SUBSURFACE INVESTIGATION &
GEOTECHNICAL RECOMMENDATIONS

PROPOSED NURSING CARE FACILITY
ELIZABETHTOWN, KENTUCKY
AWE PROJECT NO.: 15CN0284

PREPARED FOR:
RAMSEY DEVELOPMENT CORP.
706 JEFFERSON STREET
TELL CITY, INDIANA

PREPARED BY:
ALT & WITZIG ENGINEERING, INC.
GEOTECHNICAL DIVISION
WEST CHESTER, OHIO

JANUARY 5, 2016

Alt & Witzig Engineering, Inc.
6205 Schumacher Park Drive • West Chester, Ohio 45069
Phone: (513) 777-9890 • www.altwitzig.com

January 5, 2016

Ramsey Development Corp.
706 Jefferson Street
Tell City, Indiana 47586
Attention: Mr. Tim Edwards

Report of Subsurface Investigation and Geotechnical Recommendations

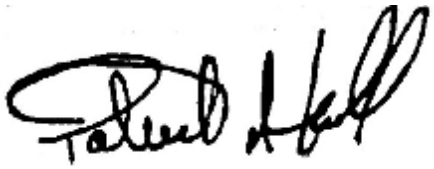
RE: Proposed Nursing Care Facility
Robinbrooke Blvd & Harmony Way
Elizabethtown, Kentucky
AWE Project No.: 15CN0284

Dear Mr. Edwards:

In compliance with your request, Alt & Witzig Engineering, Inc. has completed a subsurface investigation for the above mentioned Site. The Statement of Objectives, Scope of Work, and results of our investigation are presented in the following report. It is our pleasure to transmit a .pdf copy of our findings.

The results of our test borings and laboratory tests completed to date are presented in the appendix of the report. Our recommendations for the project are presented in the "Geotechnical Analyses and Recommendations" section of the report. If you have any questions or comments regarding this matter, please contact us at your convenience.

Sincerely,
ALT & WITZIG ENGINEERING, INC.



Zachary Stivers, P.E. Patrick A. Knoll, P.E.

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EXECUTIVE SUMMARY

Alt & Witzig Engineering, Inc. (AWE) has performed a subsurface investigation and geotechnical analysis for the proposed Nursing Care Facility to be constructed on the southeast corner of Robinbrooke Blvd. and Harmony Way in Elizabethtown, Kentucky, in conformance with the scope and limitations of our proposal dated November 30, 2015 (*AWE Proposal 1511CN033*). This investigation was performed for Ramsey Development Corp. Authorization to perform this investigation was in the form of an AWE proposal accepted by Mr. Tim Edwards of Ramsey Development Corp. and an executed agreement.

In compliance with your request, we have completed a total of 19 soil borings at the above referenced site for the proposed facility. This project includes:

- A new 296,334-SF building.
- Associated parking and drives

The purpose of this investigation was to determine the various soil profile components, the engineering characteristics of the subsurface materials, and to provide geotechnical recommendations and design parameters for use by design engineers in preparing the construction plans and bid documents.

Based on our investigation, the site appears suitable for the intended construction. The following conditions and concerns are relevant for this project.

- All of the soils, with the exception to topsoil, encountered during boring operations were suitable for reuse as structural fill. Atterberg Limits tests revealed high plastic clays ("fat") across the site. High plastic clays should be chemically treated before being used as structural fill. Otherwise these materials should be hauled from the site or wasted in green space. The building pad and parking/drive areas should be chemically stabilized using lime kiln dust (LKD) to a minimum depth of 12-inches applied at a rate of 6%. The stabilization will reduce the negative effects of shrink/swell of the highly plastic soils.

- Based on moisture contents of the boring samples, the shallow soils appear to be above optimum moisture content. These soils will have to be dried before use as structural fill.

- Conventional shallow spread footings and continuous wall footings can be used to support the facility. A net allowable soil bearing pressure of 4,000-psf is recommended to dimension conventional column and wall footings. This assumes the foundations will bear on natural soils or structural fills. If possible, wall footings should be designed to allow for at least 600-psf load to provide protection against expansion from the highly plastic clays located across the site.

1.0 INTRODUCTION

1.1 Purpose

The purpose of this investigation was to determine the various soil profile components, the engineering characteristics of the foundation materials, and to provide geotechnical recommendations and design parameters for use by design engineers and architects in preparing the foundation design of the proposed facility.

1.2 Statement of Objectives

In compliance with your request, we have completed a total of 19 soil borings at the above referenced site for the proposed development in Elizabethtown, Kentucky.

This project included:

- A review of geological maps of the area and review of geologic and related literature
- A reconnaissance of the immediate site and subsurface exploration
- Field and laboratory testing
- Engineering analysis and evaluation of the materials

1.3 Incorporations by Reference

Our subsurface investigation was conducted in accordance with guidelines set forth in the scope of services and applicable industry standards. This investigation was performed for Ramsey Development Corp. The proposed statement of objectives and scope of work were outlined in the form of AWE Proposal Number 1511CN033 duly authorized by Mr. Tim Edwards in care of Ramsey Development Corp..

1.4 Report Reliance

This report is solely for the use of Ramsey Development Corp. and any reliance of this report by third parties shall be at such party's sole risk and may not contain sufficient information for purposes of other parties for other uses. This report shall only be presented in full and may not be used to support any other objectives than those set out in the scope of work, except where written approval and consent are provided by Ramsey Development Corp. and AWE.

2.0 BACKGROUND INFORMATION

2.1 Site Location

The site of the proposed development is located in Elizabethtown, Kentucky. Specifically, the site is located on the southeast corner of Robinbrooke Blvd. and Harmony Way. The location of the site is shown on Figure 1 below.

Figure 1: 2015 Google Aerial

2.2 Site Description

The surface of the immediate Site is sloped, with a relief of 15 to 20-feet across the site. The approximate mean sea level (msl) elevation of the Site is 790-feet. Groundcover across the site consisted of grass and fill dirt. The surrounding area is moderately developed with commercial structures and roads.

3.0 WORK PERFORMED

3.1 Boring Locations

Alt & Witzig Engineering staked the locations of the borings using the provided project plans and available information from Google Earth. It is suggested that the borings be field located by the survey/site engineer and shown on the proposed site layout and grading plan. This information can be provided and our report can be modified to include this information, if desired. The boring

locations can be reviewed on the *boring location plan* found in the appendix of this report and in Figure 2 below.

Figure 2: 2015 Google Aerial – Boring Locations Over Existing Conditions

3.2 Soil Sampling

Field investigations to determine the engineering characteristics of the subsurface materials included a reconnaissance of the project site and drilling 19 borings. A standard penetration test with split-spoon sampling was performed during drilling operations. The apparent groundwater level at each boring location was also determined.

3.2.1 Soil Sampling Methodology

The soil borings were performed with a drilling rig equipped with a rotary head. Conventional hollow-stem augers were used to advance the holes. Borings were accessed by a truck mounted drilling rig. During the sampling procedure, standard penetration tests were performed at regular intervals in accordance with ASTM Method D 1586 to obtain the standard penetration value of the soil. The standard penetration value is defined as the number of blows a 140 lb hammer, falling 30 inches, required to advance the split-spoon sampler 12-inches into the soil. The results of the standard penetration tests indicate the relative density and comparative consistency of the soils, and thereby provide a basis for estimating the relative strength and compressibility of the soil profile components.

Soil samples were field classified and placed in unpreserved glass jars with Teflon-lined lids for transport to our geotechnical laboratory for further analysis.

3.2.2 Laboratory Analyses for Soil Samples

A supplementary laboratory investigation was conducted to ascertain additional pertinent engineering characteristics of the subsurface materials necessary in analyzing the behavior of the proposed structure. All phases of the laboratory investigation were conducted in accordance with

applicable ASTM Specifications. The laboratory-testing program also included:

- Visual classification in accordance with ASTM D 2488.
- Moisture content tests in accordance with ASTM D 2216.
- Atterberg limit testing in accordance with ASTM D 4318.
- Particle Size Distribution in accordance with ASTM D 422.

Samples of the cohesive soil from the split-spoon-sampling device were frequently tested in unconfined compression by use of a calibrated spring testing machine. In addition, a calibrated soil penetrometer was used as an aid in determining the strength of the soil. The values of the unconfined compressive strength as determined on soil samples from the split-spoon sampling must be considered, recognizing the manner in which they were obtained since the split-spoon sampling techniques provide a representative but somewhat disturbed soil sample.

