



**Western
Technologies
Inc.**
The Quality People
Since 1955

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June 13, 2014

Stantec Consulting, Inc.
201 North Bonita Avenue, Suite 101
Tucson, Arizona 85745

Attn: Richard Bigelow

Re: Pavement Design Memorandum
Davis Road Realignment
Mileposts 4.79 to 5.40 and 12.97 to 13.28
Cochise County, Arizona

WT Job No. 2929JH074-B

Western Technologies, Inc. (WT) has completed the geotechnical evaluation for the proposed roadway realignment of Davis Road between Mileposts 4.79 to 5.40 and 12.97 to 13.28. This study was performed in general accordance with our proposal number 2929PH396-1 dated September 14, 2009 and Proposal Amendment No. 1, dated March 1, 2011. The results of our evaluation, including the boring logs, laboratory test results, and geotechnical recommendations are attached.

Project Description

Based on information provided by Stantec Consulting, the project will consist of design and construction of approximately 0.92 miles of Davis Road between Mileposts 4.79 to 5.40 and 12.97 to 13.28. Final site grading plans were not available at the time of this report; however, it is understood that the majority of the new road alignment will require fills ranging from 1 to 8 feet to achieve final pavement grade. Should this information not be correct we should be notified immediately.

Field Exploration

Eleven test borings were advanced to depths of 5 to 21.5 feet below site grade in the proposed roadway realignment area. In addition, fourteen borings were drilled to depths of 15.5 to 26 feet in drainage structure and borrow site areas near the proposed roadway alignment. The borings were at the approximate locations shown on the attached Boring Location Diagrams, Plates 1 and 2. A field log was prepared for each soil boring. These logs contain visual classifications of the materials encountered during excavation as well as interpolation of the subsurface conditions between samples. The final logs, included as Plates 6 through 30, represent our interpretation of the field

logs and may include modifications based on laboratory observations and tests of the field samples. The final logs describe the materials encountered, their thickness, and the locations where samples were obtained.

As presented on the boring logs, soils within the upper 5 feet of existing site grades were very loose to very dense Silty SAND and Clayey SAND and stiff to hard Sandy CLAY. Groundwater was not encountered in any boring at the time of exploration.

The existing roadway pavement section was measured in Borings 1, 2 and 8 through 14 where our borings were drilled within the existing roadway. The pavement surface generally consisted of 3 to 5 inches of asphalt concrete placed on subgrade soils. Two inches of aggregate base was observed below the asphalt concrete in Boring 1. Pavement section thicknesses, where encountered, are provided on the attached Boring Logs (Plates 6 through 30). It is our understanding that existing pavements will be milled and blended with the subgrade soils, used as engineered fill or completely removed from the project site.

Laboratory Testing

Laboratory analyses were performed on representative soil samples to aid in material classification and to estimate pertinent engineering properties of the on-site soils. Testing was performed in general accordance with the applicable ASTM and Arizona methods. The tests performed included in-situ moisture content, dry density, gradation, -200 sieve analysis, plasticity, compression, soluble sulfate and chloride content, minimum electrical resistivity, moisture-density relationship (proctor) and resistance value (R-value). Laboratory test results are presented on Plates 17 through 19.

Anticipated Traffic

Davis Road has been classified as a major collector street type according to information provided by Cochise County. The type of traffic anticipated to use the roadway includes passenger vehicles, buses and small-, medium- and large-size trucks. Average daily traffic counts were provided by Cochise County for Davis Road at Mileposts 17.00 and 23.96. An average daily traffic (ADT) value of 1,508 was calculated based on the Traffic Studies report taken in October 2007 for Davis Road at Mileposts 17.00 and 23.96. This value was projected to the year 2011 by assuming a growth rate of 2 percent per year. In addition, an annual growth rate of 2 percent was estimated for this segment of Davis Road over the next 20 years. On this basis, a directional distribution factor of 50 percent and a lane distribution factor of 100 percent (1 lane per direction), a total Equivalent 18-kip Single Axle Load (ESAL) for the main roadway design lane of 1,039,709 was obtained. The following table shows the calculation of the total ESALs for an assumed traffic distribution.

Vehicle Type	Total Vehicles Design Lane	% Vehicles	ESAL Factor	Design ESAL
Automobiles	7,238,093	42	0.0008	2,432
Light Trucks	7,238,093	48	0.0100	34,743
Buses	7,238,093	1	0.2500	18,095
Medium Trucks	7,238,093	3	0.4000	86,857
Heavy Trucks	7,238,093	6	2.0668	897,582
			Total ESALs	1,039,709

Pavement Sections - Mileposts 4.79 to 5.40

A resilient modulus (M_r) of 9,377 pounds per square inch was assigned to the on-site soil based on the ADOT procedure that utilizes both measured and correlated R-values. A reliability value of 90 percent with a 0.35 combined standard error was assigned to the roadway, a value of 4.1 was assigned to the present serviceability index and 2.6 to the terminal serviceability index. Based upon these parameters and a seasonal variation factor of 1.9, the resulting pavement section alternatives according to the AASHTO procedure and anticipated design life of 20 years are:

Pavement Section Alternative No.	Asphalt Concrete (inches)	Aggregate Base (inches)
1A	5	10
2A	4½	12

Pavement Sections - Mileposts 12.97 to 13.28

A resilient modulus (M_r) of 9,035 pounds per square inch was assigned to the on-site soil based on the ADOT procedure that utilizes both measured and correlated R-values. A reliability value of 90 percent with a 0.35 combined standard error was assigned to the roadway, a value of 4.1 was assigned to the present serviceability index and 2.6 to the terminal serviceability index. Based upon these parameters and a seasonal variation factor of 1.9, the resulting pavement section alternatives according to the AASHTO procedure and anticipated design life of 20 years are:

Pavement Section Alternative No.	Asphalt Concrete (inches)	Aggregate Base (inches)
1B	5	10
2B	4½	12

Bituminous surfacing should be constructed of dense-graded, central plant-mix, asphalt concrete in accordance with Section 409 of the ADOT Standard Specifications for Road and Bridge Construction, Current Edition. The asphalt binder should be specified as PG 64-22. Base course should conform to Section 303, Class 2 or 3 of the ADOT Standard Specifications.

