development Department harmless from, any and all responsibility, claims or other actions arising from or related to the Department's acceptance of the above agent's signature for permit-related activities. I further understand that it is my sole responsibility to grant and terminate any such authorization and to ensure that the Department receives timely notice of any such grant or termination.

Signature of Contractor

Signature of Agent

CBC 058155 - BUILDING, CCC 1326166 - ROOFING
State Certification or Registration Number

N/A
County Certification Number (if applicable)

****PLEASE NOTE: BOTH SIGNATURES MUST BE NOTARIZED****

Notary for Contractor's Signature:

State of FLORIDA County of PASCO

The foregoing was acknowledged before me this 17th day of July, 2008, by Jason Warren Neumann who is personally known to me, or who produced personally known as identification.

Notary Public Signature

Melinda Cheatham
Print, Type, or Stamp Name of Notary

Notary for Agent's Signature:

State of FLORIDA County of PASCO

The foregoing was acknowledged before me this 17th day of July, 2008, by Thomas Lee Rinehart who is personally known to me, or who produced personally known as Identification.

Notary Public Signature

Print, Type, or Stamp Name of Notary

* The original of this affidavit should be kept in the possession of the above designated "Authorized Agent". This affidavit need only be produced to Hernando County when signing documents in the presence of a permit representative. When you sign a permit application be prepared to produce this affidavit, it will be copied and placed in the appropriate permit application.*

*****The Department, at its discretion, may require a contractor or license-holder to personally apply for or obtain a building permit notwithstanding any authorization allowing another person to apply for or obtain any permit on behalf of a contractor, qualifier, or license-holder.***

Revised 08/21/00 contauth.sop

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

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

W

2008056840 OFFICIAL RECORDS
ROBIN 2602/1772 BK: 2602 PG: 1772

LT1-2-2008056840-1

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LT2-2602-1772-1

10/17/2008 1:06PM # Pages 1
Filed & Recorded in Official Records of
HERNANDO COUNTY CLERK OF COURT
KAREN NICOLAI

this space reserved for recorder

Key No. _00427504_________ Permit No. ______________

NOTICE OF COMMENCEMENT

THE UNDERSIGNED hereby gives notice that improvement will be made to certain real property, and in accordance with Chapter 713, Florida State Statutes, the following information is provided in this Notice of Commencement:

1. Description of Property: Parcel No.
_R32 323 17 5210 1421 0250 2441 Dustin Circle Spring Hill FL 34608-4520____
_SPRING HILL UNIT 21 BLK 1421 LOT 25
(Legal description of the property and street address if available)

2. *General Description of Improvement* ___*Foundation Stabilization/ and or Repair*_______

3. Owner Information: Seachman Iris S Life Estate
Address _2441 Dustin Circle__________ City _Spring Hill_________ State __FL___Zip_34608-4520_
Interest in Property:___Fee Simple Titleholder___
Name of Fee Simple Titleholder (If other than owner):__same as above___
Address ______________ City ______________ State _____ Zip______

R

Contractor: Name __W.A Neumann Construction, Inc._DBA C & N Foundation Technologies, In.___
Address: _12630 Curley Rd. Suite 104_________ City San Antonio___________ State ___FL___Zip_33576____
Phone No. _(352) 588-0910______________ Fax No. __(352) 588-0911__________

5. Surety: Name ______________
Address ______________ City ______________ State _____ Zip______
Amount of Bond: $ __________ Phone No. __________ Fax No. __________

6. Lender: Name ______________
Address ______________ City ______________ State _____ Zip______
Phone No. ______________ Fax No. ______________

7. Persons within the State of Florida designated by Owner upon whom notices or other documents may be served as provided by Section 713.13(1)(a)(7), Florida Statutes:
Name ______________ Address ______________ City ______________ State ________
Phone No. ______________ Fax No. ______________

8. In addition to himself or herself, Owner designates ______________ of ______________
to receive a copy of the Lienor's Notice as provided in Section 713.13(1)(b), Florida Statutes.
Phone No. of person or entity designated by owner: ______________

9. Expiration date of Notice of Commencement (the expiration date is 1 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 1, SEC 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 WITH YOUR LENDER OR AN ATTORNEY BEFORE COMMENCING WORK OR RECORDING YOUR NOTICE OF COMMENCEMENT.

x Iris Seachman
Signature of Owner or Owner's Authorized Officer/Director/ Partner/Manager — Signatory's Title/Office
**** Signature Required by same below by 'X' mark ****

STATE OF FLORIDA **COUNTY OF** PASCO

The foregoing instrument was acknowledged before me this 23 day of SEPT, 2008, by IRIS SEACHMAN (Name of Person),
as OWNER (Type of authority e.g., office, trustee, attorney in fact) for HERSELF (Name of party on behalf of who instrument was executed).

Vicki S Jacobs Duffy
Signature of Notary

VICKI S. JACOBS DUFFY
Print, Type or Stamp Name of Notary

Personally Known ______ OR Produced Identification ✓
Type of Identification Produced: DRIVERS LIC

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.

x Iris Seachman
Signature of Natural Person Signing Above

CLERK OF CIRCUIT COURT * SUUM CUIQUE * HERNANDO COUNTY, FLORIDA

STATE OF FLORIDA
COUNTY OF HERNANDO
This is to certify that the forgoing is a true and correct copy of the original on file in my office.
Witness my hand and official seal this 10/17 2008
Karen Nicolai, Clerk Circuit Ct.
By: ______________ Deputy Clerk

VICKI S. JACOBS DUFFY
Notary Public, State of Florida
My commission expires July 6, 2012
Commission No. DD803399

NOC-P18.WPD (7/1/07)
9/24/07 tsg

HERNANDO CO. DEVELOPMENT SERVICES DEPARTMENT
Building Plans Review
Approved for Use
Approved as Noted
Not Approved
Comments Attached
This review does not relieve the Contractor from errors or omissions in this submittal or from the Contractor's responsibility for code compliance in accordance with the Florida Building Code. The issuance of this permit shall not be held to permit or approve the violation of any law, code regulation or ordinance.
By: ______ Date: ______

HSA
ENGINEERS & SCIENTISTS
A member of the CRA Family of Companies

ZONING PERMIT zoned PDPSF
to be used as Damage Repair
Checked By DMC Date 10/9/08

1227886

August 29, 2008

FILE COPY

Via Regular Mail

State Farm Florida Insurance Company
12216 Cortez Boulevard
Brooksville, Florida 34613

Attention: Mr. Ronald G. Richards, Claim Representative

Subject: **Report of Subsurface Exploration and Distress Evaluation**
The Iris S. Seachman Life Estate
2441 Dustin Circle
Spring Hill, Florida 34608-4520
Claim No. 59-D199-225
HSA Project No. 502-8857-00

Legal Description:
SPRING HILL UNIT 21 BLK 1421
LOT 25
PID:R32-323-17-5210-1421-0250

Dear Mr. Richards:

As authorized, HSA Engineers & Scientists (HSA) has completed a subsurface exploration, made observations of the distress to the home and pool, and evaluated the data obtained to determine, in our opinion, if a cause(s) of the distress to the home and pool could be identified within the depths and areas explored for this study. This report and accompanying appendices include a description of the methods and results of our subsurface exploration, and present our geotechnical evaluation of the cause(s) of the reported distress.

SCOPE OF SERVICES

Florida Statute Title XXXVII, Chapter 627.707 (2) requires, if certain conditions are met when a claim for sinkhole loss is made, "the insurer shall engage a professional engineer or a professional geologist to conduct testing … to determine the cause of the loss within a reasonable professional probability and issue a report …". The statutes impose other requirements on the insurers and professionals as well. Accordingly, the scope of work for this study included the following:

1. Conducted a reconnaissance of the site, to document the condition of the structure and to interview the property owner;

2. Reviewed readily available published shallow soils information obtained from the *Soil Survey of Hernando County, Florida* tabulated by the United States Department of Agriculture (USDA) Soil Conservation Service (now the Natural Resources Conservation Service), the local USGS 7.5 minute topographic quadrangle map, maps of the Upper Floridan Aquifer potentiometric water level (Southwest Florida Water Management District/US Geological Services maps) and general information concerning the home on the Hernando County Property Appraiser's website;
3. Conducted a relative elevation floor survey and used the collected data to map the apparent topography of slab-on-grade elements of the structure. Assessed the topography to determine whether significant settlement and/or differential movement of this structure may have occurred;
4. Conducted a ground penetrating radar (GPR) survey around accessible areas of the property and accessible areas inside of the home to assess the lateral continuity of reflective soil strata within the depth of signal penetration, and thereby identify subsurface features of interest in this study within the capabilities of the equipment. Also performed an electrical resistivity imaging (ERI) survey along the sides of the home by measuring the resistivity of subsurface materials in order to assess depths of specific layers or lateral changes in the geologic conditions;
5. Performed five (5) hand auger borings to explore the shallow soil conditions around the perimeter of the home. Hand cone penetrometer probe soundings were conducted in conjunction with the hand auger borings to evaluate relative soil density;
6. Performed two (2) Standard Penetration Test (SPT) borings to explore the deeper soil conditions at the site;
7. Excavated by hand six (6) test pits to document the type, thickness, and depth of embedment (distance from the ground surface to the bottom of the footing) of the home's foundation, pool deck and porch concrete slab thickness and decorative wall foundation;
8. Measured groundwater levels, if encountered, in the hand auger borings;
9. Used a builders level to measure the relative land surface elevation at the soil boring locations;
10. Reviewed in the laboratory and visually classified the recovered soil samples using the Unified Soil Classification System and Munsell Soil Color Chart;

1227886

11. Assessed the near surface foundation subgrade and deep soil conditions revealed in the soil borings, together with the discovered foundation element details, and their relationship to the appearance of the recorded distress. Based on the evaluations, formed an opinion that identifies the apparent cause(s) of the recorded distress;

12. Prepared this report under the supervision of Florida licensed Professional Engineers and Geologists who are experienced in the detection and assessment of geotechnical causes of structure distress, including sinkhole activity. The report summarizes our opinions and evaluations regarding the previously stated objectives and presents the data upon which our diagnosis is based.