3.3 Groundwater Elevation

Initial depths to groundwater were estimated based on where water was observed on the sampling rods. Upon completion of drilling activities, the depth to water was measured using a 100-foot tape measure with a weighted end. The depths presented on the Boring Logs are accurate only for the day on which they were recorded. The exact location of the water table shall be anticipated to fluctuate depending upon normal seasonal variations in preparation and surface runoff.

3.4 Ground Surface Elevation

Ground surface elevations were not made available at the time of the test borings. It is suggested that the borings be field located by the survey/site engineer and shown on the proposed site layout and grading plan. Borings were field staked for this investigation by means of "pacing and taping" methods.

4.0 INVESTIGATION RESULTS

The types of foundation materials encountered have been visually classified and are described in detail on the *Boring Logs*. The results of the field penetration tests, strength tests, water level observations and laboratory water contents are presented on the *Boring Logs* in numerical form. Representative samples of the soils encountered in the field were placed in sample jars and are now stored in our laboratory for further analysis if desired. Unless notified to the contrary, all samples will be disposed of after 30-days.

4.1 Subsurface Condtions

A total of 19 borings were drilled across the site for the proposed facility. Generally, similar conditions were encountered across the site.

Borings B-1 through B-13 were conducted for the proposed nursing care facility and borings P-1 through P-6 were conducted in the parking and drive areas. At the surface approximately 1 to 3-inches of topsoil was encountered. Beneath the surface materials brown, red, and gray clay and sandy clay soils with varying amounts of gravel were encountered to boring termination depths at 16-feet below ground surface elevation. The natural cohesive soils were stiff to very stiff in consistency. Intermittent sand seams were encountered across the site.

4.2 Water Observations

All borings indicated dry conditions during, upon completion, and 24-hours upon completion of boring operations. It generally takes several days to weeks of observation to accurately estimate the elevation of the water table. The exact level of the water table should be expected to fluctuate based on seasonal variations.

4.3 Seismic Parameters

The seismic site class can be approximated by averaging soil conditions within the top 100 feet with respect to the shear wave velocity. This evaluation is based on data obtained on soil to termination of the borings at 16-feet below the surface and our experience with soils in the area. Based on the field and laboratory tests performed on the encountered subsurface materials, this site should be considered a Site Class D in accordance with the current Kentucky Building Code.

5.0 GEOTECHNICAL ANALYSES AND RECOMMENDATIONS

5.1 Project Description

Preliminary plans indicate a single-story nursing care facility that will be constructed as a slab on grade. Elevations have not been provided at this time. We anticipate the structure will consist of load bearing masonry walls and wood framed walls with wood roof trusses.

The finished floor and site elevations have not been provide at this time. However due to the slopes on the site, we anticipate significant cut and fills will be required in order to establish final grades.

For our analysis, it is assumed that the structure will be moderately loaded. Maximum wall loads in the range of 3 to 5-kips per lineal foot or less are assumed. Maximum column loads in the range of 30 to 60-kips are also assumed.

5.2 Site Preparation

In order to construct the proposed facility all topsoil and organic material will need to be stripped and either wasted in green space or hauled from the Site. It is recommended that after the above-mentioned stripping has been performed, the exposed sub-grade should be proof-rolled with approved equipment. This proof-rolling will assist in identifying areas where soft soil exist. If pockets of soft materials are encountered, these soils should be removed and replaced with a well-compacted material. It is recommended that a representative of Alt & Witzig Engineering be present for this phase of this project.

It should be noted that considerable heavy construction traffic over the exposed sub-grade may cause rutting and pumping. Caution should be exercised to direct construction traffic such that the sub-grade does not fail due to construction activities.

5.2.1 On-Site Borrow/Import Soil Specifications

All of the soils, with the exception to topsoil, encountered during boring operations were suitable for reuse as structural fill. The laboratory tests indicated the shallow soils (upper 7 feet) to have moisture contents between 16% and 30% with the vast majority of the soils having

moisture contents between 16% and 20%. Optimum moisture content for the clays is anticipated to be in the range of 14% to 18% based on our experience with similar soils. Atterberg Limits tests were completed on a sample across the site. The liquid limit and plastic index ranged from 32% to 65% and 14% to 44% respectively indicating soils that are highly plastic or "fat". Highly plastic clays (LL>50) should not be used as borrow within two (2) feet of the sub-grade elevation unless they are chemically modified. It is important that proper moisture content be maintained for these soils to be used as structural fill. Based on moisture contents of the boring samples, much of the shallow soils appear to be above optimum moisture content and will require drying.

These soils will have to be dried before being used as structural fill. This can be performed by spreading the soils in a thin (12-inches or so) loose lift in favorable weather conditions and continuously disking the soils until a suitable moisture content is reached. Alternatively, chemical drying can be performed by mixing the shallow soils with lime or cement by soil weight with wet soils. A representative of AWE should be present to ensure proper placement in regards to density and moisture content of any earthwork that is performed. The exact material used for drying should be determined at the time of filling.

All fill shall be formed from material free of vegetable matter, rubbish, large rock, and other deleterious material. Prior to placement of fill, a sample of the proposed fill material should be submitted to AWE for approval. The fill material should be placed, compacted, and dried as required to secure specified compactions. Each layer should be uniformly compacted by means of suitable equipment of the type required by the materials composing the fill. Under no circumstances should a bulldozer or similar tracked vehicles be used as compacting equipment. Material containing an excess of water so the specified compaction limits cannot be attained should be spread and dried to a moisture content which will permit proper compaction. All fill should be compacted to the specified percent of the maximum density obtained in accordance with ASTM density Test D-698. Should the results of the in-place density tests indicate that the specified compaction limits are not obtained; the areas represented by such tests should be reworked and retested as required until the specified limits are reached.

5.3 Foundation Recommendations

Conventional shallow spread footings and continuous wall footings can be used to support the nursing facility. A net allowable soil bearing pressure of 4,000-psf is recommended. This assumes the foundations will bear on natural soils or structural fills. If possible, wall footings should be designed to allow for at least 600-psf load to provide protection against expansion from the highly plastic clays located across the site.

The above recommended bearing pressure is a "net allowable soil pressure". In utilizing this net allowable pressure for dimensioning footings, it is necessary to consider only those loads applied above the finished floor elevations. All exterior foundations should be founded a minimum of 36-inches or greater below the final grade to reduce frost action and movement due to volume changes in the soil due to moisture.

We suggest that all foundation excavations be inspected by *AWE* to verify that adequate bearing soils exist in the base of all footings. At the time of footing inspections, Housel Penetration Tests or other approved tests can be performed on these foundation soils.

Any footing areas that encounter soft soils during footing excavations should be undercut and replaced with lean concrete. Lean concrete is a low strength (1,500-psi 28-day compressive strength) concrete that will transfer foundations loads directly onto the soil in which the lean concrete is poured.

5.4 Groundwater Considerations

Borings indicated dry conditions during and at completion of drilling. The exact location of the water table will fluctuate depending upon normal seasonal variations in precipitation and surface runoff.

Based on these observations, groundwater concerns with short term excavations are not considered a concern. However, depending upon the time of the year and the weather conditions when the excavations are made, seepage from surface runoff may also occur into shallow excavations and soften the sub-grade soils. Since these foundation materials tend to loosen when exposed to free water, every effort should be made to keep the excavations dry should water be encountered. Sump pumps or other conventional dewatering procedures should be sufficient for this purpose. All concrete for footings be poured the same day as the excavation is made in order to prevent the softening of foundation soils.

5.5 Floor Slab Recommendations

The ground floor for the proposed facility can be constructed as a slab-on-grade supported by natural soils and/or well compacted fill materials. Due to the presence of highly plastic soils across the site, it is recommended that the building pad be chemically stabilized using LKD to a minimum depth of 12-inches applied at a rate of 6%. The stabilization will reduce the negative effects of shrink/swell of the highly plastic soils. A 4 to 6-inch compacted granular fill should be placed immediately beneath all floor slabs. This granular fill will provide a uniform surface for construction of the floor slab and minimize capillary rise of groundwater through the slab. A vapor barrier should be placed immediately below the floor slab in any areas of the building where floor coverings such as carpet, vinyl tile, ceramic tile, etc. will be placed. Where floor loads due to building structure will be necessary a modulus of sub-grade reaction of 125-pci should be used to dimension the slab thickness. If the soils are chemically stabilized a 200-pci sub-grade reaction could be used.

