

November 27, 2018

Raymond Rinker Ashton Woods – Raleigh Division 5711 Six Forks Road, Ste 300 Raleigh, NC 27609

Subject: Report of Subsurface Exploration and Preliminary Geotechnical Engineering Evaluation **Rolesville PUD** Wake Forest, NC Project No.: 180776E

Mr. Rinker:

The purpose of this report is to present the results of the subsurface exploration and preliminary geotechnical engineering analyses undertaken by TM Engineering, Inc. in connection with the above referenced project. The attached report presents our understanding of the project, reviews our exploration procedures, describes existing site and general subsurface conditions, and presents our evaluations and recommendations.

We have enjoyed working with you on this project, and we are prepared to assist you with the recommended quality assurance monitoring and testing services during construction. Please contact us if you have any questions regarding this report or if we may be of further service.

Sincerely,

TM Engineering, Inc. C3201

Toby Mallik, P.E. NC Registration No. 026472



Bryant Mueller Project Engineer Rolesville PUD Geotech November 27, 2018 Page **2** of 12

INTRODUCTION

Project Information

Our understanding of the project is based on information provided by Ashton Woods. The proposed site is located along US-401 just south of the intersection at E Young Street in Wake Forest, North Carolina. The site totals approximately 316 acres. It is our understanding that the property is being evaluated for single-family and multi-family residential development with typical associated infrastructure including roadways, utilities, and storm-water management facilities. We also anticipate applicable site clearing and grading associated with the preparation of lots for residential construction and that the streets will be paved with asphalt.

Scope of Services

The purposes of our involvement on this project were as follows: 1) provide general descriptions of the subsurface soil conditions at the site, 2) provide foundation design recommendations, and 3) comment on geotechnical aspects of the proposed development. In order to accomplish the above objectives, we undertook the following scope of services:

- 1) Visited the site to observe existing surface conditions and features; and to mark boring locations.
- 2) Reviewed readily available geologic and subsurface information relative to the project site.
- 3) Executed a subsurface exploration consisting of sixty-nine (69) soil borings to a depth of fifteen (15) feet below the existing ground surface.
- 4) Evaluated the findings of the subsurface exploration and data relative to proposed construction.
- 5) Prepared this written report summarizing our geotechnical engineering work on the project, providing descriptions of the subsurface conditions encountered, providing foundation design criteria, and discussing geotechnical related aspects of the proposed construction.

Our geotechnical scope of services did not include a survey of boring locations and elevations, quantity estimates, preparation of plans or specifications, detention pond considerations, environmental analysis or the identification and evaluation of environmental aspects of the project site.

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SUBSURFACE EXPLORATION PROCEDURES

The subsurface exploration program was comprised of sixty-nine (69) subsurface soil test borings designated B-01 through B-69 advanced to a predetermined depth of fifteen (15) below the existing ground surface. The boring locations shown were located by estimating distances from known points within the area studied and the locations should be considered approximate. A boring location map is attached.

The soil test borings were performed in accordance with generally accepted practice using an ATV mounted rotary drill rig. Hollow-stem augers were advanced to pre-selected depths, and representative soil samples were recovered with a standard split-spoon sampler in general accordance with ASTM Standards. The number of blows required to drive the split-spoon sampler three consecutive 6-inch increments is recorded, and the blows of the last two increments are summed to obtain the Standard Penetration Test (SPT) Resistance (N-value). The N-value provides a general indication of in-situ soil conditions and has been correlated with certain engineering properties of soils.

Subsurface water level readings were taken in each of the borings immediately upon completion of the soil drilling process. Periodic observation of the boreholes should be performed to monitor subsidence at the ground surface, as the borehole backfill could settle over time.

Representative portions of the split-spoon soil samples obtained throughout the exploration program were evaluated by a member of our professional staff. The soil descriptions and classifications discussed in this report and shown on the attached boring logs and subsurface diagram are based on visual observation and should be considered approximate. Copies of the boring logs are provided. Split-spoon soil samples recovered on this project will be stored for a period of sixty days. After sixty days, the samples will be discarded unless prior notification is provided to us.

SITE AND SUBSURFACE CONDITIONS

Site Description

The subject site is approximately 316 acres in size. The site is bordered by E Young Street along eastern edge. Residential subdivisions Cedar Lakes and Villages of Rolesville borders the site along the northern and western edge. The majority of the site is plowed agricultural fields with the rest being mainly heavily wooded. There are three ponds along the eastern border surrounding the residential structure/barn/shop. Additionally, another residential structure/barn/ shop is around the middle of the subject site just south of US-401. There is a large stockpile in the south west corner of the site adjacent to US-401. There are small dirt/gravel roadways that

run in between the plowed agricultural fields all throughout the site. There are multiple small creeks and natural draws out-letting south/southwest from the ponds along eastern border. Additionally, Harris Creek runs along the western border flowing north to south. The majority of the site is land that is gently to moderately sloped from the north/west of the site with approximate elevations from 390 to 400 down to south/east with approximate elevations 300 to 340. In the area north/west of US-401 there is a high point/hill in the middle with elevations of 380 to 390. The land directly west is sharply sloped down to Harris Creek with elevations of 320 to 310. See attached soil boring location map for reference.

Subsurface Conditions

The subsurface conditions discussed in the following paragraphs and those shown on the attached boring logs represent an estimate of the subsurface conditions based on interpretation of the boring data using normally accepted geotechnical engineering judgments. Subsurface conditions intermediate of the soil borings may vary from the conditions found at the specific boring locations. Should soil conditions adverse to those described in this report be encountered during site development, those conditions should be reported to the geotechnical engineer for additional review and comment.

The majority of the test borings encountered 2 to 12 inches of topsoil throughout the site. Due to a significant amount of the site being plowed agricultural fields and some of the site being heavily wooded, the depths of topsoil will vary. Underlying the topsoil, the test borings typically encountered a layer of firm to stiff fine silty clay (CL) and/or medium dense clayey fine sand (SC) material with SPT N-values ranging from 5 to 20 blows per foot (bpf) to depths ranging to 2.5 to 9 feet below existing surface. In this near surface layer, several of the test borings including B-06, B-15, B-17, B-19, B-23, B-24, B-28, B-29, B-31, B-32, B-34, B-37, B-38, B-39, B-41, B-44, B-45, B-48 through B-52, B-55, B-57 through B-62, and B-64, encountered very loose to loose and/or soft surface soils from depths varying from the existing ground surface to up to 3.5 feet below ground surface with SPT N-values ranging from 2 to 5 bpf before transitioning into the more stiff/dense clays and sands. The borings then typically transitioned into medium dense to dense silty fine sand (SM) and/or firm to very stiff fine sandy silt (ML) material with SPT N-values ranging from 6 to 60 bpf from 6 feet below existing surface to boring termination or to partially weathered rock. Several of the test borings however, including; B-01, B-03, B-08, B-11, B-19, B-20, B-28 through B-35, B-39, B-44, and B-48, instead encountered very loose to loose silty fine sand (SM) and/or soft fine sandy silt (ML) material with SPT N-values ranging from 0 to 8 bpf at depths ranging from 6 feet below existing surface to boring termination. Partially weathered rock (PWR), defined as material in excess of 100 blows per foot was encounterd in the majority of the test borings at initial depths of 0.5 to 14 feet below existing surface. The sampled PWR consisted of fine sandy silts with penetration resistances typically varying from 1 to 6 inches for 50 blows. Auger refusal due to hard rock was encountered in the majority of the soil test borings at depths from 0.5 to 13 feet below existing surface. Initial rock depth and auger refusal depth for soil test borings that encountered PWR are shown on the attached *Rock Table*. Data from the specific borings are shown on the attached subsurface diagrams and boring logs.

Measurable subsurface water was encountered the majority of the soil test borings at depths ranging from 2 to 13 feet below existing ground surface. Specific borings numbers and more information is shown in the *Dewatering* section below. In general, all of the soil samples taken during this investigation were characterized as slightly moist to moist or wet of optimum moisture content, and soils at and below where subsurface water levels were initially encountered were characterized as wet or saturated. It should be noted that groundwater elevations will fluctuate at different times of the year through seasonal changes. See attached subsurface diagram and boring logs for water table depths in the individual borings.

RECOMMENDATIONS

General

The following evaluations and recommendations are based on information provided, our observations at the site, interpretation of the field data obtained during this exploration, and our experience with similar subsurface conditions and construction projects. Subsurface conditions in unexplored locations may vary from those encountered. Should subsurface conditions adverse to those indicated in this report be encountered during construction, those differences should be reported to us so that these recommendations may be confirmed, extended, or modified as necessary. The following recommendations are to provide general guidance through the design and construction process.

Site Preparation

Site grading should begin with the removal of trees, shrubs, and any other deleterious non-soil materials from the proposed construction area. This includes organic debris, organic laden soil, and any other materials that may be deleterious to the intended construction. There are multiple structures on site that will need to be demolished and removed. Additionally, based on the preliminary sketch plan provided one out of the three existing ponds will be removed and replaced with roadway and residential lots. Removal of the dam materials and undercut/repair of soft/wet near surface soils within the pond and the draws that inlet and outlet from the pond area should be anticipated and budgeted accordingly. In addition, it should be noted that although the test borings indicated general topsoil thickness of 2 to 12 inches, a significant amount of the site is wooded and plowed agricultural fields, and deeper stripping may be required to remove organics and tree root bulbs in some isolated areas. During the stripping operations, positive surface drainage should be maintained to prevent the accumulation of water.

After stripping and/or undercutting and prior to fill placement or after achieving final grade in proposed construction areas, areas intended to support roadways, floor slabs, new fill, and foundations should be carefully evaluated by a geotechnical engineer. At that time, proofrolling of the subgrade with a 20- to 30-ton loaded truck or other pneumatic-tired vehicle of similar size and weight should be performed to identify any soft or unstable areas. Proofrolling should be performed during good weather and not while the site is wet, frozen, or severely desiccated. Proofrolling helps locate soft, weak, or excessively wet soils present at the time of construction.

Any unsuitable materials observed during the evaluation and proofrolling operations should be undercut and replaced with compacted fill or as directed by the project engineer. Once the site has been properly prepared, fill placement and other at-grade construction may proceed. If a significant amount of fill will be placed on the site in any location, additional analysis may be needed to determine the extent of fill induced settlements on the site.

As indicated above, test borings B-06, B-15, B-17, B-19, B-23, B-24, B-28, B-29, B-31, B-32, B-34, B-37, B-38, B-39, B-41, B-44, B-45, B-48 through B-52, B-55, B-57 through B-62, and B-64 encountered very loose to loose/soft surface soils from depths varying from the existing ground surface to 3.5 feet below ground surface. Initial recommendations will likely be to compact native soils in place prior to fill placement to attempt to limit undercut quantities. Any soft or weak areas that remain unimproved after a reevaluation would then be recommended for undercut and replacement of compacted fill for areas intended to support roadways, floor slabs, new fill, and foundations, especially in building pads and areas where existing grade is near final grade. Soils that are removed from these areas can be reused as structural fill if properly dried.

Difficult Excavation Considerations

As indicated by the attached test boring data, partially weathered rock (PWR) was encountered in test borings B-04 through B-07, B-09, B-10, B-12, B-13, B-15, B-18, B-21, B-22, B-23, B-25, B-26, B-27, B-36, B-37, B-38, B-40, B-41, B-43, B-45, B-47, B-49 through B-54, B-56 through B-63, B-66, and B-68 beginning at depths as shallow as 6 inches below the existing grade. Test boring B-09 also encountered very shallow PWR just below the topsoil layer to depths of 6 feet below existing grade. It should be noted that shallow PWR or rock may exist intermittently between the test boring locations and that the thickness and the continuity of partially weathered rock should be expected to vary widely even over a short distance. Additionally, it would not be unusual to find lenses of partially weathered rock within more weathered residual soils. Our experience has been that partially weathered rock materials exhibiting resistances of 50 blows per 3 inches of penetration and softer can be pre-loosened with a D-8 dozer drawing a single tooth ripper during general site grading. Material harder than 50 blows per 3 inches of penetration generally requires blasting to remove with conventional equipment. The use of a ram-hoe can also be considered if only isolated areas of PWR or rock are encountered and/or intended for removal. In areas where blasting will be required, caution should be exercised by the blasting contractor not to overblast in either a horizontal or vertical direction. Overblasting

in or near structural areas can create fracture zones which may not be identifiable during a foundation inspection or during proofrolling. Overblasted areas not repaired can be detrimental to any construction elements on the site.

Partially weathered rock which can be ripped will generally break down under the action of heavy compactors to form sand and silt sized particles intermixed with small rocks (3 inch max.), and will typically be suitable for reuse as structural fill, however this should be verified in the field by the geotechnical engineer for the project. Alternately, spoils resulting from blasting activities (blast rock) should not be used as fill below future structural areas due to the potential for long term settlement

The equipment utilized for installation of utilities and foundation elements is less powerful than that which is used during the general grading operation. Our experience has been that excavation of partially weathered rock harder than 50 blows per 4 inches of penetration is typically not possible for backhoes equivalent to a CAT 225. Large mounted tracked excavators can sometimes remove materials with penetration resistances ranging from 50 blows per 4 inches to 50 blows per 6 inches; however, the rate of excavation is slow and most contractors will request a trench rock price for any removal of partially weathered rock. It is recommended that trench depths be kept at a minimum in order to reduce the amount of difficult excavation material which may be encountered. Additionally, consideration can be given to using a common utility trench corridor if possible and pre-ripping the corridor with a D-8 dozer during site grading. Contractors have also been successful utilizing a Vermeer rock saw to install small diameter utilities extending into rock.

Dewatering Considerations

As noted in the subsurface conditions section of this report the test borings encountered groundwater levels in soil test borings B-05, B-08, B-10, B-11, B-13 through B-17, B-19, B-20, B-28 through B-32, B-34, B-35, B-37, B-39, and B-50 at depths ranging from 2 to 13 feet below existing grade. Soft and loose soils often coincided with groundwater elevations. The contractor should be prepared address groundwater if any excavations (i.e. utility trenches or storm-water ponds) of these depths are expected as it is likely the excavated area will collapse immediately following removal of material. If desired, consideration can be given to dewatering prior to excavated material. The means and methods of dewatering if desired should be determined by the contractor prior to excavation activities.

Lightweight Soils

Mica was observed in several of the underlying sandy silts and silty sands in the boring samples. Our experience with the micaceous soils in this area has been that they may exhibit a relatively low standard Proctor maximum dry density (ASTM D 698). Lightweight soils (generally having

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standard Proctor maximum dry densities of less than 90 pounds per cubic foot) are more susceptible to surface disturbance such as rutting and pumping when exposed near subgrade elevation and generally have lower shear strength. During site grading, we recommend that care be taken to protect light weight soils exposed near subgrade elevation. This would include not allowing channelized heavy traffic to operate on the soils. The use of wide tracked equipment is recommended during the stripping and grading operation. In addition, lightweight micaceous soils are moisture sensitive and can be difficult to compact during wetter winter months of December through April or May. To avoid delays during site grading operations, we recommend that site earthwork activities be scheduled after May and prior to December if possible, in order to better facilitate site grading work. Lighter weight soils should be used in deeper fill sections.

Controlled Structural Fill

With the exception of topsoil, the native onsite soils are suitable for reuse as structural fill assuming the moisture content of the soils can be controlled to be at or near optimum moisture content. Off-site fill materials, if required, should have a classification of ML, CL, SC or SM as defined by the Unified Soil Classification System. Other materials may be suitable for use as controlled structural fill material and should be individually evaluated by the geotechnical engineer. Controlled structural fill should be free of boulders, organic matter, debris, or other deleterious materials and should have a maximum particle size no greater than 3 inches. Fill soils in structural areas should *not* contain more than five percent (by weight) organic material, have a plasticity index (PI) greater than 15, or have a maximum dry density less than 90 pounds per cubic foot.