The gradient of paved surfaces should ensure positive drainage. Water should not pond in areas directly adjoining paved sections. The on-site clayey subgrade soils may soften and lose stability if subjected to conditions that result in an increase in water content.

The "design life" (20 years) of a pavement is defined as the expected life at the end of which reconstruction of the pavement will need to occur. Normal maintenance, including crack sealing, slurry sealing, and/or chip sealing, should be performed during the life of the pavement.

Placement and Compaction

Fill should be placed and compacted in horizontal lifts, using equipment and procedures that will produce recommended water contents and densities throughout the lift. Uncompacted lift thicknesses should not exceed 12 inches. Fill and subgrade soils should be moisturized to within 3 percent of optimum moisture (as determined using ASTM D698), and compacted to at least 95 percent of the maximum density (as determined using ASTM D698). Aggregate base course should be moisturized to within 3 percent of optimum moisture (as determined using ASTM D698), and compacted to at least 100 percent of the maximum density (as determined using ASTM D698).

According to ADOT pavement design procedures, the construction control R-values (R_c) for Mileposts 4.79 to 5.40 and 12.97 to 13.28 should be 20 and 22, respectively. Plates 37 and 38 provide Materials Subgrade Acceptance Charts based on an R_c of 20 and 22.

Test results on soil from the proposed borrow area indicate that they are similar to the native soils in the proposed roadway alignment. According to the attached Materials Subgrade Acceptance Charts, the soils in the borrow area are suitable for use as sub-base fill below the proposed roadway in both project areas.

Closure

The conclusions contained in this report for the proposed construction are contingent upon compliance with recommendations presented herein. Earthwork placement and compaction should be performed in accordance with applicable sections of the ADOT Standard Specifications for Road and Bridge Construction, Current Edition. To assess compliance, observation and testing should be performed under the direction of a geotechnical engineer.

Work on this project was performed in accordance with generally accepted industry standards and practices by professionals providing similar services in this locality. No other warranty, express or implied, is made. If design conditions change, or if you have any questions concerning this report or any of our testing, inspection, design and consulting services, please do not hesitate to contact us. We appreciate the opportunity to continue working with you on this project.

Sincerely,
WESTERN TECHNOLOGIES INC.
Geotechnical Engineering Services



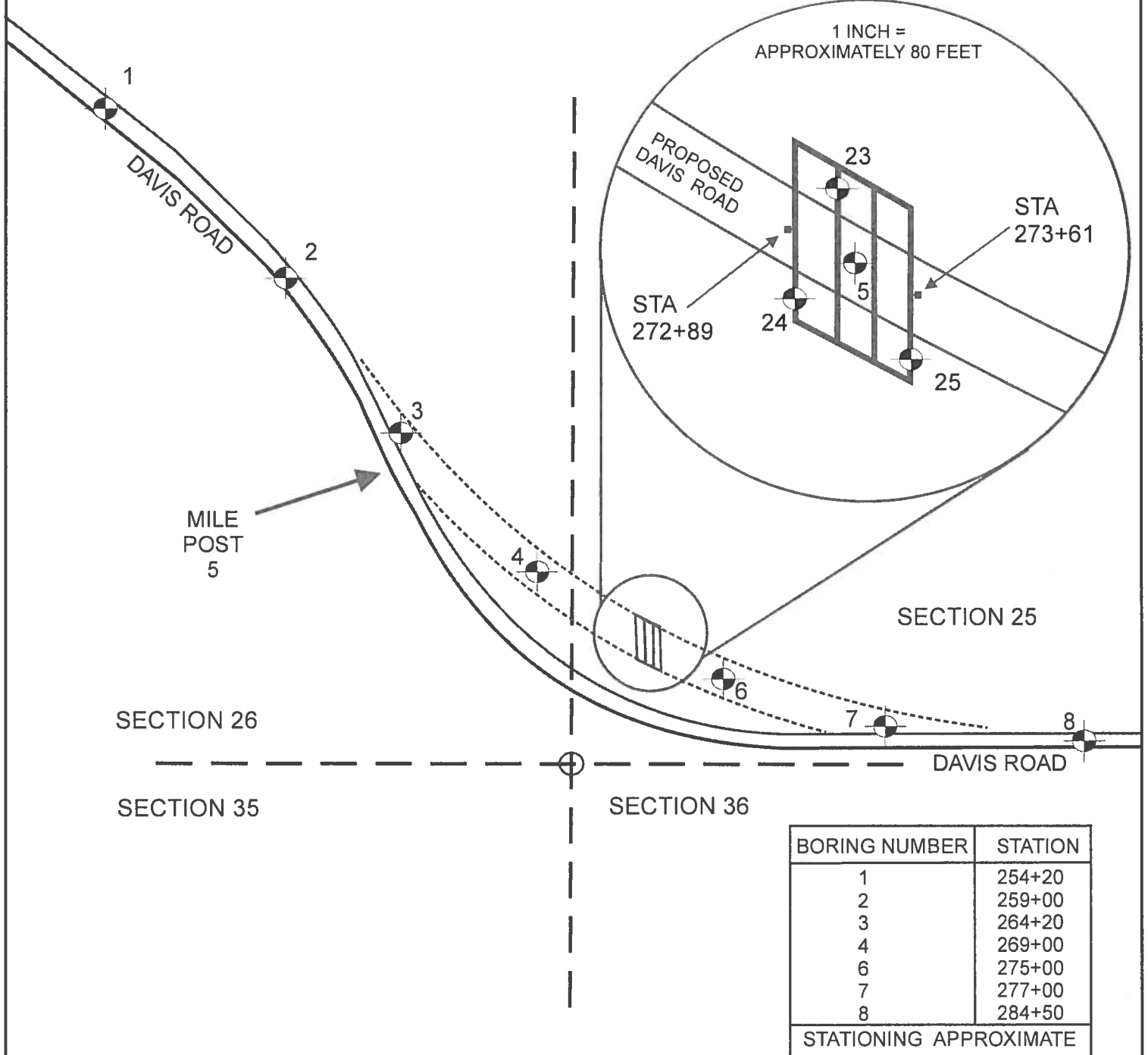
Justin M. Heinecke, P.E., R.G.
Senior Geotechnical Engineer