Before any fill is placed the exposed sub-grade should be proof-rolled with equipment approved by AWE. This proof-rolling will expose any soft, compressible soil. Soft areas should be undercut to a depth determined at the time of the proof-roll inspection and stabilized by replacing with a well-compacted fill, chemical stabilization, or discing and aerating the soils. The undercutting should occur before fill operations. Our investigation was performed during a wet period of the year. Soft surface soils were noted. Depending on the time of year, portions of the slab sub-grade could fail the proof-roll. If wet conditions are present at the time of construction modifications to the sub-grade soils will likely be required and be directed at the time of the proof-roll.

5.6 Proposed Parking and Drive Areas

The soils in the parking area of similar consistency to that of the building pad. Based upon our laboratory tests and on past experience with soils having a similar consistency, we recommend chemical stabilization of the pavement sub-grade. Using 6% LKD to a minimum depth of 12-inches, a design CBR value of 7.0 can be used for design.

It is important that all paved areas be designed to prevent water from collecting or ponding immediately beneath the pavement. It is suggested that under drains be installed in the pavement area to minimize potential saturation of these soils. The soils engineer, owner, and site design engineer should discuss the design and placement of these drains prior to construction. For under drains to be effective, minimum installation depths of 18-inches are suggested. The drains should consist of a 4-inch perforated plastic pipe encased in a clean granular backfill such as a washed No. 57 stone.

5.7 Pavement Design Recommendations

The following pavement sections were determined based on estimated traffic conditions, utilizing a twenty (20) year design life, a CBR value of 7.0, and the American Association of State Highway Officials (AASHTO) design method. **If actual traffic conditions differ greatly than mentioned below we should be contacted so that appropriate changes in the design can be made.**

For pavements used as parking lots subjected to lightly loaded vehicles such as automobiles, the following light duty pavement section is suggested:

6" of DGA
2" of asphalt binder
1½" of asphalt surface course

For pavements used as drive lanes subjected to lightly loaded vehicles such as automobiles and the occasional deliver and trash trucks, the following heavy duty pavement section is suggested:

6" of DGA
3½" of asphalt binder
1½" of asphalt surface course

6.0 STATEMENT OF LIMITATIONS

An inherent limitation of any geotechnical engineering study is that conclusions must be drawn on the basis of data collected at a limited number of discrete locations. The geotechnical parameters provided in this report were developed from the information obtained from the test borings that depict subsurface conditions only at these specific locations and on the particular date indicated on the boring logs. Soil conditions at other locations may differ from conditions encountered at these boring locations and groundwater levels shall be expected to vary with time. The nature and extent of variations between the borings may not become evident until the course of construction.

The recommendations submitted are based on the available soil information and assumed design details enumerated in this report. If actual design details differ from those specified in this report, this information should be brought to the attention of Alt & Witzig Engineering, Inc. so that it may be determined if changes in the recommendations herein are required. If deviations from the noted subsurface conditions are encountered during construction, they should also be brought to the attention of Alt & Witzig Engineering, Inc.

ALT & WITZIG ENGINEERING, INC.

APPENDIX A

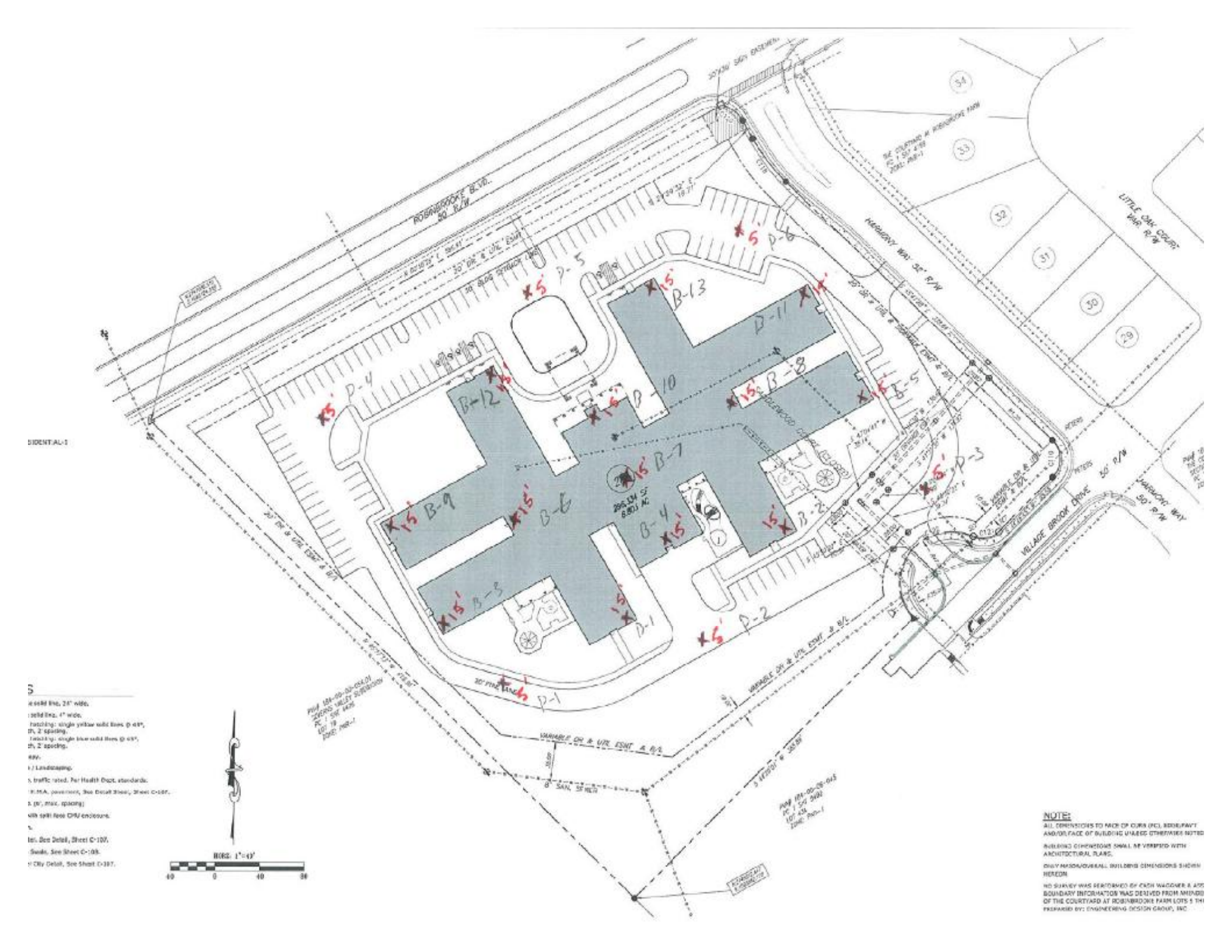
Boring Location Map
Boring Logs
General Notes