SITE LOCATION AND PROBLEM DESCRIPTION

Ms. Meeghan Casey, Staff Geologist with HSA Engineers & Scientists (HSA), completed an initial reconnaissance at the above-referenced residence on May 16, 2008. During the site visit, Ms. Casey met with Ms. Iris Seachman, the homeowner, to observe the distress in the residence. The following is based on Ms. Casey's conversations with Ms. Seachman as well as our observations of the site conditions.

Structure and Site Conditions

The residence is a single story, masonry block structure located at 2441 Dustin Circle in Spring Hill, Florida. The approximate location of this home has been superimposed on a street map of the local area and is shown on **Figure 1**. Based on a review of the information on the Hernando County Property Appraiser's website, the house was built in 1981 and Ms. Seachman purchased the home in 1983. A screen-enclosed pool deck and porch are located along the rear of the residence. Reportedly, the eastern porch was added in 1991, while the pool and pool deck are original to the structure. Additionally, a two-car garage forms the west corner of the residence.

For purposes of this report, the home is assumed to face southwest. The site on which the home is located is relatively level in the front and along the sides. The rear of the property slopes downward towards a closed body of water. Municipal water and a septic tank system service the Seachman residence. The septic tank is located in the front yard near the south corner. The general footprint of the home on the property is illustrated on **Figure 2**.

Homeowner Statements and Pertinent History

Based on our conversation with Ms. Seachman, she was most concerned with distress that has been on-going throughout the residence since she purchased the home. She is also concerned with new exterior distress that she feels is concentrated near the garage and driveway. Apparently, this distress was first observed within the last 6 months.

Reportedly, the interior walls were last painted in 2001, while the exterior walls were painted in 2002. Painting of the exposed surfaces of the residence may provide a time period reference to estimate when documented damage has appeared. For instance, where the interior face of a crack in a wall contains no evidence of the paint that was applied to that surface, we may conclude that the crack appeared after the wall surface was painted. Conversely, where the interior face of a crack in a masonry wall contains traces of the paint that was applied to that surface, we may conclude that the crack appeared before the wall surface was painted.

GENERAL STRUCTURE OVERVIEW

Distress Description

As observed by Ms. Casey, the **exterior** distress consisted of hairline to 1/16-inch wide cracks that were evident in all of the walls. Some of the cracks appeared to have been present prior to the last painting event and paint was noted within the cracks. The **interior** distress consisted of hairline (less than 1/32-inch in width) to 1/16-inch wide cracks and were most significant in the garage. The preceding distress description has been provided as a generalized summary of the visually evident damage during the time of our initial site visit. Areas hidden from view such as within walls, beneath floor finishes, behind furniture or otherwise not visible during a "walk through" were not assessed. A more detailed list of the observed distress is attached in **Appendix A**, together with selected photographs of the site and the recorded distress.

Relative Elevation Floor Survey

A relative elevation floor survey was performed to assess whether significant settlement and/or differential movement of this structure may have occurred. Prior to initiation of the elevation measurements, the plan dimensions of the main residence, pool deck, rear porch and garage were measured. A floor plan was developed using these measurements. Our field personnel then performed spot elevation measurements, while working around furniture and other obstructions. Using the collected data, together with the floor plan, equal relative elevation contours of the floor surfaces were developed. The main living area, pool deck, rear porch and garage were contoured separately because of step-downs in the floor levels and/or construction sequencing that may indicate separate concrete placements. The floor plan and elevation contour lines derived from the data are illustrated in **Figure 5**. A description of the survey methods that were used in gathering the data and creating **Figure 5** is included in **Appendix B**.

Main Living Area – A maximum difference of slightly more than 1 inch in the altitude of the floor slab surface was detected by the survey. On this floor surface, the topographically highest points were found to lie near the center of the home between the master bedroom, dining room, kitchen and family room, with generally lower areas trending towards the perimeter walls. Additional higher areas were identified in the east hallway and southeast bedroom. The topographically lowest points were detected along the east corner of the northeast bedroom, the south corner of the southeast bedroom and along the northwest wall of the master bedroom.

Garage – A maximum difference of approximately 2 inches was detected in the altitude of this floor slab surface. The topographically lowest point detected on this surface was located along the southwest side of the slab. The slab sloped downward from the highest area along the northeast wall towards the southwest wall where the vehicle entry doorway is located.

Pool Deck - A maximum difference of approximately 1-3/4 inches was measured on the surface of the pool deck slab. In general the slab sloped downward towards the edge of the slab, away from the pool basin.

Rear Porch – A maximum difference of about 3/4-inch was measured in the altitude of this floor slab surface. The slab surface descends generally towards a lower area along the center of the east side of the slab.

Significance of Slab Surface Topography – The overall magnitude of elevation change in the main living area floor slab is generally unremarkable and within commonly accepted construction tolerances, as described in **Appendix B.** No correspondingly commensurate damage was noted in the home near the lower areas, nor near the areas of the slab surface, where the inclination of the surface exceeds the ACI tolerance. Accordingly, the slab is judged to be primarily in an 'as-built' state, and the indicated topography was, in our opinion, created largely by surface finishing operations.

The pitch of the garage floor slab is mostly consistent with common construction practice to slope such slabs away from the home to promote drainage. Similarly, pool deck and porch slabs are typically pitched downward away from the residence for drainage. The pitch of the pool deck is consistent with typical construction to promote the shedding of water away from the basin and towards the pool deck edges and drain systems. The porch floor slab is also generally pitched to shed water away from the home.

Test Pit Excavations

Six (6) test pits were excavated to expose details of the as-built foundations at locations coincident with the hand auger borings at the locations illustrated on **Figure 2**. The test pits were hand-excavated using a shovel and/or post-hole diggers.

The conditions revealed in the test pits indicate that the residence and garage are supported on a conventional monolithic foundation (a reinforced thickened edge foundation integrally cast with a concrete slab-on-grade element). The foundation at the locations checked was embedded (depth from the ground surface to the bottom of the foundation) between 7-1/2 and 9 inches below the adjacent land surface.

The test pit performed on the pool deck (TP-3) indicated that the pool deck slab measured approximately 5 inches in thickness and was embedded 4 inches into the sandy soils.

Test pit TP-2 was performed on the porch slab that measured 9 inches in thickness and was embedded approximately 6 inches below grade.

Lastly, a test pit was performed on the decorative wall on the south side of the property The test pit indicated that it is supported on a cast-in-place, concrete strip or continuous wall foundation embedded about 16 inches below grade. Assuming the masonry block is centered on the foundation and based on our measurement of the lip of the foundation, we calculate that the footing is approximately 22 inches wide. Furthermore, the footing was observed to be about 6 inches thick at the location checked.

REVIEW OF PUBLIC INFORMATION

Natural Resources Conservation Service Data

The U. S. Department of Agriculture – Natural Resources Conservation Service (NRCS), formerly known as the Soil Conservation Service (SCS), has mapped the shallow soils in this area of Hernando County. This information is available from the Web Soil Survey database maintained by the NRCS. This information was outlined in a report titled *The Soil Survey of Hernando County, Florida* dated July 1977. The aerial photographs used as base maps were taken in 1973 and predates the construction of the home. The Soil Survey indicates that the site is situated on the boundary of Candler fine sand, 0 to 5 percent slopes (mapping unit 14) and Basinger fine sand, depressional (mapping unit 10).

Typically, Candler fine sand has a surface layer of dark grayish brown fine sand about 4 inches thick that is followed by brown fine sand. From depths of 9 to 20 inches, light yellowish brown fine sand typically occurs. The fine sand then grades to brownish yellow, and continues to around 50 inches deep. Very pale brown fine sand containing lamellae of brown loamy fine sand about 1/16 to 1/8 inch thick and 1 to 4 inches long is present below, and continues to over 80 inches in depth. The water table in the Candler fine sand is below a depth of 80 inches.

The Basinger soil type is poorly drained and is found in depressional areas in the flatwoods and along the edges of lakes. The surface layer is typically 7 inches of black fine sand. Below to about 25 inches in depth is light gray fine sand followed by 11 inches of dark brown and gray fine sand. Light gray fine sand is then encountered to a depth of 80 inches or greater. In most years standing water covers the soils for 6 to 9 months.

The information contained in the USDA Soil Survey is not necessarily representative of the soil deposits on the site. The survey is, however, a good basis for general evaluation of the shallow soil conditions of the area. The soil survey mapping is based on interpretation of physiographic information shown on aerial photograph maps, confirmed by the performance of scattered shallow borings. Accordingly, borders between mapping units are considered to be approximate, and the change from one mapping unit to the adjoining area may be transitional. Differences may also occur from the typical stratigraphy, and small areas of other similar and dissimilar soil deposits may occur within the soil mapping unit. Consequently, there may be differences between the soil description published by the USDA and that contained in the soil borings that were performed for this study. Based on this information, the shallow soils at the Seachman residence are more similar to the Basinger fine sand, depressional soil mapping unit.

