Headquarters 11345 U.S. Highway 1 Sebastian, FL. 32958 Orlando 723 Progress Way Sanford, FL. 32771



Mailing P.O. Box 78-1377 Sebastian, FL. 32978 Phone: 772-589-0712 C.A. # 5693 KSMengineering.net

June 30, 2020

Mark Kipp Kipp's Commercial Property, LLC 12736 79th Avenue Sebastian, FL 32958

Re: Fraternal Order of the Eagles Micco Road Micco, Florida KSM Project #: 202864-p

Dear Mr. Kipp:

Enclosed are the permeability test results and soil profile for the referenced project.

A Hydraulic Conductivity Test was performed in the field by the 'Usual Open-Hole Test' method.

The horizontal and vertical permeability flow rates were determined by excavating a test pit adjacent to the soil profiles and obtaining undisturbed shelby tube samples. We then performed a permeability test on the field samples in our laboratory.

All these tests were performed to evaluate the drainage characteristics of the soils for this particular test location.

The following table indicates the usual Open Hole Hydraulic Conductivity test results:

TEST LOCATION	HYDRAULIC CONDUCTIVITY (CES/Sq. Et – Et Head)
(Sea Focation Flan)	(or oragine internetal)

P-1

2.4 x 10⁻⁴



-2-

June 30, 2020

The following table indicates the horizontal and vertical flow rates for the test location:

TEST LOCATION (See Location Plan)	HORIZONTAL FLOW RATE	VERTICAL FLOW RATE
P-1	7.5 Ft/Day @ (0"-12") Depth	6.2 Ft/Day @ (0"-12") Depth
P-1	16.7 Ft/Day @ (12"-36") Depth	13.3 Ft/Day @ (12"-36") Depth
P-1		4.5 Ft/Day @ (36"-48*) Depth
P-1		2.0 Ft/Day @ (48"-60") Depth

The following table indicates the measured water table along with our estimated normal wet season water table and normal dry season water table for the test location:

TEST LOCATION (See Location Plan)	MEASURED WATER TABLE	ESTIMATED WET SEASON WATER TABLE	ESTIMATED DRY SEASON WATER TABLE
P-1, PB-1	30" Below Grade	17" Below Grade	53" Below Grade

This estimate is based upon our interpretation of existing site conditions and a review of the USDA Soil Survey for Brevard County, Florida. The majority of the site soils are mapped as Myakka sand (36) 0 to 2 percent slopes and Anclote sand (91), according to the Soil Survey Map of Brevard County, Florida.

If you have any questions, please feel free to contact the office.

JEK/cv

E-mail to: rebeccag@mbveng.com

	KS	KSM Engineering & Testing P.O. Box 78-1377 Sebastian, FL 32978 Tel: (772)-589-0712 Fax: (772)-689-6469				8	OR	ING	PAGE 1 OF 1
CLIE		p's Commercial Property, LLC	PROJECT NAM	E F	ratern	al Order	of the	Eagle	6, Micco Road
PRO.	JECT N	UNBER 202864-p&b	PROJECT LOCATION Micco. Florida						
DATE	: STAR	TED 8/22/20 COMPLETED 6/22/20	GROUND ELEN)N			HOLE	SIZE inches
DRIL		ONTRACTOR	GROUND WAT	ERLE	EVEL	8:			
		ETHOD Solid Socon Sample		OF D	RILLI	- NG 2.50	ft		
1000			AT END (RILLIN				
NOT				911 J 1	ING				
NOTE	ະລ <u>ີຄ</u>	Ausched Location Figh					r	-	
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	RECOVERY %	(ROD)	BLOW COUNTS (N VALUE)	POCKET PEN. (Isf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲ 20 40 60 80 PL MC LL 20 40 60 80 □ FINES CONTENT (%) □ 70 40 50 80
0	6 Y	Dark Brown Sand with Traces of Roots		+	-+		-		20 40 80 80
- 3		Grav Sand		-	-	1-2-3			
÷ -			Xs	S		(5)			
	has	Derk Brown Sand with Hardnan		-	F	6710	1		- <u>\</u>
8. 8	Pit/	Brown Sand Sliphilu Claused	X s	S		(17)			un Anno porreĝene stres
5	1 10	brown Sand, Silginity Orbyso		_	F	677	1		
÷ 3	10		Xs	S		(14)			
	1 12			_	F		1		
ŀ .			X s	s		6-8-9 (17)			· · · · · · · · · · · · · · · · · · ·
		Light Brown Sand			E				and the desired as a second
10	1963		Xis	s		9-8-7 (15)			
			2 N	_	E	(10)			
š.			Xs	s		6-5-7			
	1.5		K N	-	H	(12)			
			KA.	-		8.0.8			
15			Xs	S		(17)			A
		Boltom of borehole at 15.0 feet							





