PRELIMINARY SUBSURFACE EXPLORATION REPORT

For

SMOKERISE DRIVE EXTENSION DEVELOPMENT,
Wadsworth, Ohio

February 25, 2017

Prepared for

Lewis Land Professional, Inc.
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Wadsworth, Ohio 44281

Prepared by

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NCE PROJECT №. GE 17001

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Wadsworth, Ohio

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PRELIMINARY SUBSURFACE EXPLORATION REPORT

The following is the report of the preliminary subsurface exploration that we performed for the proposed development of Out Lots #1, #3, #4, and #5. This study was made in order to determine subsoil characteristics across the proposed lots so that our engineers could render opinions about geotechnical engineering aspects of the planned development.

1.0 DESCRIPTION OF PROPOSED PROJECT

At this time, plans have not been developed for Out Lots #1, #3, #4, and #5 as detailed on the attached plan sheet titled "Park Center Commons". For purposes of this report, we anticipate single-story to 4-story structures having various total foot print to be constructed on the subject Out Lots. Construction may either consist of wood trussing / framing with possible stone veneer or steel framed structures with load bearing masonry supported on typical shallow footings. Maximum column and strip footing loads have been estimated at 90,000 pounds and 3,000 pounds per lineal foot, respectively. Also, we anticipate asphalt drives and parking will be utilized. The existing topography of Sublots #3 and #4 are relatively level thus within 24.0 inches of final grades while Sublots #1 and #5 are irregular and will required cuts/fills up to 7.0 feet in thickness. To note, the Smokerise Drive / Park Centere Drive and Lavern Drive were recently extended and constructed, respectively.

The subject four Out Lots each vary between 1.7 to 14.0+/- acres in size as detailed on the attached plan sheet titles "Park Center Commons" are located in Wadsworth, Ohio. At the time of our field exploration, the topography varied from relatively level to somewhat irregular with an estimated maximum difference in elevation up to 7.0+/- feet. Groundcover consisted of recently planted grass with random area of woodlands as detailed on the attached "Boring Location Plan".

2.0 FIELD EXPLORATION

The field exploration commenced on December 21th, when the writer visited the site to stake the requested (9) boring locations, observe general geological conditions, rig access, and property information to adequately notify OUPS as required by state law. Then between January 2nd and 9th, all borings were advanced with an ATV mounted, medium capacity, rotary drill and continuous flight, hollow stem augers. The test holes were terminated between depths of 10.0 to 20.0 feet below the respective ground surfaces. Please see attached "Boring Location Plan" for more detail.

While drilling, split spoon samples of the subsurface soils were obtained during execution of the Standard Penetration Tests (SPT). The soils were visually/manually classified in the field by either our engineer or members of the drill crew and representative portions of each sample were sealed in glass jars for transport to our soil mechanics laboratory for further evaluation.

3.0 LABORATORY TESTING

Due to the consistency of the sampled soils no laboratory testing was deemed necessary at this time. The jarred samples will be disposed 3 months of this report's date.

4.0 SUBSURFACE PROFILE

Based on the information acquired in this exploration and the necessary assumption that subsurface conditions between, away from and below individual sampling locations and depths are similar to those found in this study, the subsurface profile can be generally described as follows:

4.1 Soil Profile

Initially, a surface layer of topsoil measuring 5.0 to 8.0 inches in thickness was followed by naturally deposited cohesive fine-grain silty clayey / clayey silty soils with several test locations having random layers of cohesionless sandy silt or sandy soils to termination depths of 10.0 to 20.0 feet below respective ground surfaces. Major exceptions to the preceding general subsurface profile existed at test locations B-8 and B-9 which

encountered auger refusal at 13.5 and 8.5 feet, respectively, due to encountering sandstone bedrock or boulder.

4.2 Groundwater

Upon the completion of each boring, groundwater was sounded with only test hole B-8 having water at the depth of 12.0' and all test holes having measured collapsed depths between 5.0 to 15.0 feet below the respective ground surfaces. Test hole B-2 and B-4 encountered water bearing wet/saturated soils at depths of 11.0 and 8.0 feet, respectively. Collapse depth is often a reliable indicator of the static groundwater elevation in cohesionless soils. For safety reasons all test holes were immediately backfilled upon completion thus no subsequent water soundings were made.

Based on the preceding information, it is our opinion that minimal if any groundwater will be encountered during the anticipated short-term, shallow excavations of 11.0 feet or less yet we cannot rule out isolated random pockets of "perched groundwater" that will be easily controlled with conventional sumps.

Relative to groundwater control, each bidding contractor should be required to conduct their own investigation into the effect groundwater will have on construction so that adequate allowance can be made in their bids.