USGS Topographic Information

Digital Raster Graphics (scanned topographic maps) projections of the Port Richey NE, Florida quadrangle provided by the United States Geological Survey (USGS) were reviewed for topographic information in the vicinity of the project site. The topographic map was produced in 1998. According to this map, the original ground surface altitude lay near El. 30± feet, referenced to the National Geodetic Vertical Datum of 1929 (NGVD 29).

Potentiometric Surface Map

The United States Geological Survey (USGS) and Southwest Florida Water Management District (SWFWMD) have measured water levels in wells installed into the Floridan Aquifer. The collected information was used to develop the Potentiometric Surface of the Upper Floridan Aquifer, West-Central Florida contour maps for low and high water levels. The low and high water levels were recorded in May and September, respectively, which are typically near the end of the spring dry season and the end of the summer rainy season. For both September 2007 and May 2007, the potentiometric water levels in the general vicinity of the residence may have occurred near El. 13 ± feet, NGVD 29.

SUBSURFACE EXPLORATION

Geophysical Testing

Ground Penetrating Radar Survey – HSA performed a GPR survey at the site to aid in locating variations in subsurface conditions and in selecting positions of soil test borings for this study. The GPR study included scanning both near surface and deeper reflective soil strata. The shallow scan instrument and range settings were optimized for enhanced resolution of potential deleterious near surface conditions that could be pertinent to our study, whereas the deeper scanning was optimized to detect possible anomalous karst or sinkhole-related features of interest. The GPR survey equipment and survey methodology are described in **Appendix C**.

Electrical Resistivity Imaging – As requested, the geophysical survey of the Seachman residence also included an electrical resistivity imaging (ERI) survey that was performed around the exterior perimeter of the home. The ERI survey measures the resistivity (the ability of a material to resist the flow of an electrical current) of subsurface materials in order to assess depths of specific layers and determine lateral changes in subsurface stratigraphic or geologic conditions. The ERI methodology and results are further described in **Appendix C**.

Soil Borings

The subsurface exploration program for this study included the performance of a series of two (2) Standard Penetration Test (SPT) borings. The SPT borings positions were selected based on an evaluation of the location of noted distress at the residence, the relative elevation floor level survey and the interpretation of the geophysical data. Borings SPT-1 and SPT-2 were drilled to nominal depths of 60 to 105 feet, respectively, using a limited access drill rig. The SPT boring and sampling method yields a sample for determination of soil type and a penetration resistance that has been correlated to soil properties. The SPT sampling method is briefly summarized in **Appendix B**.

In addition, a series of five (5) hand auger borings and associated hand cone penetrometer probe soundings were performed. As with the SPT borings, the position of these borings was also selected considering the distress exhibited in the residence. The hand auger boring locations were assigned to evaluate the general shallow soil conditions that lie within the bulk of the stress influence zone below the home's foundations and slab-on-grade elements. These hand auger borings were advanced to a nominal depth of 7 feet. The associated hand cone penetrometer probe soundings were advanced to the nominal boring termination depths. The hand auger boring and hand cone penetrometer procedures are also summarized in **Appendix B**.

Soil Boring Land Surface Altitudes

Following completion of the hand auger borings and SPT borings, relative elevations of the test boring locations were measured. For the Seachman residence, a temporary benchmark was set near the water meter. With the use of a builders level and a sighting rod (graduated in hundredths of feet), elevations relative to the temporary benchmark were determined. The land surface at boring AB-4 was found to lie at the highest altitude. The measured raw altitudes were then normalized by assigning the highest boring land surface altitude a value of 0.0 feet and adjusting the altitude of the remaining borings accordingly. The vertical position of the soil boring profiles shown on **Figures 3** and **4** reflect the measured relative elevations. The overall variation between the boring locations was slightly less than 1/2-foot.

Illustration Layout and Exploration Element Location Precision

The approximate locations of the borings and test pits are shown on **Figure 2**. The site layouts shown on the illustrations included in this report, including the floor plan in **Figure 5**, were developed from distances measured in the field, using a measuring tape and/or measuring wheel and estimated/measured directions. The precision of the information shown on these illustrations reflects the accuracy of the measurement methods that were used to create them. The precision is not comparable to that provided in a land survey of the property. Therefore, it should be understood that these illustrations are included herein as plans, to illustrate borehole positions and other features discussed in this document.

LABORATORY SERVICES

Visual and Tactile Review of Disturbed Soil Samples

The field soil boring logs and recovered soil samples were transported to our Tampa office from the project site. Following the completion of the field exploration activities, each soil sample was reviewed by our technical staff in our Tampa, Florida soil deposits laboratory, who assigned an engineering classification to the soil and rock samples that were retrieved in the field exploration. The visual classification of the samples was performed in accordance with the current Unified Soil Classification System (ASTM D 2487).

SUBSURFACE CONDITIONS

Geophysical Test Results

General – HSA performed both a ground penetrating radar (GPR) survey and an electrical resistivity imaging (ERI) survey at the Seachman residence to evaluate the reflectivity and electrical signature patterns of subsurface soils and by inference, determine the presence of anomalous subsurface features of interest commonly considered characteristic of buried karst topography or potential sinkhole indicators, based on the geophysical methods employed. The following summarizes our methodologies and presents the results of our findings.

Ground Penetrating Radar Results – As shown on **Figure 2**, and based on our interpretation, the GPR profiles appear to depict three (3) prominent subsurface features of interest, characterized herein by varying degrees of downwarping (downward dipping) of the reflective soils with associated "bow-tie" type reflection patterns (Features GPR-1 through GPR-3). These features were identified around the southwest (front left) corner of the garage, the northwest (back left) corner of the enclosed pool deck, and the southeast (front right) corner of the home, respectively.

Electrical Resistivity Imaging Results – As also shown on **Figure 2** herein, our interpretation of the ERI models revealed three (3) anomalous areas of vertical increases in ground resistivity compared to the surrounding more conductive media that, in karst environments, might represent thicker deposits of surficial sands, and by inference, in-filled or buried depressions in the subsurface more clayey soils that may be the result of deeper-seated sinkhole activity (Features ERI-1 through ERI-3). These features were positioned near the southwest (front left) corner of the home, near the northwest (back left) corner of the enclosed pool deck, and near the northeast (back right) corner of the home, respectively.

Summary of Geophysical Results

The GPR data yielded reasonable depth of signal penetration and resolution of the subsurface soil layers, having resolution to estimated depths of about 15 feet. Based on our interpretation of the data, three (3) prominent anomalous areas were identified. Our interpretation of the ERI data also identified three (3) anomalous features of interest. Of these, features ERI-1 and ERI-2 appear to coincide well with features GPR-1 and GPR-2, respectively.

Soil Boring Results

The following discussion generally describes the soil stratigraphy at the site as interpreted from the soil boring profiles, which are shown on **Figures 3** and **4**. Please refer to the boring profiles for more detailed information. In addition, please refer to **Appendix B** for information on the soil classification and stratification procedures.

General Stratigraphy – The borings penetrated a sequence of soil and rock strata that can be grouped into two (2) general zones:

- **Surficial Sand Deposits** – This soil zone included Strata 1 through 6. The surficial sandy soils extended to depths ranging from 58 to 92 feet. The hand auger borings terminated in the Strata 2 and 3 sandy soils.
- **Limestone Bedrock** – The carbonate bedrock formation (Stratum 7) was penetrated beneath the Stratum 6 cohesionless soils in borings SPT-1 and SPT-2. The borings penetrated between about 2 and 12 feet of the very pale brown limestone bedrock and were then terminated.

Penetration Resistance Distribution – The soil borings revealed that the sand deposits were generally very loose to loose within about the upper 6 to 10 feet, with denser zones below and occasionally interbedded. In boring SPT-1, the Stratum 6 soils were very loose and the sampler advanced under the weight of the drill stem and hammer from approximately 38 to 58 feet. In boring SPT-2, medium dense to dense, interbedded layers of Strata 5 and 6 sandy soils continued to the limestone surface around a depth of 92 feet. The limestone formation was initially soft with increasing hardness with depth.

Drilling Fluid Circulation Loss Events – A loss of drill fluid circulation was noted in boring SPT-1 above the limestone formation near the very loose soils. A loss of drill fluid circulation was noted in boring SPT-2 at the soil-limestone interface. A loss of drilling fluid into the borehole indicates the presence of soft or porous geologic conditions. Such fluid loss events commonly occur at or near the soil-limestone interface, in this locality, and within the limestone formation.

Groundwater Conditions

Surficial Aquifer Conditions –The surface of the surficial groundwater table was not encountered within 7 feet of the land surface in May 2008 when the hand auger borings were performed. The SPT borings were filled with cement grout/bentonite clay pellets upon completion. Consequently, we were unable to measure a stabilized water level in these borings. It should be clear that the position of the groundwater table will fluctuate seasonally in response to variation in rainfall, to surface drainage features and other factors.

Hydraulic Gradient Between Aquifers – The presence of a significant hydraulic gradient between the waters in the surficial aquifer and the waters in the underlying bedrock (in this case Floridan) aquifer is often the principal force that is responsible for the development of current-time sinkhole subsidence

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events. Based on our experience and the information gathered in this study, it appears that a moderate, vertically downward, hydraulic gradient is likely to exist between the aquifers at this property.

EVALUATION AND CONCLUSIONS

Please refer to **Appendix D** for a discussion of what types of sinkholes form in this area, how sinkholes are formed, and the characteristics that identify and pertain to the formation and behavior of the individual types of sinkhole. The attached **Appendix E** contains some excerpts from the Florida statute and a brief discussion of the statutory basis of geotechnical studies to determine the cause of distress in residence. **Appendix D** also discusses commonly encountered (signature) indicators of sinkhole activity in SPT boring data, and how distress in the structure that is attributable to differential settlement from various soil conditions, as well as distress in the structure that is attributable to non-settlement related conditions can frequently be indistinguishable from sinkhole activity.

