

GEOTECHNICAL EVALUATION REPORT

PROPOSED MOUNTAIN CROSSING SUBDIVISION

Pagosa Springs, Colorado
WT Reference No. 3127JS046

PREPARED FOR:

Summit AE
2764 Compass Drive, Suite No. 230
Grand Junction, Colorado 81506

June 26, 2017



Roger K. Southworth, P.E.
Managing Director

A handwritten signature in blue ink that reads "Jeff M. Boyd" with a small "to" and "ref" written below it.

Jeff M. Boyd, P.E.
Senior Geotechnical Engineer





**Western
Technologies
Inc.**

The Quality People
Since 1955

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June 26, 2016

Summit AE
2764 Compass Drive, Suite 230
Grand Junction, Colorado 81506

Attn: Mr. Keith Mendenhall, P.E.

Re: Geotechnical Evaluation
Proposed Mountain Crossing Subdivision
Pagosa Springs, Colorado

Job No. 3127JS046

Western Technologies Inc. has completed the geotechnical evaluation for the above-referenced project. This study was performed in general accordance with our proposal number 3127PS037 dated May 19, 2017. The results of our evaluation, including the boring location diagram, boring logs, laboratory test results, and the geotechnical recommendations are attached.

We have appreciated being of service to you in the geotechnical engineering phase of this project and are prepared to assist you during the construction phases as well. Please do not hesitate to contact us if the design conditions change or if you have any questions concerning this report. We look forward to working with you on future projects.

Sincerely,

WESTERN TECHNOLOGIES INC.

Roger K. Southworth, P.E.
Managing Director

TABLE OF CONTENTS

1.0	PURPOSE	1
2.0	PROJECT DESCRIPTION	1
3.0	SCOPE OF SERVICES	1
3.1	Field Exploration	1
3.2	Laboratory Testing	2
3.3	Analyses and Report	2
4.0	SITE CONDITIONS	2
5.0	PAVEMENT RECOMMENDATIONS	3
5.1	General	3
5.2	Design Analysis	3
5.3	General Design Considerations	4
6.0	LIMITATIONS	5
7.0	CLOSURE	6

BORING LOCATION DIAGRAM	Plate 1
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APPENDIX A

Definition of Terminology	A-1
Method of Soil Classification	A-2
Boring Log Notes	A-3
Boring Logs	A-4 through A-10

APPENDIX B

Laboratory Test Results	B-1
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**GEOTECHNICAL EVALUATION
PROPOSED MOUNTAIN CROSSING SUBDIVISION
PAGOSA SPRINGS, COLORADO**

JOB NO. 3127JS046

1.0 PURPOSE

This report contains the results of our geotechnical evaluation for the design and construction of the roads for the proposed Mountain Crossing Subdivision. The purpose of these services is to provide information and recommendations for pavement reconstruction. The results of the field exploration and the field and laboratory testing programs are presented in the Appendices.

2.0 PROJECT DESCRIPTION

The project will consist of constructing roads for a new commercial subdivision in Pagosa Springs, Colorado. The project is currently in its design stage and therefore details regarding the anticipated type and volume of traffic that the roads will experience were not available. Recommended pavement sections for various traffic loading conditions are therefore provided herein. It was expected that grade changes of less than about 3 feet would be required to develop the proposed finish site grades. We should be contacted immediately if any of our information is incorrect since a revision of the recommendations presented herein could then be necessary.

3.0 SCOPE OF SERVICES

3.1 Field Exploration

Seven borings were drilled for this project to depths of 3 to 10 feet. Six of the borings were terminated due to auger refusal on possible sandstone. The borings were drilled at the approximate locations indicated on the attached Boring Location Diagram (Plate 1). The boring locations were staked in the field by a representative of the client.

A WT geotechnical engineer monitored the drilling operations and prepared a field log for each boring. These logs contain visual classifications of the materials encountered during drilling, as well as interpolation of the subsurface conditions between samples.

The final boring logs, included in Appendix A, represent our interpretation of the field logs and may include modifications based on laboratory observations of the recovered soil



samples. The final logs describe the materials encountered, their thicknesses, and the depths at which samples were obtained.