Fill materials should be placed in horizontal lifts with a maximum thickness of eight (8) inches loose measure. New fill should be adequately keyed into stripped and scarified subgrade soils and should, where applicable, be benched into the existing slopes. During fill operations, positive surface drainage should be maintained to prevent the accumulation of water. We recommend that structural fill be compacted to at least 95 percent of the Standard Proctor (ASTM Procedure D 698) maximum dry density for fill beneath buildings and beneath pavements, except at the final foot which should also be compacted to at least 98% of the recommended index. We recommend that all compacted fill be placed at moisture contents in the range of $\pm 3\%$ of the materials optimum moisture content as determined from the Standard Proctor density test. In confined areas such as utility trenches, portable compaction equipment and thin lifts of four to six inches may be required to achieve specified degrees of compaction. Each lift of fill should be tested in order to confirm that the recommended degree of compaction is attained. We recommend that the contractor have equipment on site during earthwork for both drying and wetting of fill soils to meet the above compaction/moisture requirements. Moisture control may be difficult during winter months or extended periods of rain. Attempts to work the soils when wet can be expected to result in deterioration of otherwise suitable soil conditions.

Where construction traffic or weather has disturbed the subgrade, the upper eight (8) inches of

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soils intended for structural support should be scarified and re-compacted. Each lift of fill should be tested in order to confirm that the recommended degree of compaction is attained.

Foundation Design and Construction

The proposed structures may be supported on a shallow foundation system bearing on soils that have been suitably prepared and approved per the Site Preparation and Controlled Structural Fill recommendations in this report. We recommend that foundations be designed for a maximum allowable bearing pressure of 2,000 pounds per square foot (psf). Wall footings should be a minimum of 18 inches wide and isolated column footings should be at least 24 inches wide. A minimum embedment depth of 18 inches is recommended for exterior footings in order to bear below normal frost depth.

Excavations for footings should be made in such a way as to provide bearing surfaces that are firm and free of loose, soft, wet, or otherwise disturbed soils. Foundation concrete should not be placed on frozen or saturated subgrades. If such materials are allowed to remain below foundations, settlements will increase. Foundation excavations should be concreted as soon as practical, after they are excavated. If an excavation is left open for an extended period, a thin mat of lean concrete should be placed over the bottom to minimize damage to the bearing surface from weather or construction activities. Water should not be allowed to pond in any excavation. We recommend that all bearing surfaces be evaluated a geotechnical engineer using hand auger/ dynamic cone penetrometer testing equipment or other suitable methods prior to fill or concrete Any unsuitable material detected during this evaluation should be undercut as placement. directed by our geotechnical engineer. The actual extent of undercutting, if necessary, should be based on field observations made by the geotechnical engineer at the time of construction. Typical repairs for soft soils involve over excavating to firm bearing and then backfilling with washed stone to design bearing elevation with uniformly graded #57 or #67 washed stone while the typical repair for highly plastic clays involves excavation to a depth of at least 3 feet below design grade regardless of soil firmness.

Ground Floor Slabs

Ground floor slabs may be designed as a slab-on-grade supported by approved residual soils or newly placed controlled structural fill. Slab-on-grade support is contingent upon successful completion of the subgrade evaluation process as described in the Site Preparation recommendations in this report. The floor slab should be supported on at least 4 inches of ABC stone to provide a uniform well-compacted material immediately beneath the slab.

Floor slab construction should incorporate isolation joints along bearing walls and around column locations to allow minor movements to occur without damage. Utility or other construction excavations in the prepared floor subgrade should be backfilled to a controlled fill criterion to provide uniform floor support.

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We estimate that an assumed subgrade design modulus of 100 pci is appropriate for floor slab design calculations.

Pavement Design Considerations

Traffic information has not been provided at this time and standard Proctor and CBR testing was not performed for this investigation. TME can provide final pavement designs once traffic information is provided and results of lab testing (which is typically performed after site grading) are completed. A typical pavement structure for this type of development would consist of 3 inches of asphalt over 8 inches of CABC stone provided all necessary repairs are conducted during the earthwork process to stabilize subgrades.

Performance of pavements will be extremely dependent on the condition of the subgrade and drainage considerations implemented in the design. All subgrades should be properly compacted to 98% of the standard Proctor maximum dry density immediately prior to base course stone placement. We recommend all pavement areas be proofrolled to identify any areas displaying movement. Unstable areas should be repaired as directed by the onsite engineer or qualified technician. Stabilization techniques such as placing bridge lifts, chemical stabilization, or using geosynthetics could reduce the amount of undercut or other repair needed. Proposed grades and the availability of dry fill will likely dictate the most suitable type of repair in pavement areas. All pavements should be graded to promote runoff of water. Any landscape areas involving irrigation or perched water conditions encountered uphill of pavement sections may require installation of some type of drainage system to reduce the potential for seepage of groundwater into the base course.

Some repair should be anticipated following construction related traffic use. If consideration will be given to placing an initial lift of asphalt with the understanding a final lift will be placed after traffic associated with construction subsides, some repair work will likely be necessary prior to placement of the final lift of asphalt.

Segmental Retaining Walls

Although detailed information has not been provided regarding retaining walls, if any MSE (mechanically stabilized earth) segmental type retaining walls are proposed, TME suggests importing a select granular low plasticity backfill for any walls in excess of 5 feet in height or within possible influence of structural loading as the clays and silts that were encountered on site during this investigation are generally not recommended for use as backfill within the retaining wall reinforced zone. Although, some sands that were encountered on site during this investigation typically meet design specifications for material to be used in the reinforced zone of retaining walls. Further testing, including Grain Size Analysis and Atterberg Limits, would be needed in order to ensure material meets wall design specifications. TME recommends the site

grading, typically in the form of a drainage swale parallel to the top of the wall, should prevent surface water from flowing over the face of the wall or ponding in the reinforced zone, and drainage measures should be included by the designer to intercept water between the fill interface and the residual soils to prevent the saturation of backfill materials.

Once wall locations have been established we recommend that the plans be reviewed by a geotechnical engineer to determine if additional subsurface investigation may be recommended in those locations to provide important information to assist in the wall design and construction, such as bearing conditions for the wall foundation and reinforced zone and data to perform global stability analysis. TME recommends that adequate laboratory testing be performed to define soil strength parameters and characteristics for any proposed wall backfill material for the wall designer to use in determining the correct grid lengths and spacing for walls.

We recommend designing and generating drawings for any MSE walls during the planning stages of development to allow for informed decisions to be made regarding available backfill material, batter influences, grid length restrictions, grid conflicts with utilities, and various site grading challenges commonly creating negative issues during construction. TM Engineering can provide a design for segmental retaining walls upon request.

Slopes

Fill slopes for embankments should be maintained at no steeper than 2.5H:1V (Horizontal to Vertical) in order to maintain long term stability of the embankment sections. Slopes steeper than aforementioned may need reinforcing grid to prevent slope failure. If provided with geometry specific to onsite slopes, TM Engineering, Inc. can assist with a design for slope reinforcement.

Temporary Excavation Stability

If excavations greater than 4 feet in height are anticipated for utilities, shoring and bracing or flattening (laying back) of the slopes may be required to obtain a safe working environment. Excavations should be sloped or shored in accordance with local, state and federal regulations, including OSHA (CFR Part 1926) excavation trench safety standards. We recommend that all excavated soils be placed away from the edges of the excavation at a distance equaling or exceeding the depth of the excavation. In addition, surface runoff water should be diverted away from the crest of the excavated slopes to prevent erosion and sloughing.

Localized areas of soft or unsuitable soils not detected by our borings or in unexplored areas may be encountered once construction begins. Vertical cuts in these soils may be unstable and may present a significant hazard because they can fail without warning. Therefore, temporary construction slopes greater than 5 feet high should not be steeper than one horizontal to one vertical (1H: 1V) and excavated material should not be placed within 10 feet of the crest of any excavated slope.

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CONTINUATION OF SERVICES

We recommend that TM Engineering, Inc. be given the opportunity to review the construction plans, and project specifications when construction documents approach completion. This review evaluates whether the recommendations and comments provided herein have been understood and properly implemented. Our continued involvement on the project helps provide continuity for proper implementation of the recommendations discussed herein.

LIMITATIONS

This report has been prepared for the use of Ashton Woods for specific application to the Rolesville PUD site in Wake Forest, NC, in accordance with generally accepted soil and foundation engineering practices. No other warranty, express or implied, is made. Our recommendations are based on information furnished to us; the data obtained from the previously described subsurface exploration program, and generally accepted geotechnical engineering practice. The recommendations do not reflect variations in subsurface conditions which could be present intermediate of the boring locations or in unexplored areas of the site. Should such variations become apparent during construction, it will be necessary to re-evaluate our recommendations based upon on-site observations of the conditions. Should the location of the proposed building construction significantly be changed, TM Engineering should be notified so that we can determine if the recommendations within this report remain applicable.

Regardless of the thoroughness of a subsurface exploration, there is the possibility that conditions between borings will differ from those at the boring locations, that conditions are not as anticipated by the designers, or that the construction process has altered the soil conditions. Therefore, experienced geotechnical engineers should evaluate earthwork, pavement, and foundation construction to verify that the conditions anticipated in design actually exist.





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Rolesville PUD Rock Table

Boring Number	Initial Rock Depth (feet)	Auger Refusal Depth (feet)
4	5	5
5	2	5
6	3.5	5
7	5.5	5.5
9	3.5	5
10	9	12
12	3.5	4.5
13	9	12
15	10.5	10.5
18	13.5	
21	3	3
22	3	3
23	6	7
25	3.5	5.5
26	0.5	0.5
27	13	13
36	1.5	2
37	13.5	
38	3.5	5
40	1.5	2.5
41	8	8
43	6	6
45	5.8	5.8
47	1.5	3
49	3	3
50	14	
51	13.5	
52	2.5	2.5
53	9	12
54	1	3
56	5.5	5.5
57	9.5	10.5
58	13.5	
59	13.5	
60	8.5	8.6
61	5.5	5.5
62	3	3
63	0.7	0.7
66	13.5	
68	3	3

TME Project # 180776E





FILES/GINT/LI



PROGRAM FILES/GINT/LIBRARY

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OJEC	T NUM	MBER	R 180776E							PROJECT		Rolesville, Nort	h Carolina	
		USC	S Low Plastici	ty Clay 🛄	USCS Silt		M PWR		USCS Claye	ey Sand	USC	CS Silty Sand	<u>्रिङ</u> ी Topsoil Iger Refusal	
	0	B-28		B-29 रज्ञा	B-30		B-31	B-32	B-33	B-34		B-35	B-36	0
	-2		2-2-2 (4)	2-2-2 (4)		1-2-3 (5)					4-4-2 (6)		6-50/1"	2
	-4	,	2-3-4 (7)	<u>3-4-6</u> (10)		3-5-8 (13)		<u>3.4.6</u> (10)	 		3-3-4 (7)	8-10-6 (16)		-4
	-6		3-3-4 (7)			6-6-8 (14)	4-5-6 (11)	3-5-7 (12)	3-5-7 (12)		2-1-1 (2)	3-4-7 (11)		······
	-8 ···		1-2-3 (5)	↓ 1-1-1 (2)		2-2-2 (4)	2-2-2 (4)	1-1-2 (3)	3-3-3 (6)		1-1-2 (3)	1-1-1 (2)		······
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CL		shton Woods	_ PROJECT NAME _ Rolesville	e PUD				
PR	OJECT	NUMBER 180776E	PROJECT LOCATION Rol	lesville, N	North C	arolina	3	
DA	TE ST/	RTED 10/24/18 COMPLETED 10/24/18	_ GROUND ELEVATION _0 ft	t		HOLE	SIZE 4	
DR	ILLING	CONTRACTOR Carolina Drilling	_ GROUND WATER LEVELS): 				
	ILLING GGED			NG <u></u>				—
NO	TES _		AFTER DRILLING					
O DEPTH	GRAPHIC	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲ 20 40 60 80	
-		(CL) Firm to Stiff Brown/Orange Fine Sandy CLAY	SPT	3-3-4	_			
- _ 2. - -	5			(7)	_			
_ 5.		(ML) Firm to Stiff Gray/White Fine Sandy SILT	SPT 2	4-5-7 (12)	_			
			SPT 3	3-5-7 (12)	_		▲ ●	
	-		SPT 4	3-4-3 (7)	_			
	<u>.0</u> 	(SM) Very Loose Gray/Orange Silty Medium to Coarse SA	ND (wet)					
	0 0		SPT 5	2-2-2 (4)				
		Bottom of borehole at 15.0 feet.						

103 H Cary N Teleph	iawatha NC 275 none: 9	a Court 13 TM Engin 019-468-2545	eering, Ir	ıc.		BOF	RINC		ER B PAGE 1	- 02 OF 1
CLIEN	IT As	hton Woods F	ROJECT NAME	Roles	ville PUD					
PROJ		UMBER <u>180776E</u> F	ROJECT LOCAT		Rolesville, N	lorth C	arolina			
DATE	STAR	TED _10/24/18 COMPLETED _10/24/18 COMPLETED _10/24/18	BROUND ELEVA	TION _	0 ft		HOLE	SIZE 4		
DRILL	ING C	ONTRACTOR Carolina Drilling C			LS:					
				- DRIL	LING					
NOTE	S		AFTER DRI	LLING						
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	AMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	OCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N 20 40	VALUE	▲ 80
0.0		(OL) Stiff Orongo/Drown Fing Sondy CLAV	0			ш		· · ·	<u> </u>	.
		(CL) Stiff Orange/Brown Fine Sandy CLAY	SPT 1	_	3-5-6 (11)	-		•		
<u>2.5</u> 			SPT	_	4-4-7	-				
50			2		(11)			T		
	-	(ML) Stiff Orange/Brown Fine Sandy SILT	SPT	-	4-5-7	-				
			3		(12)					
		(SM) Medium Dense to Dense Brown Silty Medium to Coarse S	SAND			-				
			SPT 4		7-11-18 (29)					
						_				
 101 Hg 15.0		Bottom of borehole at 15.0 feet	SPT 5		20-20-13 (33)					
		Boltom of DOTENDIE at 13.0 reet.								

103 Hi Cary N Teleph	iawatha IC 275 ione: §	a Court 13 TM Eng 219-468-2545	gineering, In	c.		BOF	RING	G NUMBER B-03 PAGE 1 OF 1
CLIEN	IT As	hton Woods	PROJECT NAME	Roles	ville PUD			
PROJ	ECT N	UMBER _ 180776E	PROJECT LOCAT	ion _F	Rolesville, N	North C	arolina	a
DATE	STAR	TED 10/24/18 COMPLETED 10/24/18			0 ft		HOLE	SIZE _4
	ING C				LS:			
LOGG		CHECKED BY BNM	AT TIME OF	DRILL	ING			
NOTE	s		AFTER DRI	LING				
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲ 20 40 60 80
0.0		(CL) Firm Brown/Gray Fine Sandy CLAY						
 			SPT 1		2-3-4 (7)			•
		(ML) Firm to Stiff Brown Fine Sandy SILT				-		
 <u>5.0</u>			SPT 2		5-7-9 (16)	_		
			SPT		3-5-5	_		
7.5			3		(10)	-		
			SPT 4		3-3-3 (6)	-		
10.0					(-)	_		
12.5								
		(SM) Loose Gray/Black Silty Fine to Medium SAND (wet)	SPT 5		3-3-2 (5)	-		
	<u></u>	Bottom of borehole at 15.0 feet.				1	<u> </u>	

103 H Cary N Teleph	iawatha NC 275 none: 9	a Court 13 TM E1 19-468-2545	ıgineering, I	nc	2.	E	3OF	RINC	g num	BE PA	R B 3E 1	-04 OF 1
CLIEN	NT As	hton Woods		E _F	Roles	ville PUD						
PROJ		JMBER 180776E	PROJECT LOCA	ATIC	DN _F	Rolesville, N	lorth C	arolina	1			
DATE	STAR	TED 11/2/18 COMPLETED 11/2/18	GROUND ELEV	ATIO	ON _	0 ft		HOLE	SIZE 4			
DRILL	ING C	ONTRACTOR Carolina Drilling	GROUND WATE	RL	EVE	LS:						
DRILL	ING M	ETHOD <u>SS</u>	AT TIME (OF [DRILI	LING						
LOGG	GED BY	Joey CHECKED BY BNM	AT END C)F D	RILL	ING						
NOTE	S		AFTER DI	RILL	LING				1			
o DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER		RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SP 20	T N V 40	ALUE - 60	▲ 80
 		TOPSOIL										
		(SM) Medium Dense Gray Silty Fine SAND	SP 1	т		5-15-50/4"						>>4
2		Partially Weathered Rock sampled as SM					-					
 _ 3 _												
 			SP 2	T		50/2"	-					>>
5		Refusal at 5.0 feet.									•	
		Bottom of borehole at 5.0 feet.										