A handwritten signature in black ink, appearing to read "Matt S".

Randall D. Harris, P.E.
Senior Geotechnical Engineer

Copies to: Addressee (3)

TOWNSHIP 20 SOUTH
RANGE 23 EAST



LEGEND

REFERENCE PLAN PROVIDED BY STANTEC

- APPROXIMATE LOCATION OF DAVIS ROAD REALIGNMENT
- APPROXIMATE BORING LOCATION

0 400 800 1200

SCALE: 1 INCH = APPROXIMATELY 400 FEET



DAVIS ROAD REALIGNMENT	
Boring Location Diagram	
Western Technologies Inc.	
Job No. 2929JH074-B	PLATE: 1

TOWNSHIP 21 SOUTH
RANGE 24 EAST
SECTION 13

1 INCH =
APPROXIMATELY 100 FEET

DAVIS ROAD

MILE
POST
13

STA
687+21

STA
687+65

DAVIS ROAD

PROPOSED
STORMWATER
BASIN

OLD
BASIN
LOCATION

TOWNSHIP 21 SOUTH
RANGE 25 EAST
SECTION 18

DAVIS ROAD

BORING NUMBER	STATION
9	685+80
11	689+95
12	692+32
13	695+10
14	700+00
STATIONING APPROXIMATE	

LEGEND

REFERENCE PLAN PROVIDED BY STANTEC

SECTION LINE

APPROXIMATE BORING LOCATION

0 300 600 900

SCALE: 1 INCH = APPROXIMATELY 300 FEET



DAVIS ROAD REALIGNMENT

Boring Location Diagram

Western Technologies Inc.

Job No. 2929JH074-B

PLATE: 2

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 material placed on a subgrade or subbase.
Base Course Grade	Top of base course.
Bench	A horizontal surface in a sloped deposit.
Caisson	A concrete foundation element cast in a circular excavation which may have an enlarged base. Sometimes referred to as a cast-in-place pier.
Concrete Slabs-on-Grade	A concrete surface layer cast directly upon a base, 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 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 & Gravel Base	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.

DAVIS ROAD REALIGNMENT

Definition of Terminology

Western Technologies Inc.

Job No.: 2929JH074-B

Plate: 3

COARSE-GRAINED SOILS
LESS THAN 50% FINES *

GROUP SYMBOLS	DESCRIPTION	MAJOR DIVISIONS
GW	WELL-GRADED GRAVELS OR GRAVEL-SAND MIXTURES, LESS THAN 5% FINES	GRAVELS MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE SIZE
GP	POORLY-GRADED GRAVELS OR GRAVEL-SAND MIXTURES, LESS THAN 5% FINES	
GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES, MORE THAN 12% FINES	
GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES, MORE THAN 12% FINES	
SW	WELL-GRADED SANDS OR GRAVELLY SANDS, LESS THAN 5% FINES	SANDS MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE
SP	POORLY-GRADED SANDS OR GRAVELLY SANDS, LESS THAN 5% FINES	
SM	SILTY SANDS, SAND-SILT MIXTURES, MORE THAN 12% FINES	
SC	CLAYEY SANDS, SAND-CLAY MIXTURES, 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	INORGANIC SILTS, VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50
CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS	
OL	ORGANIC SILTS OR ORGANIC SILT-CLAYS OF LOW PLASTICITY	
MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDS OR SILTS, ELASTIC SILTS	SILTS AND CLAYS LIQUID LIMIT MORE THAN 50
CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS	
OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY	
PT	PEAT, MUCK AND OTHER HIGHLY ORGANIC SOILS	HIGHLY ORGANIC SOILS

NOTE: Fine-grained soils may receive dual classification based upon plasticity characteristics.

SOIL SIZES

COMPONENT	SIZE RANGE
BOULDERS	Above 12 in.
COBBLES	3 in. – 12 in.
GRAVEL	No. 4 – 3 in.
Coarse	3/4 in. – 3 in.
Fine	No. 4 – 3/4 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	2 – 4
FIRM	4 – 8
STIFF	8 – 16
VERY STIFF	16 – 32
HARD	Over 32

RELATIVE DENSITY

SANDS & GRAVELS	BLOWS PER FOOT *
VERY LOOSE	0 – 4
LOOSE	4 – 10
MEDIUM DENSE	10 – 30
DENSE	30 – 50
VERY DENSE	Over 50

*Number of blows of 140 pound hammer falling 30 inches to drive a 2 inch O.D. (1 3/8 inch ID) split spoon (ASTM D1586).

PLASTICITY OF FINE GRAINED SOILS

PLASTICITY INDEX	TERM
0	NON-PLASTIC
1 – 7	LOW
8 – 25	MEDIUM
Over 25	HIGH

DEFINITION OF WATER CONTENT

DRY
SLIGHTLY DAMP
DAMP
MOIST
WET
SATURATED

DAVIS ROAD REALIGNMENT

Method of Classification

Western Technologies Inc.