The Unified Soil Classification System was used to classify the soil. The soil classification symbols appear on the boring logs and are briefly described in Appendix A.

3.2 Laboratory Testing

Laboratory tests were performed on representative samples to aid in material classification and to estimate the pertinent engineering properties of the soil. Testing was performed in general accordance with applicable ASTM methods. The following tests were performed and the results are presented in Appendix B.

- Water Content
- Liquid and Plastic Limits

The laboratory test results were used to develop the recommendations contained in this report.

3.3 Analyses and Report

Analyses were performed and this report was prepared for the exclusive purpose of providing geotechnical engineering information and recommendations. The scope of services for this project does not include, either specifically or by implication, any environmental assessment of the site or identification of contaminated or hazardous materials or conditions. If the owner is concerned about the potential for such contamination, other studies should be undertaken. We are available to discuss the scope of such studies with you.

This geotechnical engineering report includes a description of the project, a discussion of the field and laboratory testing programs, a discussion of the subsurface conditions, and design recommendations as required to satisfy the purpose previously described.

4.0 SITE CONDITIONS

The borings typically encountered completely to severely weathered shale to the boring termination depths. The completely weathered shale contained characteristics more indicative of lean clay than shale. Six of the borings were terminated at depths of about 3 to



9 feet due to auger refusal in probable sandstone. Groundwater was not encountered in the borings during drilling.

5.0 PAVEMENT RECOMMENDATIONS

5.1 General

The recommendations contained in this report are based on our understanding of the project criteria described in Section 2.0, **Project Description**, and the assumption that the soil and subsurface conditions are those disclosed by the borings. Others may change the plans, final elevations, or details of the project during design or construction. Substantially different subsurface conditions from those described herein may be encountered or become known. Any changes in the project criteria or subsurface conditions shall be brought to our attention in writing.

5.2 Design Analysis

The pavement design was performed in accordance with AASHTO design procedures using commercial computer software. A description of the pavement design methodology and pavement sections for various traffic loading are provided in the following sections.

TABLE 1 –PAVEMENT DESIGN PARAMETERS

Design Parameter	Design Value
Reliability, R	90%
Overall Deviation, S_o	0.50
Initial Serviceability	4.5
Terminal Serviceability	2.5
Effective Soil Resilient Modulus, $(M_R)_{eff}$	5,200 psi
Asphalt Structural Layer Coefficient	0.44
Existing Base Course - Structural Layer Coefficient	0.11



The results of the analysis are presented in the following table:

TABLE 2 - CALCULATED DAILY 18-KIP EQUIVALENT SINGLE AXLE LOADS

Design Section	Calculated Structural Number, SN	Calculated Daily 18-Kip Equivalent Single Axle Loads, ESALs*
3 inches Asphalt	2.20	2.74
8 inches Base Course		
4 inches Asphalt	2.64	8.90
8 inches Base Course		
5 inches Asphalt	3.08	22.60
8 inches Base Course		

* Based on 20-year design period with a growth factor of 1.0

The approximate average daily traffic (ADT) for different amounts of automobile and truck traffic (combination trucks) for the three pavement sections are presented below. These traffic values are for design lane traffic and assume a lane distribution factor of one and a directional factor of one.

TABLE 3 - CALCULATED DESIGN LANE TRAFFIC

Design Section	ADT for 3 Percent Percent Trucks	ADT for 5 Percent Trucks	ADT for 7 Percent Percent Trucks
3 inches Asphalt	80	50	35
8 inches Base Course			
4 inches Asphalt	250	155	115
8 inches Base Course			
5 inches Asphalt	635	395	285
8 inches Base Course			

The design team should determine which section to use based upon the anticipated amount of daily traffic and the amount of this traffic that will be from trucks.

5.3 General Design Considerations

The "design life" of a pavement is defined as the expected life at the end of which reconstruction of the pavement will need to occur. The gradient of paved surfaces should



ensure positive drainage. Water should not be allowed to pond in areas directly adjoining paved sections.