Headquarters 11345 U.S. Highway 1 Sebastian, FL, 32958 Orlando 723 Progress Way Sanford, FL. 32771



Mailing C.A. # 5693 KSMengineering.net

June 30, 2020

Mark Kipp Kipp's Commercial Property, LLC 12736 79th Avenue Sebastian, FL 32958

Re: Fraternal Order of the Eagles Micco Road Micco, Florida KSM Project #: 202864-b

Dear Mr. Kipp:

As requested, KSM Engineering & Testing has performed a subsurface investigation at the referenced site. Presentation of the data gathered during the investigation, together with our geotechnical related opinions, are included in this report.

A. Site Description:

At the time of drilling, the site was fairly flat with heavy surface vegetation and many trees. Trails were cleared on the site for our investigation.

B. Project Description:

A one-strory commercial building is planned to be constructed on the site. Loads from the structure will be transferred to the ground by conventional shallow footings. We estimate the maximum loads will be less than 2,500 pounds per linear foot along the wall foundation.

Some additional site fill may be required to reach the desired grades.

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Mailing **SIVE** ENGINEERING AND TESTING P.O. Box 78-1377 Sebastian, FL. 32978 Phone: 772-589-0712 C.A. # 5693 KSMengineering.net

Micco Road Micco, Florida

June 30, 2020

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C. The scope of our study consisted of the following:

- 1. Performed Standard Penetration Test Borings in the proposed construction area to estimate the subsoil relative density.
- 2. Measured the groundwater level at each boring.
- 3. Evaluated the existing soil conditions with respect to the proposed construction and provided recommendations for site preparation and foundation design.
- 4. Prepared this report to document our findings.

D. Site Investigation:

The site investigation program consisted of performing four (4) Standard Penetration Test borings (SPT), in the proposed construction area. The SPT borings were terminated at depths of 10 to 14 feet below grade. The locations of the borings are indicated on the attached boring logs.

The SPT borings were completed in accordance with procedures described in ASTM D-1586. A standard 1.5 inch I.D., 2 inch O.D. split-spoon sampler is driven into the soil by successive blows of a 140 pound hammer freely falling 30 inches. The number of blows required to drive the sampler 1 foot, after seating 6 in., is designated the Penetration Resistance, or "N" value. At regular intervals the sampler is extracted from the ground and opened to allow visual examination and classification of the retained soil sample, Also, the groundwater table was allowed to stabilize and the depth of the groundwater elevation recorded from existing grade.

The records of the soils encountered, the penetration resistances and groundwater level are shown on the attached logs.



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June 30, 2020

E. Engineering Evaluation and Conclusions:

Based on the information obtained from this site investigation, we are pleased to offer the following evaluation:

The boring logs indicate the subsurface soils consist mostly of fine-grained sand and slightly clayed fine-grained sand. "N" values recorded during the boring operation indicate the soil density is generally loose near the surface and becomes medium dense after the first 2 to 3 feet. Please refer to the soil boring logs for specific information relative to the soil description.

Based on the existing soil conditions, the proposed structure can be supported on a shallow foundation system provided that the site is properly prepared.

The following sections provide recommendations for the site preparation and foundation design.

F. Site Preparation:

The proposed building area and areas to be paved, plus a minimum margin of five feet beyond the proposed construction shall be stripped and grubbed of surface debris, including vegetation, roots and organic matter. Stumps shall be removed entirely. Due to the large amount of vegetation to be cleared on this site, the surface soils will be very loose. The building area should be graded level and proofrolled. Any soft yielding areas shall be excavated and replaced with clean compacted fill. Sufficient passes should be made during compaction operations to produce a density no less than 95 percent of its modified dry Proctor value (ASTM D 1557) to a depth of two feet. This is especially important due to the loose surface soils.