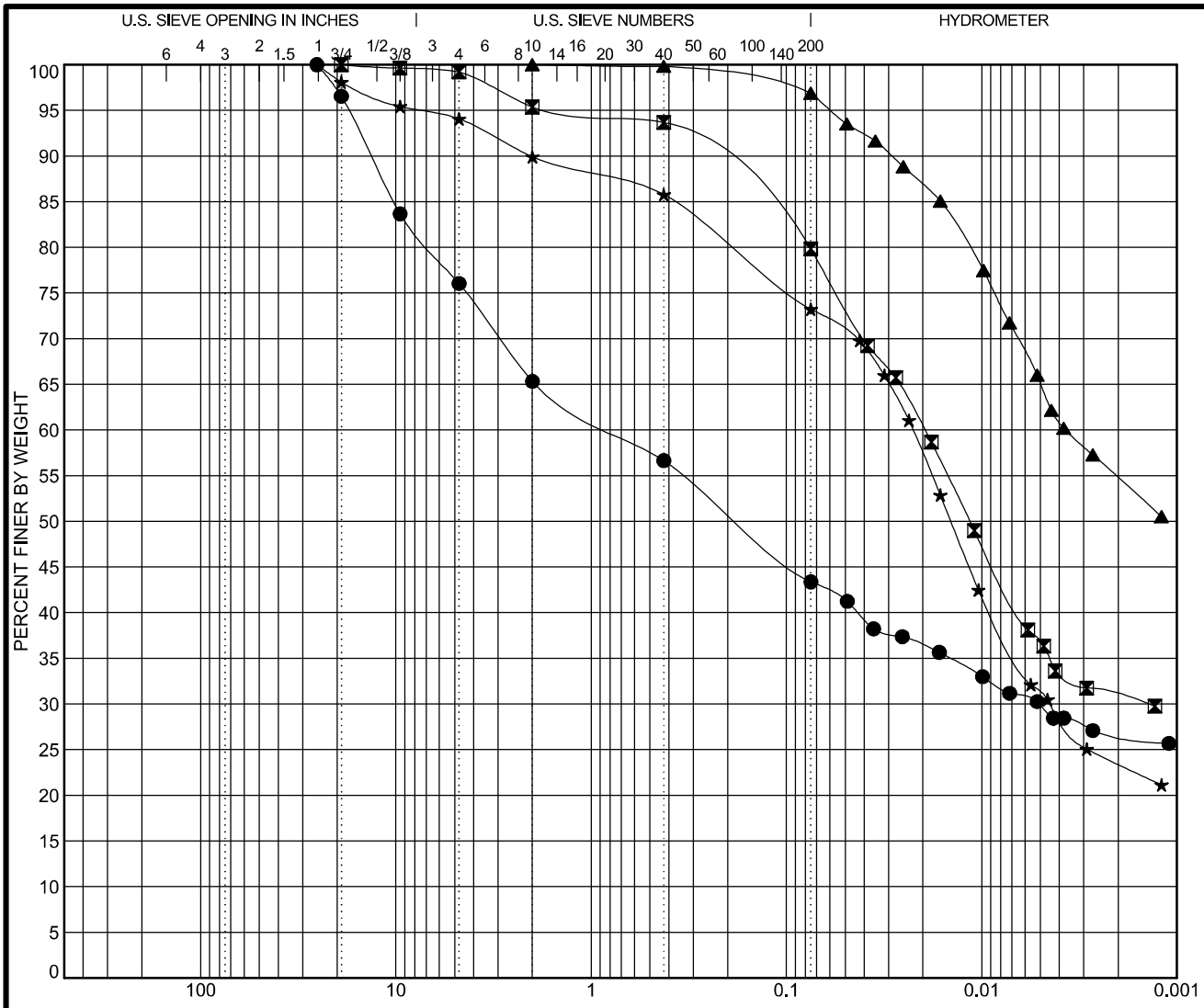
RECOMMENDED SPECIFICATIONS FOR COMPACTED FILLS AND BACKFILLS

All fill shall be formed from material free of vegetable matter, rubbish, large rock, and other deleterious material. Prior to placement of fill, a sample of the proposed fill material should be submitted to the soil engineer for his approval. The fill material should be placed in layers not to exceed eight (8) inches in loose thickness and should be sprinkled with water as required to secure specified compactions. Each layer should be uniformly compacted by means of suitable equipment of the type required by the materials composing the fill. Under no circumstances should a bulldozer or similar tracked vehicles be used as compacting equipment. Material containing an excess of water so the specified compaction limits cannot be attained should be spread and dried to a moisture content which will permit proper compaction. All fill should be compacted to the specified percent of the maximum density obtained in accordance with ASTM density Test D-698 (98 percent of maximum dry density below in the building and pavement areas). Should the results of the in-place density tests indicate that the specified compaction limits are not obtained; the areas represented by such tests should be reworked and retested as required until the specified limits are reached.


Robinbrooke Blvd
1600
© 2015 Google


P-6 5'
P-5 5'
B-13 15'
B-11 15'
B-12 15'
P-4 5'
B-10 15'
B-8 15'
B-5 15'
B-7 15'
P-3 5'
B-9 15'
B-6 15'
B-4 15'
B-2 15'
B-1 15'
B-3 15'
P-2 5'
P-1 5'
© 2015 Google


ROSEMEADOW DR.
50' R/W
HARMONY WAY 50' R/W
LITTLE OAK COURT
VAR. R/W
VILLAGE BROOK DRIVE
50' R/W
HARMONY WAY
50' R/W
B-1
B-2
B-3
B-4
B-5
B-6
B-7
B-8
B-9
B-10
B-11
B-12
B-13
P-1
P-2
P-3
P-4
P-5
P-6
34
33
32
31
30
29
VARIABLE DR & UTIL ESMT & B/L
8" SAN. SEWER
NOTE:
ALL DIMENSIONS TO FACE OF CURB (FC), EDGE OF PAVT AND/OR FACE OF BUILDING UNLESS OTHERWISE NOTED
BUILDING DIMENSIONS SHALL BE VERIFIED WITH ARCHITECTURAL PLANS.
ONLY MASONRY/WALL BUILDING DIMENSIONS SHOWN HEREON
NO SURVEY WAS PERFORMED BY CASH WAGONER & ASS
BOUNDARY INFORMATION WAS DERIVED FROM AMENDE
OF THE COURTYARD AT ROSEMEADOW FARM LOTS 5 TH
PREPARED BY: ENGINEERING DESIGN GROUP, INC.



** Testing Completed in Accordance with ASTM D 422.*
Soils Classified in Accordance with ASTM D 2487

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	B-11	9.5 to 11.0	CLAYEY SAND with GRAVEL SC	51	21	30		
⊠	B-4	4.5 to 6.0	LEAN CLAY with SAND CL	38	16	22		
▲	B-5	14.5 to 16.0	FAT CLAY CH	65	21	44		
★	B-7	2.0 to 3.5	LEAN CLAY with SAND CL	32	18	14		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-11	9.5 to 11.0	25.4	0.774	0.005		24.0	32.7	16.7	26.6
⊠	B-4	4.5 to 6.0	19.05	0.02	0.001		0.8	19.4	49.0	30.8
▲	B-5	14.5 to 16.0	2	0.004			0.0	3.1	42.1	54.8
★	B-7	2.0 to 3.5	25.4	0.022	0.004		5.9	20.8	49.8	23.4

Alt & Witzig Engineering, Inc.
6205 Schumacher Park Dr.
West Chester, OH 45069
Telephone:
Fax:

GRAIN SIZE DISTRIBUTION

Project: Elizabethtown Healthcare

Location: Robinbrook Blvd and Harmony Way

Number: 15CN0284

BORING LOG

Alt & Witzig Engineering, Inc.

CLIENT **Ramsey Development Corporation**
PROJECT NAME **Elizabethtown Healthcare**
PROJECT LOCATION **Robinbrook Blvd and Harmony Way**

BORING # **B-1**
ALT & WITZIG FILE # **15CN0284**

DRILLING and SAMPLING INFORMATION

Date Started **12/15/15**
Date Completed **12/15/15**
Boring Method **HSA**
Driller **J. Roark**

Hammer Wt. **140** lbs.
Hammer Drop **30** in.
Spoon Sampler OD **2** in.
Rig Type **D-50 Track ATV**

STRATA ELEV.	SOIL CLASSIFICATION / SURFACE ELEVATION	Strata Depth	Depth Scale	Sample No.	Sample Type	Sampler Graphics / Recovery Graphics	Ground Water	TEST DATA: Standard Penetration Test, N - blows/foot	TEST DATA: Qu-tsf Unconfined Compressive Strength	TEST DATA: PP-tsf Pocket Penetrometer	TEST DATA: Moisture Content % / *Dry Unit Weight (pcf)*	Remarks
	TOPSOIL (3")	0.3										
	Brown and Gray CLAY			1	SS			15		2.0	19.0	
		5.0	5	2	SS			14		4.0	18.3	
				3	SS			20	4.8	4.0	19.0	
	Brown, Gray, and Red Silty CLAY		10	4	SS			18	3.7	2.5	18.8	
			15	5	SS			18			18.4	
		16.0										
	End of Boring at 16 feet											

Sample Type
SS - Driven Split Spoon
ST - Pressed Shelby Tube
CA - Continuous Flight Auger
RC - Rock Core
CU - Cuttings
CT - Continuous Tube

Groundwater
○ During Drilling *DRY ft.*
▽ At Completion *DRY ft.*

Boring Method
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling

BORING LOG

Alt & Witzig Engineering, Inc.