5.0 ENGINEERING ANALYSIS

Based on the preceding information, it is our opinion that the anticipated improvements will be properly supported by the observed and sampled soils. The following concerns exist for the development of each site:

1) The subject open areas have recently been farmed thus we anticipate the top 12.0 to 24.0 inches of soil below the surface topsoil layer to have elevated moisture contents above their "optimum moisture content" as determined by the Standard Proctor test thus some means of aeriation and recompaction MUST be anticipated in this upper zone; and

2) The site's native cohesive fine-grain silty clayey soils are considered sensitive when exposed to repeated heavy construction traffic and excessive moisture and may quickly break down and thus excessively pump/rut. Therefore, consideration MUST be given to constructing temporary/permanent construction roads around the planned structure so that continual access may be provided throughout construction especially if winter/early spring commencement. Temporary/permanent construction roads may consist of #1/#2 crushed limestone aggregate with or without 300 psi woven separations fabric and/or structural geo-grids.

6.0 RECOMMENDATIONS

Based on our interpretation of the results of this exploration and the necessary assumption that subsoil characteristics between, away from and below individual sampling locations and depths are similar to those described herein, the following recommendations are offered for your consideration and use in completing this project.

6.1 Site Preparation and Earthwork

The first stage of construction after removing the surface topsoil layer and any obvious wet/soft soils will be to proofroll the exposed grades with a fully loaded tandem or tri-axle dump truck. The proofroll operation will consist of making at least two (2) forward and back passes in each of two (2) perpendicular directions. The proofroll will serve to detect any zones of soft, loose, or otherwise poor soil, which lie just below the surface. If such zones are identified they can be corrected in accordance with the recommendations of our representative who should be on site to witness the proofroll.

Following the proofroll and any required remedial work the construction area can be filled to grade as required with the site's native silty clayey soils. Fill should be placed in maximum loose 8.0 inch thick measured lifts at optimum moisture $\pm$2.0%. Each lift should be uniformly compacted with mechanical equipment to at least 98.0% of the standard Proctor maximum dry laboratory density (ASTM D698). This requirement is for the building and pavement areas and may be relaxed to 92.0% for lawn or other landscaped areas.

We recommend testing all fills for in-place density to help assure adequate compaction. Samples of the proposed fill material should be submitted to our soil mechanics laboratory no later than 8 working days before use for the determination of moisture-density relationships.

6.2 Foundations

The proposed structures will be properly supported by conventional shallow spread footings bearing on firm naturally deposited soils or engineered fill. Given that foundation subgrades are observed prior to placement of concrete and steel reinforcement foundations may be designed using a net allowable soil bearing capacity of 2,500 pounds per square foot. Given that the recommendations within this report are followed, it is our opinion that total and differential settlements will not exceed 1.0 and 0.75 inches, respectively.

Footings with a potential exposure to frost must bear a minimum of 42.0 inches below final exterior grade. Interior footers can bear at nominal depth although we recommend that at least 4.0 inches of aggregate or soil separate the floor slab and top of footing.

Footings should be concreted the day they are excavated to reduce the time that the soils are exposed to the elements. Backfilling should be accomplished as soon as possible for the same reason.

6.3 Seismic Coefficient

According to the data presented in this report a "Site Class of C" may be used in design of structural elements.

6.4 Groundwater Control

Based on the preceding information, it is our opinion that minimal if any groundwater will be encountered during the anticipated short-term, shallow excavations of 11.0 feet or less yet we cannot rule out isolated random pockets of "perched groundwater" that will be easily controlled with conventional sumps.

To repeat, contractors bidding the project must be required to make their own assessment of how groundwater may affect construction so that they can include adequate allowances in their bids.

6.5 Lateral Earth Pressure

The following lateral earth pressure parameters have been estimated for use in design of earth retention systems that may be required for the project:

	Soil Description		
Design Parameter	**Silty Clay/ Clayey Silt**	**Sand/ Silty Sand**	**Washed #57 Aggregate**
Total Unit Weight, γ (PCF)	135	125	105
Internal friction angle, ϕ	15°	30°	40°
Active Pressure Coefficient, K_a	0.600	0.333	0.217
At Rest Pressure Coefficient, K_o	0.750	0.500	0.357
Passive Pressure Coefficient, K_p	1.670	3.000	4.598
Cohesion, c (PSF)	1000	0	0
Coefficient of (Sliding) Friction, f	0.237	0.364	Not Applicable

6.6 Pavements and Slabs

Provided that the concerns and recommendations presented in the "Engineering Analysis" and "Site Preparation and Earthwork" sections are closely followed, we do not anticipate any problem supporting properly designed and built slabs. Slabs may be designed using an estimated CBR = 6 (Modulus Subgrade Reaction = 160 pci).
We recommend that final plans for interior slabs and pavements include at least 4.0 and 6.0 inches of free-draining aggregate base, respectively.

6.6 Safety

The contractor must be made aware that excavation protection systems are required to observe the rules specified in local, state, or federal safety regulations; e.g., OSHA Health and Safety Standards for Excavations, 29 CFR Part 1926, or successor regulations. Such regulations are strictly enforced and, if not followed, the owner or the contractors could be liable for substantial penalties.