103 H Cary I Telepl	liawatha NC 275 hone: 9	a Court 13 TM E1 19-468-2545	ngineering, Iı	ıc.		BOF	RINC	g num	BER PAGE	B-05 1 OF 1
CLIE	NT As	hton Woods	PROJECT NAME	Roles	sville PUD					
PROJ	ECT N	JMBER _ 180776E			Rolesville, N	North C	arolina			
DATE	STAR	TED 11/2/18 COMPLETED 11/2/18			0 ft		HOLE	SIZE 4		
				R LEVE	LS: LINC 2.30) ft / Eld	-2 3	0 ft		
LOGO	GED BY	Joey CHECKED BY BNM	AT END OF				57-2.0	011		
NOTE	S		AFTER DR	LLING						
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SP 20	T N VAL 40 60	UE ▲ 80
 		TOPSOIL								
		(SM) Dense Tan Silty Fine SAND	SPT 1		18-29- 50/3"					>>2
		Partially Weathered Rock sampled as SM ∑		_		_				
					50/2"	-				>>/
		Refusal at 5.0 feet. Bottom of borehole at 5.0 feet.								

103 H Cary N Teleph	iawatha IC 275 ² Ione: 9	Court 13 TM E	ngineering	g, In	IC.	ville PUD	BOF	KING	DINIBLE B-U6 PAGE 1 OF 1
PROJ	ECT NU	JMBER _180776E	PROJECT	LOCAT	ION _F	Rolesville, N	North C	arolina	1
DATE	STAR	ED 11/2/18 COMPLETED 11/2/18	GROUND E	LEVA		D ft		HOLE	SIZE 4
DRILL	ING CO	DNTRACTOR Carolina Drilling		VATER		LS:			
	ING MI		AII AT F		· DRILI DRILI	_ING ING			
NOTE	s		AFTI	ER DRI	LLING				
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION		SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲ 20 40 60 80
	<u>x 1, </u>	TOPSOIL							
	<u> </u>								
	<u></u>								
 1	<u>1/</u>								
		(SM) Loose Gray Silty Fine SAND							
				CDT					
-				1		(5)			
2									
					_		-		
-									
3									
				ODT	-	50/48			
		Partially Weathered Rock sampled as SW		2			1		
4									
· _									
 -									
5		Refusal at 5.0 feet.					<u> </u>	1	<u> </u>
		Bottom of dorehole at 5.0 feet.							

103 Hiawatha Cary NC 275 Telephone: S	a Court TM Er 113 TM Er 219-468-2545	gineering, Inc.	BO	RING NUMBER B-07 PAGE 1 OF 1
CLIENT As	hton Woods	PROJECT NAME Rolesville Pl	JD	
PROJECT N		PROJECT LOCATION Rolesvi	lle, North C	Carolina
	COMPLETED 10/24/18 COMPLETED 10/24/18	GROUND ELEVATION 0 ft		HOLE SIZE 4
	IFTHOD SS	GROUND WATER LEVELS:		
LOGGED BY	CHECKED BY BNM	AT END OF DRILLING		
NOTES		AFTER DRILLING		
o DEPTH (ft) GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER RECOVERY % (RQD) BLOW COLINTS	(N VALUE) POCKET PEN. (fsf)	▲ SPT N VALUE ▲ 20 40 60 80
	(ML) Firm Orange/Brown Fine Sandy SILT	SPT 3-3 1 (8	-5	
4 		SPT 3-3 2 (7	-4)	
	Refusal at 5.5 feet. Bottom of borehole at 5.5 feet.			1 1 : : : :

103 Hi Cary N Teleph	awatha IC 275 one: §	a Court TM Eng 13 TM Eng 219-468-2545	gineering, In	ic.		BOF	RING	B NUMBER B-08 PAGE 1 OF 1
CLIEN	T As	hton Woods	PROJECT NAME	Roles	ville PUD			
PROJ	ECT N	UMBER _180776E	PROJECT LOCAT	ION _	Rolesville, N	North C	Carolina	1
DATE	STAR	TED 10/24/18 COMPLETED 10/24/18	GROUND ELEVAT		0 ft		HOLE	SIZE 4
DRILL	ING C	ONTRACTOR Carolina Drilling		LEVE	LS:			
					LING <u>12.4</u>	10 ft / E	-lev -12	2.40 ft
NOTE	си ві S				.ing <u></u>			
					·	1		
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT (pcf)	▲ SPTN VALUE ▲ 20 40 60 80
		(CL) Firm Orange/Brown Fine Sandy CLAY		_				
			SPT 1	_	2-3-3 (6)			••••••••••••••••••••••••••••••••••••••
		(ML) Stiff to Very Stiff Orange/Brown Fine Sandy SILT	SPT 2	-	4-6-8 (14)	_		
			SPT 3	-	5-9-12 (21)	-		
7.5		(SM) Loose Gray/Tan Silty Fine to Medium SAND (wet)		_	(= 1)	_		
			SPT 4		3-4-5 (9)			
12.5		<u>≁</u>	SPT	-	2-3-3			
			5		(6)			
		Bottom of borehole at 15.0 feet.				1		

103 H Cary N Teleph	iawatha NC 275 none: 9	a Court 13 TM E1 119-468-2545	ngineering, I	nc.		BOF	RING	G NUMBER B-09 PAGE 1 OF 1
CLIEN	NT As	hton Woods	PROJECT NAME	Role	sville PUD			
PROJ	ECT NI	JMBER _180776E	PROJECT LOCA	TION _	Rolesville, N	North C	Carolina	3
DATE	STAR	TED _11/2/18 COMPLETED _11/2/18	GROUND ELEVA	TION	0 ft		HOLE	SIZE _4
DRILL		ONTRACTOR Carolina Drilling	GROUND WATE		ELS:			
				F DRIL	LING			
NOTE	S		AFTER DR		3			
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RCOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT (pcf)	▲ SPT N VALUE ▲ 20 40 60 80
0		TOPSOIL	<u>о</u>			а.		
		(CL) Firm Gray/Brown Fine Sandy CLAY	SPT 1		3-3-4 (7)	_		
3		Partially Weathered Rock sampled as SM		F	50/1"	-		>>
		Dofusal at 5.0 fast						
		Refusa at 5.0 feet. Bottom of borehole at 5.0 feet.						

103 Hi Cary N Teleph	awatha IC 275 Ione: 9	a Court 13 TM Eng 019-468-2545	gineering, Ir	ıc.	I	BOF	RINC	g nu	MB F	ER E PAGE 1	B-10 OF 1
CLIEN	T As	hton Woods	PROJECT NAME	Roles	ville PUD						
PROJI	ECT N	UMBER _ 180776E	PROJECT LOCAT		Rolesville, N	North C	arolina	I			
DATE	STAR	TED _11/2/18 COMPLETED _11/2/18	GROUND ELEVA	TION _	0 ft		HOLE	SIZE _4	ļ.		
DRILL	ING C	ONTRACTOR Carolina Drilling		RLEVE	LS:						
DRILL	ING M	ETHOD SS	_ \Box AT TIME OI	F DRILI	LING _5.50) ft / El	ev -5.5	0 ft			
LOGG	ED B	Joey CHECKED BY BNM	_ AT END OF	DRILL	ING						
NOTE	s		_ AFTER DRI	LLING							
			щ	%		z	_⊢ .	▲	SPT N	i value	
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYF NUMBER	RECOVERY (RQD)	BLOW COUNTS (N VALUE)	POCKET PE (tsf)	DRY UNIT W (pcf)	20	40_	60	80
0.0	. <u></u>	TOPSOIL							:		:
	<u>// · · · //</u> · · · · · · · · · · · · · · · · · · ·								•••••		
		(CL) Firm Brown/Orange Fine Sandy CLAY		-		-					
		(),									
			SPI		1-4-4 (8)			♠ 🗄	÷		:
2.5		(SM) Medium Dense Orange/Gray Silty Fine to Medium SA	ND	1		1					
			SPT		3-4-10				•••••	•••••	••••
			2		(14)				•••••		
5.0											
		∇									
-		<u>-</u>							•••••	:	
_				-		-			•••••		
			SPI		3-6-11 (17)						
					. ,						
1.5				1		1			<u>`</u> `		÷
_											
					40 50 57						
· _		Partially Weathered Rock sampled as SM			18-50/5"						
	$\langle \rangle \rangle$			1		1					
10.0	X										
	$\langle \rangle \rangle$								•••••		
· _	$\langle \rangle \rangle$								•••••	····:	••••
	X										
		Refusal at 12.0 feet. Bottom of borehole at 12.0 feet									

103 H Cary N Teleph	iawath IC 275 Ione: 9	a Court 13 TM Eng 919-468-2545	gineering, Ir	ıc.		BOF	RINC	G NUMBER B-11 PAGE 1 OF 1	
CLIENT _Ashton Woods PROJECT NAME _ Rolesville PUD									
PROJ	PROJECT NUMBER 180776E PROJECT LOCATION Rolesville, North Carolina								
DATE	STAR	TED 10/25/18 COMPLETED 10/25/18	GROUND ELEVA	TION _	0 ft		HOLE	SIZE 4	
DRILL	DRILLING CONTRACTOR Carolina Drilling GROUND WATER LEVELS:								
LOGG	DRILLING METHOD SS → AT TIME OF DRILLING 11.30 ft / Elev - 11.30 ft								
NOTES									
o DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲ 20 40 60 80	
		(CL) Stiff Orange/Brown Fine Sandy Silty CLAY				_			
 2.5			SPT 1		3-4-7 (11)			^	
		(IVIL) Suff to very Suff Orange/Black Fine Sandy SILT	SPT 2	_	3-4-6 (10)	_			
			SPT 3	-	7-10-10 (20)	-			
7.5 7.5		(SM) Loose Orange/Gray Silty Fine to Medium SAND		_		-			
10.0			SPT 4		1-2-5 (7)	_			
		$\overline{\Delta}$							
			SPT 5		2-4-3 (7)	_			
15.0		Bottom of borehole at 15.0 feet.							

103 H Cary I Telepl	liawatha NC 275 none: 9	a Court 13 TM Er 119-468-2545	ngineerii	ng, Ir	ıc.	I	BOF	RING	G NUMBER B-12 PAGE 1 OF 1		
CLIE	NT As	hton Woods	PROJEC		Roles	ville PUD					
PROJ		JMBER 180776E	PROJECT LOCATION Rolesville, North Carolina								
DATE	STAR	TED _10/24/18 COMPLETED _10/24/18		ELEVA		0 ft		HOLE	SIZE 4		
DRILI	LING C	ONTRACTOR Carolina Drilling		WATER	LEVE	LS:					
DRILI	ling m	ETHOD SS	AT	TIME OF	DRILI	_ING					
LOGO	GED BY	Doug CHECKED BY BNM	AT END OF DRILLING								
NOTE	S		AFTER DRILLING								
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION		SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲ 20 40 60 80		
		(CL) Firm Orange/Brown Medium Sandy CLAY									
1											
L.				SPT		7-5-4 (9)					
2						(0)					
					1		-				
3											
Ļ.		Partially Weathered Rock Sampled as SM			1		1				
				SPT		50					
4	\mathbb{K}				1		-				
	\bigotimes										
		Refusal at 4.5 feet.		L	1			1			
		Bottom of borenole at 4.5 feet.									

103 H Cary I Telepl	103 Hiawatha Court Cary NC 27513 Telephone: 919-468-2545BORING NUMBER B-13 PAGE 1 OF 1PAGE 1 OF 1											
CLIE	CLIENT Ashton Woods PROJECT NAME Rolesville PUD											
PROJECT NUMBER 180776E PROJECT LOCATION Rolesville, North Carolina								a				
DATE	STAR	TED 11/2/18 COMPLETED 11/2/18			0 ft		HOLE	SIZE 4				
		ETHOD SS										
LOGO	GED B	/ Joey CHECKED BY BNM	AT END OF DRILLING									
NOTE	S		AFTER DRILLING									
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT 20 40	N VALUE 60	▲ 80		
0.0	<u></u>	TOPSOIL						: :	:	:		
		(CL) Firm to Stiff Brown/Tan Fine Sandy Silty CLAY	SPT 1	-	3-3-4 (7)	_		•				
<u>2.5</u>				-		-						
5.0			SPT 2	-	3-6-6 (12)	-						
7.5		Σ	SPT 3	-	4-4-6 (10)	-						
		Partially Weathered Rock sampled as SM	SPT 4	-	28-50/2"	-				~~		
10.0												
		Refusal at 12.0 feet. Bottom of borehole at 12.0 feet.										
103 H Cary N Telept	iawath NC 275 none: 1	a Court TM En 513 919-468-2545	gineering, In	ic.		BOF	RING	3 NUMB	FR B-14 PAGE 1 OF	4		
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CLIEN	NT As	shton Woods	PROJECT NAME	Roles	ville PUD							
PROJ	ECT N	UMBER _ 180776E	PROJECT LOCAT	ion <u>f</u>	Rolesville, N	North C	arolina	1				
DATE	STAF	COMPLETED 10/25/18			0 ft		HOLE	SIZE 4		—		
	ING C		\square GROUND WATER		LS: ING 116	30 ft / E	- lev _11	1 60 ft				
LOGO	GED B	Y Doug CHECKED BY BNM	AT TIME OF	DRILL	ING					—		
NOTE	s		AFTER DRI	LLING								
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT 1 20 40	N VALUE ▲ 60 80			
0.0	<u>, 14: .</u>	TOPSOIL	/									
-		(SC) Medium Dense Gray/Brown Clayey Fine SAND								• • • • •		
			SPT 1		2-4-7 (11)			1		•••••		
2.5		(ML) Firm to Very Stiff Gray/Brown Fine Sandy SILT				1						
										••••		
					0 - 44							
L -			2		6-7-11 (18)							
5.0				-		-						
				-		-						
			SPT		3-5-6					••••		
			3		(11)			T		• • • • •		
1.5				1		1						
			SPT		4-7-3 (10)							
10.0				-		_						
- 												
<u>-</u> -		$\overline{\Sigma}$										
12.5												
										• • • • •		
	1			1		1						
			SPT		2-3-4 (7)					••••		
15.0					× /							
		Bottom of borehole at 15.0 feet.										

103 H Cary Telep	liawath NC 275 hone: S	a Court 13 TM En 019-468-2545	gineering, In	ic.		BOF	RING	G NUMBER B-15 PAGE 1 OF 1
CLIE	NT As	hton Woods	PROJECT NAME	Roles	ville PUD			
PRO	JECT N	UMBER _ 180776E	PROJECT LOCAT	ion <u>f</u>	Rolesville, N	North C	arolina	3
DAT	E STAR	TED _10/25/18 COMPLETED _10/25/18	GROUND ELEVAT		0 ft		HOLE	SIZE 4
DRIL		ONTRACTOR Carolina Drilling			LS:		-	
				· DRILI	LING <u>7.00</u>) ft / Ele	ev -7.0	00 ft
NOT	GED BI							
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	20 40 60 80
0.0	<u></u>	TOPSOIL (plowed)						
-		(SM) Loose Gray Silty Medium SAND		-		-		
- - 2.5			SPT 1		2-3-4 (7)			
-		(CL) Stiff Orange/Brown Fine Sandy CLAY		-				
			SPT 2		3-6-8 (14)			
5.0		(ML) Stiff Orange/Brown Fine Sandy SILT		-				
_	-			-		_		
	-	Ϋ́	SPT 3		4-6-7 (13)			
2		(SM) Dense Gray/Black Silty Fine to Medium SAND		-		-		
10.0			SPT 4	-	3-8-28 (36)	-		
		Refusal at 10.5 feet. Bottom of borehole at 10.5 feet.						