Job No.: 2929JH074-B

Plate: 4

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.

"**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-in. outside diameter split-barrel sampler driven into the ground with a 140 lb. drop-hammer dropped 30 in. repeatedly until a penetration of 18 in. is achieved or until refusal. The number of blows, or "blow count", of the hammer is recorded for each of three 6-in. increments totaling 18 in. The number of blows required for advancing the sampler for the last 12 in. (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 D 1586).

"**R**" in "**BLOW COUNTS**" refers to a 3-in. outside diameter ring-lined split spoon sampler driven into the ground with a 140 lb. drop-hammer dropped 30 in. repeatedly until a penetration of 12 in. is achieved or until refusal. The number of blows required to advance the sampler 12 in. 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 D 3550).

"**SAMPLE TYPE**" refers to the form of sample recovery, in which **N** = **Split-barrel sample**, **R** = **Ring-lined 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. The symbol "**DU**" indicates that determination of dry density was not possible.

"**MOISTURE CONTENT (% OF DRY WT.)**" refers to the laboratory-determined water content in percent (Ref. ASTM D2216).

"**USCS**" refers to the "Unified Soil Classification System" Group Symbol for the soil type as defined by ASTM D 2487 and D 2488. 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.

DAVIS ROAD REALIGNMENT	
Boring Log Notes	
Western Technologies Inc.	
Job No.: 2929JH074-B	Plate: 5

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.

DATE DRILLED: 10-26-09			BORING NO. 1			EQUIPMENT TYPE: CME-75		
LOCATION: See Location Diagram						DRILLING TYPE: 7"HSA		
ELEVATION: Not Determined						FIELD ENGINEER: R. Woner		
MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOW COUNTS	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
		G				SC		3 inches Asphalt Concrete on 2 inches Aggregate Base Course
								Clayey SAND; brown, medium dense, damp
					5			Boring Stopped at 5 Feet
					10			
N- STANDARD PENETRATION TEST R- RING SAMPLE NR- NO SAMPLE RECOVERY G- GRAB SAMPLE B- BUCKET SAMPLE						NOTES: Groundwater Not Encountered		
 WESTERN TECHNOLOGIES INC.						PROJECT: DAVIS ROAD REALIGNMENT		PLATE 6
						REF. NO.: 2929JH074-B		
						BORING LOG		

DATE DRILLED: 10-26-09
LOCATION: See Location Diagram
ELEVATION: Not Determined

BORING NO. 2

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

MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOW COUNTS	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
		G				SC		4 inches Asphalt Concrete on 0 inches Aggregate Base Course Clayey SAND; brown, medium dense, slightly damp
					5			Boring Stopped at 5 Feet
					10			

N- STANDARD PENETRATION TEST
R- RING SAMPLE
NR- NO SAMPLE RECOVERY
G- GRAB SAMPLE
B- BUCKET SAMPLE

NOTES: Groundwater Not Encountered



WESTERN TECHNOLOGIES INC.

PROJECT: DAVIS ROAD REALIGNMENT
REF. NO.: 2929JH074-B

BORING LOG

PLATE

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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.

DATE DRILLED: 10-26-09

LOCATION: See Location Diagram

ELEVATION: Not Determined

BORING NO. 3

EQUIPMENT TYPE: CME-75

DRILLING TYPE: 7"HSA

FIELD ENGINEER: R. Woner

MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOW COUNTS	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
		G				SC		Clayey SAND; reddish brown, medium dense, slightly damp
					5			Boring Stopped at 5 Feet
					10			

N- STANDARD PENETRATION TEST
R- RING SAMPLE
NR- NO SAMPLE RECOVERY
G- GRAB SAMPLE
B- BUCKET SAMPLE

NOTES: Groundwater Not Encountered



WESTERN TECHNOLOGIES INC.

PROJECT: DAVIS ROAD REALIGNMENT

REF. NO.: 2929JH074-B

PLATE

8

BORING LOG

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.

DATE DRILLED: 10-27-09
LOCATION: See Location Diagram
ELEVATION: Not Determined

BORING NO. 4

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

MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOW COUNTS	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
		G			5	CL		Sandy CLAY; brown, stiff, slightly damp
					10			Boring Stopped at 5 Feet

N- STANDARD PENETRATION TEST
R- RING SAMPLE
NR- NO SAMPLE RECOVERY
G- GRAB SAMPLE
B- BUCKET SAMPLE

NOTES: Groundwater Not Encountered



WESTERN TECHNOLOGIES INC.

PROJECT: DAVIS ROAD REALIGNMENT
REF. NO.: 2929JH074-B

BORING LOG

PLATE

9

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.

DATE DRILLED: 10-27-09
 LOCATION: See Location Diagram
 ELEVATION: Not Determined

BORING NO. 5

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

MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOW COUNTS	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
4.1	95	G				SM		Silty SAND; brown, loose, slightly damp
		R		15				
10.0	102	R		9	5			becomes damp
								with gravel
		R		50/8"	10			silt increases, becomes dense
		R		50/4"	15			becomes very dense
		G		50/6"	20	SC		Clayey SAND; reddish brown, very dense, slightly damp
		R		50/2" NR	25			
Boring Stopped at 25 Feet								

N- STANDARD PENETRATION TEST
 R- RING SAMPLE
 NR- NO SAMPLE RECOVERY
 G- GRAB SAMPLE
 B- BUCKET SAMPLE

NOTES: Groundwater Not Encountered



WESTERN TECHNOLOGIES INC.

PROJECT: DAVIS ROAD REALIGNMENT
 REF. NO.: 2929JH074-B

BORING LOG

PLATE

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.

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.