Construction site safety generally is the sole responsibility of the contractor. The contractor shall also be solely responsible for the means, methods, techniques, sequences, and operations of the proposed construction. Under no circumstances is North Central Engineering assuming responsibility for construction site safety or the contractor's activities; such responsibility is not implied and should not be inferred.

6.7 Field Observation

Field observation comprises the second phase of a complete geotechnical engineering service, permitting those who developed the report to observe site excavation and thereby assess the reliability of their subsurface profile and the appropriateness of their preliminary recommendations. Actual conditions often differ from those expected, and that situation can create serious problems unless a qualified individual is available to decide what to do about them, where and when they are found. Decisions such as these are "judgment calls," and the quality of judgment can have a profound impact on the project's bottom line. The geotechnical engineers of record are most qualified to make effective judgment calls, because they are the individuals who are most familiar with the report and its original findings and preliminary recommendations. Further, the geotechnical engineer of record is in the best position to respond quickly to unanticipated conditions that are encountered.

7.0 GENERAL CONSIDERATIONS AND LIMITATIONS

This exploration and report are based on the proposed project as described herein. Should the project description, location, structural characteristics or proposed use change, we must be contacted to review the changes and modify our report as we deem necessary. In addition, in order for us to prepare this report, it was necessary to assume that subsurface conditions between, below and away from individual sampling locations and depths are similar to those described herein. If differing subsoil characteristics subsequently become evident, we must be asked to review the new information and then be allowed to modify our report as necessary. Conclusions about this site drawn by others from the data presented herein are strictly their responsibility.

7.1 Standard of Care

North Central Engineering has endeavored to provide its services in a manner that is consistent with appropriate professional practice and the level of care and skill ordinarily exercised by members of the profession currently practicing in this locality, at the same time, and under similar conditions as this project. No other representation, expressed or implied, is included or intended in this document.