CLIENT **Ramsey Development Corporation**
PROJECT NAME **Elizabethtown Healthcare**
PROJECT LOCATION **Robinbrook Blvd and Harmony Way**

BORING # **B-2**
ALT & WITZIG FILE # **15CN0284**

DRILLING and SAMPLING INFORMATION

Date Started **12/15/15**
Date Completed **12/15/15**
Boring Method **HSA**
Driller **J. Roark**
Hammer Wt. **140** lbs.
Hammer Drop **30** in.
Spoon Sampler OD **2** in.
Rig Type **D-50 Track ATV**

STRATA ELEV.	SOIL CLASSIFICATION / SURFACE ELEVATION	Strata Depth	Depth Scale	Sample No.	Sample Type	Sampler Graphics / Recovery Graphics	Ground Water	TEST DATA: Standard Penetration Test, N - blows/foot	TEST DATA: Qu-tsf Unconfined Compressive Strength	TEST DATA: PP-tsf Pocket Penetrometer	TEST DATA: Moisture Content % / Dry Unit Weight (pcf)	Remarks
	TOPSOIL (3")	0.3										
	Brown and Red CLAY			1	SS			14	4.7	3.3	22.1	
		5.0	5	2	SS			14	4.3	4.0	18.7	
				3	SS			14				
	Brown, Gray, and Red Silty CLAY with Gravel		10	4	SS			15		2.8	18.6	
			15	5	SS			16		4.5	16.7	
		16.0										
	End of Boring at 16 feet											

Sample Type
SS - Driven Split Spoon
ST - Pressed Shelby Tube
CA - Continuous Flight Auger
RC - Rock Core
CU - Cuttings
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Groundwater
○ During Drilling *DRY ft.*
▽ At Completion *DRY ft.*

Boring Method
HSA - Hollow Stem Augers
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BORING LOG

Alt & Witzig Engineering, Inc.

CLIENT **Ramsey Development Corporation**
PROJECT NAME **Elizabethtown Healthcare**
PROJECT LOCATION **Robinbrook Blvd and Harmony Way**

BORING # **B-3**
ALT & WITZIG FILE # **15CN0284**

DRILLING and SAMPLING INFORMATION

Date Started **12/14/15**
Date Completed **12/14/15**
Boring Method **HSA**
Driller **J. Roark**

Hammer Wt. **140** lbs.
Hammer Drop **30** in.
Spoon Sampler OD **2** in.
Rig Type **D-50 Track ATV**

STRATA ELEV.	SOIL CLASSIFICATION / SURFACE ELEVATION	Strata Depth	Depth Scale	Sample No.	Sample Type	Sampler Graphics / Recovery Graphics	Ground Water	TEST DATA: Standard Penetration Test, N - blows/foot	TEST DATA: Qu-tsf Unconfined Compressive Strength	TEST DATA: PP-tsf Pocket Penetrometer	TEST DATA: Moisture Content % / Dry Unit Weight (pcf)	Remarks
	TOPSOIL (3")	0.3										
	Brown and Red Sandy CLAY	3.5		1	SS			11	3.1	2.5	27.2	
	Brown, Gray, and Red CLAY with a Trace of Gravel	10.0	5	2	SS			12	3.7	2.5	22.0	
				3	SS			9	1.7	2.3	17.5	
	Brown and Red CLAY with Sand	16.0	10	4	SS			12	2.1	4.5	18.2	
	End of Boring at 16 feet		15	5	SS			15		2.8	21.3	

Sample Type
SS - Driven Split Spoon
ST - Pressed Shelby Tube
CA - Continuous Flight Auger
RC - Rock Core
CU - Cuttings
CT - Continuous Tube

Groundwater
○ During Drilling *DRY ft.*
▽ At Completion *DRY ft.*
▼ After *24* hours *DRY ft.*
Caved After *24* hours at *8' ft*

Boring Method
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling

BORING LOG

Alt & Witzig Engineering, Inc.

CLIENT **Ramsey Development Corporation**
PROJECT NAME **Elizabethtown Healthcare**
PROJECT LOCATION **Robinbrook Blvd and Harmony Way**

BORING # **B-4**
ALT & WITZIG FILE # **15CN0284**

DRILLING and SAMPLING INFORMATION

Date Started **12/15/15**
Date Completed **12/15/15**
Boring Method **HSA**
Driller **J. Roark**

Hammer Wt. **140** lbs.
Hammer Drop **30** in.
Spoon Sampler OD **2** in.
Rig Type **D-50 Track ATV**

STRATA ELEV.	SOIL CLASSIFICATION / SURFACE ELEVATION	Strata Depth	Depth Scale	Sample No.	Sample Type	Sampler Graphics / Recovery Graphics	Ground Water	TEST DATA: Standard Penetration Test, N - blows/foot	TEST DATA: Qu-tsf Unconfined Compressive Strength	TEST DATA: PP-tsf Pocket Penetrometer	TEST DATA: Moisture Content % / *Dry Unit Weight (pcf)*	Remarks
	Brown, Gray, and Red CLAY			1	SS			20	4.7	4.5	20.8	Topsoil had been stripped from the surface.
			5	2	SS			15	3.1	2.8	20.2	
				3	SS			14	5.9	2.3	20.7	
		8.5										
	Brown and Red Sandy CLAY		10	4	SS			25		3.3	18.4	
		12.0										
	Brown, Gray, and Red CLAY		15	5	SS			7	2.7	1.5	34.9	
		16.0										
	End of Boring at 16 feet											

Sample Type
SS - Driven Split Spoon
ST - Pressed Shelby Tube
CA - Continuous Flight Auger
RC - Rock Core
CU - Cuttings
CT - Continuous Tube

Groundwater
○ During Drilling *DRY ft.*
▽ At Completion *DRY ft.*

Boring Method
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling

BORING LOG

Alt & Witzig Engineering, Inc.

CLIENT **Ramsey Development Corporation**
PROJECT NAME **Elizabethtown Healthcare**
PROJECT LOCATION **Robinbrook Blvd and Harmony Way**

BORING # **B-5**
ALT & WITZIG FILE # **15CN0284**

DRILLING and SAMPLING INFORMATION

Date Started **12/14/14**
Date Completed **12/14/15**
Boring Method **HSA**
Driller **J. Roark**

Hammer Wt. **140** lbs.
Hammer Drop **30** in.
Spoon Sampler OD **2** in.
Rig Type **D-50 Track ATV**

STRATA ELEV.	SOIL CLASSIFICATION / SURFACE ELEVATION	Strata Depth	Depth Scale	Sample No.	Sample Type	Sampler Graphics / Recovery Graphics	Ground Water	TEST DATA: Standard Penetration Test, N - blows/foot	TEST DATA: Qu-tsf Unconfined Compressive Strength	TEST DATA: PP-tsf Pocket Penetrometer	TEST DATA: Moisture Content % / *Dry Unit Weight (pcf)*	Remarks
	TOPSOIL (3")	0.3										
	Brown Silty CLAY			1	SS			13	6.2	4.5	17.8	
		5.0	5	2	SS			15	3.9	4.3	18.9	
				3	SS			10		1.8	23.6	
	Brown, Gray, and Red CLAY with a Trace of Gravel		10	4	SS			15		4.5	27.9	
			15	5	SS			12	4.3	4.3	28.3	
		16.0										
	End of Boring at 16 feet											

Sample Type
SS - Driven Split Spoon
ST - Pressed Shelby Tube
CA - Continuous Flight Auger
RC - Rock Core
CU - Cuttings
CT - Continuous Tube

Groundwater
○ During Drilling *DRY ft.*
▽ At Completion *DRY ft.*
▼ After *24* hours *DRY ft.*
Caved After *24* hours at *7' ft*

Boring Method
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling

BORING LOG

Alt & Witzig Engineering, Inc.

CLIENT **Ramsey Development Corporation**
PROJECT NAME **Elizabethtown Healthcare**
PROJECT LOCATION **Robinbrook Blvd and Harmony Way**

BORING # **B-6**
ALT & WITZIG FILE # **15CN0284**

DRILLING and SAMPLING INFORMATION

Date Started **12/15/15**
Date Completed **12/15/15**
Boring Method **HSA**
Driller **J. Roark**
Hammer Wt. **140** lbs.
Hammer Drop **30** in.
Spoon Sampler OD **2** in.
Rig Type **D-50 Track ATV**

STRATA ELEV.	SOIL CLASSIFICATION / SURFACE ELEVATION	Strata Depth	Depth Scale	Sample No.	Sample Type	Sampler Graphics / Recovery Graphics	Ground Water	Standard Penetration Test, N - blows/foot	Qu-tsf Unconfined Compressive Strength	PP-tsf Pocket Penetrometer	Moisture Content % / *Dry Unit Weight (pcf)*	Remarks
	TOPSOIL (1")	0.1										
	Brown Silty CLAY			1	SS			20		4.5	19.6	
		4.0										
	Brown, Gray, and Red CLAY with Gravel		5	2	SS			19		3.3	26.2	
				3	SS			16		2.8	27.7	
		9.0										
	Brown and Red CLAY		10	4	SS			18		3.5	28.1	
		12.0										
	Brown and Gray CLAY		15	5	SS			8	2.5	2.0	32.2	
		16.0										
	End of Boring at 16 feet											

TEST DATA

Sample Type
SS - Driven Split Spoon
ST - Pressed Shelby Tube
CA - Continuous Flight Auger
RC - Rock Core
CU - Cuttings
CT - Continuous Tube

Groundwater
○ During Drilling *DRY ft.*
▽ At Completion *DRY ft.*

Boring Method
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling

BORING LOG

Alt & Witzig Engineering, Inc.