Pavement design methods are intended to provide an adequate thickness of structural materials over a particular subgrade such that wheel loads are reduced to a level the subgrade can support. The support characteristics of the subgrade for pavement design do not account for shrink and swell movements of an expansive clayey subgrade such as the soils encountered on this project. Consequently, the pavement may be adequate from a structural standpoint, yet still experience cracking and deformation due to shrink/swell movement of the subgrade. It is therefore important to minimize moisture changes in the subgrade in order to reduce shrink/swell movements. The pavement surface, subbase surface, and adjacent areas should be well drained. Excessive watering of landscaped areas adjacent to pavements should be avoided. Proper maintenance should be performed on cracks in the pavement surface to prevent water from penetrating through to the base or subbase material. Even with these precautions, some movement and related cracking may still occur, requiring periodic maintenance.

The completely weathered shale, which has characteristics more indicative of lean clay, can be used in the planned pavement areas. The existing shale is not recommended for use as fill because it will breakdown and become unstable in the presence of water.. The pavement subgrade preparation should be performed in accordance with the Colorado Department of Transportation standard specifications.

6.0 LIMITATIONS

This report has been prepared assuming the project criteria described in **Section 2.0**. If changes in the project criteria occur, or if different subsurface conditions are encountered or become known, the conclusions and recommendations presented herein shall become invalid. In any such event, WT should be contacted in order to assess the effect that such variations may have on our conclusions and recommendations.

The recommendations presented are based entirely upon data derived from a limited number of samples obtained from widely spaced borings. The attached logs are an indicator of subsurface conditions only at the specific locations and times noted. This report assumes the uniformity of the geology and soil structure, however variations can and often do exist. Whenever any deviation, difference or change is encountered or becomes known, WT should be contacted.

This report is for the exclusive benefit of our client alone. There are no intended third-party beneficiaries of our contract with the client or this report, and nothing contained in the contract or



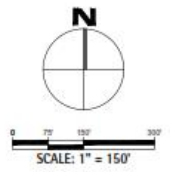
this report shall create any express or implied contractual or any other relationship with, or claim or cause of action for, any third party against WT.

This report is valid for the earlier of one year from the date of issuance, a change in circumstances, or discovered variations. After expiration, no person or entity shall rely on this report without the express written authorization of WT.

7.0 CLOSURE

We prepared this report as an aid to the designers of the proposed project. The comments, statements, recommendations and conclusions set forth in this report reflect the opinions of the authors. These opinions are based upon data obtained at the boring locations and from laboratory tests. Work on your project was performed in accordance with generally accepted standards and practices utilized by professionals providing similar services in this locality. No other warranty, express or implied, is made.





 APPROXIMATE BORING LOCATION

*Geotechnical
Environmental
Inspections
Materials*



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Technologies Inc.**
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PROJECT: PROPOSED MOUNTAIN CROSSING SUBDIVISION
JOB NO.: 3127JS046

BORING LOCATION DIAGRAM

PLATE: 1

Allowable Soil Bearing Capacity	The recommended maximum contact stress developed at the interface of the foundation element and the supporting material.
Backfill	A specified material placed and compacted in a confined area.
Base Course	A layer of specified aggregate material placed on a subgrade or subbase.
Base Course Grade	Top of base course.
Bench	A horizontal surface in a sloped deposit.
Caisson/Drilled Shaft	A concrete foundation element cast in a circular excavation which may have an enlarged base (or belled caisson).
Concrete Slabs-On-Grade	A concrete surface layer cast directly upon base course, subbase or subgrade.
Crushed Rock Base Course	A base course composed of crushed rock of a specified gradation.
Differential Settlement	Unequal settlement between or within foundation elements of a structure.
Engineered Fill	Specified soil or aggregate material placed and compacted to specified density and/or moisture conditions under observations of a representative of a soil engineer.
Existing Fill	Materials deposited through the action of man prior to exploration of the site.
Existing Grade	The ground surface at the time of field exploration.
Expansive Potential	The potential of a soil to expand (increase in volume) due to absorption of moisture.
Fill	Materials deposited by the actions of man.
Finished Grade	The final grade created as a part of the project.
Gravel Base Course	A base course composed of naturally occurring gravel with a specified gradation.
Heave	Upward movement.
Native Grade	The naturally occurring ground surface.
Native Soil	Naturally occurring on-site soil.
Rock	A natural aggregate of mineral grains connected by strong and permanent cohesive forces. Usually requires drilling, wedging, blasting or other methods of extraordinary force for excavation.
Sand and Gravel Base Course	A base course of sand and gravel of a specified gradation.
Sand Base Course	A base course composed primarily of sand of a specified gradation.
Scarify	To mechanically loosen soil or break down existing soil structure.
Settlement	Downward movement.
Soil	Any unconsolidated material composed of discrete solid particles, derived from the physical and/or chemical disintegration of vegetable or mineral matter, which can be separated by gentle mechanical means such as agitation in water.
Strip	To remove from present location.
Subbase	A layer of specified material placed to form a layer between the subgrade and base course.
Subbase Grade	Top of subbase.
Subgrade	Prepared native soil surface.