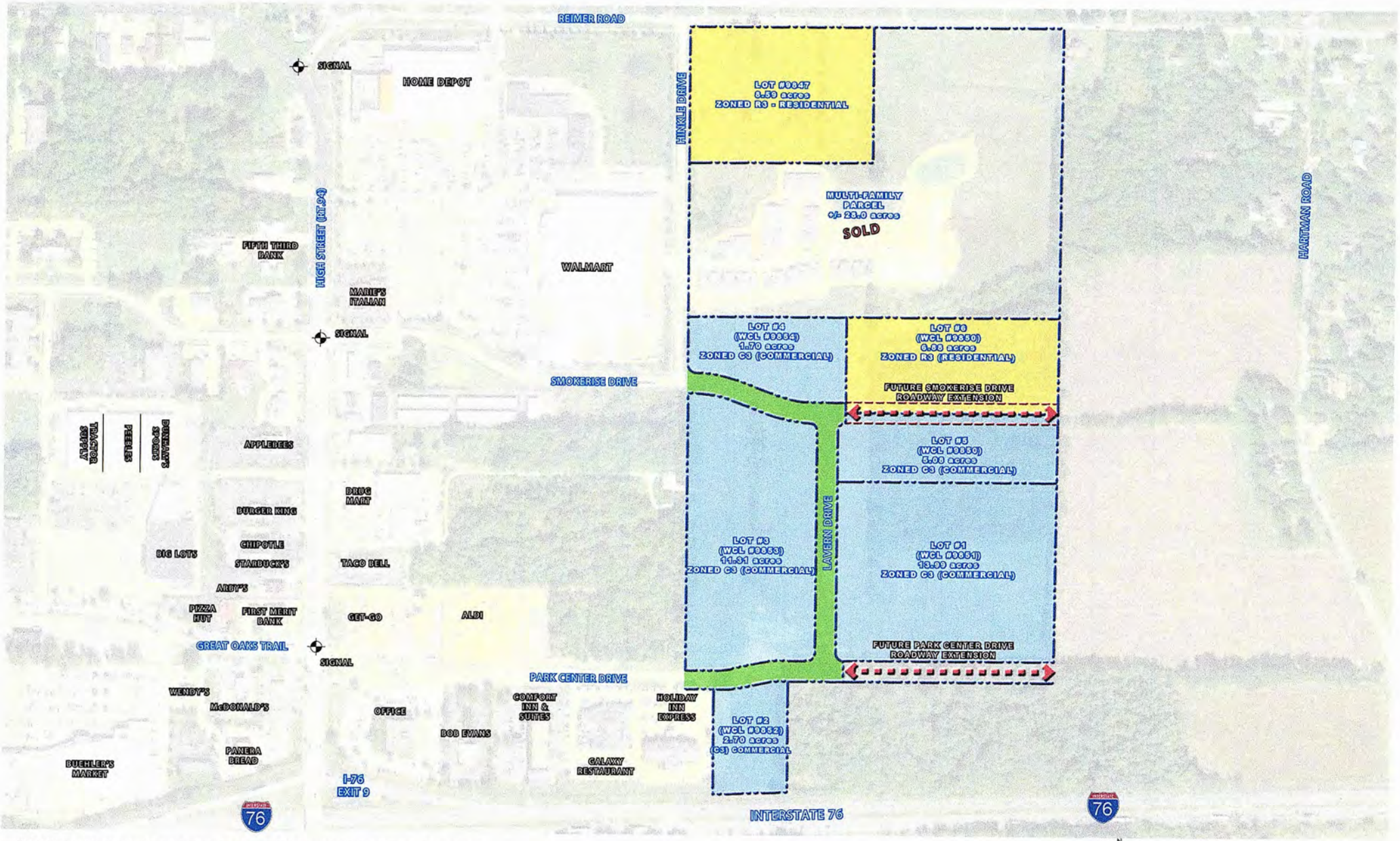
Respectfully submitted,

NORTH CENTRAL ENGINEERING, LTD.

S C Porpora

Steven C. Porpora, P.E., M.S.C.E.

PC: File



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AMERICAN HOSPITALITY GROUP
LIBERTY CENTER
200 WEST SMOKERISE DRIVE, SUITE 300
WADSWORTH, OHIO 44281

N

SCALE: 1" = 150'-0"

CONCEPTUAL LAND-USE PLAN

PARK CENTER COMMONS

Wadsworth, Ohio

CONCEPTUAL SITE PLAN

PARK CENTER COMMONS

ka

kainc.com

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06.06.2016
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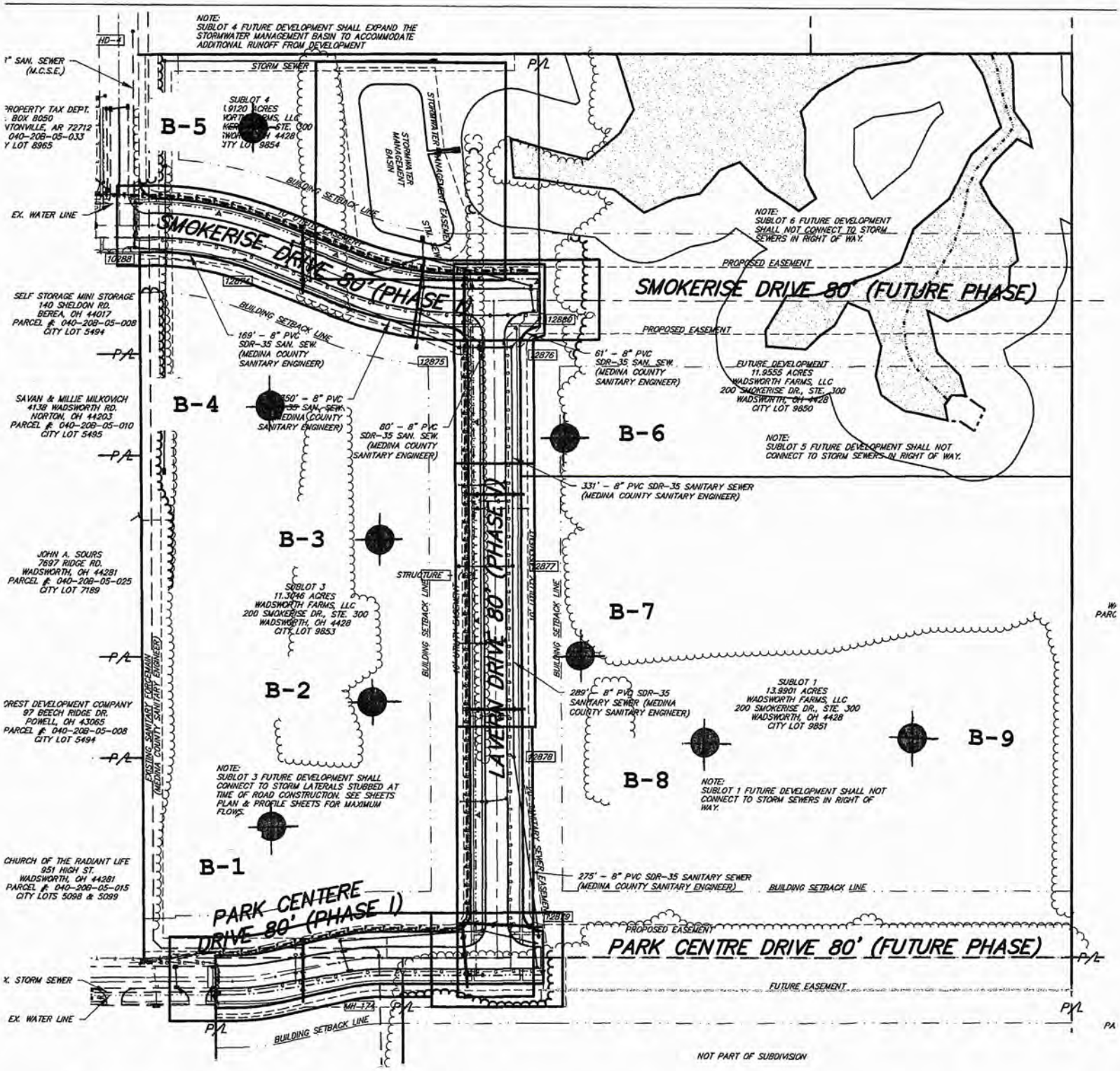