CLIENT **Ramsey Development Corporation**
PROJECT NAME **Elizabethtown Healthcare**
PROJECT LOCATION **Robinbrook Blvd and Harmony Way**

BORING # **B-7**
ALT & WITZIG FILE # **15CN0284**

DRILLING and SAMPLING INFORMATION

Date Started **12/15/15**
Date Completed **12/15/15**
Boring Method **HSA**
Driller **J. Roark**

Hammer Wt. **140** lbs.
Hammer Drop **30** in.
Spoon Sampler OD **2** in.
Rig Type **D-50 Track ATV**

STRATA ELEV.	SOIL CLASSIFICATION / SURFACE ELEVATION	Strata Depth	Depth Scale	Sample No.	Sample Type	Sampler Graphics / Recovery Graphics	Ground Water	TEST DATA: Standard Penetration Test, N - blows/foot	TEST DATA: Qu-tsf Unconfined Compressive Strength	TEST DATA: PP-tsf Pocket Penetrometer	TEST DATA: Moisture Content % / *Dry Unit Weight (pcf)*	Remarks
	TOPSOIL (2")	0.2										
	Brown and Red Silty CLAY with Gravel			1	SS			17		3.5	18.8	
			5	2	SS			24		3.3	30.3	
		8.0		3	SS			17		4.5	29.8	
	Brown, Gray, and Red CLAY with Gravel		10	4	SS			14	2.7	3.3	33.4	
			15	5	SS			10	2.2	1.8	28.5	
		16.0										
	End of Boring at 16 feet											

Sample Type
SS - Driven Split Spoon
ST - Pressed Shelby Tube
CA - Continuous Flight Auger
RC - Rock Core
CU - Cuttings
CT - Continuous Tube

Groundwater
○ During Drilling *DRY ft.*
▽ At Completion *DRY ft.*

Boring Method
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling

BORING LOG

Alt & Witzig Engineering, Inc.

CLIENT **Ramsey Development Corporation**
PROJECT NAME **Elizabethtown Healthcare**
PROJECT LOCATION **Robinbrook Blvd and Harmony Way**

BORING # **B-8**
ALT & WITZIG FILE # **15CN0284**

DRILLING and SAMPLING INFORMATION

Date Started **12/15/15**
Date Completed **12/15/15**
Boring Method **HSA**
Driller **J. Roark**

Hammer Wt. **140** lbs.
Hammer Drop **30** in.
Spoon Sampler OD **2** in.
Rig Type **D-50 Track ATV**

STRATA ELEV.	SOIL CLASSIFICATION / SURFACE ELEVATION	Strata Depth	Depth Scale	Sample No.	Sample Type	Sampler Graphics / Recovery Graphics	Ground Water	TEST DATA: Standard Penetration Test, N - blows/foot	TEST DATA: Qu-tsf Unconfined Compressive Strength	TEST DATA: PP-tsf Pocket Penetrometer	TEST DATA: Moisture Content % / *Dry Unit Weight (pcf)*	Remarks
	TOPSOIL (1")	0.1										
	Brown Sandy CLAY	3.0		1	SS			10	5.5	4.5	21.1	
			5	2	SS			14	3.7	3.8	18.5	
				3	SS			14	4.9	3.5	19.7	
	Brown, Gray, and Red Silty CLAY		10	4	SS			14	6.3	3.3		
			15	5	SS			20		2.3	18.9	
	End of Boring at 16 feet	16.0										

Sample Type
SS - Driven Split Spoon
ST - Pressed Shelby Tube
CA - Continuous Flight Auger
RC - Rock Core
CU - Cuttings
CT - Continuous Tube

Groundwater
○ During Drilling *DRY ft.*
▽ At Completion *DRY ft.*

Boring Method
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling

BORING LOG

Alt & Witzig Engineering, Inc.

CLIENT **Ramsey Development Corporation**
PROJECT NAME **Elizabethtown Healthcare**
PROJECT LOCATION **Robinbrook Blvd and Harmony Way**

BORING # **B-9**
ALT & WITZIG FILE # **15CN0284**

DRILLING and SAMPLING INFORMATION

Date Started **12/14/15**
Date Completed **12/14/15**
Boring Method **HSA**
Driller **J. Roark**

Hammer Wt. **140** lbs.
Hammer Drop **30** in.
Spoon Sampler OD **2** in.
Rig Type **D-50 Track ATV**

STRATA ELEV.	SOIL CLASSIFICATION / SURFACE ELEVATION	Strata Depth	Depth Scale	Sample No.	Sample Type	Sampler Graphics / Recovery Graphics	Ground Water	TEST DATA: Standard Penetration Test, N - blows/foot	TEST DATA: Qu-tsf Unconfined Compressive Strength	TEST DATA: PP-tsf Pocket Penetrometer	TEST DATA: Moisture Content % / *Dry Unit Weight (pcf)*	Remarks
	TOPSOIL (3")	0.3										
	Brown, Gray, and Red CLAY			1	SS			12	3.5	3.3	27.6	
			5	2	SS			20	2.9	3.7	19.9	
		8.0		3	SS			13		2.8	28.3	
	Red CLAY with Sand		10	4	SS			10		2.5	21.0	
			15	5	SS			10		1.0	21.5	
		16.0										
	End of Boring at 16 feet											

Sample Type
SS - Driven Split Spoon
ST - Pressed Shelby Tube
CA - Continuous Flight Auger
RC - Rock Core
CU - Cuttings
CT - Continuous Tube

Groundwater
○ During Drilling *DRY ft.*
▽ At Completion *DRY ft.*
▼ After *24* hours *DRY ft.*
Caved After *24* hours at *5.5' ft*

Boring Method
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling

BORING LOG

Alt & Witzig Engineering, Inc.

CLIENT **Ramsey Development Corporation**
PROJECT NAME **Elizabethtown Healthcare**
PROJECT LOCATION **Robinbrook Blvd and Harmony Way**

BORING # **B-10**
ALT & WITZIG FILE # **15CN0284**

DRILLING and SAMPLING INFORMATION

Date Started **12/15/15**
Date Completed **12/15/15**
Boring Method **HSA**
Driller **J. Roark**
Hammer Wt. **140** lbs.
Hammer Drop **30** in.
Spoon Sampler OD **2** in.
Rig Type **D-50 Track ATV**

STRATA ELEV.	SOIL CLASSIFICATION / SURFACE ELEVATION	Strata Depth	Depth Scale	Sample No.	Sample Type	Sampler Graphics / Recovery Graphics	Ground Water	TEST DATA: Standard Penetration Test, N - blows/foot	TEST DATA: Qu-tsf Unconfined Compressive Strength	TEST DATA: PP-tsf Pocket Penetrometer	TEST DATA: Moisture Content % / *Dry Unit Weight (pcf)*	Remarks
	TOPSOIL (1")	0.1										
	Brown Silty CLAY			1	SS			16		4.5	17.5	
			5	2	SS			17	3.7	3.5	18.2	
		7.0		3	SS			15			29.5	
	Brown, Gray, and Red CLAY with Gravel		10	4	SS			15			24.9	
			15	5	SS			11		2.3	28.3	
		16.0										
	End of Boring at 16 feet											

Sample Type
SS - Driven Split Spoon
ST - Pressed Shelby Tube
CA - Continuous Flight Auger
RC - Rock Core
CU - Cuttings
CT - Continuous Tube

Groundwater
○ During Drilling *DRY ft.*
▽ At Completion *DRY ft.*

Boring Method
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling

BORING LOG

Alt & Witzig Engineering, Inc.