DATE DRILLED: 10-27-09			BORING NO. 6			EQUIPMENT TYPE: CME-75		
LOCATION: See Location Diagram						DRILLING TYPE: 7"HSA		
ELEVATION: Not Determined						FIELD ENGINEER: R. Woner		
MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOW COUNTS	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
		G				SC		Clayey SAND; reddish brown, medium dense, slightly damp
					5			Boring Stopped at 5 Feet
					10			
N-	STANDARD PENETRATION TEST					NOTES: Groundwater Not Encountered		
R-	RING SAMPLE							
NR-	NO SAMPLE RECOVERY							
G-	GRAB SAMPLE							
B-	BUCKET SAMPLE							
 WESTERN TECHNOLOGIES INC.						PROJECT: DAVIS ROAD REALIGNMENT		PLATE 11
						REF. NO.: 2929JH074-B		
						BORING LOG		

DATE DRILLED: 10-26-09
LOCATION: See Location Diagram
ELEVATION: Not Determined

BORING NO. 7

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

MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOW COUNTS	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
		G				SC		Clayey SAND; brown, medium dense, slightly damp
					5			Boring Stopped at 5 Feet
					10			

N- STANDARD PENETRATION TEST
R- RING SAMPLE
NR- NO SAMPLE RECOVERY
G- GRAB SAMPLE
B- BUCKET SAMPLE

NOTES: Groundwater Not Encountered



WESTERN TECHNOLOGIES INC.

PROJECT: DAVIS ROAD REALIGNMENT
REF. NO.: 2929JH074-B

BORING LOG

PLATE

12

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.

DATE DRILLED: 10-26-09

LOCATION: See Location Diagram

ELEVATION: Not Determined

BORING NO. 8

EQUIPMENT TYPE: CME-75

DRILLING TYPE: 7"HSA

FIELD ENGINEER: R. Woner

MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOW COUNTS	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
		G				SC		5 inches Asphalt Concrete on 0 inches Aggregate Base Course
								Clayey SAND; with gravel, tan, medium dense, slightly damp
					5			Boring Stopped at 5 Feet
					10			

N- STANDARD PENETRATION TEST
R- RING SAMPLE
NR- NO SAMPLE RECOVERY
G- GRAB SAMPLE
B- BUCKET SAMPLE

NOTES: Groundwater Not Encountered



WESTERN TECHNOLOGIES INC.

PROJECT: DAVIS ROAD REALIGNMENT

REF. NO.: 2929JH074-B

PLATE

13

BORING LOG

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.

DATE DRILLED: 10-26-09

LOCATION: See Location Diagram

ELEVATION: Not Determined

BORING NO. 9

EQUIPMENT TYPE: CME-75

DRILLING TYPE: 7"HSA

FIELD ENGINEER: R. Woner

MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOW COUNTS	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
		G				SC		3 inches Asphalt Concrete on 0 inches Aggregate Base Course
								Clayey SAND; with gravel, brown, medium dense, damp
					5			Boring Stopped at 5 Feet
					10			

N- STANDARD PENETRATION TEST
R- RING SAMPLE
NR- NO SAMPLE RECOVERY
G- GRAB SAMPLE
B- BUCKET SAMPLE

NOTES: Groundwater Not Encountered



WESTERN TECHNOLOGIES INC.

PROJECT: DAVIS ROAD REALIGNMENT

REF. NO.: 2929JH074-B

PLATE

14

BORING LOG

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.

DATE DRILLED: 10-26-09
 LOCATION: See Location Diagram
 ELEVATION: Not Determined

BORING NO. 10

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

MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOW COUNTS	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
		G				SC		3 inches Asphalt Concrete on 0 inches Aggregate Base Course
7.6	96	R		26				Clayey SAND; brown, medium dense, slightly damp
5.9	98	R		20	5			becomes damp
7.9	94	R		17	10			
		R		50/4" NR	15			becomes very dense
								Refusal at 16 Feet on Nested Cobbles
					20			
					25			

N- STANDARD PENETRATION TEST
 R- RING SAMPLE
 NR- NO SAMPLE RECOVERY
 G- GRAB SAMPLE
 B- BUCKET SAMPLE

NOTES: Groundwater Not Encountered



WESTERN TECHNOLOGIES INC.

PROJECT: DAVIS ROAD REALIGNMENT
 REF. NO.: 2929JH074-B

BORING LOG

PLATE

15

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.

DATE DRILLED: 10-26-09
LOCATION: See Location Diagram
ELEVATION: Not Determined

BORING NO. 11

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

MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOW COUNTS	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
		G				SC		3 inches Asphalt Concrete on 0 inches Aggregate Base Course Clayey SAND; with gravel, reddish brown, medium dense, damp
					5			Boring Stopped at 5 Feet
					10			

N- STANDARD PENETRATION TEST
R- RING SAMPLE
NR- NO SAMPLE RECOVERY
G- GRAB SAMPLE
B- BUCKET SAMPLE

NOTES: Groundwater Not Encountered



WESTERN TECHNOLOGIES INC.

PROJECT: DAVIS ROAD REALIGNMENT
REF. NO.: 2929JH074-B

BORING LOG

PLATE

16

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.

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.