103 ⊢ Cary I Telepl	liawath NC 275 hone: §	a Court TM Eng 13 TM Eng 919-468-2545	ineering, In	ıc.	I	BOF	RINC	g nume	SER B PAGE 1	B-16 OF 1
CLIEI	NT As	hton Woods	PROJECT NAME	Roles	ville PUD					
PROJ	ECT N	UMBER _180776E	PROJECT LOCAT	ION _	Rolesville, N	North C	arolina	1		
DATE	STAR	TED 10/25/18 COMPLETED 10/25/18	GROUND ELEVA	TION _	0 ft		HOLE	SIZE 4		
DRIL		ONTRACTOR Carolina Drilling			LS:					
				- DRIL	LING <u>11.9</u>	90 ft / E	-11	1.90 ft		
NOTE	S		_ AT END OF							
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	20 40) 60	80
0.0	<u></u>	TOPSOIL (plowed)							:	:
F .		(SC) Medium Dense Gray Clayey Fine to Medium SAND								••••••••
			SPT 1		3-5-7 (12)			A		
		(CL) Stiff Orange/Brown Fine Sandy CLAY								
5.0			SPT 2		4-6-8 (14)			•		
						_				
7.5	-		SPT 3		4-4-5 (9)	_				
	-		SPT		3-5-5	_				
10.0	-		4	-	(10)	_				
		Ψ								
	-									
5			SPT 5		3-3-3 (6)					
		Bottom of borehole at 15.0 feet.								

103 ⊢ Cary I Telepl	iawath NC 275 none: 9	a Court TM Eng 13 TM Eng 219-468-2545	ineering, Ir	ıc.		BOF	RING	G NUMBER B-17 PAGE 1 OF 1
CLIEI	NT As	hton Woods	PROJECT NAME	Roles	ville PUD			_
PROJ	ECT N	UMBER _ 180776E	PROJECT LOCAT	ion _F	Rolesville, N	North C	arolina	a
DATE	STAR	TED 10/25/18 COMPLETED 10/25/18	GROUND ELEVA		<u>0 ft</u>		HOLE	SIZE 4
					LS:	-0 4 / F	-lov 1	D 50 #
				DRILI	ING	ουπ/Ε	1ev - 10	J.50 π
NOTE	S		AFTER DRI					
								SPT N VALUE
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN (tsf)	DRY UNIT WT (pcf)	20 40 60 80
0.0	<u></u>	TOPSOIL (plowed)						
·		(SC) Loose Gray Clayey Fine SAND						·····
- ·			SPT 1		3-3-4 (7)	-		•
		(CL) Very Stiff Brown/Tan Fine Sandy CLAY		-		_		
			SPT 2		5-8-12 (20)			
	-	(ML) Firm to Stiff Gray/Black Fine to Medium Sandy SILT						
7.5	-		SPT 3		4-5-4 (9)			A
	-					_		
			SPT 4		6-6-8 (14)			
		Σ						
12.5								
15.0			SPT 5		3-4-3 (7)			
		Bottom of borehole at 15.0 feet.						· · · · · · · · · · · · · · · · · · ·

103 H Cary N Teleph	iawatha IC 275 ione: §	a Court TM Engi	neerir	ng, In	IC.	E	BOF	RINC	g nui	ABE P4	AGE 1	-18 OF 1
CLIEN	IT As	hton Woods	PROJECT		Roles	ville PUD						
PROJ	ECT N	UMBER _180776E	PROJECT	LOCAT	ION _F	Rolesville, N	North C	arolina	1			
DATE	STAR	TED _11/2/18 COMPLETED _11/2/18	GROUND	ELEVA		0 ft		HOLE	SIZE 4			
DRILL	ING C	ONTRACTOR Carolina Drilling	GROUND	WATER	LEVE	LS:						
DRILL			AT			LING						
NOTE	יבט שו פ					.ing <u></u>						
	<u> </u>								•			
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION		SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	20	40	60	80
0.0	. <u></u>	TOPSOIL								÷		:
		(CL) Stiff Tan/Brown Fine Sandy CLAY										
 _ <u>2.5</u>				SPT 1		3-4-6 (10)			A			
 		(SM) Loose to Medium Dense White/Tan Silty Fine to Mediur	n SAND		-		-					
 <u>5.0</u>				2	-	(13)	-					
 7.5				SPT 3	_	4-4-5 (9)	_					
 		(ML) Firm Tan/Brown Micaceous Fine Sandy SILT		V	-							
				SPT 4	_	2-3-5 (8)	-					
		Partially Weathered Rock sampled as SM		SPT		50/2"						>>
		Bottom of borehole at 13.7 feet.		5	I							

103 Hiawath Cary NC 279 Telephone:	na Court 513 TM Eng 919-468-2545	ineering, Ir	ıc.		BOF	RINO	G NUMBER B-19 PAGE 1 OF 1
	shton Woods	PROJECT NAME	Roles	ville PUD			
PROJECT	UMBER 180776E	PROJECT LOCAT	ION _F	Rolesville, N	North C	arolina	3
DATE STAI	RTED 11/2/18 COMPLETED 11/2/18	GROUND ELEVA	FION _	0 ft		HOLE	SIZE _ 4
DRILLING	CONTRACTOR Carolina Drilling		LEVE	LS:			
				_ING12.0	00 ft / E	lev -1	2.00 ft
				ING <u></u>			
DEPTH (ft) GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPTN VALUE ▲ 20 40 60 80
<u></u>	TOPSOIL						
	(SC) Very Loose Gray Clayey Fine SAND	SPT	_	2-1-2	-		
25				(3)			
	(CL) Stiff Brown/Orange Fine Sandy CLAY		-		-		
		SPT 2	_	6-6-8 (14)			
	(ML) Soft Black/White Micaceous Fine Sandy SiL1 (wet)		-		_		
7.5		SPT 3		1-1-2 (3)			
					_		
		SPT 4	_	1-1-3 (4)	_		
					_		
		SPT 5		3-3-4 (7)			
	Bottom of dorenole at 15.0 feet.						

103 H Cary N Teleph	iawath NC 27 none:	na Court 513 TM Eng 919-468-2545	ineering, Ir	nc.		BOF	RINC	3 NUMBE	:R B- AGE 1 (-20 DF 1
CLIEN	IT <u>A</u>	shton Woods	PROJECT NAME	Roles	ville PUD					
PROJ	ECT	IUMBER _ 180776E	PROJECT LOCAT		Rolesville, N	North C	Carolina	1		
DATE	STA	COMPLETED 11/2/18	GROUND ELEVA	TION _	0 ft		HOLE	SIZE 4		
DRILL	ING (CONTRACTOR Carolina Drilling			LS:					
				- DRIL	LING <u>12.0</u>	JU ft / E	-12-12	<u>2.00 ft</u>		
NOTE	S									
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT (pcf)	20 40	<u>60</u>	80
0.0	<u></u>	TOPSOIL								:
	17.3.1,	(CL) Stiff Brown/Tan Fine Sandy CLAY								
				1						
			SPT		3-5-6 (11)					
2.5										
		(ML) Firm Tan Fine Sandy Silty Clayey SILT								
-				4						
					445					
			2		(9)					
5.0		(ML) Soft to Eirm Plack/Prown Micasonus Eine Sandy SILT	(wot)	-		-				
<u> </u>			(wet)						•••••	
 -				-		-				
			SPT		1-1-2					
			3		(3)					•
/.ə				1						<u>.</u>
										•
			SPT		1-1-3 (4)					
10.0										
- 										
		l⊻								
12.5	$\left\{ \left \left \right \right\} \right\}$									<u>:</u>
<u>-</u> -	$\left\{ \left \left \right \right\} \right\}$									
	$\left\{ \left \left \right \right\} \right\}$			-		-				
	$\left\{ \left \left \right \right\}$		SPT		1-2-3					
	$\left\{ \left \right \right\}$		5		(5)					
15.0		Bottom of borehole at 15.0 feet.		1	1		1			<u></u>
·										

103 Hiawatha Cary NC 2751 Telephone: 91	Court 3 TM En 9-468-2545	igineering, Ii	nc.		BOF	RING	G NUMBER B-21 PAGE 1 OF 1		
CLIENT Asht	ton Woods	PROJECT NAME	Roles	ville PUD					
PROJECT NU	MBER _ 180776E	PROJECT LOCATION Rolesville, North Carolina							
DATE START	ED 10/24/18 COMPLETED 10/24/18	GROUND ELEVA	TION _	0 ft		HOLE	SIZE 4		
DRILLING CO	NTRACTOR Carolina Drilling	GROUND WATER LEVELS:							
DRILLING ME	THOD <u>SS</u>	AT TIME O	F DRIL	LING					
LOGGED BY	Doug CHECKED BY BNM	AT END OF	DRILL	_ING					
NOTES		AFTER DR				1			
DEPTH (ft) GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲ 20 40 60 80		
	TOPSOIL								
	(CL) Stiff Brown Fine Sandy CLAY								
					1				
		SPT		2-4-6					
				(10)					
			1		1				
	Refusal at 3.0 feet.		_	ļ	!	I			
	Bottom of borehole at 3.0 feet.								

103 H Cary Telep	liawatha NC 275 hone: 9	a Court 13 TM E1 19-468-2545	ngineerin	ig, Ir	nc.		BOF	RING	G NUMBER B-2 PAGE 1 OF	22 ⁼ 1
CLIE	NT Asl	nton Woods	PROJECT	NAME	Roles	ville PUD				
PRO	JECT NI	JMBER <u>180776E</u>	PROJECT	LOCAT		Rolesville, N	North C	arolina	1	
DAT		TED 10/25/18 COMPLETED 10/25/18	GROUND	ELEVA	TION _	0 ft		HOLE	SIZE 4	
DRIL	LING CO	ONTRACTOR Carolina Drilling	GROUND	WATER	RLEVE	LS:				
DRIL	LING M	ETHOD SS	AT		F DRILI	_ING				-
LOG	GED BY	Doug CHECKED BY BNM	AT	end of	DRILL	ING				
NOT	ES		AFTER DRILLING							
DEPTH (ff)	GRAPHIC LOG	MATERIAL DESCRIPTION		SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲ 20 40 60 80	<u> </u>
0		(CL) Very Stiff Brown Fine Sandy CLAY								
_										
-										
-										
1					-		_			
-										• • • • •
				SPT		5-3-13				
-	-////			1		(16)			▲	
2										
-										
2					-		-			
; -										• • • • •
2										,
3		Defined at 0.0 feat								
		Rerusal at 3.0 feet. Bottom of borehole at 3.0 feet.								
5										
2										

103 H Cary N Teleph	awatha IC 275 Ione: 9	a Court 13 TM En 19-468-2545	gineering, In	ıc.		BOF	RINC) NU	MB	PAGI	t B- E 1 C	23)F 1
CLIEN	IT As	nton Woods	PROJECT NAME	Roles	ville PUD							
PROJ		JMBER <u>180776E</u>	PROJECT LOCAT		Rolesville, N	North C	arolina					
DATE	STAR	TED 10/25/18 COMPLETED 10/25/18	GROUND ELEVA		0 ft		HOLE		ŧ			
DRILL	ING C	ONTRACTOR Carolina Drilling	GROUND WATER	LEVE	LS:							
DRILL	ING M	ETHOD SS	AT TIME OF	DRIL	LING							
LOGG	ED BY	Doug CHECKED BY BNM	AT END OF	DRILL	.ING							
NOTE	s		AFTER DRI	LLING								
o DEPTH o (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ 20	SPT 40	N VA	LUE ▲ 0 8	⊾ 30
0.0		(SC) Loose Gray Clayey Medium SAND							:			
								:	:			:
											:	
				1		1		:::::::::::::::::::::::::::::::::::::::	:::::::::::::::::::::::::::::::::::::::			:
									:			
-			OPT		244			••••••	•••••		•••••	
					(8)				÷			
-									•••••			:
									:			
2.5		(SC) Madium Dance Orange Clayov Sity Fine SAND		-		-			<u> </u>			<u>:</u>
		(SC) Medium Dense Orange Clayey Siny Fine SAND										
-												
											÷	-
_						_						
									:			
									i			-
			SPT		3-5-8				:			-
			2		(13)				:		:	
-											•••••	
50									X			-
5.0				1		1						<u>.</u>
												:
-									•••••			
								÷	i			$\left \right\rangle$
-		Partially Weathered Rock sampled as SM		-	E0/2"	-			•••••		• • • • • • • •	
					30/3	-						
-												
									:			:
		Refueal at 7.0 feet						÷				<u>:</u>
		Bottom of borehole at 7.0 feet.										

103 H Cary I Telepl	iawatha NC 275 none: §	a Court 13 TM Eng i 219-468-2545	ineering, In	ic.	I	BOF	RING	G NUMBER B- PAGE 1 (-24 DF 1
CLIE	NT <u>As</u>	hton Woods	PROJECT NAME	Roles	ville PUD				
PROJ			PROJECT LOCAT		Rolesville, N	North C	arolina		
	ING C	ONTRACTOR Carolina Drilling	GROUND ELEVA		<u>0 ft</u>		HOLE	SIZE <u>4</u>	
DRILI	LING M		AT TIME OF	DRIL	Ling				
LOGO	GED BY	CHECKED BY BNM	AT END OF	DRILL	.ING				
NOTE	s		AFTER DRI	LLING		1	1	1	
o DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲ 20 40 60 8	▶ <u>80</u>
		(SC) Very Loose Gray Clayey Fine SAND		-		_			
2.5			1	-	(4)				
		(CL) Stiff Orange/Brown Fine Sandy CLAY	SPT	-	4-6-6	-			
5.0		(ML) Firm to Stiff Brown/Gray Fine to Medium Sandy SILT		-	(12)	-			
7.5	-		SPT 3	-	4-5-6 (11)	_		A	
			SPT 4	-	3-3-4 (7)	_		▲	
<u>10.0</u>				-		_			
12.5			SPT		2-3-5				
15.0		Bottom of borehole at 15.0 feet.	5		(8)				

103 H Cary Telep	liawatha NC 275 hone: §	a Court 13 TM Er 019-468-2545	ngineering, In	ıc.		BOF	RINC	g nun	IBEF PAG	₹ B- ;E 1 C	• 25 DF 1
CLIE	NT As	hton Woods	PROJECT NAME	Roles	ville PUD						
PRO	JECT N	UMBER _ 180776E	PROJECT LOCAT	ION _	Rolesville, N	North C	arolina	l			
DATI		TED 10/25/18 COMPLETED 10/25/18	GROUND ELEVA		0 ft		HOLE	SIZE 4			
					LS:						
LOG	GED BY		AT TIME OF		_ING						
NOT	ES		AFTER DRI	LLING							
μ	с Н		TYPE ER	RY % 0)	V TS UE)	PEN.	T WT.	▲ SF 20	PT N VA 40 (LUE 4	30
DEP1	GRAPI	MATERIAL DESCRIPTION	SAMPLE	RECOVE (RQI	BLOV COUN (N VAL	POCKET (tsf)	DRY UNI (pcf				
0		(CL) Firm Orange/Brown Fine Sandy CLAY								:	:
-									•••		
F											
1											
-											
-	-////										
-	-////		ODT		2.2.2						
-					(5)			A			
2								 :	 :		÷
	-										
				-		-					
3										<u>.</u>	<u>.</u>
	_										
	-	Partially Weathered Rock sampled as SM		-		1					
	-200		SPT 2		50						
4	->>>>			-		-				÷	<u>.</u>
	-										
									•••		
									•••••••••		
5											
								<u>.</u>			
0	<u>_</u> K///X	Refusal at 5.5 feet. Bottom of borehole at 5.5 feet.		1	1	1	1	l :	<u>.</u>	<u>:</u>	<u>:</u>