General Structure Assessment

General – It is our opinion that most of the distress that has developed in the home, as documented herein, consisting of predominantly hairline cracks (minor distress) in the interior and exterior wall surfaces, is neither symptomatic of significant distress nor structurally significant. Furthermore, the home has not, in our opinion, sustained "structural damage". That is, damage to the structure has not been so severe that repairs, installation of foundation underpins, or other measures are necessary to reestablish the load supporting capabilities of the structure.

Minor Cracks in Wall and Ceiling Surfaces – The majority of the observed distress is characteristic of the effects of small differential settlement, of thermally-induced strain of building materials, and of the normal behavior and age deterioration of building materials. Many homes of similar age and construction have developed similar minor distress. It should be understood that the extent and severity of cracks in the structure's components tends to increase as the home ages.

Some of the hairline-width cracks may also be the product of other mechanisms, such as concrete and mortar shrinkage, thermal expansion/contraction movements, etc. Wood shrink-swell with changes in humidity has also been implicated in the appearance of cracks in sensitive finishes, such as interior drywall on wood frame partitions.

The cause(s) of the appearance of minor cracks in brittle masonry surfaces include the development of minor differential settlement along the foundation elements. These differential settlements may develop as the result of variation in load applied on the foundations (for example, when individual walls support different sections of the roof, when concentrated loads are applied on either side of door

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and window frames, etc.), and as the result of small differences in the compressibility of the foundation subgrade soil deposits, caused by natural variations in soil types and density or by inconsistent treatment of the foundation bearing surfaces during construction of the home, etc. Please refer to later sections of this report for a discussion of soil conditions that may have contributed to settlement of this structure.

Ceramic Floor Tile Distress - The cracking distress in the ceramic floor tile in the kitchen appears consistent with concrete shrinkage cracking of the underlying slab, and resultant telegraphing or upwards propagation of the slab cracks through the tiles because of small movements at the crack due to factors such as thermal expansion-contraction movements. There appeared no debonding or loosening of the tiles or pronounced settlement of the interior floor slab, as indicated by a vertical offset of the crack, that otherwise could suggest an alternate cause of the observed cracks. Telegraphed shrinkage cracks are a common cause of distress in tile placed on concrete floors. Removal of the tile, which was not done to avoid defacing the floor, could provide further insight into this distress.

Minor Cracks in Concrete Slabs-On-Grade – It is also our opinion that the noted cracks in the concrete slabs of the driveway, porch and garage floor are consistent with or originated from shrinkage or contraction of the slabs. Once formed, the shrinkage cracks are subject to differential settlement caused by various soil conditions and/or exacerbation by thermal expansion-contraction movements. Shrinkage cracks generally occur after initial concrete curing and with the contraction of the concrete slab, as it cooled after being heated by the reaction of the hydration of the cement in the plastic mix. This is an inherent property of Portland cement concrete. Control cuts or joints are used to provide a stress relief plane at selected alignments and tend to minimize or control the random cracks that occur. According to the American Concrete Institute (ACI), crack control joints should be installed in concrete at intervals about equal to the slab width. Longitudinal crack control joints should be installed in slabs that are wider than about 10 to 12 feet. The pattern of control joints in concrete slabs should be approximately square. The length-to-width ratios of rectangular slab sections should not exceed 1.5. Because the shrinkage cracks start to develop soon after the concrete sets, the control joints need to be formed into the wet concrete or cut as soon as the concrete can support the weight of the equipment.

Shallow Embedment of Foundation – The conditions revealed in the test pits indicate that the foundation of the home is embedded as shallow as about 7-1/2 to 9 inches into the loose sand deposits. The Standard Building Code (replaced in Florida in 2001 by the Florida Building Code) outlines various criteria for foundations. In particular, the Standard Building Code, which was in effect when the house was constructed, calls for a minimum foundation depth of 12 inches below ground surface. The shallow embedment of portions of the foundation may have allowed settlement to occur that is somewhat in excess of more deeply embedded foundations.

Diagnosis of Causes of Distress

Shallow Soil Conditions – It is HSA's opinion that most of the settlement-related distress in the home can be attributed to post-construction compression of the very loose to loose, near surface sand deposits, which were identified at the boring locations below the foundation bearing levels. This distress may be related to particle reorientation and long-term creep compression of the loose sand deposits. The distress may also be related to incremental compression of the loose, rapidly draining soil deposits when these are subjected to excess water/saturation, such as during storm events and occurring from irrigation water misdirected towards the foundation walls. The saturation of loose sand deposits may alter the effective stress conditions of the soil deposits that underlie the foundations, decreasing their shear strength, increasing their compressibility and thereby allow further compression to occur under the same static weight that was applied by the foundation immediately following construction. Accumulation of these incremental compression events may produce detectable settlement of the overlying structure and thereby lead to the appearance of minor distress in the structure's components. This condition is relatively common and has been judged to cause minor distress at other homes. The loose condition of the near surface sand deposits is related to inadequate compaction during site preparation and depositional processes, and is not related to sinkhole activity.

Sinkhole Activity Evaluation – Geotechnical Engineers and Geologists commonly infer the existence of active or incipient sinkhole activity conditions from the discovery of signature subsurface conditions, revealed in the SPT boring data. These signature conditions include the discovery of abnormally weak, apparently raveled soil deposits (*i.e.*, consistently very loose or very soft soil deposits as indicated by the SPT sampler advancing under the weight of the drill rods or sampling hammer), which extend a significant distance upward from the surface of the porous limestone bedrock towards the land surface. This condition is often found above the surface of a zone of very soft limestone that appears to have been created by corrosion of the parent rock. In rare cases, actual cavernous zones in the bedrock have been penetrated in SPT borings. This corroded rock zone often contains fragments of the soil deposits that overlie the bedrock, and have migrated downward to be intermingled with the corroded rock zone (alternate explanations of this condition include a variable depositional environment during the transition in sediment types or an erosional condition causing mixing of the soil deposits during deposition).

An additional indicator that sinkhole activity may be present is the incidence of loss of drilling fluid circulation events. While such fluid loss events are common in and just above the soft and porous limestone bedrock, in this locality, fluid loss events that occur coincident with the presence of abnormally weak soil zones above the bedrock surface are generally thought to provide additional evidence of the presence of sinkhole activity conditions. Frequently, fluid loss events occur at the interface of the bedrock surface or within the bedrock mass without the appearance of abnormally weak soil deposits. In such events, the fluid loss event is often attributed to the presence of minor fissures in the bedrock mass.

At this property, approximately 20 feet of very loose sands were penetrated in boring SPT-1, indicated by relatively low 'N' values and the advancement of the sampler under the weight of the drill rods and sampling hammer. With reference to the subsurface conditions described in this report and illustrated on **Figure 4**, it is our opinion that geologic conditions consistent with sinkhole activity were discovered in boring SPT-1.

Distress Evaluation and Cause(s) of Subsidence Opinion – Therefore, based on the foregoing discussions and opinions, and in compliance with Florida statutes, **it is HSA's opinion that sinkhole activity is a cause of the damage to the structure, within a reasonable professional probability. Furthermore, it is also HSA's opinion that the analyses and tests that were performed by HSA in the execution of this study were of sufficient scope to identify sinkhole activity as a cause of the damage, within a reasonable professional probability.** This report is certified in general accordance with Florida Statute 627.7073.

RECOMMENDATIONS

General

Although the structure may have been affected by differential displacement (minor settlement), the extent of the observed distress is, in our estimation, sparse and cosmetic. Furthermore, in our opinion, the distress in the structure is not severe enough to constitute structural damage, as defined in this report, in **Appendix E**. Therefore, structural modifications to the foundation, such as underpinning, or other structural repairs are not required or recommended.

The level of distress that may be attributed to the discovered sinkhole activity and soil conditions is now, and is predicted to be, sparse and minor. The distress can be managed from a routine maintenance standpoint with occasional patching and painting. The discovered sinkhole activity conditions can be remediated by the injection of grout into the sinkhole activity zones. This recommended correction (mitigation) of the discovered sinkhole activity conditions could reduce the frequency and severity of the cracks in the structure by limiting the amount of settlement, if any, from the sinkhole activity. Recommended methods to correct the geologic sinkhole activity are described below.

Remediation of Sinkhole Activity

Intent – The identified sinkhole activity zones can be remediated by injecting a low to moderate slump (4 to 6 inch slump) cementicious grout, under pressure, into the discovered sinkhole activity conditions. The purpose of the grout injection program is to restrict and/or seal breaches in the surface of the limestone (where evident) that connect the soil deposits that overlie the rock surface to suspected cavernous bedrock zones, by injecting grout within and along the top surface of the limestone about the affected area, thereby reducing the potential for future subsoil raveling and migration. In addition, the grouting may serve to compress and reinforce the discovered weak soil zones that lie upon the rock surface and thereby reduce the potential for mass subsidence (sagging) of the overlying undisturbed soil zones into the discovered weak soil zones. While it is possible that some cavernous zones may be filled using this technique, any such filling of the cavernous zones is unintentional and unnecessary.