CLIENT **Ramsey Development Corporation**
PROJECT NAME **Elizabethtown Healthcare**
PROJECT LOCATION **Robinbrook Blvd and Harmony Way**

BORING # **B-11**
ALT & WITZIG FILE # **15CN0284**

DRILLING and SAMPLING INFORMATION

Date Started **12/14/15**
Date Completed **12/14/15**
Boring Method **HSA**
Driller **J. Roark**

Hammer Wt. **140** lbs.
Hammer Drop **30** in.
Spoon Sampler OD **2** in.
Rig Type **D-50 Track ATV**

STRATA ELEV.	SOIL CLASSIFICATION / SURFACE ELEVATION	Strata Depth	Depth Scale	Sample No.	Sample Type	Sampler Graphics / Recovery Graphics	Ground Water	TEST DATA: Standard Penetration Test, N - blows/foot	TEST DATA: Qu-tsf Unconfined Compressive Strength	TEST DATA: PP-tsf Pocket Penetrometer	TEST DATA: Moisture Content % / *Dry Unit Weight (pcf)*	Remarks
	TOPSOIL (2")	0.2										
	Brown Silty CLAY			1	SS			15	3.1	3.5	17.9	
			5	2	SS			46	4.8	3.5	19.2	
		7.0		3	SS			16			26.7	
	Red CLAY with Gravel											
		10.0	10	4	SS			17	3.3	4.5	26.3	
	Brown, Gray, and Red CLAY with Gravel											
			15	5	SS			12	4.3	4.5	19.8	
		16.0										
	End of Boring at 16 feet											

Sample Type
SS - Driven Split Spoon
ST - Pressed Shelby Tube
CA - Continuous Flight Auger
RC - Rock Core
CU - Cuttings
CT - Continuous Tube

Groundwater
○ During Drilling *DRY ft.*
▽ At Completion *DRY ft.*
▼ After *24* hours *DRY ft.*
Caved After *24* hours at *9.5' ft*

Boring Method
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling

BORING LOG

Alt & Witzig Engineering, Inc.

CLIENT **Ramsey Development Corporation**
PROJECT NAME **Elizabethtown Healthcare**
PROJECT LOCATION **Robinbrook Blvd and Harmony Way**

BORING # **B-12**
ALT & WITZIG FILE # **15CN0284**

DRILLING and SAMPLING INFORMATION

Date Started **12/14/15**
Date Completed **12/14/15**
Boring Method **HSA**
Driller **J. Roark**
Hammer Wt. **140** lbs.
Hammer Drop **30** in.
Spoon Sampler OD **2** in.
Rig Type **D-50 Track ATV**

TEST DATA

STRATA ELEV.	SOIL CLASSIFICATION / SURFACE ELEVATION	Strata Depth	Depth Scale	Sample No.	Sample Type	Sampler Graphics / Recovery Graphics	Ground Water	Standard Penetration Test, N - blows/foot	Qu-tsf Unconfined Compressive Strength	PP-tsf Pocket Penetrometer	Moisture Content % / *Dry Unit Weight (pcf)*	Remarks
	TOPSOIL (3")	0.3										
	Brown and Gray CLAY			1	SS			13	4.3	4.3	22.8	
			5	2	SS			27		3.8	15.9	
		7.0		3	SS			12	3.3	3.3	31.4	
	Brown, Gray, and Red CLAY											
		10.5	10	4	SS			10	2.1	2.0	18.2	
	Red Sandy CLAY											
			15	5	SS			11		1.3	31.0	
		16.0										
	End of Boring at 16 feet											

Sample Type
SS - Driven Split Spoon
ST - Pressed Shelby Tube
CA - Continuous Flight Auger
RC - Rock Core
CU - Cuttings
CT - Continuous Tube

Groundwater
○ During Drilling *DRY ft.*
▽ At Completion *DRY ft.*
▼ After *24* hours *DRY ft.*
Caved After *24* hours at *5' ft*

Boring Method
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling

BORING LOG

Alt & Witzig Engineering, Inc.

CLIENT **Ramsey Development Corporation**
PROJECT NAME **Elizabethtown Healthcare**
PROJECT LOCATION **Robinbrook Blvd and Harmony Way**

BORING # **B-13**
ALT & WITZIG FILE # **15CN0284**

DRILLING and SAMPLING INFORMATION

Date Started **12/14/15**
Date Completed **12/14/15**
Boring Method **HSA**
Driller **J. Roark**
Hammer Wt. **140** lbs.
Hammer Drop **30** in.
Spoon Sampler OD **2** in.
Rig Type **D-50 Track ATV**

STRATA ELEV.	SOIL CLASSIFICATION / SURFACE ELEVATION	Strata Depth	Depth Scale	Sample No.	Sample Type	Sampler Graphics / Recovery Graphics	Ground Water	TEST DATA: Standard Penetration Test, N - blows/foot	TEST DATA: Qu-tsf Unconfined Compressive Strength	TEST DATA: PP-tsf Pocket Penetrometer	TEST DATA: Moisture Content % / Dry Unit Weight (pcf)	Remarks
	TOPSOIL (3")	0.3										
	Brown and Red Silty CLAY with Gravel			1	SS			20	3.9	4.3	16.6	
			5	2	SS			24	5.0	4.5	22.5	
		7.0		3	SS			13	3.1	4.0	21.0	
	Brown, Gray, and Red CLAY		10	4	SS			15	3.1	4.3	20.6	
			15	5	SS			16		1.8	23.6	
		16.0										
	End of Boring at 16 feet											

Sample Type
SS - Driven Split Spoon
ST - Pressed Shelby Tube
CA - Continuous Flight Auger
RC - Rock Core
CU - Cuttings
CT - Continuous Tube

Groundwater
○ During Drilling *DRY ft.*
▽ At Completion *DRY ft.*
▼ After *24* hours *DRY ft.*
Caved After *24* hours at *6' ft*

Boring Method
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling

BORING LOG

Alt & Witzig Engineering, Inc.

CLIENT **Ramsey Development Corporation**

PROJECT NAME **Elizabethtown Healthcare**

PROJECT LOCATION **Robinbrook Blvd and Harmony Way**

BORING # **P-1**

ALT & WITZIG FILE # **15CN0284**

DRILLING and SAMPLING INFORMATION

Date Started **12/14/15**

Date Completed **12/14/15**

Boring Method **HSA**

Driller **J. Roark**

Hammer Wt. **140** lbs.

Hammer Drop **30** in.

Spoon Sampler OD **2** in.

Rig Type **D-50 Track ATV**

TEST DATA

STRATA ELEV.	SOIL CLASSIFICATION / SURFACE ELEVATION	Strata Depth	Depth Scale	Sample No.	Sample Type	Sampler Graphics / Recovery Graphics	Ground Water	Standard Penetration Test, N - blows/foot	Qu-tsf Unconfined Compressive Strength	PP-tsf Pocket Penetrometer	Moisture Content % / *Dry Unit Weight (pcf)*	Remarks
	TOPSOIL (3")	0.3										
	Brown and Red CLAY			1	SS			11		3.3	26.2	
			5	2	SS			10	3.9	3.3	24.8	
	End of Boring at 6 feet	6.0										

Sample Type

SS - Driven Split Spoon
ST - Pressed Shelby Tube
CA - Continuous Flight Auger
RC - Rock Core
CU - Cuttings
CT - Continuous Tube

Groundwater

○ During Drilling *DRY ft.*
▽ At Completion *DRY ft.*

Boring Method

HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling

BORING LOG

Alt & Witzig Engineering, Inc.

CLIENT **Ramsey Development Corporation**

PROJECT NAME **Elizabethtown Healthcare**

PROJECT LOCATION **Robinbrook Blvd and Harmony Way**

BORING # **P-2**

ALT & WITZIG FILE # **15CN0284**

DRILLING and SAMPLING INFORMATION

Date Started **12/15/15**

Date Completed **12/15/15**

Boring Method **HSA**

Driller **J. Roark**

Hammer Wt. **140** lbs.

Hammer Drop **30** in.

Spoon Sampler OD **2** in.

Rig Type **D-50 Track ATV**

TEST DATA

STRATA ELEV.	SOIL CLASSIFICATION / SURFACE ELEVATION	Strata Depth	Depth Scale	Sample No.	Sample Type	Sampler Graphics / Recovery Graphics	Ground Water	Standard Penetration Test, N - blows/foot	Qu-tsf Unconfined Compressive Strength	PP-tsf Pocket Penetrometer	Moisture Content % / *Dry Unit Weight (pcf)*	Remarks
	TOPSOIL (3")	0.3										
	Brown and Red CLAY			1	SS			16	5.0	4.3	23.3	
			5	2	SS			10	4.3	3.0	22.7	
	End of Boring at 6 feet	6.0										

Sample Type

SS - Driven Split Spoon
ST - Pressed Shelby Tube
CA - Continuous Flight Auger
RC - Rock Core
CU - Cuttings
CT - Continuous Tube

Groundwater

○ During Drilling *DRY ft.*
▽ At Completion *DRY ft.*

Boring Method

HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling

BORING LOG

Alt & Witzig Engineering, Inc.