COARSE-GRAINED SOILS
LESS THAN 50% FINES

GROUP SYMBOLS	DESCRIPTION	MAJOR DIVISIONS
GW	WELL-GRADED GRAVEL OR WELL-GRADED GRAVEL WITH SAND, LESS THAN 5% FINES	GRAVELS MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE SIZE
GP	POORLY-GRADED GRAVEL OR POORLY-GRADED GRAVEL WITH SAND, LESS THAN 5% FINES	
GM	SILTY GRAVEL OR SILTY GRAVEL WITH SAND, MORE THAN 12% FINES	
GC	CLAYEY GRAVEL OR CLAYEY GRAVEL WITH SAND, MORE THAN 12% FINES	
SW	WELL-GRADED SAND OR WELL-GRADED SAND WITH GRAVEL, LESS THAN 5% FINES	SANDS MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE
SP	POORLY-GRADED SAND OR POORLY-GRADED SAND WITH GRAVEL, LESS THAN 5% FINES	
SM	SILTY SAND OR SILTY SAND WITH GRAVEL, MORE THAN 12% FINES	
SC	CLAYEY SAND OR CLAYEY SAND WITH GRAVEL, MORE THAN 12% FINES	

NOTE: Coarse-grained soils receive dual symbols if they contain 5% to 12% fines (e.g., SW-SM, GP-GC).

FINE-GRAINED SOILS
MORE THAN 50% FINES

GROUP SYMBOLS	DESCRIPTION	MAJOR DIVISIONS
ML	SILT, SILT WITH SAND OR GRAVEL, SANDY SILT, OR GRAVELLY SILT	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50
CL	LEAN CLAY OF LOW TO MEDIUM PLASTICITY, SANDY CLAY, OR GRAVELLY CLAY	
OL	ORGANIC SILT OR ORGANIC CLAY OF LOW TO MEDIUM PLASTICITY	
MH	ELASTIC SILT, SANDY ELASTIC SILT, OR GRAVELLY ELASTIC SILT	SILTS AND CLAYS LIQUID LIMIT MORE THAN 50
CH	FAT CLAY OF HIGH PLASTICITY, SANDY FAT CLAY, OR GRAVELLY FAT CLAY	
OH	ORGANIC SILT OR ORGANIC CLAY OF HIGH PLASTICITY	
PT	PEAT AND OTHER HIGHLY ORGANIC SOILS	HIGHLY ORGANIC SOILS

NOTE: Fine-grained soils may receive dual classification based upon plasticity characteristics (e.g. CL-ML).

SOIL SIZES

COMPONENT	SIZE RANGE
BOULDERS	Above 12 in.
COBBLES	3 in. – 12 in.
GRAVEL	No. 4 – 3 in.
Coarse	¾ in. – 3 in.
Fine	No. 4 – ¾ in.
SAND	No. 200 – No. 4
Coarse	No. 10 – No. 4
Medium	No. 40 – No. 10
Fine	No. 200 – No. 40
Fines (Silt or Clay)	Below No. 200

NOTE: Only sizes smaller than three inches are used to classify soils

CONSISTENCY

CLAYS & SILTS	BLOWS PER FOOT
VERY SOFT	0 – 2
SOFT	3 – 4
FIRM	5 – 8
STIFF	9 – 15
VERY STIFF	16 – 30
HARD	OVER 30

RELATIVE DENSITY

SANDS & GRAVELS	BLOWS PER FOOT
VERY LOOSE	0 – 4
LOOSE	5 – 10
MEDIUM DENSE	11 – 30
DENSE	31 – 50
VERY DENSE	OVER 50

NOTE: Number of blows using 140-pound hammer falling 30 inches to drive a 2-inch-OD (1½-inch ID) split-barrel sampler (ASTM D1586).