BORING LOCATION PLAN

SMOKERISE DRIVE EXTENSION DEVELOPMENT

Wadsworth, Ohio

Project No. GE 17001	NTS
Drawn By: S.C.P.	Date: 2-25-2017

NORTH CENTRAL ENGINEERING, LTD.

800 SOUTH PROGRESS DRIVE, MEDINA, OHIO 44256

PHONE (330) 454-1113

RED BY –
SSIONALS INC.
NG LAND SURVEYING
TH ROAD SUITE 100
44281 (330) 335-8232
OVERALL PLAN.DWG

North Central Engineering, Ltd.

TEST BORING LOG

Boring B-1

PROJECT NAME:	Smokerise Drive Extension Development		
PROJECT LOCATION:	Wadsworth, Ohio		
CLIENT NAME:	Lewis Land Professionals, Inc.	***DATE DRILLED:***	1/9/17
PROJECT NUMBER:	GE 17001	***DEPTH WATER ENCOUNTERED:***	None
BORING METHOD:	2-1/4" I.D. Hollow Stem Auger	***WATER DEPTH AT COMPLETION:***	None
SAMPLER USED:	2.0" O.D. Split Spoon	***DEPTH BORING CAVED AT:***	10.0'

GROUND SURFACE ELEVATION OF BORING: Not Available

	Sample Depth ft.	Blow Counts per each 6" interval	"N" Value	W* %	Qp* tsf	R* In	Description of Materials Encountered	
							6.5" TOPSOIL	
2.5	0-2	2-3-3-3	6	--	2.0	15	Medium stiff to stiff mottled brown/gray SILTY CLAY, moist	2.5
5	3.5-5	2-6-9	15	--	4.0	16		5
7.5	6-7.5	8-12-12	24	--	4.5+	13	Very stiff mottled brown/gray SILTY CLAY, little gravel, moist	7.5
10	8.5-10	4-13-12	25	--	4.5+	14		10
12.5								12.5
15	13.5-15	5-5-7	12	--	4.0	14	Stiff mottled brown/gray SILTY CLAY, little gravel, moist	15
17.5								17.5
20	18.5-20	13-11-9	20	--		15	Medium dense brown SANDY SILT, little sandstone fragments, moist	20
							Boring Terminated @ 20.0'.	

W- Moisture Content, %* ***Qp**- Approx. unconfined compressive strength using a pocket penetrometer* ***R****- Length of Sample Recovered*

North Central Engineering, Ltd.

TEST BORING LOG

Boring B-2

PROJECT NAME:	Smokerise Drive Extension Development		
PROJECT LOCATION:	Wadsworth, Ohio		
CLIENT NAME:	Lewis Land Professionals, Inc.	***DATE DRILLED:***	1/9/17
PROJECT NUMBER:	GE 17001	***DEPTH WATER ENCOUNTERED:***	11.0'
BORING METHOD:	2-1/4" I.D. Hollow Stem Auger	***WATER DEPTH AT COMPLETION:***	None
SAMPLER USED:	2.0" O.D. Split Spoon	***DEPTH BORING CAVED AT:***	5.0'

GROUND SURFACE ELEVATION OF BORING: Not Available

	Sample Depth ft.	Blow Counts per each 6" interval	"N" Value	W* %	Qp* Tsf	R* In	Description of Materials Encountered	
							7.0" TOPSOIL	
2.5	0-2	1-1-2-4	3	--	1.0	11	Soft to medium stiff mottled brown/gray SILTY CLAY, moist	2.5
5	3.5-5	6-7-8	15	--	3.5	18	Stiff mottled brown/gray CLAYEY SILT, little gravel, moist	5
7.5	6-7.5	11-11-12	*23	--	4.5+	*6	Stiff brown CLAYEY SILT, little gravel, moist *Drove rock.	7.5
10	8.5-10	5-10-15	*25	--	4.5+	*8	*Drove rock.	10
12.5								12.5
15	13.5-15	9-9-16	25	--	4.5+	15	Very stiff brown SILTY CLAY, moist	15
17.5							Boring Terminated @ 15.0'.	17.5
20								20

W- Moisture Content, %* ***Qp**- Approx. unconfined compressive strength using a pocket penetrometer* ***R****- Length of Sample Recovered*

North Central Engineering, Ltd.