After the exposed surface has been proofrolled, the building and pavement areas may be filled to the desired grades. The fill material shall consist of clean granular sand containing less than 10% material passing the U.S. Standard No. 200 mesh sieve. Place structural fill in loose layers of 12 inches in thickness and compact each lift to at least 95 percent of its modified dry Proctor value.

After excavating for the footings, the disturbed footing subgrade should be recompacted to 95 percent (minimum) of its modified dry Proctor value. This can be best achieved by making several passes with a relatively light-weight walk-behind vibratory sled or roller.



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June 30, 2020

G. Foundation:

Provided that our recommendations for site preparation are followed, the proposed structure may be supported on conventional concrete, steel reinforced footings designed for an allowable soil bearing pressure of 2,500 pounds per square foot, or less.

With the foundation properly designed and the site properly prepared, we anticipate total settlements less than $\frac{3}{4}$ of an inch and differential settlement of less than $\frac{1}{4}$ of an inch. The majority of the settlement should occur during construction.

H. Floor Slabs:

A conventional slab-on-grade can be used in the "at grade" portion of the building. We recommend the disturbed subgrade below the floor slab be re-compacted to 95 percent of the modified Proctor maximum dry density (ASTM D 1557) prior to placement of the concrete. An estimated modulus of subgrade reaction of 150 pounds per cubic inch (pci) can be used for design of the slab-on-grade. We recommend that expansion or control joints be incorporated between the floor slab and column or wall footings. Control joints should also be incorporated in the slab at frequent intervals to control shrinkage cracks.

A moisture barrier is recommended beneath the floor slab to prevent moisture migration from the underlying soil resulting in dampness of the slab.

I. Drives and Parking Areas: (Standard Duty Only)

We performed three (3) hand-augers in the proposed roadway to evaluate the soils in relation to the proposed pavement. We did not find any "muck" or other unsuitable material in the test borings. Penetrometer readings recorded during the investigation indicates the existing soil density is loose to medium dense.



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June 30, 2020

The relationship of the static cone penetrometer reading to the relative density is listed below:

Relative Density	Static Penetrometer Reading
Very Loose or Soft	<15
Loose	15 – 40
Medium Dense	40 70
Dense	70+

The static cone penetrometer readings are indicated on the attached boring logs.

Although a comprehensive pavement evaluation was not within the scope of this study the site may be prepared to support a flexible pavement or rigid concrete pavement. The pavement should be designed for the anticipated loads and frequencies. The minimum pavement design for standard duty asphalt should include the following:

Clear the roadway area of any surface debris, including vegetation, roots and organic matter. Stumps shall be removed entirely. The cleared areas should be graded level and proof rolled. Any soft yielding areas shall be excavated and replaced with clean compacted fill. Sufficient passes should be made during compaction operations to produce a density no less than 95 percent of its modified dry Proctor value (AASHTO T180) to a depth of two feet. This will be very important on this site due to the loose surface soils.

Additional fill shall consist of clean granular sand containing less than 10% material passing the U.S. Standard No. 200 mesh sieve and placed in loose layers of 12 inches and compacted to the above densities.

Eight inches of suitable clayed soil having a Limerock Bearing Ratio (LBR) of 40 should be used for the stabilized subgrade and compacted to 98 percent of its modified dry Proctor value (AASHTO T180).

The base course shall be six inches of cemented coquina rock (LBR of 100) or limerock and compacted to 98 percent of its modified dry Proctor value (AASHTO T180). A minimum of 16 inches separation should be maintained between the bottom of the base and the high seasonal groundwater table.

The asphalt wearing surface should consist of 1 ½" of type S-3 in accordance with the Florida Department of Transportation Standard Specification for Road and Bridge Construction.