Installation of Injection Pipes – We recommend that grout injection pipes be installed through the sand and clay deposits that overlie the bedrock surface to contact or slightly penetrate into the surface of the limestone. The purpose of penetrating the rock surface is to identify the presence of a competent base on which the grout column will bear, and to determine whether rock void zones underlie the surface of a thin rock void zone ceiling. We recommend that injection points be installed to a depth of not more than 100 feet below the home. Exception to this restriction may be granted by the engineer.

Recommended Injection Point Location Plan – Based on past experience in this locality, knowledge of local geology, and considering areas that were not explored with test borings, it is our opinion that subsurface grout injection operations should be performed through injection points that are installed around the entire perimeter of the home and pool deck. In doing so, the operations will both provide qualitative confirmation that sinkhole activity conditions do or do not underlie the structure at frequently checked locations and will remediate sinkhole activity conditions where these are found. Preliminarily, we recommend that 27 grout injection pipes be installed at relatively equally spaced (approximately 10 foot) intervals around the perimeter of the home and pool deck. The recommended grout pipe locations are shown on **Figure 6**. Some of the grout pipes should be installed at an angle, to intercept the bedrock and direct the flow of grout below interior areas of the home.

Grout Injection Procedures – Grout should be injected first within and along the surface of the limestone. Initially, the injection pipe should be withdrawn slightly and injection operations to seal the surface of the bedrock should be performed. Following completion of the sealing injection volume, the injection pipe should be incrementally raised a few feet and injection of grout into the weak zones above the bedrock should then be performed. During the injection operation, the contractor should monitor the grout pumping for indications that the porous zones and weak soil zones are adequately filled. Criteria for progressing to the next grouting level should include line pressure increases, grout rising to the ground surface in the annular space of the borehole and/or movement on or around the home. Incremental withdrawal of the injection pipe and grouting of each interval should continue until the injection depth becomes too shallow to confine the grout and the risk of ground heave becomes a concern.

We recommend that grout injection cease at a depth no shallower than 20 feet, at any location, to avoid disturbing the surficial sand deposits that support the home's foundations and floor slab. Exception to this restriction may be granted by the engineer, who reviews the grout injection operations, in the event that injection records indicate that very weak soil deposits exist above depths of 20 feet. To reduce excessive grout flow away from the injection location, grout quantities should be limited to 20 cubic yards per location per day, unless otherwise directed by the engineer.

<u>Contractor's Grout Injection Plan</u> – It is important that HSA work with the contractor during the grout injection operations to provide assistance in the development of the grout injection program that is responsive to the recommendations made herein, to monitor the injection operations and to record injection pipe depths and grout consumption.

<u>Possible Unintended Effects of Grout Injection</u> – The owner should be advised that performance of the deep grout injection operations might induce some additional differential movement in components of the home due to settlement or heave of the soil mass that underlies the home, both during and following the injection operations. In our experience, settlement of the home and/or nearby structures occurs most frequently during early stages of grout injection, before deep conditions are stabilized. Ground heave occurs when the pressure in a zone of fluid grout exceeds the geostatic stress (weight) applied by the overlying soil mass and structure. A pre-grouting distress survey of adjacent homes is recommended prior to grouting to observe preexisting distress visible from the subject property to determine whether those structures have been affected by the injection operations.

Please note that it is possible that the proposed grout injection operations may include injection of cementicious grout into fractures and void zones in the limestone aquifer. It has been our experience that nearby water wells may be affected by such grouting operations. Some of the effects could include the appearance of cloudy/sandy conditions in water withdrawn from affected wells. In some instances, the well collection zone may become sealed by intrusion of the grout. This operation may affect wells both within and beyond the limits of the subject property, depending on the transmissivity of the rock mass. Several factors influence the severity of this condition. These factors include the extent and severity of fissures and cavernous conditions in the limestone mass in this area, the size and depth of nearby wells, the proximity of the grouting operation to the wells and whether water is being withdrawn from the wells during the grout injection operations.

<u>Remediation Cost Estimate</u> – It is very difficult, if not impossible, to accurately predict the length of injection pipe that will be installed and the quantity of grout that will be necessary to stabilize the discovered sinkhole activity. Accordingly, the associated cost to perform the remediation operation is

also difficult to estimate. While acknowledging this high degree of uncertainty, based on our experience with similar situations in this area of Hernando County, we estimate that the grout intake could range between approximately 450 and 550 cubic yards. Based on these grout volume quantities, combined with the installation of an estimated 2,145 lineal feet of injection pipe and using nominal current unit rates, we estimate the cost of the proposed grouting program to range between approximately $105,000.00 and $125,000.00. This budget estimate does not include engineering monitoring fees or cosmetic repair costs.

Because it is very difficult to estimate the extent of such a grouting program, it is common practice to proceed with the grout injection operations, on a unit rate basis. Detailed pipe installation and injection records should be created by HSA personnel in the field, to document the injection operations. Based on those records, modifications to the program, as necessary, may be made to address differing and unexpected conditions below the home. The grout injection program should be observed and monitored by of a representative of our firm to assess the effectiveness of the program and to assign appropriate modification when necessary, as outlined by the grouting plan described herein.

Damaged Structure Element Restoration

Following a stabilization period of about 6 to 8 weeks after completion of the grout injection operations to remediate the sinkhole activity, cracks that appear on the exterior of the perimeter walls can be patched with an elastomeric sealant and then painted. In many cases, where cracks are hairline-width, they can be simply painted over with an elastomeric paint that would be able to expand and contract as future movement develops in the exterior walls. The purpose of this repair is to prevent and/or minimize future moisture intrusion and insect infestation. Interior drywall cracks may generally be simply patched and painted. Any remaining cosmetic/aesthetic issues should also be addressed following correction of the geologic conditions.

CLOSURE

The report should be read in its entirety to obtain a more complete understanding of the information provided, and to aid in any decisions made, or actions taken, based on this information. This report is certified in accordance with Florida Statute 627.7073; no warranties are expressed or implied. In addition to limitations of the test methods discussed throughout the report further limitations as given in **Appendix F**.

HSA Engineers & Scientists appreciates the opportunity to be of service to you on this project. If you have any questions, please do not hesitate to contact us.

Sincerely,
HSA Engineers & Scientists
Engineering Business No. 00007098
Geology Business No. GB135

Meeghan Casey, B.S.
Staff Geologist

Bernd T. Rindermann, P.G.
Senior Geologist 9/26/08
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Senior Geotechnical Engineer
Florida License No. 42449

Attachments: Figures 1 – 6
Appendices A – F

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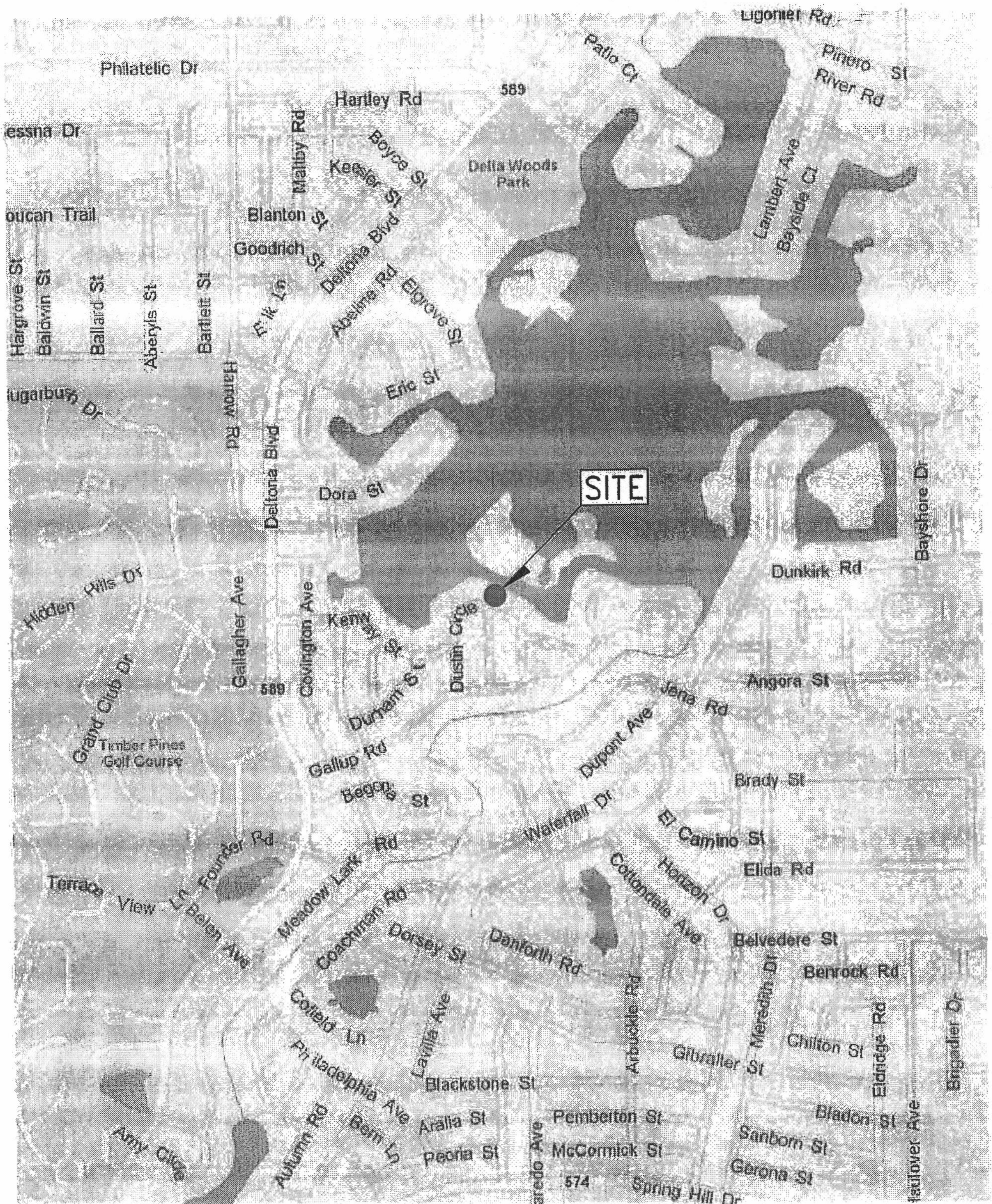
SECTION 32, TOWNSHIP 23 SOUTH, RANGE 17 EAST