103 H Cary I Telep	liawatha NC 275 hone: 9	TM E 13 TM E 19-468-2545	ngineerii	ng, Ir	ıc.		BOF	RING	B NUMBER B-26 PAGE 1 OF 1
CLIE	NT As	nton Woods	PROJEC	T NAME	Roles	ville PUD			
PROJ		JMBER _ 180776E	PROJEC	T LOCAT		Rolesville, N	lorth C	arolina	
DATE		TED 11/2/18 COMPLETED 11/2/18		ELEVA		0 ft		HOLE	SIZE 4
DRIL	LING C	DNTRACTOR Carolina Drilling		WATER	LEVE	LS:			
DRIL	LING M	ETHOD <u>SS</u>	AT		- DRILI	LING			
LOG	GED BY	Doug CHECKED BY BNM	AT	END OF	DRILL	.ING			
NOTE	ES		AF	ter Dri	LLING				
o DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION		SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲ 20 40 60 80
OGRAM FILES/GINT/LIBRARY/ROLES/ILLEPOD.GPJ		(CL) Firm Brown Fine Sandy CLAY Refusal at 0.5 feet. Bottom of borehole at 0.5 feet.							
SEOTECH BH PLOTS - GINT STD US.GDT - 11/15/18 12:06 - C.NPF									

103 H Cary N Telept	iawath NC 275 none: §	a Court 13 TM E1 219-468-2545	ngineering, Inc.	E	3OF	RING	G NUMBER B-27 PAGE 1 OF 1
CLIEN	NT As	hton Woods	PROJECT NAME Role	esville PUD			
PROJ	ECT N	UMBER _ 180776E	PROJECT LOCATION	Rolesville, N	lorth C	arolina	a
DATE	STAR	TED 11/2/18 COMPLETED 11/2/18	GROUND ELEVATION	<u>0 ft</u>		HOLE	SIZE 4
				ELS:			
LOGO		(Doug CHECKED BY BNM	AT FIME OF DRIL	LLING <u></u>			
NOTE	s		AFTER DRILLING	G			
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER RECOVERY %	(KAUU) BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲ 20 40 60 80
<u>0.0</u> 		(CL) Soft Brown Fine Sandy CLAY (moist)			-		
2.5			SPT 1	1-2-2 (4)	-		
		(IVIL) FIRM to Stiff Brown/Tan Fine Sandy SILT	SPT	5-7-8	-		
				(13)	-		
7.5			SPT 3	3-5-5 (10)	-		
			SDT	224	-		
10.0	-		4	(7)	-		
2 12.5							
		Refusal at 13.0 feet. Bottom of borehole at 13.0 feet.					

103 H Cary Telep	liawatha NC 275 hone: §	a Court 13 TM Engi 219-468-2545	neering, In	ıc.	E	BOF	RING	G NUMBE	ER B-2 Age 1 OF	28 : 1
CLIE	NT <u>As</u>	hton Woods	PROJECT NAME	Roles	ville PUD					
PRO.	JECT N	UMBER _180776E	PROJECT LOCAT	ion _	Rolesville, N	lorth C	arolina	1		
DATI	E STAR	TED 11/2/18 COMPLETED 11/5/18	GROUND ELEVAT		<u>0 ft</u>		HOLE	SIZE 4		
	LING C		GROUND WATER ∇ at time of		LS:) ft / 드l/	ov 78	0.ft		
LOG	GED BY	CHECKED BY BNM		DRILL	.ING		 1.0	011		
NOT	ES		AFTER DRI	LLING						
O DEPTH O (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N 20 40	VALUE ▲ 60 80	
_	- <u>11</u> -11-11-11-11-11-11-11-11-11-11-11-11-	TOPSOIL (CL) Soft Brown Fine Sandy CLAY (moist)								
- - 2.5			SPT 1		2-2-2 (4)	_		^		
-		(CL) Firm Brown/Orange Fine Sandy CLAY		_						
- - 5.0		(SM) Vory Losso to Losso Croy/M/bite Missoonus Silty Fire t	SPT 2		2-3-4 (7)	_				•••••
		(SM) Very Loose to Loose Gray/White Micaceous Sity Fine t Medium SAND (wet)		-						
7.5		∇	SPT 3		3-3-4 (7)	-				·····
		-		-		-				
10.0			SPT 4	_	1-2-3 (5)	-				
12.5										•••••
15.0			SPT 5		0-1-1 (2)					• • • • • •
	<u> </u>	Bottom of borehole at 15.0 feet.		<u>ı</u>	1	<u>.</u>	1		: :	

103 H Cary I Telep	liawatha NC 275 hone: §	a Court 13 TM Engi 019-468-2545	neerir	ng, In	IC.		BOF	RING	G NUMBE	R B- GE 1 C	29 DF 1
CLIE	NT As	hton Woods	PROJECT		Roles	ville PUD					
PRO	ECT N	UMBER _180776E	PROJECT	LOCAT	ION _F	Rolesville, N	North C	arolina	a		
DATE	STAR	TED _11/2/18 COMPLETED _11/5/18	GROUND	ELEVA		0 ft		HOLE	SIZE 4		
DRIL	LING C	ONTRACTOR Carolina Drilling		WATER	LEVE	LS:					
DRIL			⊥A ⊥_			_ING <u>8.00</u>) ft / Ele	ev -8.0	00 ft		
NOTE	5ED B1					ING <u></u>					
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION		SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	20 40	60 8	30
0.0	·	TOPSOIL									:
- ·		(CL) Soft Brown Fine Sandy CLAY (moist)									
				SPT 1		2-2-2 (4)	_		•		
		(CL) Stiff Brown/Orange Fine Sandy CLAY									
				SDT	-	346					
- 5.0				2		(10)					
		(ML) Firm Brown Fine Sandy SILT									
	-			SPT 3		4-4-5 (9)					
		(SM) Very Loose Gray/White Silty Fine to Medium SAND (we $\underline{\nabla}$	et)								
							-				
10 0				4		1-1-1 (2)					
0 I 0 I 0 I 0 I 0 I 0 I 0 I 0 I 0 I 0 I											
12.5											
				SPT		0-1-3	1				
				5		(4)					
	1.1.1.1	Bottom of borehole at 15.0 feet.			I		1	<u> </u>			:
5											

103 H Cary Telep	liawatha NC 275 hone: §	a Court 13 TM Engi 019-468-2545	neering, Ir	ıc.	I	BOF	RING	g numb	ER B-	30 F 1
CLIE	NT <u>As</u>	hton Woods	PROJECT NAME	Roles	ville PUD					
PRO.	JECT N	UMBER _ 180776E	PROJECT LOCAT	ION _	Rolesville, N	North C	arolina	a		
DATI	E STAR	TED 11/2/18 COMPLETED 11/2/18	GROUND ELEVA	FION _	0 ft		HOLE	SIZE 4		
DRIL	LING C	ONTRACTOR Carolina Drilling		LEVE	LS:					
DRIL					LING <u>8.00</u>) ft / Ele	ev -8.0	00 ft		<u> </u>
	GED BI				.ING					
O DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SP11 20 40	60 80	<u>0</u>
-		(CL) Firm to Stiff Brown/Gray Fine Sandy CLAY								
- 			SPT 1	-	1-2-3 (5)	-				
- - - 5.0			SPT 2	-	3-5-8 (13)					
		(SM) Medium Dense Gray Silty Medium to Coarse SAND				_				
7.5		(SM) Very Loose to Loose Gray/White Silty Fine SAND (wet)		-	6-6-8 (14)	-				
			SPT 4	-	2-2-2 (4)	_				
0021-01-01-01-01-01-01-01-01-01-01-01-01-01				-						
12.5				_						
			SPT 5		2-2-3 (5)					
		Bottom of borehole at 15.0 feet.								

103 H Cary Telep	liawatha NC 275 hone: §	a Court 13 TM En 019-468-2545	gineering, In	ic.		BOF	RING	G NUMBER B-31 PAGE 1 OF 1
CLIE	NT <u>As</u>	hton Woods	PROJECT NAME	Roles	ville PUD			
PRO	JECT N	JMBER _ 180776E	PROJECT LOCAT	ion <u>f</u>	Rolesville, N	North C	arolina	a
		TED 11/2/18 COMPLETED 11/2/18 ONTRACTOR Coreline Drilling			0 ft		HOLE	SIZE _4
	LING C	ETHOD SS	$\overline{\nabla}$ AT TIME OF	DRILI	LS: LING 8.10) ft / Ele	ev -8.1	0 ft
LOG	GED BY	Doug CHECKED BY BNM	AT END OF	DRILL	ING			
NOT	ES		AFTER DRI	LLING				
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲ 20 40 60 80
		(CL) Soft Brown Fine Sandy CLAY (moist)		_		_		
- - 2.5			SPT 1	-	2-2-2 (4)			
-		(CL) Sun Gray Fille Sandy CLAT	SPT 2	-	4-4-7 (11)	_		
		(SM) Medium Dense Gray Silty Fine SAND		-		-		
		(SM) Very Loose Gray/White Silty Fine SAND (wet)	SPT 3	-	4-5-6 (11)	_		
		$\overline{\Delta}$	CDT	-	2.2.2	-		
10.0			4	-	(4)	_		
			SPT 5		2-1-3 (4)			
		Bottorn of Dorenole at 15.0 feet.						

103 Cary Tele	Hiawath NC 275 phone: 9	a Court 13 TM En 019-468-2545	gineering, In	ıc.		BOF	RING	g nur	MBEF PAG	R B-32 E 1 OF 1	
CLI	ENT As	hton Woods	PROJECT NAME	Roles	ville PUD						_
PRC	JECT N	UMBER _180776E	PROJECT LOCAT	ION _	Rolesville, N	North C	arolina	a			_
DAT	E STAR	TED 11/2/18 COMPLETED 11/2/18	GROUND ELEVA	FION _	0 ft		HOLE	SIZE 4			—
					LS:		~ 70	0 4			
		(Doug CHECKED BY BNM	AT TIME OF AT END OF	DRILL	LING <u>7.90</u>		ev -7.9				-
NOT	ES		AFTER DRI	LLING							_
DEPTH	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ S 20	SPT N VA 40 6	LUE ▲ 60 80	
<u>0.0</u> - -	-	(CL) Soft Brown Fine Sandy CLAY (moist)									••••
- - 2.5		(CL) Stiff Brown/Gray Fine Sandy CLAY	SPT 1		1-1-3 (4)	_					••••
			SPT 2	-	3-4-6 (10)					· · · · · · · · · · · · · · · · · · ·	••••
		(SM) Medium Dense Gray Silty Fine SAND		-	2 5 7						••••
		$\underline{\nabla}$ (SM) Very Loose Gray/White Silty Fine SAND (wet)			(12)	_					
			SPT	_	1-1-2	_					••••
10.0 	 		4	_	(3)	_					••••
											••••
			SPT 5		1-1-2 (3)						••••
		Bottom of borehole at 15.0 feet.									

103 Car Tele	Hiawatha / NC 275 phone: §	a Court 13 TM Eng 19-468-2545	ineerir	ıg, Ir	IC.		BOF	RING	G NUMBER B-33 PAGE 1 OF 1
CLI	ENT As	hton Woods	PROJECT		Roles	ville PUD			
PRO	JECT N	UMBER 180776E	PROJECT	LOCAT	ion <u>F</u>	Rolesville, N	North C	arolina	a
DA		TED 11/2/18 COMPLETED 11/5/18 ONTRACTOR Caroling Drilling	GROUND	ELEVA		D ft		HOLE	SIZE _4
	LLING C	ETHOD SS			E DRILL	_5: _ING			
LO	GED B	Doug CHECKED BY BNM	AT	END OF	DRILL	ING			
NO	'ES		AF	ter dri	LLING				
O DEPTH	GRAPHIC LOG	MATERIAL DESCRIPTION		SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲ 20 40 60 80
-		TOPSOIL (CL) Firm Brown/Orange Fine Sandy CLAY							
- - _ 2.5				SPT 1	_	2-2-3 (5)	_		
- - - 5.0				SPT 2	-	3-4-5 (9)	_		
		(ML) Firm to Stiff Tan/Brown Micaceous Fine Sandy SILT		SPT	_	3-5-7	_		
				3	-	(12)	_		
	- - - - - -			SPT 4	-	3-3-3 (6)	-		•
		(SM) Very Loose Gray Micaceous Silty Fine SAND (wet)							
12.					-				
		Bottom of borehole at 15.0 feet.		SPT 5		1-2-1 (3)			

103 H Cary I Telepl	iawatha NC 275 none: §	a Court 13 TM Engi 19-468-2545	neering, Ir	ıc.	I	BOF	RING	G NUMBER B-34 PAGE 1 OF 1
CLIE	NT As	hton Woods	PROJECT NAME	Roles	ville PUD			
PROJ	ECT N	UMBER _ 180776E	PROJECT LOCAT	ION _	Rolesville, N	lorth C	arolina	a
DATE	STAR	TED 11/5/18 COMPLETED 11/5/18	GROUND ELEVA		<u>0 ft</u>		HOLE	SIZE _4
					LS:			NO #
				DRIL	ING		<u> -0.0</u>	
NOTE	S	0	AFTER DRI	LLING				
o DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲ 20 40 60 80
	<u></u>	TOPSOIL (SM) Loose Brown/Tan Silty Medium SAND						
ļ .								
 2.5			SPT 1		4-4-2 (6)	_		▲
		(CL) Firm Brown/Tan Medium Sandy CLAY		-		_		
 5.0			SPT 2		3-3-4 (7)			^
		(SM) Very Loose to Loose Brown/Tan Micaceous Silty Fine S. (wet)	AND					
7.5			SPT 3		2-1-1 (2)	-		
		∑ ∑						
10.0			SPT 4		1-1-2 (3)			
12.5								
						-		
 			SPT 5		1-2-3 (5)			
		Bottom of borehole at 15.0 feet.						

103 H Cary N Telept	iawatha NC 275 none: 9	a Court 13 TM Engi 019-468-2545	neering, In	IC.	I	BOF	RING	G NUMBER B-35 PAGE 1 OF 1
CLIEN	T As	hton Woods	PROJECT NAME	Roles	ville PUD			
PROJ		JMBER _180776E	PROJECT LOCAT	ion <u>F</u>	Rolesville, N	North C	arolina	a
DATE	STAR	TED _10/24/18 COMPLETED _10/24/18	GROUND ELEVA		0 ft	<u> </u>	HOLE	SIZE 4
DRILL	ING C				LS:		- 4	0.50 (
				י וופח	LING	50 ft / E	lev -1	0.50 ft
NOTE	S							
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	20 40 60 80
		(CL) Firm to Very Stiff Orange/Gray Fine Sandy CLAY		_				
 _ <u>2.5</u> 			SPT 1	-	2-2-4 (6)	_		
 <u>5.0</u>		(SM) Madium Danas Cray/Tan Silky Madium to Caaraa SANI	SPT 2		8-10-6 (16)	_		
		(SM) Medium Dense Gray/Tan Silty Medium to Coarse SAN	SPT	-	3-4-7	-		
7.5		(SM) Very Loose Brown Silty Fine SAND (saturated)		-	(11)	-		
 			SPT 4	-	1-1-1 (2)			
		Σ						
12.5				-				
15.0			SPT 5		1-1-1 (2)			
		Bottom of borehole at 15.0 feet.						