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June 30, 2020

Where a concrete pavement section is used, a minimum thickness of 5 inches is recommended within light duty areas. The concrete should be reinforced to withstand the design traffic loads and saw cuts constructed for crack control. The concrete should have a minimum compressive strength of 4,000 psi. Six inches of suitable clayed soil having a Limerock Bearing Ratio (LBR) of 20 and compacted to no less than 98 percent of its modified dry Proctor value (AASHTO T180) should be used as a base.

Standard duty pavement areas are considered car and pickup truck loading conditions and a few medium trucks such as delivery and garbage truck loading conditions.

J. Closure:

This report has been prepared in accordance with generally accepted soil and foundation engineering practices based on the results of the test borings and the assumed loading conditions. No warranties, either expressed or implied, are intended or made. This report does not reflect any variations which may occur between the borings. If variations appear evident during the course of construction, it would be necessary to re-evaluate the recommendations of this project.

Environmental conditions, wetland delineation, water quality, and municipal requirements are not a part of this report.

We are pleased to be of assistance to you on this phase of your project. When we may be of further service to you or should you have any questions, please feel free to contact the office.



JEK/cv

E-mail to: rebeccag@mbveng.com

	KS	M Figure 10					BO	RIN	G NUMBER B-1 PAGE 1 OF 1
GLIEN	п К	p's Commercial Property, LLC		PROJECT NAM	Frate	rnal Order	of the	Eagle	s, Micco Road
PROJ	ECT N	UMBER 202864-p&b		PROJECT LOC		Micco, Flor	ida		
DATE	STAR	TED 6/25/20 COMPLET	ED 6/25/20	GROUND ELEV	ATION			HOLE	SIZE Inches
	ING C	ONTRACTOR		GROUND WAT	RLEVE	15:			<i>(</i>
DRILL	JNG M	ETHOD Split Spoon Sample			of Drill	LING 1.87	r ft	_	
LOGO	32D 81	MS/SH CHECKED	AT END (FDRILL	.ING				
NOTE	NOTES See Attached Location Plan				RILLING				
DEPTH	GRAPHIC LOG	MATERIAL DES	SCRIPTION	SAMPLE TYPE NIIMBER	RECOVERY % (ROD)	BLOW COUNTS (N VALUE)	POCKET PEN. (Isf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲ 20 40 60 80 PL MC LL 20 40 60 80 □ FINES CONTENT (%) □ 20 40 60 80
	0.0	Dark Gray Sand with Traces of Re	oots						
1		⊈ Gray Sand		Xs	s	1-2-2			
					_	(4)	1		
				X s	5	3-3-4			A
5		Dark Brown Sand		Ê			1		·
L .				X s	s	(14)			
	100	Back Brown Pand with Transa al	Play		_		-		· · · · · · · · · · · · · · · · · · ·
		Dark Brown Sand with Traces of	∠iey	Xs	s	(17)			
	12	Brown Sand		X s	s	9-8-8	1		
10	19833	Bottom of boreh	ole at 10.0 feet			(16)	1	Į.,	
EOTECH BH PLOTS, - GNT STD US LAB (GUT - 609/2012 15 - K.W.S.M. FILESKO BOLS (NSM-SERVER/jackros-1788 GPL				ı					