TEST BORING LOG

Boring B-3

PROJECT NAME:	Smokerise Drive Extension Development		
PROJECT LOCATION:	Wadsworth, Ohio		
CLIENT NAME:	Lewis Land Professionals, Inc.	***DATE DRILLED:***	1/9/17
PROJECT NUMBER:	GE 17001	***DEPTH WATER ENCOUNTERED:***	None
BORING METHOD:	2-1/4" I.D. Hollow Stem Auger	***WATER DEPTH AT COMPLETION:***	None
SAMPLER USED:	2.0" O.D. Split Spoon	***DEPTH BORING CAVED AT:***	6.0'

GROUND SURFACE ELEVATION OF BORING: Not Available

	Sample Depth ft.	Blow Counts per each 6" interval	"N" Value	W* %	Qp* Tsf	R* In	Description of Materials Encountered	
							5.0" TOPSOIL	
							Medium stiff mottled brown/gray CLAYEY SILT, trace gravel, moist	
2.5	0-2	2-2-3-5	5	--	1.5	15		2.5
							Stiff to very stiff brown SILTY CLAY, little gravel, moist	
5	3.5-5	4-6-9	15	--	4.0	18		5
7.5	6-7.5	8-9-9	18	--	4.5+	12		7.5
10	8.5-10	5-7-7	14	--	4.5+	18		10
12.5								12.5
							Stiff gray SILTY CLAY, little gravel, moist	
15	13.5-15	4-5-6	11	--	3.0	16		15
							Boring Terminated @ 15.0'.	
17.5								17.5
20								20

W- Moisture Content, %* ***Qp**- Approx. unconfined compressive strength using a pocket penetrometer* ***R****- Length of Sample Recovered*

800 South Progress Drive, Unit #3 - Medina, Ohio 44256 - (330) 454-1113

North Central Engineering, Ltd.

TEST BORING LOG

Boring B-4

PROJECT NAME:	Smokerise Drive Extension Development		
PROJECT LOCATION:	Wadsworth, Ohio		
CLIENT NAME:	Lewis Land Professionals, Inc.	**DATE DRILLED:**	1/9/17
PROJECT NUMBER:	GE 17001	**DEPTH WATER ENCOUNTERED:**	8.0'
BORING METHOD:	2-1/4" I.D. Hollow Stem Auger	**WATER DEPTH AT COMPLETION:**	None
SAMPLER USED:	2.0" O.D. Split Spoon	**DEPTH BORING CAVED AT:**	15.0'

GROUND SURFACE ELEVATION OF BORING: Not Available

	Sample Depth ft.	Blow Counts per each 6" interval	"N" Value	W* %	Qp* tsf	R* In	Description of Materials Encountered	
							8.0" TOPSOIL	
	0-2	2-1-3-4	4	--	0.5	18	Soft to Medium stiff brown SILTY CLAY, moist	
2.5								2.5
5	3.5-5	4-8-6	14	--	2.5	17	Stiff mottled brown/gray CLAYEY SILT, little gravel, moist	5
7.5	6-7.5	6-7-9	16	--	3.5	18	Stiff mottled brown/gray SILTY CLAY, trace gravel, moist	7.5
10	8.5-10	4-7-9	16	--	3.5	17	Stiff brown SILTY CLAY, some sand, little gravel, moist	10
12.5								12.5
15	13.5-15	7-14-16	30	--	4.5+	17	Very stiff mottled brown/gray SILTY CLAY, some sand, little gravel, moist	15
17.5								17.5
20	18.5-20	11-33-40	73	--	4.5+	18	Hard mottled brown/gray SILTY CLAY, some sand, little gravel, moist	20
							Boring Terminated @ 20.0'.	

**W- Moisture Content, %* *Qp- Approx. unconfined compressive strength using a pocket penetrometer* *R- Length of Sample Recovered*

North Central Engineering, Ltd.

TEST BORING LOG

Boring B-5

PROJECT NAME:	Smokerise Drive Extension Development		
PROJECT LOCATION:	Wadsworth, Ohio		
CLIENT NAME:	Lewis Land Professionals, Inc.	***DATE DRILLED:***	1/2/17
PROJECT NUMBER:	GE 17001	***DEPTH WATER ENCOUNTERED:***	None
BORING METHOD:	2-1/4" I.D. Hollow Stem Auger	***WATER DEPTH AT COMPLETION:***	None
SAMPLER USED:	2.0" O.D. Split Spoon	***DEPTH BORING CAVED AT:***	11.0'