DATE DRILLED: 10-26-09			BORING NO. 12			EQUIPMENT TYPE: CME-75		
LOCATION: See Location Diagram						DRILLING TYPE: 7"HSA		
ELEVATION: Not Determined						FIELD ENGINEER: R. Woner		
MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOW COUNTS	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
17.7	105	G				SM		3 inches Asphalt Concrete on 0 inches Aggregate Base Course
		R		43 NR				Silty SAND; trace gravel, reddish brown, medium dense, slightly damp with gravel
		R		41	5	CL		Sandy CLAY; brown, very stiff, moist
		G		28	10			
		R		44	15	SM		Silty SAND; with gravel, brown, medium dense, damp
		R		50/10"	20			gravel increases, becomes dense
		R		50/9"	25			
								Boring Stopped at 25.8 Feet
N- STANDARD PENETRATION TEST R- RING SAMPLE NR- NO SAMPLE RECOVERY G- GRAB SAMPLE B- BUCKET SAMPLE						NOTES: Groundwater Not Encountered		
WESTERN TECHNOLOGIES INC.						PROJECT: DAVIS ROAD REALIGNMENT		PLATE
						REF. NO.: 2929JH074-B		
						BORING LOG		17

DATE DRILLED: 10-26-09

LOCATION: See Location Diagram

ELEVATION: Not Determined

BORING NO. 13

EQUIPMENT TYPE: CME-75

DRILLING TYPE: 7"HSA

FIELD ENGINEER: R. Woner

MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOW COUNTS	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
		G				SC		4 inches Asphalt Concrete on 0 inches Aggregate Base Course
					5			Clayey SAND; with gravel, reddish brown, medium dense, slightly damp
					10			Boring Stopped at 5 Feet

N- STANDARD PENETRATION TEST
R- RING SAMPLE
NR- NO SAMPLE RECOVERY
G- GRAB SAMPLE
B- BUCKET SAMPLE

NOTES: Groundwater Not Encountered



WESTERN TECHNOLOGIES INC.

PROJECT: DAVIS ROAD REALIGNMENT

REF. NO.: 2929JH074-B

PLATE

18

BORING LOG

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.

EQUIPMENT TYPE: CME-75

DRILLING TYPE: 7"HSA

FIELD ENGINEER: R. Woner

MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOW COUNTS	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
		G				SC		3 inches Asphalt Concrete on 0 inches Aggregate Base Course
								Clayey SAND; trace gravel, reddish brown, medium dense, damp
					5			Boring Stopped at 5 Feet
					10			

N-	STANDARD PENETRATION TEST
R-	RING SAMPLE
NR-	NO SAMPLE RECOVERY
G-	GRAB SAMPLE
B-	BUCKET SAMPLE

NOTES: Groundwater Not Encountered



WESTERN TECHNOLOGIES INC.

PROJECT: DAVIS ROAD REALIGNMENT

REF. NO.: 2929JH074-B

PLATE

19

BORING LOG

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.

DATE DRILLED: 10-27-09
 LOCATION: See Location Diagram
 ELEVATION: Not Determined

BORING NO. 15

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

MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOW COUNTS	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
		G				CL		Sandy CLAY; brown, very stiff, slightly damp
		R		50/11"				becomes hard
		G		47	5	SC		Clayey SAND; reddish brown, medium dense, slightly damp
		R		23				
		G			10			
		R		50/7"				becomes very dense
		R		50/7"	15			
								Boring Stopped at 15.5 Feet
					20			
					25			

N- STANDARD PENETRATION TEST
 R- RING SAMPLE
 NR- NO SAMPLE RECOVERY
 G- GRAB SAMPLE
 B- BUCKET SAMPLE

NOTES: Groundwater Not Encountered



WESTERN TECHNOLOGIES INC.

PROJECT: DAVIS ROAD REALIGNMENT
 REF. NO.: 2929JH074-B

BORING LOG

PLATE

20

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.

DATE DRILLED: 10-27-09
 LOCATION: See Location Diagram
 ELEVATION: Not Determined

BORING NO. 16

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

MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOW COUNTS	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
12.8	109	G				SC		Clayey SAND; brown, medium dense, slightly damp
		R		47				becomes damp
6.8	102	G		41	5			
		R						
6.5	95	R		36				
		G			10			becomes dense
5.8	107	R		50/11"				
6.2	104	R		47	15			becomes medium dense
								Boring Stopped at 16 Feet
					20			
					25			

N- STANDARD PENETRATION TEST
 R- RING SAMPLE
 NR- NO SAMPLE RECOVERY
 G- GRAB SAMPLE
 B- BUCKET SAMPLE

NOTES: Groundwater Not Encountered



WESTERN TECHNOLOGIES INC.

PROJECT: DAVIS ROAD REALIGNMENT
 REF. NO.: 2929JH074-B

BORING LOG

PLATE

21

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.

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.

DATE DRILLED: 10-27-09			BORING NO. 17			EQUIPMENT TYPE: CME-75		
LOCATION: See Location Diagram						DRILLING TYPE: 7"HSA		
ELEVATION: Not Determined						FIELD ENGINEER: R. Woner		
MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOW COUNTS	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
		G				CL		Sandy CLAY; trace gravel, brown, medium dense, slightly damp
		R		35				
		G		43	5	SC		Clayey SAND; brown, medium dense, slightly damp
		R		39				
		G			10			
		R		23				sand increases
		R		47	15			Boring Stopped at 16 Feet
					20			
					25			
N- STANDARD PENETRATION TEST R- RING SAMPLE NR- NO SAMPLE RECOVERY G- GRAB SAMPLE B- BUCKET SAMPLE						NOTES: Groundwater Not Encountered		
WESTERN TECHNOLOGIES INC.						PROJECT: DAVIS ROAD REALIGNMENT		PLATE 22
						REF. NO.: 2929JH074-B		
						BORING LOG		

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.

DATE DRILLED: 3-14-11			BORING NO. 18			EQUIPMENT TYPE: CME-75		
LOCATION: See Location Diagram						DRILLING TYPE: 8"HSA		
ELEVATION: Not Determined						FIELD ENGINEER: R. Woner		
MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOW COUNTS	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
		G				SC		Clayey SAND; brown, medium dense, slightly damp
		R		27				
		R		31	5			
		R		50/6"	10			becomes very dense
		R						with gravel
		G		50/8"	15	CL		Sandy CLAY; with gravel, brown, hard, slightly damp
		R		50/9"	20			
								Boring Stopped at 20.75 Feet
					25			

N- STANDARD PENETRATION TEST R- RING SAMPLE NR- NO SAMPLE RECOVERY G- GRAB SAMPLE B- BUCKET SAMPLE	NOTES: Groundwater not encountered.
--	-------------------------------------

 WESTERN TECHNOLOGIES INC.	PROJECT: DAVIS ROAD REALIGNMENT REF. NO.: 2929JH074-B	PLATE 23
	BORING LOG	

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.