PLASTICITY OF FINE GRAINED SOILS

PLASTICITY INDEX	TERM
0	NON-PLASTIC
1 – 7	LOW
8 – 20	MEDIUM
Over 20	HIGH

DEFINITION OF WATER CONTENT

DRY
SLIGHTLY DAMP
DAMP
MOIST
WET
SATURATED



The number shown in "**BORING NO.**" refers to the approximate location of the same number indicated on the "Boring Location Diagram" as positioned in the field by pacing or measurement from property lines and/or existing features, or through the use of Global Positioning System (GPS) devices. The accuracy of GPS devices is somewhat variable.

"**DRILLING TYPE**" refers to the exploratory equipment used in the boring wherein **HSA = hollow stem auger**, and the dimension presented is the outside diameter of the HSA used.

"**N**" in "**BLOW COUNTS**" refers to a 2-inch outside diameter split-barrel sampler driven into the ground with a 140 pound drop-hammer dropped 30 inches repeatedly until a penetration of 18 inches is achieved or until refusal. The number of blows, or "blow count", of the hammer is recorded for each of three 6-inch increments totaling 18 inches. The number of blows required for advancing the sampler for the last 12 inches (2nd and 3rd increments) is defined as the Standard Penetration Test (SPT) "**N**"-Value. Refusal to penetration is considered more than 50 blows per 6 inches. (Ref. ASTM D1586).

"**R**" in "**BLOW COUNTS**" refers to a 3-inch outside diameter ring-lined split barrel sampler driven into the ground with a 140 pound drop-hammer dropped 30 inches repeatedly until a penetration of 12 inch is achieved or until refusal. The number of blows required to advance the sampler 12 inches is defined as the "**R**" blow count. The "**R**" blow count requires an engineered conversion to an equivalent SPT N-Value. Refusal to penetration is considered more than 50 blows per foot. (Ref. ASTM D3550).

"**CS**" in "**BLOWS/FT.**" refers to a 2½-in. outside diameter California style split-barrel sampler, lined with brass sleeves, driven into the ground with a 140-pound hammer dropped 30 inches repeatedly until a penetration of 18 inches is achieved or until refusal. The number of blows of the hammer is recorded for each of the three 6-inch increments totaling 18 inches. The number of blows required for advancing the sampler for the last 12 inches (2nd and 3rd increments) is defined as the "**CS**" blow count. The "**CS**" blow count requires an engineered conversion to an equivalent SPT N-Value. Refusal to penetration is considered more than 50 blows for a 6-inch increment. (Ref. ASTM D 3550)

"**SAMPLE TYPE**" refers to the form of sample recovery, in which **N** = Split-barrel sample, **R** = Ring-lined sample, "**CS**" = California style split-barrel sample, **G** = Grab sample, **B** = Bucket sample, **C** = Core sample (ex. diamond bit rock coring).

"**DRY DENSITY (LBS/CU FT)**" refers to the laboratory-determined dry density in pounds per cubic foot. The symbol "**NR**" indicates that no sample was recovered.

"**WATER (MOISTURE) CONTENT**" (% of Dry Wt.) refers to the laboratory-determined water content in percent using the standard test method ASTM D2216.

"**USCS**" refers to the "Unified Soil Classification System" Group Symbol for the soil type as defined by ASTM D2487 and D2488. The soils were classified visually in the field, and where appropriate, classifications were modified by visual examination of samples in the laboratory and/or by appropriate tests.

These notes and boring logs are intended for use in conjunction with the purposes of our services defined in the text. Boring log data should not be construed as part of the construction plans nor as defining construction conditions.