HERNANDO COUNTY, FLORIDA



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JOB NO.: 502885700	CAD NO.: 885700-01	DATE: 08/13/08

HSA
ENGINEERS & SCIENTISTS
4019 E. Fowler Avenue Tampa, Florida 33617 Tel: (813) 971-3882

SEACHMAN RESIDENCE
2441 DUSTIN CIRCLE
SPRING HILL, FLORIDA

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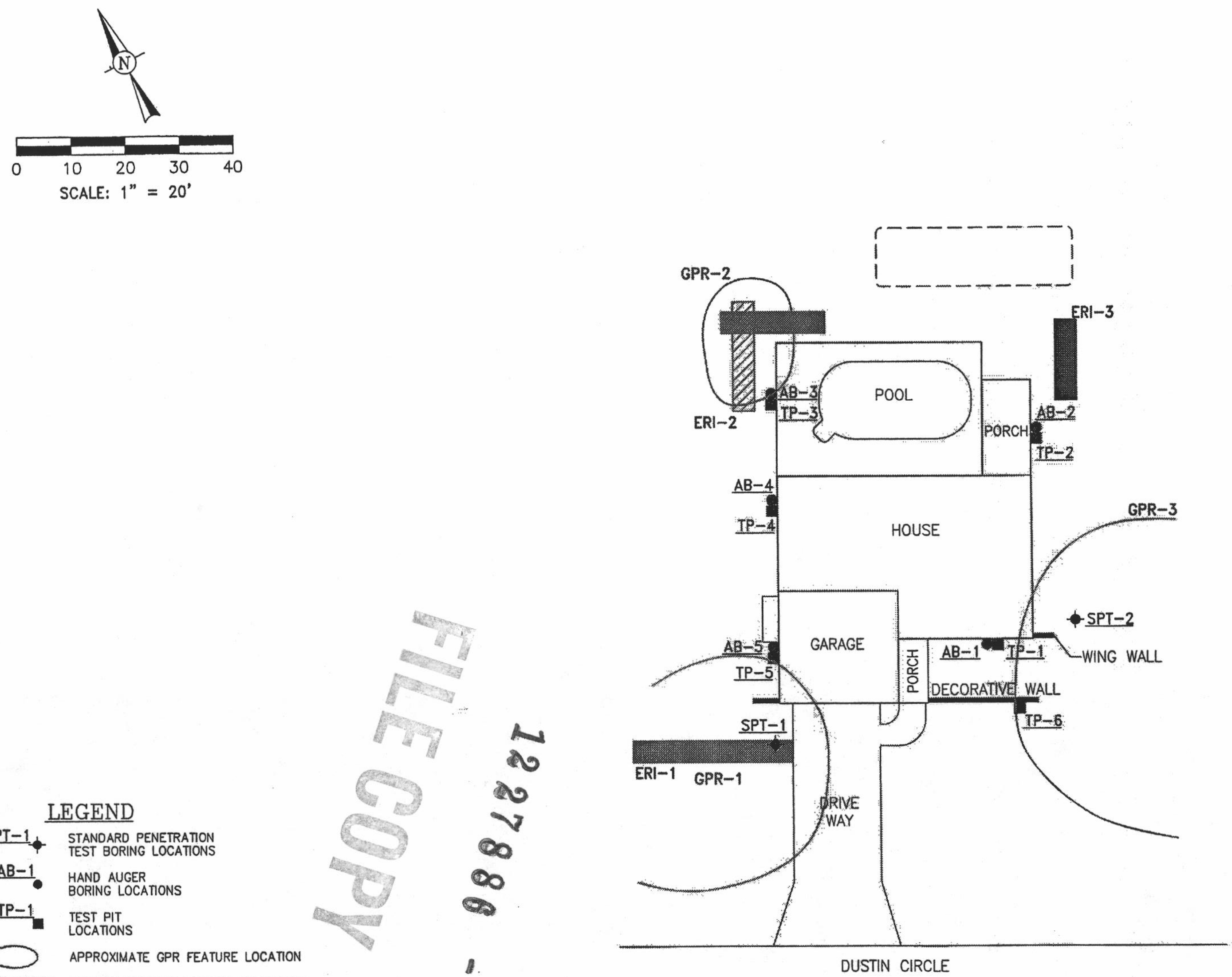
SHEET TITLE
SITE LOCATION MAP

FIGURE 1



LEGEND

- SPT-1 — STANDARD PENETRATION TEST BORING LOCATIONS
- AB-1 — HAND AUGER BORING LOCATIONS
- TP-1 — TEST PIT LOCATIONS
- (oval) — APPROXIMATE GPR FEATURE LOCATION
- (dashed box) — POSSIBLE INFILLED TRENCH OR STREAM CHANNEL
- (solid box) — APPROXIMATE RESISTIVE ERI FEATURE LOCATION
- (hatched box) — APPROXIMATE RELATIVELY SUBTLE RESISTIVE ERI FEATURE LOCATION

NOTES:

1. BASE MAP GENERATED FROM FIELD TAPE MEASUREMENTS AND ESTIMATED DIRECTIONS.
2. BUILDING OUTLINE & LOCATION ARE APPROXIMATE.
3. BORING & TEST PIT LOCATIONS ARE APPROXIMATE.

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2441 DUSTIN CIRCLE
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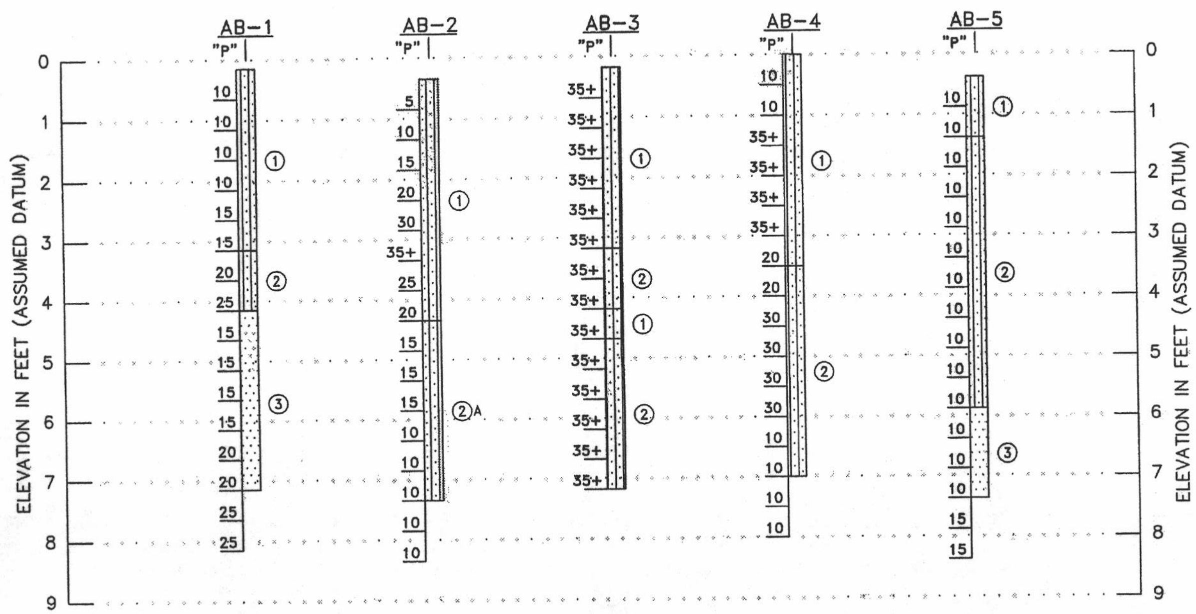
DESIGNED	N/A	JOB NO.:	502885700
DRAWN	DLW	DATE:	08/13/08
CHECKED	RDM	CAD NO.:	885700-01

SHEET TITLE
BORING LOCATION MAP

FIGURE 2



NOTE: GROUNDWATER NOT ENCOUNTERED

LEGEND:

① LIGHT GRAY (10YR 7/1) TO LIGHT BROWNISH GRAY (10YR 6/2) FINE SAND TO SLIGHTLY SILTY FINE SAND (SP/SP-SM)

② GRAYISH BROWN (10YR 5/2) TO DARK GRAY (10YR 4/1) SLIGHTLY SILTY FINE SAND (SP-SM)

③ VERY PALE BROWN (10YR 8/3) TO WHITE (10YR 8/1) FINE SAND (SP)

④ LIGHT GRAY (10YR 7/2) SLIGHTLY CLAYEY FINE SAND (SP-SC)

⑤ DARK GRAYISH BROWN (10YR 4/2) TO GRAYISH BROWN (10YR 5/2) TO PALE BROWN (10YR 6/3) TO LIGHT GRAY (10YR 7/2) SLIGHTLY SILTY TO SILTY FINE SAND (SP-SM/SM)

⑥ LIGHT GRAY (10YR 7/1) SILTY CLAYEY FINE SAND (SM-SC)