GROUND SURFACE ELEVATION OF BORING: Not Available

	Sample Depth ft.	Blow Counts per each 6" interval	"N" Value	W* %	Qp* tsf	R* In	Description of Materials Encountered	
							6.0" TOPSOIL	
2.5	0-2	1-2-5-7	7	--		18	Medium stiff brown SILTY CLAY, some sand, little gravel, moist	2.5
5	3.5-5	4-5-6	11	--		17	Medium dense brown SANDY SILT, little clay, moist	5
7.5	6-7.5	8-8-10	18	--		17	Very stiff brown CLAYEY SILT, little gravel, moist	7.5
10	8.5-10	3-4-4	*8	--		*0	Loose brown SANDY SILT, little gravel, moist *Drove rock.	10
12.5								12.5
15	13.5-15	14-12-9	21	--		13	Very stiff brown CLAYEY SILT, some sand, little gravel, moist	15
17.5							Boring Terminated @ 15.0'.	17.5
20								20

W- Moisture Content, %* ***Qp-* *Approx. unconfined compressive strength using a pocket penetrometer* ***R-*** *Length of Sample Recovered*

North Central Engineering, Ltd.

TEST BORING LOG

Boring B-6

PROJECT NAME:	Smokerise Drive Extension Development		
PROJECT LOCATION:	Wadsworth, Ohio		
CLIENT NAME:	Lewis Land Professionals, Inc.	**DATE DRILLED:**	1/2/17
PROJECT NUMBER:	GE 17001	**DEPTH WATER ENCOUNTERED:**	None
BORING METHOD:	2-1/4" I.D. Hollow Stem Auger	**WATER DEPTH AT COMPLETION:**	None
SAMPLER USED:	2.0" O.D. Split Spoon	**DEPTH BORING CAVED AT:**	9.0'

GROUND SURFACE ELEVATION OF BORING: Not Available

	Sample Depth ft.	Blow Counts per each 6" interval	"N" Value	W* %	Qp* tsf	R* In	Description of Materials Encountered	
							7.0" TOPSOIL	
							Medium stiff brown SILTY CLAY, moist	
2.5	0-2	1-3-3-5	6	--	1.0	18		2.5
							Stiff to very stiff mottled brown/gray SILTY CLAY, little gravel, moist	
5	3.5-5	6-13-13	26	--	3.5	18		5
7.5	6-7.5	8-12-14	26	--	4.5+	15		7.5
							Stiff brown CLAYEY SILT, little sand and gravel, moist	
10	8.5-10	5-7-5	12	--	4.0	14		10
12.5								12.5
							Medium dense brown SANDY SILT, little clay and gravel, moist	
15	13.5-15	5-10-6	16	--		15		15
17.5								17.5
							Stiff gray CLAYEY SILT, little sand and gravel, moist	
20	18.5-20	4-5-4	9	--	3.5	13		20
							Boring Terminated @ 20.0'.	

**W- Moisture Content, %* *Qp- Approx. unconfined compressive strength using a pocket penetrometer* *R- Length of Sample Recovered*

North Central Engineering, Ltd.

TEST BORING LOG

Boring B-7

PROJECT NAME:	Smokerise Drive Extension Development		
PROJECT LOCATION:	Wadsworth, Ohio		
CLIENT NAME:	Lewis Land Professionals, Inc.	**DATE DRILLED:**	1/9/17
PROJECT NUMBER:	GE 17001	**DEPTH WATER ENCOUNTERED:**	None
BORING METHOD:	2-1/4" I.D. Hollow Stem Auger	**WATER DEPTH AT COMPLETION:**	None
SAMPLER USED:	2.0" O.D. Split Spoon	**DEPTH BORING CAVED AT:**	5.5'

GROUND SURFACE ELEVATION OF BORING: Not Available

	Sample Depth ft.	Blow Counts per each 6" interval	"N" Value	W* %	Qp* tsf	R* In	Description of Materials Encountered	
							6.5" TOPSOIL	
							Medium stiff brown CLAYEY SILT, moist	
2.5	0-2	1-2-2-5	4	--	0.5	15		2.5
							Medium stiff to very stiff mottled brown/gray SILTY CLAY, little gravel, moist	
5	3.5-5	2-3-8	11	--	2.5	17		5
7.5	6-7.5	10-10-10	20	--	4.5+	17		7.5
							Stiff brown SILTY CLAY, some sand, trace gravel, moist	
10	8.5-10	3-5-5	10	--	3.0	16		10
12.5								12.5
							Stiff gray CLAYEY SILT, little gravel, moist	
15	13.5-15	5-8-8	16	--	3.5	18		15
							Boring Terminated @ 15.0'.	
17.5								17.5
20								20

W- Moisture Content, %* ***Qp-* *Approx. unconfined compressive strength using a pocket penetrometer* ***R-*** *Length of Sample Recovered*

North Central Engineering, Ltd.