Boring logs depict our interpretations of subsurface conditions at the locations and on the date(s) noted. Variations in subsurface conditions and characteristics may occur between borings. Groundwater levels may fluctuate due to seasonal variations and other factors.

The stratification lines shown on the boring logs represent our interpretation of the approximate boundary between soil or rock types based upon visual field classification at the boring location. The transition between materials is approximate and may be more or less gradual than indicated.

<p><i>Geotechnical Environmental Inspections Materials</i></p>  <p>Western Technologies Inc. The Quality People Since 1955 wt-us.com</p>	<p>BORING LOG NOTES</p>	<p>PLATE A-3</p>
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DATE DRILLED: 6-6-17
 LOCATION: See Boring Location Diagram
 ELEVATION: Not Determined

BORING NO. B-1

EQUIPMENT TYPE: CME-75
 DRILLING TYPE: 7" HSA
 FIELD ENGINEER: R GOWDA

WATER CONTENT (%)	DRY DENSITY (psf)	SAMPLE TYPE	SAMPLE	BLOWS/FT.	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
4.7		G						SHALE; dark gray, completely to severely weathered, soft, dry
		G			5			
		G						
					10			
								Boring terminated at 7 feet due to auger refusal in probable sandstone

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

- N- STANDARD PENETRATION TEST
- R- RING SAMPLE
- NR- NO SAMPLE RECOVERY
- G- GRAB SAMPLE
- B- BUCKET SAMPLE
- BN- BLUNT NOSE PENETROMETER

NOTES: **Groundwater Not Encountered**



PROJECT: **PROPOSED MOUNTAIN CROSSING SUBDIVISION**
 REF. NO.: 3127JS046





BORING LOG

PLATE
A-4

DATE DRILLED: 6-6-17
 LOCATION: See Boring Location Diagram
 ELEVATION: Not Determined

BORING NO. B-2

EQUIPMENT TYPE: CME-75
 DRILLING TYPE: 7" HSA
 FIELD ENGINEER: R GOWDA

WATER CONTENT (%)	DRY DENSITY (psf)	SAMPLE TYPE	SAMPLE	BLOWS/FT.	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
1.8		G						SHALE; dark gray, completely to severely weathered, soft, dry
1.1		G						
					5			Boring terminated at 5 feet due to auger refusal in probable sandstone
					10			

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

- N- STANDARD PENETRATION TEST
- R- RING SAMPLE
- NR- NO SAMPLE RECOVERY
- G- GRAB SAMPLE
- B- BUCKET SAMPLE
- BN- BLUNT NOSE PENETROMETER

NOTES: Groundwater Not Encountered



WESTERN TECHNOLOGIES INC.

PROJECT: PROPOSED MOUNTAIN CROSSING SUBDIVISION
 REF. NO.: 3127JS046


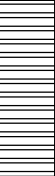

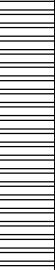


BORING LOG

PLATE
A-5

DATE DRILLED: 6-6-17
 LOCATION: See Boring Location Diagram
 ELEVATION: Not Determined

BORING NO. B-3

EQUIPMENT TYPE: CME-75
 DRILLING TYPE: 7" HSA
 FIELD ENGINEER: R GOWDA

WATER CONTENT (%)	DRY DENSITY (psf)	SAMPLE TYPE	SAMPLE	BLOWS/FT.	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
1.7		G						SHALE; dark gray, completely to severely weathered, soft, dry
1.5		G						
		G			5			
								Boring terminated at 8.5 feet due to auger refusal in probable sandstone
					10			

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

- N- STANDARD PENETRATION TEST
- R- RING SAMPLE
- NR- NO SAMPLE RECOVERY
- G- GRAB SAMPLE
- B- BUCKET SAMPLE
- BN- BLUNT NOSE PENETROMETER

NOTES: **Groundwater Not Encountered**



PROJECT: **PROPOSED MOUNTAIN CROSSING SUBDIVISION**
 REF. NO.: 3127JS046

BORING LOG

PLATE
A-6

DATE DRILLED: 6-6-17
 LOCATION: See Boring Location Diagram
 ELEVATION: Not Determined