⑦ VERY PALE BROWN (10YR 8/2) LIMESTONE (LS)

(7.5YR 5/1)	MUNSELL SOIL COLOR CHART DESIGNATION
(SP)	UNIFIED SOIL CLASSIFICATION GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW
"N" 5	BLOW COUNTS AT SHOWN DEPTH
"P" 5	HAND PENETROMETER READING AT SHOWN DEPTH (E= ERRATIC)
HA	BORING ADVANCED BY HAND AUGER
WH	WEIGHT OF ROD & HAMMER
WR	WEIGHT OF ROD
100%	LOSS OF DRILLING FLUID CIRCULATION IN PERCENT
A	WITH TRACE ROOTS
B	WITH TRACE LIMESTONE FRAGMENTS

SEACHMAN RESIDENCE
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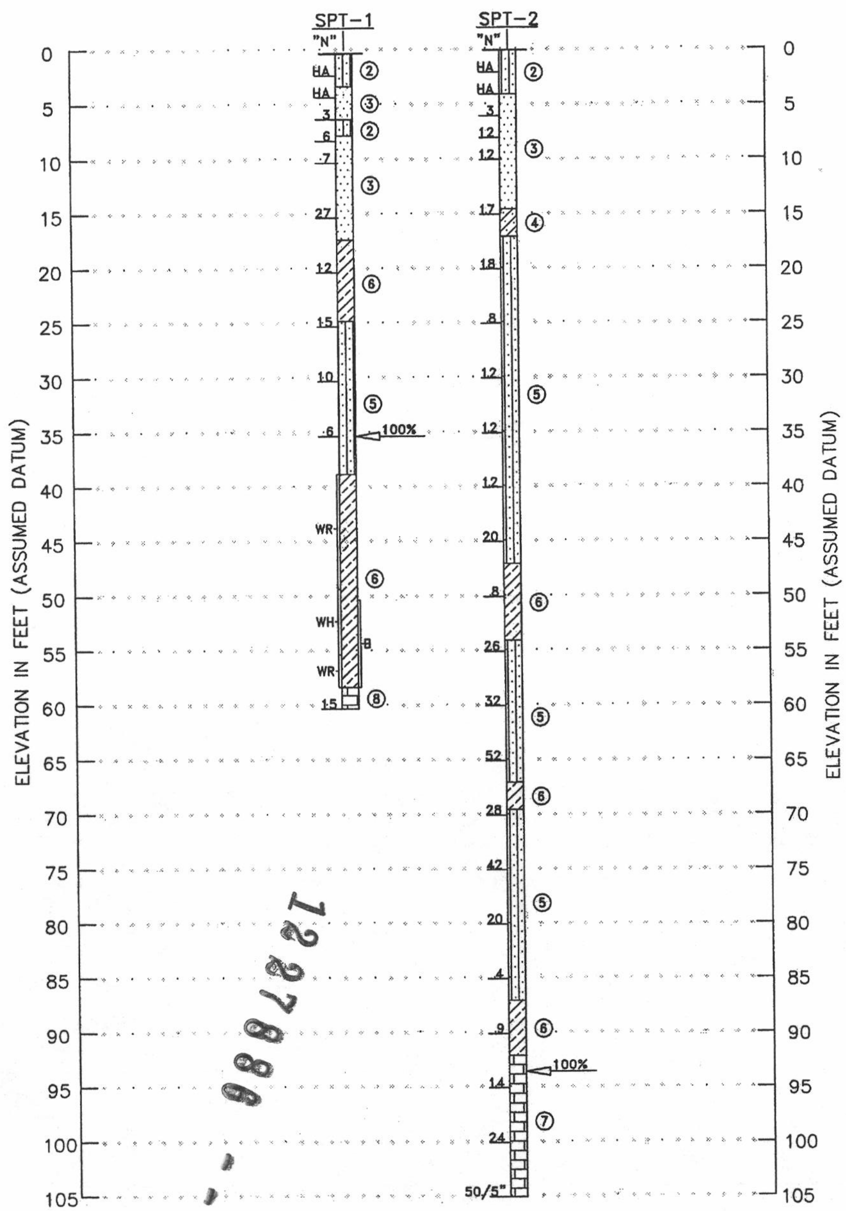
CHECKED	RDM	CAD NO.:	885700-01

SHEET TITLE
BORING PROFILES

FIGURE 3



LEGEND:

①		LIGHT GRAY (10YR 7/1) TO LIGHT BROWNISH GRAY (10YR 6/2) FINE SAND TO SLIGHTLY SILTY FINE SAND (SP/SP-SM)
②		GRAYISH BROWN (10YR 5/2) TO DARK GRAY (10YR 4/1) SLIGHTLY SILTY FINE SAND (SP-SM)
③		VERY PALE BROWN (10YR 8/3) TO WHITE (10YR 8/1) FINE SAND (SP)
④		LIGHT GRAY (10YR 7/2) SLIGHTLY CLAYEY FINE SAND (SP-SC)
⑤		DARK GRAYISH BROWN (10YR 4/2) TO GRAYISH BROWN (10YR 5/2) TO PALE BROWN (10YR 6/3) TO LIGHT GRAY (10YR 7/2) SLIGHTLY SILTY TO SILTY FINE SAND (SP-SM/SM)
⑥		LIGHT GRAY (10YR 7/1) SILTY CLAYEY FINE SAND (SM-SC)
⑦		VERY PALE BROWN (10YR 8/2) LIMESTONE (LS)

(7.5YR 5/1)	MUNSELL SOIL COLOR CHART DESIGNATION
(SP)	UNIFIED SOIL CLASSIFICATION GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW
"N" 5	BLOW COUNTS AT SHOWN DEPTH
"P" 5	HAND PENETROMETER READING AT SHOWN DEPTH (E= ERRATIC)
HA	BORING ADVANCED BY HAND AUGER
WH	WEIGHT OF ROD & HAMMER
WR	WEIGHT OF ROD
◁ 100%	LOSS OF DRILLING FLUID CIRCULATION IN PERCENT
A	WITH TRACE ROOTS
B	WITH TRACE LIMESTONE FRAGMENTS

SEACHMAN RESIDENCE
2441 DUSTIN CIRCLE
SPRING HILL, FLORIDA

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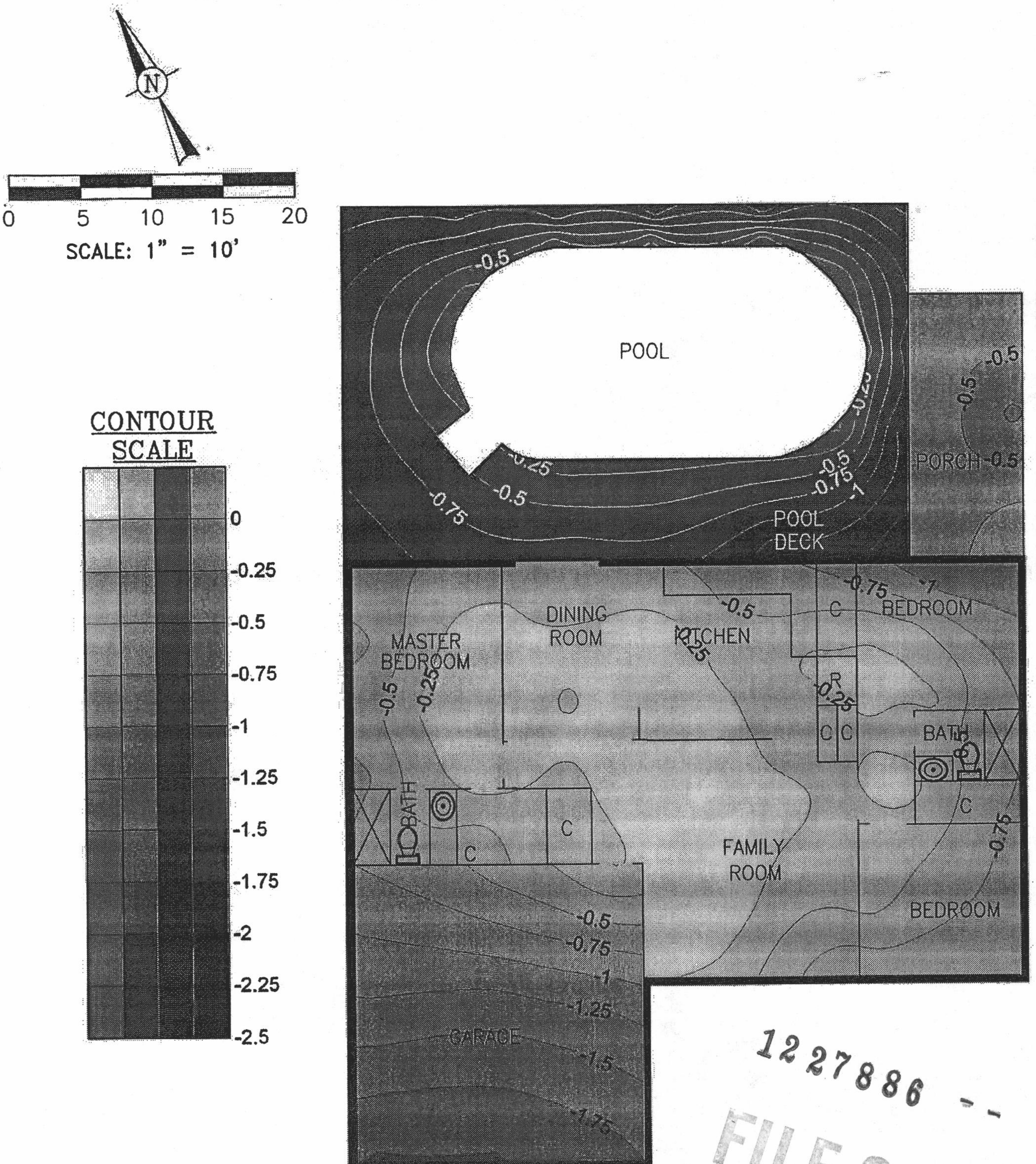
DESIGNED	N/A	JOB NO.:	502885700
DRAWN	DLW	DATE:	08/13/08
CHECKED	RDM	CAD NO.:	885700-01