103 Hiawatha Cary NC 2751 Telephone: 9	Court 3 TM Er 19-468-2545	BORING NUMBER B-3 page 1 OF							
CLIENT Ash	ton Woods	PROJECT NAME Rolesville PUD							
PROJECT NU	IMBER 180776E	PROJECT LOCATION Rolesville, North Carolina							
DATE START	ED <u>10/25/18</u> COMPLETED <u>10/25/18</u>	GROUND ELEVATION 0 ft HOLE SIZE 4							
DRILLING CO	DNTRACTOR Carolina Drilling	GROUND WATER LEVELS:							
DRILLING ME	ETHOD <u>SS</u>	AT TIME OF DRILLING							
LOGGED BY	Doug CHECKED BY BNM	AT END OF DRILLING							
NOTES		AFTER DRILLING							
DEPTH (ft) GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER RECOVERY % (RQD) POCKET PEN. (Ist) DRY UNIT WT. (pcf) (pcf) (pcf)							
	(SM) Medium Dense Gray Silty Fine SAND Partially Weathered Rock sampled as SM Refusal at 2.0 feet. Bottom of borehole at 2.0 feet.	SPT 6-50/1"							

103 H Cary I Telepl	iawath NC 275 none: {	a Court 113 TM Eng 919-468-2545	ineering, In	ic.	E	30F	RING	G NUMBER B-37 PAGE 1 OF 1				
CLIE	NT As	hton Woods	PROJECT NAME	Roles	ville PUD							
PROJ	ECT N	UMBER 180776E	PROJECT LOCATION Rolesville, North Carolina									
DATE	STAR	TED 10/25/18 COMPLETED 10/25/18	GROUND ELEVAT		0 ft		HOLE	SIZE 4				
DRILI	ING C	ONTRACTOR Carolina Drilling		LEVE	LS:							
DRILI	ING M	IETHOD SS	$_$ \blacksquare At time of	DRIL	LING 12.5	60 ft / E	lev -12	2.50 ft				
LOGO	SED B	Y _Doug CHECKED BY _BNM	_ AT END OF	DRILL	.ING							
NOTE	s		_ AFTER DRI				1	1				
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲ 20 40 60 80				
0.0		(SM) Loose Gray Silty Fine SAND										
			SPT		2-2-3 (5)			▲				
2.5												
		(SM) Medium Dense Gray/Tan Silty Fine to Medium SAND		1		1						
-												
-				1		-						
-			SPT		4-6-13							
			2		(19)							
5.0				-		-						
-												
-				{		-						
-			SPT		5-7-10							
-			3		(17)			†				
7.5				-		-						
-												
-				-								
-												
_			SPI 4		(13)							
10.0												
-												
-												
-												
- 12 5												
12.0		≚										
-												
-	<u>زراز انها</u>	Partially Weathered Rock sampled as SM			50/1"			······				
		Bottom of borehole at 13.6 feet.	5									

103 Hia Cary N0 Telepho	awatha Cour C 27513 one: 919-46	t 8-2545	TM En	gineerin	ng, In	IC.	I	BOF	RINC	G NUMBER B-38 PAGE 1 OF 1
CLIENT	Ashton W	Voods		PROJEC [®]		Roles	/ille PUD			
PROJE		R <u>180776E</u>		PROJEC	LOCAT		Rolesville, N	lorth C	arolina	I
DATE S	STARTED _	10/24/18 COMPLET	ED 10/24/18	GROUND	ELEVA1) ft		HOLE	SIZE 4
DRILLI	NG CONTR	ACTOR Carolina Drilling		GROUND	WATER	LEVE	_S:			
DRILLI	NG METHO	D <u>SS</u>		AT	TIME OF	DRILL	.ING			
LOGGE	ED BY Dou	Ig CHECKED	BY BNM	AT	END OF	DRILL	ING			
NOTES	;			AF	TER DRI	LLING		1		
DEPTH (ft)	GRAPHIC LOG	MATERIAL DES	SCRIPTION		SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲ 20 40 60 80
	(S	(C) Loose Tan/Orange Clayey Fine	≥ SAND		SPT 1		3-4-4 (8)			
	Pa	artially Weathered Rock sampled a	as SM		SPT 2	-	50/3"			>>
	×/>N	Refusal at Bottom of boreh	5.0 feet. ole at 5.0 feet.			<u> </u>		<u> </u>	1	L

103 Hi Cary N Teleph	awatha IC 275 Ione: 9	a Court 13 TM En 019-468-2545	gineering, In	ic.		Bof	RING	g num	BER PAGE	B- (39 F 1
CLIEN	IT As	hton Woods	PROJECT NAME	Roles	ville PUD						
PROJ	ECT N	UMBER _180776E	PROJECT LOCAT	ION _	Rolesville, N	North C	arolina	a			
DATE	STAR	TED 10/24/18 COMPLETED 10/24/18	GROUND ELEVA	rion _	0 ft		HOLE	SIZE 4			
	ING C				LS:	00 ft / E		1 00 ft			
LOGG		CHECKED BY BNM	AT TIME OF					1.00 11			
NOTE	s		AFTER DRI	LLING							
0.0 DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SP 20	T N VAL 40 60	_UE ▲ 0 80	D
		(SC) Loose Gray/Brown Clayey Medium SAND (wet)	SPT 1	-	2-3-4 (7)			•			
 		(ML) Stiff Gray/Tan Fine Sandy SILT	SPT 2	-	3-5-7 (12)						
5.0			SPT 3	-	3-5-6 (11)	-		.			
		(SM) Very Loose Brown Silty Fine SAND (saturated)		-		-			-		
10.0 			SPT 4	-	1-2-2 (4)	-					
 12.5		¥									
			SPT 5	-	1-2-1 (3)						
	. [].:	Bottom of borehole at 15.0 feet.				1			: :	:	

103 Hiawath Cary NC 275 Telephone: 9	a Court 13 TM En 019-468-2545	gineerii	ng, In	ıc.		BOF	RINC	B NUMBER B-40 PAGE 1 OF 1
	hton Woods	PROJEC		Roles	ville PUD			
PROJECT N	UMBER _ 180776E	PROJEC	T LOCAT	ion _	Rolesville, N	North C	arolina	1
DATE STAR	TED 10/24/18 COMPLETED 10/24/18		ELEVA		0 ft		HOLE	SIZE 4
		GROUND			LS:			
	(Doug CHECKED BY BNM	AT			.ING			
NOTES		AF	TER DRI	LLING				
o DEPTH (ft) GRAPHIC LOG	MATERIAL DESCRIPTION		SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲ 20 40 60 80
$\frac{\sqrt{1}}{\sqrt{1}} \cdot \frac{\sqrt{1}}{\sqrt{1}}$	TOPSOIL							
	(SM) Medium Dense Gray/Brown Silty Fine SAND							
1				-		-		
	Partially Weathered Rock sampled as SM		SPT 1		2-50			
SOGRAM								
2:06 - C:\PF								
115/18 1	Refusal at 2.5 feet.		L					
TS - GINT STD US.GDT - 11	Boltom of Dorehole at 2.5 reet.							
GEOTECH BH PLC								

103 H Cary Telep	liawatha NC 275 hone: §	a Court 13 TM En 019-468-2545	igineeri	ng, In	IC.		BOF	RING	S NUMBER B-41 PAGE 1 OF 1
CLIE	NT As	hton Woods	PROJEC	T NAME	Roles	ville PUD			
PRO.	JECT N	UMBER 180776E	PROJEC	T LOCAT	ION _F	Rolesville, N	North C	arolina	<u>I</u>
DATE	E STAR	TED _10/24/18 COMPLETED _10/24/18		ELEVA		0 ft		HOLE	SIZE 4
DRIL	LING C	ONTRACTOR Carolina Drilling		WATER	LEVE	LS:			
DRIL	LING M	ETHOD <u>SS</u>	AT	TIME OF	DRILI	LING			
LOG	GED B)	CHECKED BY BNM	AT	END OF	DRILL	.ING			
NOTE	ES		AF				1	1	
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION		SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲ 20 40 60 80
0.0	<u></u>	TOPSOIL							
		(CL) Soft Orange/Brown Fine Sandy CLAY							
L .									
				SPT		1-2-2			▲
-						(4)			
2.5		(ML) Firm to Stiff Brown/Orange Fine Sandy SILT			-		-		
		(
	$\left \left \right \right $								
-nor									
							1		
2 Y Y Y				SPT		3-4-6			
				2		(10)			
5.0					-		-		
29- ·	-								
¥1.									
- <u>-</u>					1		1		
21.81									
/GL/L				SPT		3-3-5			
				3		(8)			
7.5					-		-		
2 U									
		Refusal at 8.0 feet.							
		Bottom of borehole at 8.0 feet.							

103 ⊢ Cary I Telepi	iawatha NC 275 none: §	a Court 13 TM Er 019-468-2545	ngineering, Inc.	BO	RINO	G NUMBER B-42 PAGE 1 OF 1
CLIEI	NT <u>As</u>	hton Woods	PROJECT NAME Rolesville PUD			
PROJ		UMBER 180776E	PROJECT LOCATION Rolesville	North C	Carolina	
DATE	ING C	ONTRACTOR Carolina Drilling	$\frac{0 \pi}{0 \pi}$ GROUND ELEVATION <u>0 \pi</u>		HOLE	: SIZE <u>4</u>
DRIL	LING M	ETHOD <u>SS</u>	AT TIME OF DRILLING			
LOG	GED BY	Doug CHECKED BY BNM	AT END OF DRILLING			
NOTE	S		AFTER DRILLING			
0 DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER RECOVERY % (RQD) BLOW COUNTS	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲ 20 40 60 80
		(CL) Firm Orange/Brown Fine Sandy CLAY				
			SPT 3-3-3 1 (6)			
 <u>- 5.0</u>		(ML) Firm Orange/Tan Fine Sandy SILT	SPT 3-3-4 2 (7)			
			SPT 2-2-3 3 (5)			
			SPT 3-3-3 4 (6)			
			SPT 4-4-4 5 (8)			
de ol e ol		Bottom of borehole at 15.0 feet.				

1 C T	103 H Cary N Felept	iawatha NC 275 none: 9	a Court 13 TM En 19-468-2545	gineering, I	nc.		BOF	RING	g nui	MBEI PAC	R B- 3E 1 0	43 DF 1
0		NT As	hton Woods	PROJECT NAME	Roles	sville PUD						
F	PROJ		JMBER 180776E	PROJECT LOCA	tion _	Rolesville, N	North C	Carolina	1			
			TED 10/25/18 COMPLETED 10/25/18 ONTRACTOR Constitue Drilling			0 ft		HOLE	SIZE _ 4			
	JRILL JRILL		ETHOD SS			LS: LING						
		SED BY	Doug CHECKED BY BNM	AT FINE O		_ING						
N	NOTE	S		AFTER DR	ILLING							
	o DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ s 20	SPT N V/ 40	4LUE ▲ 60 8	80
	0.0	<u></u>	TOPSOIL						:			
	- - - 2.5		(CL) Firm Orange/Brown Fine Sandy CLAY	SPT 1	-	2-2-3 (5)	_		•			
	- - - 5.0			SPT 2	-	2-3-5 (8)						
ן פוא -			Refusal at 6.0 feet.								:	:
			Bottom of borehole at 6.0 feet.									

103 H Cary I Telepl	iawath NC 275 none: §	a Court TM Eng	gineering, In	ıc.	I	BOF	RING	G NUMBER B-44 PAGE 1 OF 1
CLIE	NT As	hton Woods	PROJECT NAME	Roles	ville PUD			
PROJ	ECT N	UMBER <u>180776E</u>	PROJECT LOCAT	ion <u>f</u>	Rolesville, N	North C	arolina	3
		TED _10/25/18 COMPLETED _10/25/18 ONTRACTOR Caroling Drilling			0 ft		HOLE	SIZE _4
				DRILI	LS: ING			
LOGO	GED B	CHECKED BY BNM	_ AT END OF	DRILL	ING			
NOTE	s		AFTER DRI	LLING				
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	MPLE TYPE NUMBER	ECOVERY % (RQD)	BLOW COUNTS (N VALUE)	DCKET PEN. (tsf)	RY UNIT WT. (pcf)	▲ SPT N VALUE ▲ 20 40 60 80
0.0			SP	RE		РС	D	
		(SC) Loose Gray Clayey Fine SAND		-		_		
2.5			SPT 1		2-3-4 (7)			
		(CL) Firm Orange/Brown Medium Sandy CLAY						
			SPT 2		3-3-4 (7)			
<u>5.0</u>				_		-		
		(ML) Firm Orange/Brown Micaceous Fine Sandy SILT		-		-		
7.5			SPT 3		3-5-4 (9)			•
	-			_				
			SPT 4		4-5-3 (8)			•
	-		-	-				
12.5								
		(SM) Loose Tan Silty Medium to Coarse SAND	SPT 5		3-4-2 (6)	-		
		Bottom of borehole at 15.0 feet.		I				

103 Car Tele	3 Hi ry N eph	awa IC 2 one	atha 2751 e: 9	Court TM Eng 3 19-468-2545	ineering, Iı	nc.	I	Bof	RIN	g ni	JMB	ER PAGE	B-4 1 OF	i5 ∶1
CL	IEN	Т_	Asł	ton Woods	PROJECT NAME	Role	sville PUD							
PR	OJE	ЕСТ		IMBER 180776E	PROJECT LOCA		Rolesville, N	North C	arolin	а				
DA	TE	ST	AR	ED _10/25/18 COMPLETED _10/25/18	GROUND ELEVA	TION	0 ft		HOLI	ESIZE	4			
DR	ILL	ING	G CC	ONTRACTOR Carolina Drilling		RLEVE	ELS:							
DR	ILL	ING	6 MI	THOD <u>SS</u>	_ AT TIME O	f dril	_LING							
LO	GG	ED	BY	Doug CHECKED BY BNM	_ AT END OF	DRIL	LING							
NO	TE	s _			_ AFTER DR	ILLING	<u> </u>							
DEPTH	(tt) 0	GRAPHIC	LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT (pcf)	2	▲ SPT I 0 40	N VALU 60	IE ▲ 80	
		<u>×1</u> /	: <u>``</u>	TOPSOIL										
		\square	\square	(CL) Soft Orange/Brown Fine Sandy CLAY										
F	-												•••••	
╞	_					_		-				·····		
Γ					SPT		1-1-2					į		
							(3)							
F	-											·····		
2.	5	4	4	(ML) Firm Gray/Plack Micacoous Modium Sandy SILT		-		-						
	_													
											:		i	
	_					-		1				••••••	•••••	
-	_											·····		
					SPT	•	2-3-4							
	_				<u></u>		(7)							
5 5	0													
						1]			÷	:	i	
	_												•••••	
				Bottom of borehole at 5.8 feet.										