	KS	M Engineering P.O. Box 78-137 Sebastian, FL 32 Tel: (772)-589-07 Fax: (772)-589-64	& Testing , 978 12 189					BO	RIN	G NUMBER B-2 PAGE 1 OF 1
CLIE	NT Kir	p's Commercial Property, I	LC	PROJEC		Fraler	nal Order	of the	Eagle	s, Micco Road
PRO	JECT N	UMBER 202864-p&b		PROJEC	T LOCAT		licco, Flor	ida		
DATE	E STAR	TED 6/25/20	GROUNE	ELEVA				HOLE	SIZE Inches	
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DRIL	LING M	ETHOD Spill Spoon Samp	le	¥.at	TIME OF	ORILL	ING 1.83	1 ft		
LOG	GED BY	MS/SH	CHECKED BY JEK	AT	END OF	DRILLI	NG			
NOTI	ES Se	Attached Location Plan		AF	TER DRI	LLING				
DEPTH	GRAPHIC LOG	MATI	ERIAL DESCRIPTION		SAMPLE TYPE NUMBER	RECOVERY % (ROD)	BLOW COUNTS (N VALUE)	POCKET PEN. (Ist)	DRY UNIT WT. (pd)	▲ SPT N VALUE ▲ 20 40 60 80 PL MC LL 20 40 60 60 □ FINES CONTENT (%) □ 20 40 60 80
-	0.0	Gray Sand with Traces	of Roots							
-		⊈ Gray Sand			X ss	1 [2-2-2			
Ĩ					Δ		(4)			
					X ss		4-3-4			
5	1778					1				
-		Dark Brown Send			X SS		7-6-8 (14)			. An information and
ŀ	14	Dark Provin Sand with	Roma Olau			1	10.10.0			
ŀ	- 12	Dark brown Sand with	some Clay		X ss		10-10-8 (18)			···· •
ł	14	Brown Sand				1 1	977			
10	1933	oronti ound			X 88		(14)			
ł	-				M		7.8.8			
-	-00				X SS		(16)			****
-	-				X ss		9-10-10 (20)			
	10.101	Botto	m of borehole at 14.0 feet.			I I	(20)	1	ł i	κ. ».

	KS	SM	KSM Er P.O. Bo Sebasti Tel: (77 Fax: (77	ngineer 5x 78-13 ian, FL '2)-589- 72)-589	ing & Tes 377 32978 0712 -6469	sting						BO	RIN	IG NUMBER B
CLIE	NT Ki	op's Cor	nmercial i	Propert	y, LLC			 PROJEC		Frate	mai Order	of the	Eagle	s, Micco Road
PROJ	IECT N	UMBER	202864	-o&b				 PROJEC	T LOCAT		Micco, Flo	rida		
DATE	STAR	TED 6	/25/20		COMP		/25/20	 GROUN	D ELEVA	TION _			HOLE	SIZE inches
DRILL	LING C	ONTRA	CTOR					 GROUN	D WATER		LS:			
DRILL		ETHOD	Split Sp	oon Sa	mple		1000	 ¥. A1	TIME OF		_ING _1.7	5 11		
LOGG		MS/S	ін 		CHEC	KED BY	JEK	 A	TEND OF	DRILL	ING			
NOTES See Allacheo Location Plan				 A1				-		1				
0 DEPTH (#)	GRAPHIC LOG			MA	TERIAL	DESCRIF	TION		SAMPLE TYPE NUMBER	RECOVERY % (ROD)	BLOW COUNTS (N VALUE)	POCKET PEN. (Isi)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲ 20 40 60 80 PL MC LL 1 40 50 80 □ FINES CONTENT (% 20 40 50 80
	0.0	Dari	k Gray Sa	nd with	Traces	of Roots						1	1	
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6		Dan	C Brown S	and						1	7.0.7	-		hard and a second secon
									X ss		(15)			
	12	Dari	k Brown S	and. S	iantiv Cla	aved		 	M		9-8-8	-		
					· · · · · ·				X SS		(16)			- f
10	12	Ligh	t Brown S	Sand					X ss		7-8-8			
				Bot	tom of b	orehole at	10.0 fest.					1		