SHEET TITLE
BORING PROFILES

FIGURE 4



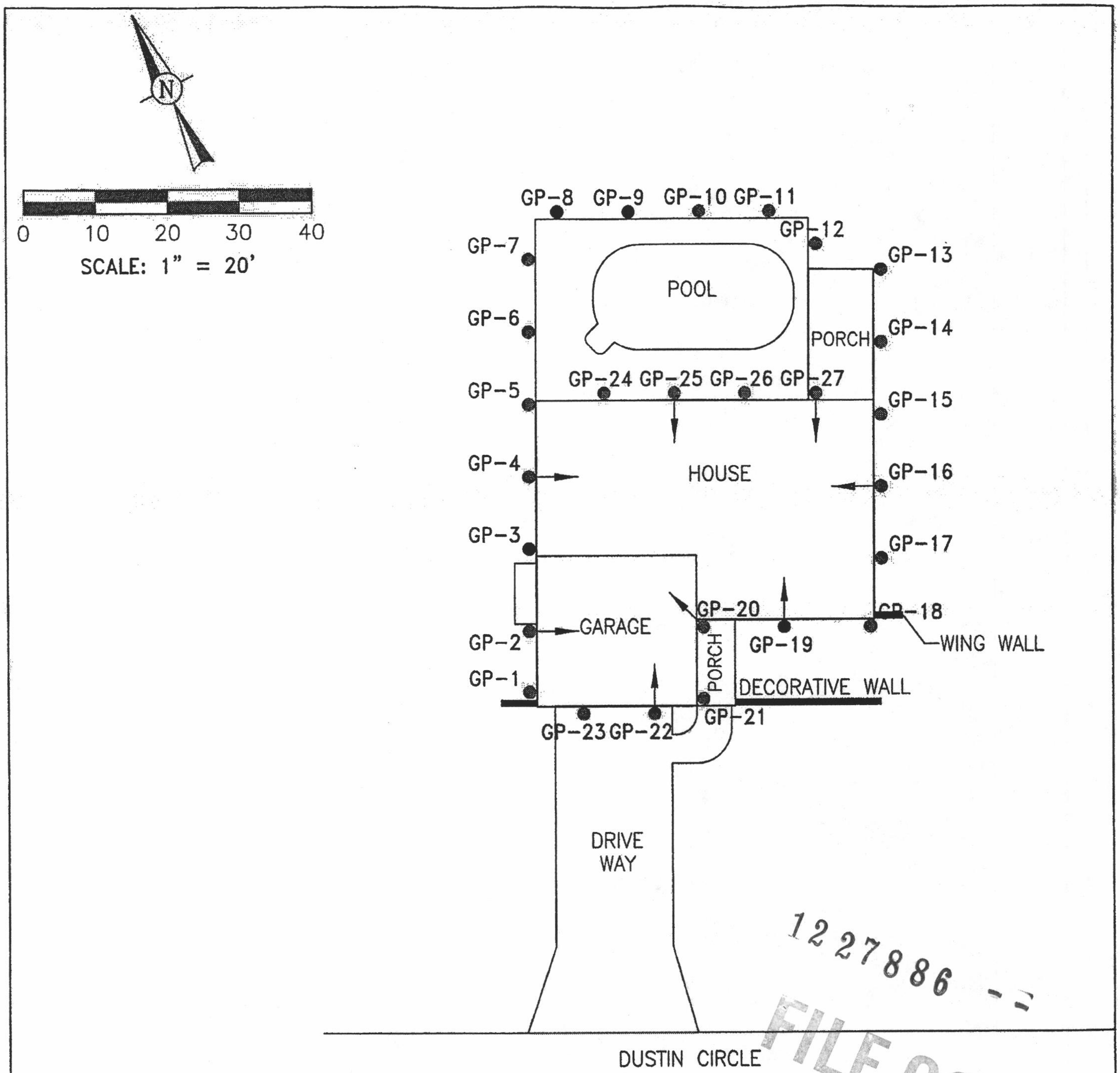
LEGEND

—— 0 ——: CONTOURS, RELATIVE ELEVATION IN INCHES
CONTOUR INTERVAL = 0.25 INCHES

NOTE:

1. LIVING AREA, POOL DECK, REAR PORCH AND GARAGE ARE CONTOURED SEPARATELY
2. DATA HAS BEEN ADJUSTED FOR FLOOR FINISH DIFFERENCES AND MINOR THRESHOLD VARIATIONS

JOB NO.: 502885700 CAD NO.: 885700-01 DATE: 08/13/08 HSA ENGINEERS & SCIENTISTS 4019 E. Fowler Avenue Tampa, Florida 33617 Tel: (813) 971-3882	SEACHMAN RESIDENCE 2441 DUSTIN CIRCLE SPRING HILL, FLORIDA	SHEET TITLE FLOOR ELEVATION SURVEY FIGURE 5



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NOTES:

1. BASE MAP GENERATED FROM FIELD TAPE MEASUREMENTS AND ESTIMATED DIRECTIONS.
2. BUILDING OUTLINE & LOCATION ARE APPROXIMATE.
3. GROUT POINT LOCATIONS ARE APPROXIMATE AND MAY BE ADJUSTED IN THE FIELD.
4. GROUT INJECTION PIPES SHOULD BE INSTALLED BY MEANS OF ROTARY WASH DRILLING.
5. ANGLED GROUT POINTS TO BE INSTALLED AT 4:1(V:H) INCLINATION FROM PLUMB, UNLESS OTHERWISE NOTED.

LEGEND

GP-1 ●	GROUT INJECTION POINT LOCATION
←	DIRECTION OF ANGLED GROUT POINT

JOB NO.: 502885700
CAD NO.: 885700-01
DATE: 08/13/08

HSA ENGINEERS & SCIENTISTS
4019 E. Fowler Avenue Tampa, Florida 33617 Tel: (813) 971-3882

SEACHMAN RESIDENCE
2441 DUSTIN CIRCLE
SPRING HILL, FLORIDA

SHEET TITLE
GROUT POINT LOCATION MAP

FIGURE 6

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PERMIT CARD INSTRUCTIONS

X The permit card must be displayed on street side of lot facing the street in a permanent, substantial shelter accessible to the inspector.

X The permit card must remain displayed until all Final Inspections are completed.

X No inspections will be made unless an approved set of plans is available at jobsite for the inspections.

X Your first inspection must be made within 180 days of permit issuance date.

X It is the contractor's (owner/builder's) responsibility to ensure that required inspections are made prior to proceeding with each stage of the project. Please refer to the list of required inspections given to you with your permit.

X It is the contractor or owner/builder's responsibility to ensure corrections are made to items that have been red tagged, the red tags paid, and re-inspections performed and approved prior to proceeding with work. Failure of the contractor or owner/builder to request and receive re-inspections before proceeding with additional work may result in disciplinary action or a fine against the contractor or owner/builder.

X Final Inspections must be requested within ten (10) days of completion of your project.

X Final Inspections that have been red tagged must be reinspected within seven (7) days. All red tag fees must be paid prior to final inspection.

X You must have a completed inspection within every 180 days for your permit to remain active. If a completed inspection is not obtained your permit may become inactive and require you to pay additional fees to reactivate the permit.

X The life of the permit is 2 years from date of issuance.

I have read and understand the permit card instructions as listed above.

Jason W Newman
Owner/Contractor Signature

Date 9/29/08

Permit Representative Initials

Note: This applies to the two-page application forms. For a check list of documents required for application processing, please refer to the appropriate checklist in the application packets.

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✓ Application has been date stamped received

✓ FBC2004 stamp

✓ Fax number for deficiencies

✓ Key number

✓ Date

✓ Complete description of work to be done/description matches contract, if applicable

✓ Valuation of work to be done

✓ Type of construction marked

✓ Legal description

✓ Address, if applicable

✓ Directions to job site

✓ Property owner's name, address and interest in property

NA Name of fee simple titleholder (if other than owner) and address

NA Permitting service name, if applicable

✓ Contractor, address, and license number

NA Electrical subcontractor, if applicable, phone and license number

NA Plumbing subcontractor, if applicable, phone and license number

NA Mechanical subcontractor, if applicable, phone and license number

NA Roofing subcontractor, if applicable, phone and license number

NA Aluminum subcontractor, if applicable, phone and license number

NA Bonding company name and address, if applicable

NA Architect/Engineer's name and address, if applicable

NA Mortgage Lender's name and address, if applicable

✓ Application signed

- ____ By owner (owner/builder permit)
- ✓ By contractor (contractor permit)
- ✓ By authorized agent
  - ____ Original Agent Authorization submitted

✓ Application Notarized

✓ Application approved/initialed by Permit Representative

✓ Applicant has been advised of any documents which are required and have not been submitted

✓ Permit fee or advanced payment has been verified as being correct, in accordance with fee schedule

✓ Notice of commencement received (signed by owner, certified, recorded copy)

Permit Representative: [signature]

Date: 10-8-8