103 Cai Tel	3 Hi ry N eph	awa IC 2 one	atha 275 e: 9	a Court 13 TM En 019-468-2545	gineerii	ng, In	ıc.	I	BOF	RING	g nu	MBE P/	ER B AGE 1	OF 1
CL	IEN	Т_	As	hton Woods	PROJEC		Roles	ville PUD						
PR	OJE			UMBER 180776E	PROJEC			<u>Rolesville, N</u>	North C	arolina				
		SI	AR G C	TED <u>10/25/18</u> COMPLETED <u>10/25/18</u>	GROUND			0 ft S'		HOLE	: SIZE <u>4</u>			
DR		INC	6 M	ETHOD SS	AT	TIME OF	DRILI	_ing						
LO	GG	ED	BY	Doug CHECKED BY BNM	AT	END OF	DRILL	ING						
NC	TE	s _			AF	TER DRI	LLING		1	1				
o DEPTH	0 (ff)	GRAPHIC	POG	MATERIAL DESCRIPTION		SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ 20	SPT N 40	VALUE 60	▲ 80
	-			TOPSOIL (CL) Firm Brown/Orange Fine Sandy CLAY										
-	-					SPT 1		2-2-3 (5)			^			
- 2.	5			(ML) Firm to Stiff Brown/Orange Fine Sandy SILT			-							
-	-					SPT 2		3-3-4 (7)	-					
<u>5.</u>	0						-		-					
	-					SPT	_	3-4-6 (10)	-					
7.	5			(SM) Madium Danas Tan/Cray Silly Fina SAND			-	()	_					
	-													
						SPT 4		4-5-7 (12)						
							-							
1 81/91/11 -														
12 9.90	.5													
						SPT 5		4-6-8 (14)	-					
	.0			Bottom of borehole at 15.0 feet.										<u> </u>

103 Hiawatha Cary NC 2751 Telephone: 9	Court TM En 13 19-468-2545	igineering, In	ıc.		BOF	RING	g nun	IBEF PAG	R B-47 E 1 OF 1
CLIENT Ast	iton Woods	PROJECT NAME	Roles	ville PUD					
PROJECT NU	JMBER _ 180776E	PROJECT LOCAT		Rolesville, N	North C	arolina	l		
DATE START	TED11/5/18 COMPLETED11/5/18	GROUND ELEVA		0 ft		HOLE	SIZE 4		
DRILLING CO	DNTRACTOR Carolina Drilling	GROUND WATER	LEVE	LS:					
DRILLING ME	ETHOD SS	AT TIME OF	DRIL	LING					
LOGGED BY	Doug CHECKED BY BNM	AT END OF	DRILL	.ING					
NOTES		AFTER DRI	LLING						
DEPTH (ft) GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SI 20	PT N VA <u>40 (</u>	LUE ▲ 60 80
	TOPSOIL (SC) Medium Dense Brown/Tan Clayey Fine SAND Partially Weathered Rock sampled as SM Partially Weathered Rock sampled as SM Refusal at 3.0 feet. Bottom of borehole at 3.0 feet.	SPT 1		4-50/3"					>>

103 H Cary I Telep	liawath NC 275 hone:	a Court TM En 513 TM En 919-468-2545	igineering, Inc.	E	30F	RINC	B NUMBER B-48 PAGE 1 OF 1
CLIEI	NT As	hton Woods	PROJECT NAME _ Role	esville PUD			
PROJ	ECT N	UMBER 180776E	PROJECT LOCATION	Rolesville, N	lorth C	arolina	I
DATE	E STAF	COMPLETED 10/24/18 COMPLETED 10/24/18		<u>0 ft</u>		HOLE	SIZE _4
				/ELS:			
LOGO	GED B	CHECKED BY BNM	AT END OF DRI	LLING			
NOTE	S		AFTER DRILLIN	G			
O DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER RECOVERY %	(RQU) BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲ 20 40 60 80
		TOPSOIL (SC) Very Loose Gray Clayey Fine SAND					
ļ .					-		
2.5			SPT 1	2-2-1 (3)			†
		(ML) Firm Orange/Brown Fine Sandy SILT					
			SPT	4-4-5	-		
50			2	(9)			T
			SPT 3	2-3-4 (7)			
7.5 					-		
			SPT 4	2-3-4 (7)			▲
10.0					-		
	$\left\{ \left \right \right\}$						
<u>9</u> / <u>c</u>	$\left\{ \left \left \right \right \right\}$						
	$\left \left \right \right $						
					-		
5 		(IVIL) Soft Orange/Brown Fine Sandy SILT		2-2-2			
	$\left \left \right \right $		5	(4)			
		Bottom of borehole at 15.0 feet.			1	1	l <u>; ; ; ;</u> ;

103 Hia Cary No Telepho	awatha C 2751 one: 9	Court TM E 1 3 TM E 1 19-468-2545	ngineerii	ng, In	ıc.		BOF	RINC	g nume	BER B PAGE 1	-49 OF 1
CLIEN	T Ast	ton Woods	PROJEC	ΓΝΑΜΕ	Roles	ville PUD					
PROJE	CT NU	MBER _ 180776E	PROJEC	LOCAT		Rolesville, N	North C	arolina	l		
DATE	STAR	ED _11/5/18 COMPLETED _11/5/18		ELEVA		0 ft		HOLE	SIZE 4		
DRILLI	NG CO	ONTRACTOR Carolina Drilling		WATER	LEVE	LS:					
DRILLI	ING MI	THOD <u>SS</u>	AT	TIME OF		LING					
LOGGI	ED BY	CHECKED BY _BNM	AT			ING					
NOTES	•		Ar				1				
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION		SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT 20 40	N VALUE . 0 60	▲ <u>80</u>
	<u>x, 1%</u> <u>.</u> t	TOPSOIL									
	<u>'/ · · · / /</u>										
;	<u></u>										
		(CL) Soft Brown/Tan Fine Sandy CLAV									
										:	-
-										•••••	
1											:
					1		1			:	:
											÷
				SPT		1-2-2					:
				1		(4)					•
2											<u> </u>
											-
											•
										·····	
					-		-				
3		Refusal at 3.0 feet.								:	:
		Bottom of borehole at 3.0 feet.									
103 Hi Cary N Teleph	awath IC 275 Ione: §	a Court TM En 513 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	gineering, Ir	ıc.	E	Bof	RING	B NUMBER B-50 PAGE 1 OF 1			
----------------------------	----------------------------	--	-----------------------	---------------------	-----------------------------	----------------------	-----------------------	------------------------------			
CLIEN	IT As	hton Woods	PROJECT NAME	Roles	ville PUD						
PROJ	ECT N	UMBER _ 180776E	PROJECT LOCAT		Rolesville, N	lorth C	arolina	l			
DATE	STAR	COMPLETED 11/2/18	GROUND ELEVA		0 ft		HOLE	SIZE 4			
DRILL	ING C	ONTRACTOR Carolina Drilling			LS:						
					LING <u>12.7</u>	'0 ft / E	-12-12	2.70 ft			
NOTE	S S				.ing <u></u>						
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	20 40 60 80			
0.0	<u>74 1</u> %	TOPSOIL									
F -		(SM) Very Loose Brown Silty Fine to Medium SAND									
 2.5			SPT 1		1-1-1 (2)			\			
		(ML) Firm to Stiff Tan Micaceous Fine Sand SILT		1							
			SPT 2	_	3-4-5 (9)	_					
<u>5.0</u> 				-		_					
7.5			SPT 3		4-6-7 (13)						
		(SM) Medium Dense Tan/Brown Silty Fine SAND		-		-					
 			SPT 4		7-11-11 (22)						
12.5		Σ									
			SPT	1	18-50/2"	1		>>/			
		Partially Weathered Rock sampled as SM	5								
		Bottom of Dorehole at 14.2 feet.									

103 Hi Cary N Teleph	awatha IC 275 one: 9	a Court 13 TM E 1 119-468-2545	ngineering, Ir	ıc.	I	Bof	RING	G NUMBER B-51 PAGE 1 OF 1
CLIEN	T_As	hton Woods	PROJECT NAME	Roles	ville PUD			
PROJI		UMBER 180776E	PROJECT LOCAT		Rolesville, N	lorth C	arolina	3
DATE	STAR	TED _11/2/18 COMPLETED _11/5/18	GROUND ELEVA	TION _	0 ft		HOLE	SIZE _ 4
DRILL	ING C	ONTRACTOR Carolina Drilling		LEVE	LS:			
DRILL	ING M	ETHOD SS	AT TIME OF	DRIL	LING			
	ED BY	CHECKED BY BNM	AT END OF		.ING			
	s					1		
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲ 20 40 60 80
		(SM) Very Loose Brown Silty Fine SAND						
 2.5			SPT 1		1-1-2 (3)			$\left \begin{array}{c} \\ \end{array} \right $
		(CL) Stiff Brown/Tan Fine Sandy CLAY				-		
 <u>5.0</u>			SPT 2		4-4-6 (10)	_		
		(SM) Medium Dense Brown/Tan Slity Fine SAND						
7.5			SPT 3	-	3-5-7 (12)	-		
			SDT		7 0 12	-		
10.0			4		(22)			
12.5					50///			
j		Partially vveathered Rock sampled as SM Bottom of borehole at 13.8 feet.	5 SPT	<u> </u>	50/4"			

103 Hi Cary N Teleph	awatha IC 275 ⁻ Ione: 9	Court TM En 13 TM En 19-468-2545	ıgineerii	ng, Ir	nc.		BOF	RINC	B NUMBER B-5 PAGE 1 OF	52 F 1
CLIEN	IT <u>As</u> ł	nton Woods	PROJEC		Roles	ville PUD				
PROJ		JMBER 180776E	PROJEC			Rolesville, N	North C	arolina		
DATE	STAR	TED11/8/18 COMPLETED11/8/18		ELEVA	TION _	0 ft		HOLE	SIZE 4	
DRILL	ING CO	DNTRACTOR Carolina Drilling		WATER	RLEVE	LS:				
DRILL	ING M	ETHOD <u>SS</u>	AT		F DRILI	LING				
LOGG	ED BY	Doug CHECKED BY BNM	AT	END OF	DRILL	.ING				
NOTE	s		AF	TER DRI	LLING					
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION		SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲ 20 40 60 80	<u>)</u>
	<u></u>	TOPSOIL								
	1/ · <u>· · · ·</u>									
	1/: <u>1/</u> .									
		(SC) Very Loose Brown/Gray Clayey Fine SAND								
										• • • • •
										• • • • •
					1		1			
										• • • • •
				1		(4)				
2										
										• • • • •
										• • • • •
	1.7.7.1	Refusal at 2.5 feet.			1		1	I		
		Bottom of borehole at 2.5 feet.								
í .										

103 H Cary I Telepl	iawatha NC 275 none: 9	a Court 13 TM E1 019-468-2545	igineering, In	ic.		BOF	RING	G NUMBER B-53 PAGE 1 OF 1
CLIE	NT As	hton Woods	PROJECT NAME	Roles	ville PUD			
PROJ		JMBER _180776E	PROJECT LOCAT	ion _F	Rolesville, N	North C	arolina	3
DATE	STAR	TED 11/5/18 COMPLETED 11/5/18	GROUND ELEVA		0 ft		HOLE	SIZE _ 4
DRILI	ING C	ONTRACTOR Carolina Drilling	GROUND WATER	LEVE	LS:			
					LING			
NOTE	эси вт :S				.ing <u></u>			
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	20 40 60 80
0.0	<u></u>	TOPSOIL						
		(CL) Firm Brown/Tan Fine Sandy CLAY						
				-		-		
			SPT		2-3-3			
			1		(6)			Π
2.5		(SM) Medium Dense Brown/Tan Silty Fine SAND		-		-		
			SPT		5-7-9 (16)			
50								
						1		
						1		
			SPT		6-7-6			
			3		(13)			
7.5				-				
			SPT					
		Partially Weathered Rock sampled as SM	4		5-50			
				1		1		·····
10.0								
<u> </u>								
2								
	\swarrow							
		Refusal at 12.0 feet. Bottom of borehole at 12.0 feet.						

103 Hiawatha Court Cary NC 27513TM EnTelephone:919-468-2545	BORING NUMBER B-54 page 1 OF 1
CLIENT Ashton Woods	PROJECT NAME Rolesville PUD
PROJECT NUMBER 180776E	PROJECT LOCATION Rolesville, North Carolina
DATE STARTED _11/5/18 COMPLETED _11/5/18	GROUND ELEVATION _0 ft HOLE SIZE _4
DRILLING CONTRACTOR Carolina Drilling	GROUND WATER LEVELS:
DRILLING METHOD SS	AT TIME OF DRILLING
LOGGED BY Doug CHECKED BY BNM	AT END OF DRILLING
NOTES	AFTER DRILLING
MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER RECOVERY % (ROD) NUMBER (ROD) SAMPLE TYPE 50 40 90 80 10 VALUE) (Ist) (pcf) (pcf) (pcf)
<u>ストンス</u> <u>オトンス</u> <u>オトンス</u> TOPSOIL <u>オトンス</u> - <u>オトンス</u>	
(SM) Very Dense Brown Silty Fine SAND	
1 .::::: Partially Weathered Rock sampled as SM 	SPT 50/5"
Refusal at 3.0 feet. Bottom of borehole at 3.0 feet.	

103 H Cary I Telepl	liawatha NC 275 hone: 9	a Court 13 TM E1 19-468-2545	ngineering, In	c.	I	BOF	RINO	G NUMBER B-55 PAGE 1 OF 1
CLIE	NT As	hton Woods	PROJECT NAME	Roles	ville PUD			
PROJ	ECT NI	JMBER _180776E	PROJECT LOCAT	ion _f	Rolesville, N	North C	arolina	1
DATE	STAR	TED11/5/18 COMPLETED11/5/18	GROUND ELEVAT	ION _	0 ft		HOLE	SIZE 4
DRILI		ONTRACTOR Carolina Drilling	GROUND WATER	LEVE	LS:			
				DRILI	_ING			
NOTE	S		AFTER DRIL	LING				
				-				
o DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	20 40 60 80
0.0	<u></u>	TOPSOIL						
		(SC) Very Loose Brown/Tan Clayey Fine SAND						
			SPT 1		2-2-2 (4)			↑
2.5		(SM) Medium Dense Brown/Tan Silty Fine SAND				1		
						1		
			SPT 2		3-5-7 (12)			
5.0					(1-)			
						1		
			COT		F 0 7			
			3		5-6-7 (13)			
7.5						-		
						-		
			SPT		5-6-6			
			4		(12)			
10.0								
 2								
12.5								
						-		
5			CDT .		6-6-8			
2 -			5		(14)			
15.0		Bottom of borehole at 15.0 feet.						
5								

103 H Cary Telep	liawatha NC 275 hone: S	a Court 13 TM Er 19-468-2545	ngineering, Ir	ıc.		BOF	RING	G NUMBER B-56 PAGE 1 OF 1
CLIE	NT As	hton Woods	PROJECT NAME	Roles	ville PUD			
PRO		UMBER 180776E			Rolesville, N	North C	arolina	
		TED <u>11/5/18</u> COMPLETED <u>11/5/18</u>	GROUND ELEVA		0 ft I S:		HOLE	SIZE _4
DRIL		ETHOD SS		FDRILI	LING			
LOG	GED BY	Doug CHECKED BY BNM	AT END OF	DRILL	ING			
NOT	ES		AFTER DRI	LLING				
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲ 20 40 60 80
	<u></u>	TOPSOIL						
		(SM) Medium Dense Brown/Tan Silty Fine SAND	SPT 1		8-7-8 (15)	-		
4		Refusal at 5.5 feet	SPT 2	-	10-7-6 (13)			
		Bottom of borehole at 5.5 feet.						

103 H Cary N Teleph	iawatha NC 275 none: 9	a Court 13 TM Engi 19-468-2545	neering, In	c.	E	Bof	RING	S NUMBER B-57 PAGE 1 OF 1
CLIEN	NT As	hton Woods	PROJECT NAME	Roles	ville PUD			
PROJ		UMBER 180776E	PROJECT LOCAT	ION _F	Rolesville, N	lorth C	arolina	3
DATE	STAR	TED 11/8/18 COMPLETED 11/8/18	GROUND ELEVAT	ION _	0 ft		HOLE	SIZE 4
DRILI		ONTRACTOR Carolina Drilling	GROUND WATER	LEVE	LS:			
					_ING			
NOTE	3ED D1				ING <u></u>			
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPTN VALUE ▲ 20 40 60 80
0.0	<u></u>	TOPSOIL						
 		(SC) Very Loose Gray/Tan Clayey Fine SAND				-		
			SPT 1		2-2-2 (4)			•
<u>2.5</u> 	-	(ML) Very Stiff to Hard Brown/Tan Micaceous Fine Sandy SIL	T			-		
5.0			SPT 2		7-9-16 (25)			
						_		
7.5	- - 		SPT 3		9-12-25 (37)			
		(SM) Dense Brown/Tan Silty Fine to Medium SAND	SPT 4		23-37- 50/3"	_		>>
10.0		Partially Weathered Rock sampled as SM						
		Refusal at 10.5 feet. Bottom of borehole at 10.5 feet.						