CLIENT **Ramsey Development Corporation**
PROJECT NAME **Elizabethtown Healthcare**
PROJECT LOCATION **Robinbrook Blvd and Harmony Way**

BORING # **P-3**
ALT & WITZIG FILE # **15CN0284**

DRILLING and SAMPLING INFORMATION

Date Started **12/14/15**
Date Completed **12/14/15**
Boring Method **HSA**
Driller **J. Roark**

Hammer Wt. **140** lbs.
Hammer Drop **30** in.
Spoon Sampler OD **2** in.
Rig Type **D-50 Track ATV**

STRATA ELEV.	SOIL CLASSIFICATION / SURFACE ELEVATION	Strata Depth	Depth Scale	Sample No.	Sample Type	Sampler Graphics / Recovery Graphics	Ground Water	TEST DATA: Standard Penetration Test, N - blows/foot	TEST DATA: Qu-tsf Unconfined Compressive Strength	TEST DATA: PP-tsf Pocket Penetrometer	TEST DATA: Moisture Content % / Dry Unit Weight (pcf)	Remarks
	Brown and Red CLAY			1	SS			10	6.3	4.5	22.3	
			5	2	SS			11		4.3	21.9	
	End of Boring at 6 feet	6.0										

Sample Type
SS - Driven Split Spoon
ST - Pressed Shelby Tube
CA - Continuous Flight Auger
RC - Rock Core
CU - Cuttings
CT - Continuous Tube

Groundwater
○ During Drilling *DRY ft.*
▽ At Completion *DRY ft.*
▼ After *24* hours *DRY ft.*
Caved After *24* hours at *1' ft*

Boring Method
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling

BORING LOG

Alt & Witzig Engineering, Inc.

CLIENT **Ramsey Development Corporation**
PROJECT NAME **Elizabethtown Healthcare**
PROJECT LOCATION **Robinbrook Blvd and Harmony Way**

BORING # **P-4**
ALT & WITZIG FILE # **15CN0284**

DRILLING and SAMPLING INFORMATION

Date Started **12/14/15**
Date Completed **12/14/15**
Boring Method **HSA**
Driller **J. Roark**

Hammer Wt. **140** lbs.
Hammer Drop **30** in.
Spoon Sampler OD **2** in.
Rig Type **D-50 Track ATV**

STRATA ELEV.	SOIL CLASSIFICATION / SURFACE ELEVATION	Strata Depth	Depth Scale	Sample No.	Sample Type	Sampler Graphics / Recovery Graphics	Ground Water	TEST DATA: Standard Penetration Test, N - blows/foot	TEST DATA: Qu-tsf Unconfined Compressive Strength	TEST DATA: PP-tsf Pocket Penetrometer	TEST DATA: Moisture Content % / *Dry Unit Weight (pcf)*	Remarks
	TOPSOIL (2")	0.2										
	Brown and Gray CLAY			1	SS			10	2.5	0.8	22.3	
		5.0	5	2	SS			16		2.0	23.0	
	Brown and Gray CLAY with Gravel	6.0										
	End of Boring at 6 feet											

Sample Type
SS - Driven Split Spoon
ST - Pressed Shelby Tube
CA - Continuous Flight Auger
RC - Rock Core
CU - Cuttings
CT - Continuous Tube

Groundwater
○ During Drilling *DRY ft.*
▽ At Completion *DRY ft.*

Boring Method
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling

BORING LOG

Alt & Witzig Engineering, Inc.

CLIENT **Ramsey Development Corporation**
PROJECT NAME **Elizabethtown Healthcare**
PROJECT LOCATION **Robinbrook Blvd and Harmony Way**

BORING # **P-5**
ALT & WITZIG FILE # **15CN0284**

DRILLING and SAMPLING INFORMATION

Date Started **12/14/15**
Date Completed **12/14/15**
Boring Method **HSA**
Driller **J. Roark**

Hammer Wt. **140** lbs.
Hammer Drop **30** in.
Spoon Sampler OD **2** in.
Rig Type **D-50 Track ATV**

STRATA ELEV.	SOIL CLASSIFICATION / SURFACE ELEVATION	Strata Depth	Depth Scale	Sample No.	Sample Type	Sampler Graphics / Recovery Graphics	Ground Water	TEST DATA: Standard Penetration Test, N - blows/foot	TEST DATA: Qu-tsf Unconfined Compressive Strength	TEST DATA: PP-tsf Pocket Penetrometer	TEST DATA: Moisture Content % / *Dry Unit Weight (pcf)*	Remarks
	TOPSOIL (2")	0.2										
	Brown and Gray Silty CLAY			1	SS			13	2.5	3.0	24.3	
			5	2	SS			17	2.3	2.3	21.5	
	End of Boring at 6 feet	6.0										

Sample Type
SS - Driven Split Spoon
ST - Pressed Shelby Tube
CA - Continuous Flight Auger
RC - Rock Core
CU - Cuttings
CT - Continuous Tube

Groundwater
○ During Drilling *DRY ft.*
▽ At Completion *DRY ft.*

Boring Method
HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling

BORING LOG

Alt & Witzig Engineering, Inc.

CLIENT **Ramsey Development Corporation**

PROJECT NAME **Elizabethtown Healthcare**

PROJECT LOCATION **Robinbrook Blvd and Harmony Way**

BORING # **P-6**

ALT & WITZIG FILE # **15CN0284**

DRILLING and SAMPLING INFORMATION

Date Started **12/14/15**

Date Completed **12/14/15**

Boring Method **HSA**

Driller **J. Roark**

Hammer Wt. **140** lbs.

Hammer Drop **30** in.

Spoon Sampler OD **2** in.

Rig Type **D-50 Track ATV**

TEST DATA

STRATA ELEV.	SOIL CLASSIFICATION / SURFACE ELEVATION	Strata Depth	Depth Scale	Sample No.	Sample Type	Sampler Graphics / Recovery Graphics	Ground Water	Standard Penetration Test, N - blows/foot	Qu-tsf Unconfined Compressive Strength	PP-tsf Pocket Penetrometer	Moisture Content % / Dry Unit Weight (pcf)	Remarks
	TOPSOIL (3")	0.3										
	Brown and Red Silty CLAY with Gravel			1	SS			29		3.8	16.2	
			5	2	SS			25	1.4	2.0	20.3	
	End of Boring at 6 feet	6.0										

Sample Type

SS - Driven Split Spoon
ST - Pressed Shelby Tube
CA - Continuous Flight Auger
RC - Rock Core
CU - Cuttings
CT - Continuous Tube

Groundwater

○ During Drilling *DRY ft.*
▽ At Completion *DRY ft.*

▼ After *24* hours *DRY ft.*
Caved After *24* hours at *2' ft*

Boring Method

HSA - Hollow Stem Augers
CFA - Continuous Flight Augers
DC - Driving Casing
MD - Mud Drilling

GENERAL NOTES

SAMPLE IDENTIFICATION

The Unified Soil Classification System is used to identify the soil unless otherwise noted.

SOIL PROPERTY SYMBOLS

N:	Standard "N" penetration: Blows per foot of a 140 pound hammer falling 30 inches on a 2 inch O.D. split-spoon.
Qu:	Unconfined compressive strength, TSF
Qp:	Penetrometer value, unconfined compressive strength, TSF
Mc:	Water content, %
LL:	Liquid limit, %
PL:	Plastic limit, %
Dd:	Natural dry density, PCF
▼ :	Apparent groundwater level at time noted after completion

DRILLING AND SAMPLING SYMBOLS

SS:	Split-spoon - 1 3/8" I.D., 2" O.D., except where noted
ST:	Shelby tube - 3" O.D., except where noted
AU:	Auger sample
DB:	Diamond bit
CB:	Carbide bit
WS:	Washed sample

RELATIVE DENSITY AND CONSISTENCY CLASSIFICATION

TERM (NON-COHESIVE SOILS)	BLOWS PER FOOT
Very loose	0 - 4
Loose	5 - 10
Firm	11 - 30
Dense	31 - 50
Very Dense	Over 50

TERM (COHESIVE SOILS)	Qu (TSF)
Very soft	0 - 0.25
Soft	0.25 - 0.50
Medium	0.50 - 1.00
Stiff	1.00 - 2.00
Very Stiff	2.00 - 4.00
Hard	4.00+

PARTICLE SIZE

Boulders	8 in.(+)	Coarse Sand	5 mm-0.6 mm	Silt	0.075 mm - 0.005 mm
Cobbles	8 in. - 3 in.	Medium Sand	0.6mm-0.2 mm	Clay	0.005mm(-)
Gravel	3 in. - 5 mm	Fine Sand	0.2mm-0.075 mm		