CLIE		KSM Engineering & Testing P.O. Box 78-1377 Sebestian, FL 32978 Tel: (772)-589-0712 Fax: (772)-589-6469 o's Commercial Property, LLC	PROJECT NAM	le Fra	itemat Order	BO	RIN	AG NUMBER B-4 PAGE 1 OF 1
PRO	JECT N	JMBER 202864-08b	PROJECT LOCATION Micro Florida					
DAT	E STAR	TED 8/25/20 COMPLETED 8/25/20	GROUND ELE				HOLE	8IZE inches
DRIL	LING C	ONTRACTOR	GROUND WAT	ERLE	VELS:			
DRIL	LING M	ETHOD Split Spoon Sample		of Dr	ILLING 1.9	2 ft		
LOG	GED BY	MS/SH CHECKED BY JEK	AT END	OF DR	LLING			
NOT	ES Se	Attached Location Plan	AFTER	RILLIN	IG			
DEPTH	GRAPHIC	MATERIAL DESCRIPTION	SAMPLE TYPE	RECOVERY %	(HQID) BLOW COUNTS (N VALUE)	POCKET PEN. (Isf)	DRY UNIT WT. (pd)	▲ SPT N VALUE ▲ 20 40 60 80 PL MC LL 20 40 60 80 □ FINES CONTENT (%) □ 20 40 60 80
Ť	0 2	Gray Sand with Traces of Roots						
-	-	Gray Sand	X s	s	2-2-2 (4)			
	1※		Xs	s	3-5-5	1		X
5		Dark Brown Sand		_	(10)	1		
÷	- 22	Deals Dealer Deale Dilabella Diaced	X s	s	8-6-5			
_	- 10	Dark Brown Sand, Signity Clayed	K X	=		1		
-0	- 10		Xs	S	4-5-7			· · · · · · · · · · · · · · · · · · ·
	14	Light Brown Sand		-	777	1		
10	-023		Xs	8	(14)			
2	-		M	_	10-10-9	-		oung ving ving ving ving
88	- 63		Xs	s	(19)			*****
3			Xs	s	10-8-8			
čě.	Protected.	Bottom of borehole at 14.0 feet.		_	(10)	1		10 P - 1 P
ALCON STITUUES - SMIL 312 US DAG UN - SSOUND 12 19 - K SKAM FILESON DOCS (XSM-SEN								

Headquarters: 11345 U.S. Highway 1 Sebastian, FL. 32958 Orlando: 723 Progress Way Sanford, FL. 32771	KS	NE ENGINAND 1	IEERING Testing	Mailing: P.O. Box 78-1377 Sebastian, FL. 32978 Phone: 772-589-0712 C.A. # 5693 KSMengineering.net
Date :	June 22, 2020			
Location:	Fraternal Order Micco Road Micco, Florida HA-1, See Atta	r of the Eagles iched Location Plan		
DEPTH IN FEET	STRATA FROM-TO	PEN READINGS	DESCRI SOI	PTION OF LS
-0-	0" – 12"		Gray Sand	with Traces of Roots
= 1=:	12" – 48"	18	Gray Sand	
-2-		23		
-3-		20		
-4	48" - 72"	34	Dark Brown	n Sand
-5-		37		
-6		40		

Water Table: 22" Below Existing Grade Job #: KSM 202864-1ha

Headquarters: 11345 U.S. Highway 1 Sebastian, FL. 32958 Orlando: 723 Progress Way Sanford, FL. 32771	KS	M ENGIN AND T	EERING Esting	Mailing: P.O. Box 78-1377 Sebastian, FL 32978 Phone: 772-589-0712 C.A. # 5693 KSMengineering.net
Date :	June 22, 2020			
Location:	Fraternal Order Micco Road Micco, Florida HA-2, See Atta	r of the Eagles ched Location Plan		
DEPTH IN FEET	STRATA FROM-TO	PEN READINGS	DESCRII SOII	PTION OF _S
-0-	0" – 12"		Dark Gray S of Roots	Sand with Traces
-1	12" – 48"	15	Gray Sand	
-2-		19		
-3-		24		
-4	48" - 72"	31	Dark Brown	Sand
-5-		38		
-6		38		

Water Table: 26" Below Existing Grade Job #: KSM 202864-2ha

Headquarters: 11345 U.S. Highway 1 Sebastian, FL. 32958 Orlando: 723 Progress Way Sanford, FL. 32771	KS	M ENGIN AND T	EERING Esting	Mailing: P.O. Box 78-1377 Sebastian, FL. 32978 Phone: 772-589-0712 C.A. # 5693 KSMengineering.net
Date :	June 22, 2020			
Location:	Fraternal Orde Micco Road Micco, Florida HA-3, See Atta	r of the Eagles Iched Location Plan		
DEPTH IN FEET	STRATA FROM-TO	PEN READINGS	DESCRI SOI	PTION OF LS
-0-	0" – 12"		Gray Sand	with Traces of Roots
-1		20	****************	
	12" - 48"		Gray Sand	
-2-		24		
-3-		29		
-4	48" 72"	33	Dark Brown	Sand
-5-		33		
-6		39		

Water Table: 25" Below Existing Grade Job #: KSM 202864-3ha