DATE DRILLED: 3-14-11			BORING NO. 19			EQUIPMENT TYPE: CME-75		
LOCATION: See Location Diagram						DRILLING TYPE: 8"HSA		
ELEVATION: Not Determined						FIELD ENGINEER: R. Woner		
MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOW COUNTS	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
		G				SC		Clayey SAND; brown, medium dense, slightly damp
8.4	91	R		23				becomes damp
5.4	95	R		25	5			
6.9	92	R		36	10			
5.0	99	R		50/8"	15			becomes dense with cobbles, becomes very dense
		N		50/2"				Auger Refusal at 17 Feet on Nested Cobbles
					20			
					25			

N- STANDARD PENETRATION TEST R- RING SAMPLE NR- NO SAMPLE RECOVERY G- GRAB SAMPLE B- BUCKET SAMPLE	NOTES: Groundwater not encountered.
--	-------------------------------------

WESTERN TECHNOLOGIES INC.	PROJECT: DAVIS ROAD REALIGNMENT REF. NO.: 2929JH074-B	PLATE 24
	BORING LOG	

DATE DRILLED: 3-14-11

LOCATION: See Location Diagram

ELEVATION: Not Determined

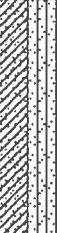
BORING NO. 20

EQUIPMENT TYPE: CME-75

DRILLING TYPE: 8"HSA

FIELD ENGINEER: R. Woner

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.

MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOW COUNTS	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
3.9	100	G		12	5	SC-SM		Silty, Clayey SAND; brown, loose, slightly damp
1.5	113	G R	 	31	10	SC		Clayey SAND; with gravel, medium dense, slightly damp
2.7	109	R		50/5"	15			becomes very dense
								Boring Stopped at 15.5 Feet
					20			
					25			

N- STANDARD PENETRATION TEST
 R- RING SAMPLE
 NR- NO SAMPLE RECOVERY
 G- GRAB SAMPLE
 B- BUCKET SAMPLE

NOTES: Groundwater not encountered.



WESTERN TECHNOLOGIES INC.

PROJECT: DAVIS ROAD REALIGNMENT

REF. NO.: 2929JH074-B

PLATE

25

BORING LOG

DATE DRILLED: 3-14-11

LOCATION: See Location Diagram

ELEVATION: Not Determined

BORING NO. 21

EQUIPMENT TYPE: CME-75

DRILLING TYPE: 8"HSA

FIELD ENGINEER: R. Woner

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.

MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOW COUNTS	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
2.6	106	G		16	5	SC-SM		Silty, Clayey SAND; brown, loose, slightly damp
		R						with trace gravel
3.0	100	G		50/12"	10	SC		Clayey SAND; with gravel, brown, dense, slightly damp
		R						
2.7	115	R		29	15			becomes medium dense
								Boring Stopped at 16 Feet
					20			
					25			

N- STANDARD PENETRATION TEST
 R- RING SAMPLE
 NR- NO SAMPLE RECOVERY
 G- GRAB SAMPLE
 B- BUCKET SAMPLE

NOTES: Groundwater not encountered.



WESTERN TECHNOLOGIES INC.

PROJECT: DAVIS ROAD REALIGNMENT
 REF. NO.: 2929JH074-B

BORING LOG

PLATE

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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.

DATE DRILLED: 3-14-11			BORING NO. 22			EQUIPMENT TYPE: CME-75		
LOCATION: See Location Diagram						DRILLING TYPE: 8"HSA		
ELEVATION: Not Determined						FIELD ENGINEER: R. Woner		
MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOW COUNTS	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
6.6	101	G		50/12"	5	SC		Clayey SAND; brown, dense, slightly damp
		G R						with trace gravel
2.6	103	G R		50/12"	10	GC		Clayey GRAVEL; with sand, brown, dense, slightly damp
								gravel increases
3.0	113	R		50/8"	15			
								Boring Stopped at 15.75 Feet
					20			
					25			
N- STANDARD PENETRATION TEST R- RING SAMPLE NR- NO SAMPLE RECOVERY G- GRAB SAMPLE B- BUCKET SAMPLE						NOTES: Groundwater not encountered.		
 WESTERN TECHNOLOGIES INC.						PROJECT: DAVIS ROAD REALIGNMENT REF. NO.: 2929JH074-B		PLATE 27
						BORING LOG		

DATE DRILLED: 3-14-11

LOCATION: See Location Diagram

ELEVATION: Not Determined

BORING NO. 23

EQUIPMENT TYPE: CME-75

DRILLING TYPE: 8"HSA

FIELD ENGINEER: R. Woner

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.

MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOW COUNTS	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
		G				SC		Clayey SAND; brown, medium dense, damp
		R		17				with trace gravel
		R		11	5			becomes loose
								with gravel
		G R		50/6"	10			gravel increases, becomes very dense
		R		50/2" NR	15			with cobbles
								Auger Refusal at 15 Feet on Nested Cobbles
					20			
					25			

N- STANDARD PENETRATION TEST
 R- RING SAMPLE
 NR- NO SAMPLE RECOVERY
 G- GRAB SAMPLE
 B- BUCKET SAMPLE

NOTES: Groundwater not encountered.



WESTERN TECHNOLOGIES INC.