BORING NO. B-4

EQUIPMENT TYPE: CME-75
 DRILLING TYPE: 7" HSA
 FIELD ENGINEER: R GOWDA

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

WATER CONTENT (%)	DRY DENSITY (psf)	SAMPLE TYPE	SAMPLE	BLOWS/FT.	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
		G						SHALE; dark gray, completely to severely weathered, soft, dry
		G						
		G			5			
					10			
								Boring terminated at 9 feet due to auger refusal in probable sandstone

- N- STANDARD PENETRATION TEST
- R- RING SAMPLE
- NR- NO SAMPLE RECOVERY
- G- GRAB SAMPLE
- B- BUCKET SAMPLE
- BN- BLUNT NOSE PENETROMETER

NOTES: **Groundwater Not Encountered**



PROJECT: **PROPOSED MOUNTAIN CROSSING SUBDIVISION**
 REF. NO.: 3127JS046





BORING LOG

PLATE
A-7

DATE DRILLED: 6-6-17
 LOCATION: See Boring Location Diagram
 ELEVATION: Not Determined

BORING NO. B-5

EQUIPMENT TYPE: CME-75
 DRILLING TYPE: 7" HSA
 FIELD ENGINEER: R GOWDA

WATER CONTENT (%)	DRY DENSITY (psf)	SAMPLE TYPE	SAMPLE	BLOWS/FT.	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
1.8		G						SHALE; dark gray, completely to severely weathered, soft, dry
4.6		G			5			
					10			Boring terminated at 10 feet

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

- N- STANDARD PENETRATION TEST
- R- RING SAMPLE
- NR- NO SAMPLE RECOVERY
- G- GRAB SAMPLE
- B- BUCKET SAMPLE
- BN- BLUNT NOSE PENETROMETER

NOTES: **Groundwater Not Encountered**



PROJECT: **PROPOSED MOUNTAIN CROSSING SUBDIVISION**
 REF. NO.: 3127JS046

BORING LOG





PLATE
A-8

DATE DRILLED: 6-6-17
 LOCATION: See Boring Location Diagram
 ELEVATION: Not Determined

BORING NO. B-6

EQUIPMENT TYPE: CME-75
 DRILLING TYPE: 7" HSA
 FIELD ENGINEER: R GOWDA

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

WATER CONTENT (%)	DRY DENSITY (psf)	SAMPLE TYPE	SAMPLE	BLOWS/FT.	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
0.9		G						SHALE; dark gray, completely to severely weathered, soft, dry
1.2		G						
					5			Boring terminated at 3 feet due to auger refusal in probable sandstone
					10			

- N- STANDARD PENETRATION TEST
- R- RING SAMPLE
- NR- NO SAMPLE RECOVERY
- G- GRAB SAMPLE
- B- BUCKET SAMPLE
- BN- BLUNT NOSE PENETROMETER

NOTES: **Groundwater Not Encountered**




PROJECT: **PROPOSED MOUNTAIN CROSSING SUBDIVISION**
 REF. NO.: 3127JS046

BORING LOG

PLATE
A-9

Boring No.	Depth (ft)	USCS Class.	Water Content (%)	Particle Size Distribution (%) Passing by Weight						Atterberg Limits		Pocket Penetrometer (tsf)	Remarks
				3"	¾"	#4	#10	#40	#200	LL	PI		
B-1	0 - 2	SHALE	4.7							31	11		
B-2	0 - 2	SHALE	1.8										
B-2	2 - 5	SHALE	1.1										
B-3	0 - 2	SHALE	1.7							30	12		
B-3	2 - 5	SHALE	1.5										
B-5	0 - 2	SHALE	1.8										
B-5	5 - 10	SHALE	4.6										
B-6	0 - 2	SHALE	0.9							28	12		
B-6	2 - 3	SHALE	1.2										

NOTE:

<p>Geotechnical Environmental Inspections Materials</p>  <p>Western Technologies Inc. The Quality People Since 1955 wt-us.com</p>	<p>PROJECT: PROPOSED MOUNTAIN CROSSING SUBDIVISION JOB NO.: 3127JS046</p>	<p>PLATE</p> <p>B-1</p>
	<p>LABORATORY TEST RESULTS</p>	