TEST BORING LOG

Boring B-8

PROJECT NAME:	Smokerise Drive Extension Development		
PROJECT LOCATION:	Wadsworth, Ohio		
CLIENT NAME:	Lewis Land Professionals, Inc.	**DATE DRILLED:**	1/4/17
PROJECT NUMBER:	GE 17001	**DEPTH WATER ENCOUNTERED:**	None
BORING METHOD:	2-1/4" I.D. Hollow Stem Auger	**WATER DEPTH AT COMPLETION:**	12.0'
SAMPLER USED:	2.0" O.D. Split Spoon	**DEPTH BORING CAVED AT:**	13.0'

GROUND SURFACE ELEVATION OF BORING: Not Available

	Sample Depth ft.	Blow Counts per each 6" interval	"N" Value	W* %	Qp* tsf	R* In	Description of Materials Encountered	
							7.0" TOPSOIL	
2.5	0-2	1-2-4-5	6	--	1.0	13	Medium stiff brown SILTY CLAY, trace sand and organics, moist	2.5
5	3.5-5	6-7-9	16	--	3.5	18	Stiff brown SILTY CLAY, little sand and gravel, moist	5
7.5	6-7.5	4-8-7	15	--	4.0	10		7.5
10	8.5-10	4-14-21	35	--		13	Dense mottled brown/gray coarse grain SAND, moist	10
12.5								12.5
15	13.5-15	50/2.0"	50	--		2	Hard brown SANDSTONE/BOULDER, moist	15
17.5							Boring Terminated @ 15.0'. Auger refusal @ 13.5'.	17.5
20								20

**W- Moisture Content, %* *Qp- Approx. unconfined compressive strength using a pocket penetrometer* *R- Length of Sample Recovered*

North Central Engineering, Ltd.

TEST BORING LOG

Boring B-9

PROJECT NAME:	Smokerise Drive Extension Development		
PROJECT LOCATION:	Wadsworth, Ohio		
CLIENT NAME:	Lewis Land Professionals, Inc.	***DATE DRILLED:***	1/9/17
PROJECT NUMBER:	GE 17001	***DEPTH WATER ENCOUNTERED:***	None
BORING METHOD:	2-1/4" I.D. Hollow Stem Auger	***WATER DEPTH AT COMPLETION:***	None
SAMPLER USED:	2.0" O.D. Split Spoon	***DEPTH BORING CAVED AT:***	7.5'

GROUND SURFACE ELEVATION OF BORING: Not Available

	Sample Depth ft.	Blow Counts per each 6" interval	"N" Value	W* %	Qp* Tsf	R* In	Description of Materials Encountered	
							8.0" TOPSOIL	
2.5	0-2	1-2-4-4	6	--		14	Medium stiff brown CLAYEY SILT, little sand and gravel, moist	2.5
5	3.5-5	9-10-9	19	--		18	Medium dense brown SANDY SILT, little clay and gravel, moist	5
7.5	6-7.5	8-11-12	23	--		14		7.5
10	8.5-10	50/3.0"	50	--		0	Medium hard brown SANDSTONE/BOULDER, moist	10
							Boring Terminated @ 10.0'.	
							Auger refusal @ 8.5'.	
12.5								12.5
15								15
17.5								17.5
20								20

W- Moisture Content, %* ***Qp**- Approx. unconfined compressive strength using a pocket penetrometer* ***R****- Length of Sample Recovered*

GENERAL SYMBOLS & TERMS

SAMPLING SYMBOLS

SS: Split-Spoon 1-3/8" I.D. 2.0" O.D.
AU: Auger Sample
BK: Bulk Sample
ST: Shelby Tube - 3.0" O.D.
RC: Rock Core

SOIL PROPERTY SYMBOLS

MC: Moisture Content
LL: Liquid Limit, %
PI: Plasticity index, %
▼: Groundwater encountered
WOH: Weight of Hammer
WOR: Weight of Rod

RELATIVE CONSISTENCY OF COHESIVE SOILS

DESCRIPTION	STANDARD PENETRATION	UNCONFINED COMP. STRENGTH, TSF*
Very Soft	0-2	< 0.25
Soft	2-4	0.25 -0.50
Medium Stiff	5-8	0.50 – 1.0
Stiff	9-16	1.0 – 2.0
Very Stiff	17-32	2.0 – 4.0
Hard	Over 32	4.0+

RELATIVE DENSITY OF NON-COHESIVE SOILS

DESCRIPTION	STANDARD PENETRATION
Very Loose	0 - 4
Loose	5- 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	Over 50

PERCENTAGE OF OTHER COMPONTENTS

DESCRIPTION	PERCENT
Trace	0 - 10
Little	10 - 20
Some	20 - 35
And	35 - 50

PARTICLE SIZE

DESCRIPTION	SIZE
Boulders	12.0 in +
Cobbles	3.0 in. - 12.0 in. +
Gravel	< 3.0 in.
Coarse Sand	5mm - 0.6mm
Medium Sand	0.6mm - 0.2mm
Fine Sand	0.2mm - 0.74mm
Silt	0.074mm - 0.005mm
Clay	-0.005mm

Soil samples are identified using The Unified Soil Classification System unless otherwise noted.