103 H Cary I Telept	iawatha NC 275 none: 9	a Court 13 TM E1 019-468-2545	ngineering, Inc. BORING NUMBER B-58
CLIER	NT As	hton Woods	PROJECT NAME Rolesville PUD
PROJ		UMBER 180776E	PROJECT LOCATION Rolesville, North Carolina
DATE	STAR	TED11/8/18 COMPLETED11/8/18	GROUND ELEVATION _0 ft HOLE SIZE _4
DRILI	ING C	ONTRACTOR Carolina Drilling	GROUND WATER LEVELS:
DRILI	ING M	ETHOD <u>SS</u>	AT TIME OF DRILLING
LOGO	GED BY	Doug CHECKED BY BNM	AT END OF DRILLING
NOTE	S		AFTER DRILLING
o DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER RECOVERY % (ROD) NUMBER RECOVERY % (ROD) NUMBER RECOVERY % (ROD) NUMBER RECOVERY % (ROD) NUMBER (ROD) NUMBER NUMBER NUMBER Sbirn ATTE Spiru NOTE NOTE NUMBER
0.0	<u>x 14: x</u> 7.7.7.7.7	TOPSOIL	
		(SC) Loose Brown/Tan Clayey Fine SAND	
 <u>2.5</u>		(CL) Firm Brown/Tan Fine Sandy CLAY	SPT 2-2-3 (5)
			SPT 3-4-4 (8)
		(SM) Medium Dense Brown/Tan Silty Fine SAND	SPT 4-6-8 (14)
7.5			
10.0			4 6-9-11 (20)
12.5			
j 		Partially Weathered Rock sampled as SM Bottom of borehole at 13.8 foot	SPT50/3" : : : ≥
		Boltom of Dorenoie at 13.8 feet.	

103 H Cary N Teleph	iawatha NC 275 none: §	a Court 13 TM Engin 199-468-2545	eering, In	ic.	E	BOF	RING	G NUMBER B-59 PAGE 1 OF 1
CLIEN	NT As	hton Woods P	ROJECT NAME	Roles	ville PUD			
PROJ	ECT N	UMBER 180776E P	ROJECT LOCAT		Rolesville, N	lorth C	arolina	a
DATE	STAR	TED <u>11/8/18</u> COMPLETED <u>11/8/18</u> G	ROUND ELEVA		0 ft		HOLE	SIZE _ 4
DRILI	ING C	ONTRACTOR Carolina Drilling G	ROUND WATER	LEVE	LS:			
DRILI	ING M	ETHOD <u>SS</u>	AT TIME OF	DRILI	LING			
LOGO	GED BY	Doug CHECKED BY BNM	AT END OF	DRILL	.ING			
NOTE	S		AFTER DRI	LLING				
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲ 20 40 60 80
0.0	<u>x, 1%</u> . <u>«</u>	TOPSOIL						
F -		(SM) Very Loose Brown/Tan Silty Fine SAND						
 - 2.5 		(SM) Medium Dense to Dense Brown/Tan Micaceous Silty Fine	SAND	-	1-2-2 (4)	-		
5.0			SPT 2	-	18-25-31 (56)	-		
7.5			SPT 3	-	7-14-11 (25)	-		
			SPT 4	-	11-20-23 (43)	-		
	<u>~</u>	 Partially Weathered Rock sampled as SM Bottom of borehole at 13.7 feet. 	SPT 5		50/2")	1	1; >>>

103 H Cary I Telep	liawatha NC 275 hone: 9	a Court 13 TM Engi 119-468-2545	neering, In	IC.	E	Bof	RINC	G NUMBER B-6 PAGE 1 OF	60 F 1
CLIE	NT As	hton Woods	PROJECT NAME	Roles	ville PUD				
PRO		JMBER _ 180776E	PROJECT LOCAT	ion <u>F</u>	Rolesville, N	lorth C	arolina	3	
DATE	E STAR	TED 11/8/18 COMPLETED 11/8/18			0 ft		HOLE	SIZE 4	
		ETHOD SS		E DRILI	LS: ING				
LOG	GED BY	Doug CHECKED BY BNM	AT END OF	DRILL	ING				
NOTE	S		AFTER DRI	LLING					
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲ 20 40 60 80)
0.0	<u> </u>	TOPSOIL							
		(SC) Very Loose Brown/Tan Clayey Fine SAND		_		_			
			SPT 1		1-1-2 (3)				
		(SM) Medium Dense to Very Dense Brown/Tan Silty Fine SA		-		-			
			SPT 2		5-11-18 (29)	_			
				_		_			
			SPT 3		17-27-33 (60)				
/.5 				-		-			
	1	Partially Weathered Rock sampled as SM Refusal at 8.6 feet. Bottom of borehole at 8.6 feet.	SPT 4	J	50/1"	,		· · · · ·	

103 H Cary I Telepl	iawatha NC 275 none: 9	a Court 13 TM En 019-468-2545	gineering, Ir	ıc.		BOF	RING	B NUMBER B-61 PAGE 1 OF 1
CLIE	NT As	hton Woods	PROJECT NAME	Roles	ville PUD			
PROJ		JMBER _ 180776E	PROJECT LOCAT		Rolesville, N	North C	arolina	1
DATE	STAR	TED11/9/18 COMPLETED11/9/18	GROUND ELEVA	TION _	0 ft		HOLE	SIZE 4
DRILI		ONTRACTOR Carolina Drilling			LS:			
		ETHOD <u>SS</u>			LING			
LOGO	ED BY		AT END OF		.ING			
	.s							
o DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲
	<u>, 1, , , 1</u>	TOPSOIL						
 		(SM) Very Loose Brown Silty Fine SAND		_				
 2			SPT 1		2-2-2 (4)			
 		(SM) Medium Dense Gray/Brown Silty Fine SAND						
				_				
			SPT 2		3-5-12 (17)			
5				-		-		
		Refusal at 5.5 feet. Bottom of borehole at 5.5 feet.						

103 I Cary Telep	Hiawatha NC 275 ⁻ phone: 9	a Court 13 TM E 1 19-468-2545	ngineerin	ig, In	ıc.		BOF	RING	B NUMBER B-62 PAGE 1 OF 1		
CLIE	NT Ast	nton Woods	PROJECT	NAME	Roles	ville PUD					
PRO	JECT NI	JMBER _ 180776E	PROJECT LOCATION Rolesville, North Carolina								
DAT	E STAR	TED 11/9/18 COMPLETED 11/9/18	GROUND	ELEVA		0 ft		HOLE	SIZE 4		
DRIL	LING CO	ONTRACTOR Carolina Drilling	GROUND	WATER	LEVE	LS:					
DRIL	LING M	ETHOD <u>SS</u>	AT		= DRILI	LING					
LOG	GED BY	Doug CHECKED BY BNM	AT	END OF	DRILL	.ING					
NOT	ES		AF	fer Dri	LLING						
0 DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION		SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲ 20 40 60 80		
	<u></u>	TOPSOIL									
-											
		(SM) Very Loose Brown/Gray Silty Fine SAND									
-											
-	-										
1											
- '					1		1				
_											
D.GP	-										
EPO											
						400					
ROLE						(4)					
ARY											
	-										
GINT											
ROG					-		-				
- C:F											
12:06											
5/18											
<u>+</u> 3		Refusal at 3.0 feet									
9.GD1		Bottom of borehole at 3.0 feet.									
Э́р											
SINTS											
8- 9-											
PLOI											
НВН											
DTEC											
ЭЩ СШ											

103 Cary Telep	Hiawatha / NC 275 ⁻ phone: 9	Court 13 TM F 19-468-2545	Engineerii	ng, Ir	ıc.		BOF	RINC	g nu	MBEI PAC	R B-63 SE 1 OF 7
CLIE	ENT Ast	nton Woods	PROJEC		Roles	ville PUD					
PRO	JECT NU	JMBER 180776E	PROJEC			Rolesville, N	Jorth C	arolina			
DAT		TED 11/9/18 COMPLETED 11/9/18	GROUNE	ELEVA		0 ft		HOLE	SIZE 4		
DRIL	LLING CO	DNTRACTOR Carolina Drilling		WATER	R LEVE	LS:					
DRIL	LLING MI	ETHOD SS	AT		F DRILI	LING					
LOG	GED BY	Doug CHECKED BY BNM	AT	END OF	DRILL	.ING					
NOT	'ES		AF	TER DRI	LLING						
o DEPTH	GRAPHIC LOG	MATERIAL DESCRIPTION		SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ 20	SPT N V/ 40	ALUE ▲ 60 80
GPU		(SM) Very Dense Brown/Gray Silty Fine SAND									
GEOTECH BH PLOTS - GINT STD US.GDT - 11/15/18 12:06 - C:\PROGRAM FILES\GINT\LIBRARY\ROLESVILLEPOD.C		Bottom of borehole at 0.7 feet.									

103 Hi Cary N Teleph	awatha IC 275 one: 9	a Court 13 TM E1 119-468-2545	ngineering, In	c.		BOF	RINO	G NUMBER B-64 PAGE 1 OF 1		
CLIEN	T As	hton Woods	PROJECT NAME	Roles	ville PUD					
PROJE		UMBER 180776E	PROJECT LOCAT	ION _F	Rolesville, N	North C	arolina	3		
	DATE STARTED HOLE SIZE HOLE SIZE HOLE SIZE									
DRILL	DRILLING METHOD SS AT TIME OF DRILLING									
LOGGED BY Doug CHECKED BY BNM AT END OF DRILLING										
NOTE	s		AFTER DRIL	LING			1			
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲ 20 40 60 80		
0.0	<u></u>	TOPSOIL								
		(SC) Loose Brown Clayey Fine SAND								
			SPT 1		1-3-3 (6)			•		
		(SM) Medium Dense Tan/Gray Silty Fine SAND								
			SPT 2		4-6-8 (14)	_				
						_				
			SPT 3		5-6-7 (13)	_				
						_				
10.0		(ML) Firm Tan/Gray Fine Sandy SILT	SPT 4		4-5-7 (12)	_				
12.5										
			SPT 5		4-4-5 (9)					
		Bottom of borehole at 15.0 feet.								

103 H Cary Telep	liawath NC 275 hone:	a Court 513 TM E1 919-468-2545	ngineering, Inc.	BO	RING	G NUMBER B-65 PAGE 1 OF 1
CLIE	NT A	shton Woods	PROJECT NAME Rolesville PUD			
PRO	JECT N	UMBER 180776E	PROJECT LOCATION Rolesville	, North C	Carolina	<u>a</u>
	E STAF	RTED11/9/18 COMPLETED11/9/18 CONTRACTOR Corpling	GROUND ELEVATION ft		HOLE	SIZE _4
	LING C	IETHOD SS	GROUND WATER LEVELS:			
LOG	GED B	Y Doug CHECKED BY BNM	AT END OF DRILLING			
NOT	ES		AFTER DRILLING			
0.0 DEPTH	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER RECOVERY % (RQD) BLOW COUNTS	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲ 20 40 60 80
-	- <u> </u> . <u></u>	TOPSOIL (ML) Firm to Stiff Grav/Tan Fine Sandy SILT				
-		(
-			SPT 3-3-4			▲ · · · · · · · · · · · · · · · · · · ·
2.5	1					
_						
_						
-			SPT 3-6-7			
-			2 (13)			
5.0						
-	1					
			SPI 3-5-7 3 (12)			▲
7.5						
- I						
	1		SPT 4-5-4 4 (9)			▲ · · · · · · · · · · · · · · · · · · ·
10.0						
- C:/PK						
12:06 -						
181/61						
12 12 5						
LOI:			571 = 5-7-7 (14)			
표 <u>15.0</u> 풍		Bottom of borehole at 15.0 feet				
EOIE						

103 H Cary I Telepl	iawatha NC 275 none: 9	a Court 13 TM Eng 019-468-2545	ineering, In	c.		BOF	RINC	B NUMBER B-66 PAGE 1 OF 1
CLIE	NT As	hton Woods	PROJECT NAME	Roles	ville PUD			
PROJ		UMBER _180776E	PROJECT LOCAT	ION _F	Rolesville, N	North C	arolina	L
DATE STARTED 11/9/18 GROUND ELEVATION 0							HOLE	SIZE _4
DRILI	ING C	ONTRACTOR Carolina Drilling	_ GROUND WATER	LEVE	LS:			
					LING			
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	20 40 60 80
0.0	<u>, , , , , , , , , , , , , , , , , , , </u>	TOPSOIL						
		(SM) Medium Dense to Dense Gray/Tan Silty Fine SAND						
 <u>2.5</u>			SPT 1		4-5-6 (11)	-		
 <u>- 5.0</u>			SPT 2		4-6-8 (14)	-		
7.5			SPT 3		4-6-7 (13)	-		
10.0			SPT 4		9-12-25 (37)	-		
12.5		Partially Weathered Rock sampled as SM			50/3"			
		Bottom of borehole at 13.8 feet.						

CLIE	NT As									
PRO		hton Woods	PROJECT NAME	Roles	/ille PUD					
	PROJECT NUMBER 180776E PROJECT LOCATION Rolesville, North Carolina									
		TED _11/9/18 COMPLETED _11/9/18 ONTRACTOR Caroling Deilling			<u>) ft</u>		HOLE	SIZE _ 4		
	LING C	IETHOD SS	AT TIME OF	DRILL	.s: .ING					
LOG	GED BY	Doug CHECKED BY BNM	AT END OF	DRILL	ING					
NOT	ES		AFTER DRIL	LING						
0. DEPTH	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲ 20 40 60 80		
-	-	(CL) Firm Brown/Tan Fine Sandy CLAY	SDT		2.2.4					
-	-		1		(6)					
_ <u>2.5</u> _ _		(SM) Medium Dense Brown/Gray Silty Fine SAND				_				
- - <u>5.0</u>			SPT 2		3-4-7 (11)	-				
			SPT 3		4-5-6 (11)	_				
7.5						-				
10.0			SPT 4		6-6-7 (13)	-		•		
12.5										
			SPT 5		6-7-7 (14)					
15.0	<u></u>	Bottom of borehole at 15.0 feet.				<u> </u>	I			

103 Hiawatha Court Cary NC 27513 Telephone: 919-468-2545	gineering, Inc. BORING NUMBER B-68 PAGE 1 OF 1
CLIENT _Ashton Woods PROJECT NUMBER _180776E DATE STARTED _11/9/18 COMPLETED _11/9/18 DRILLING CONTRACTOR _Carolina Drilling DRILLING METHOD _SS LOGGED BY _Doug CHECKED BY _BNM NOTES	PROJECT NAME _Rolesville PUD PROJECT LOCATION _Rolesville, North Carolina GROUND ELEVATION _0 ft HOLE SIZE _4 GROUND WATER LEVELS: AT TIME OF DRILLING AT END OF DRILLING AFTER DRILLING
HI (U) O) OHADO MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER RECOVERY % (N VALUE) POCKET PEN. (1st) (st) (st) (st) (st) (st) (st) (st) (
(SM) Medium Dense Orange/White Silty Fine SAND	SPT 4-5-6 1 (11)

103 H Cary N Teleph	iawatha NC 275 none: 9	a Court 13 TM E1 019-468-2545	ngineering, In	c.	I	BOF	RING	G NUMBER B-69 PAGE 1 OF 1		
CLIEN	T As	hton Woods	PROJECT NAME	Roles	ville PUD					
PROJ		UMBER 180776E	PROJECT LOCATI	ON _F	Rolesville, N	North C	arolina	l		
		TED <u>11/9/18</u> COMPLETED <u>11/9/18</u>		ION (Dft		HOLE	SIZE _ 4		
DRILL	DRILLING METHOD _SS AT TIME OF DRILLING									
LOGO	LOGGED BY Doug CHECKED BY BNM AT END OF DRILLING									
NOTE	s		AFTER DRIL	LING						
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲ 20 40 60 80		
	<u> </u>	TOPSOIL (CL) Firm Brown Fine Sandy CLAY								
			SPT 1		2-3-5 (8)			^		
		(SM) Loose to Medium Dense Silty Fine SAND				-				
5.0			SPT 2		4-4-6 (10)			· · · · · · · · · · · · · · · · · · ·		
						_				
7.5			SPT 3		3-3-4 (7)					
						_				
10.0			SPT 4		3-4-6 (10)	-				
 - 12.5										
						-				
			SPT 5		4-4-6 (10)					
		Bottom of borehole at 15.0 feet.								