PROJECT: DAVIS ROAD REALIGNMENT

REF. NO.: 2929JH074-B

PLATE

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BORING LOG

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.

DATE DRILLED: 3-14-11			BORING NO. 24			EQUIPMENT TYPE: CME-75		
LOCATION: See Location Diagram						DRILLING TYPE: 8"HSA		
ELEVATION: Not Determined						FIELD ENGINEER: R. Woner		
MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOW COUNTS	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
		G				SC		Clayey SAND; trace gravel, loose, damp
14.2	78	R		16				becomes moist
11.9	112	R		26	5			becomes medium dense
								with gravel
9.8	118	R		50/6"	10			becomes very dense, damp
		R		50/6"	15			
		N		50/1"				Auger Refusal at 17 Feet on Nested Cobbles & Boulders
					20			
					25			

N- STANDARD PENETRATION TEST R- RING SAMPLE NR- NO SAMPLE RECOVERY G- GRAB SAMPLE B- BUCKET SAMPLE	NOTES: Groundwater not encountered.
--	-------------------------------------

WESTERN TECHNOLOGIES INC.	PROJECT: DAVIS ROAD REALIGNMENT REF. NO.: 2929JH074-B	PLATE 29
	BORING LOG	

DATE DRILLED: 3-14-11

LOCATION: See Location Diagram

ELEVATION: Not Determined

BORING NO. 25

EQUIPMENT TYPE: CME-75

DRILLING TYPE: 8"HSA

FIELD ENGINEER: R. Woner

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.

MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOW COUNTS	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
		G				SC		Clayey SAND; brown, medium dense, damp
		R		19				
		R		15	5			becomes loose
		R		50/7"	10			becomes very dense
		R		50/6"	15			
		R		50/8"	20			sand decreases
					25			
								Boring Stopped at 20.75 Feet

N- STANDARD PENETRATION TEST
 R- RING SAMPLE
 NR- NO SAMPLE RECOVERY
 G- GRAB SAMPLE
 B- BUCKET SAMPLE

NOTES: Groundwater not encountered.



WESTERN TECHNOLOGIES INC.

PROJECT: DAVIS ROAD REALIGNMENT

REF. NO.: 2929JH074-B

PLATE

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BORING LOG

SOIL PROPERTIES

Boring No.	Depth (ft.)	Soil Class.	Initial Dry Density (pcf)	Initial Water Content (%)	Compression Properties			Expansion Properties		Plasticity		Percent Passing #200	R-Value	Remarks
					Surcharge (ksf)	Total Compression (%)		Surcharge (ksf)	Expansion (%)	Liquid Limit	Plasticity Index			
						In-Situ	After Saturation							
1	0-5	SC								31	15	40		
2	0-5	SC								25	12	42	25	
3	0-5	SC								22	8	31		
4	0-5	CL								32	14	68		
5	0-5	SM								--	NP	14		
5	2-3	SM	95	4.1										2
5	5-6	SM	102	10.0			0.6							2
							2.1	4.7						
							3.0	5.5						
6	0-5	SC								29	15	45		
7	0-5	SC								33	17	43	22	
8	0-5	SC								31	8	19		
9	0-5	SC								21	7	34		

Note: Initial Dry Density and Initial Water Content are in-situ values unless otherwise noted.
NP = Non-Plastic

Remarks

1. Compacted density (approx. 95% of ASTM D698 max. density at moisture content slightly below optimum.)
2. Submerged to approximate saturation.
3. Slight rebound after saturation.
4. Sample disturbance observed.

DAVIS ROAD REALIGNMENT

Soil Properties

WESTERN TECHNOLOGIES INC.

Job No. 2929JH074-B

Plate: 31

SOIL PROPERTIES														
Boring No.	Depth (ft.)	Soil Class.	Initial Dry Density (pcf)	Initial Water Content (%)	Compression Properties			Expansion Properties		Plasticity		Percent Passing #200	R-Value	Remarks
					Surcharge (ksf)	Total Compression (%)		Surcharge (ksf)	Expansion (%)	Liquid Limit	Plasticity Index			
						In-Situ	After Saturation							
10	0-5	SC								23	9	30		2 2
10	2-3	SC	96	7.6										
10	5-6	SC	98	5.9	1.0	1.5								
					2.0	3.2	11.1							
10	10-11	SC	94	7.9	3.0		12.4							
11	0-5	SC								21	6	13	23	
12	0-5	SM								--	NP	23		
12	5-6	CL	105	17.7										
13	0-5	SC								27	13	33		
14	0-5	SC								20	7	32	21	
16	2-3	SC	109	12.8										
16	5-6	SC	102	6.8										
16	8-9	SC	95	6.5										
16	12-13	SC	107	5.8										
16	15-16	SC	104	6.2										

Note: Initial Dry Density and Initial Water Content are in-situ values unless otherwise noted.											
NP = Non-Plastic											
Remarks											
1. Compacted density (approx. 95% of ASTM D698 max. density at moisture content slightly below optimum.)											
2. Submerged to approximate saturation.											
3. Slight rebound after saturation.											
4. Sample disturbance observed.											
DAVIS ROAD REALIGNMENT											
Soil Properties											
WESTERN TECHNOLOGIES INC.											
Job No. 2929JH074-B								Plate: 32			

SOIL PROPERTIES														
Boring No.	Depth (ft.)	Soil Class.	Initial Dry Density (pcf)	Initial Water Content (%)	Compression Properties			Expansion Properties		Plasticity		Percent Passing #200	R-Value	Remarks
					Surcharge (ksf)	Total Compression (%)		Surcharge (ksf)	Expansion (%)	Liquid Limit	Plasticity Index			
						In-Situ	After Saturation							
19	2-3	SC	91	8.4										2
19	5-6	SC	95	5.4										
19	10-11	SC	92	6.9	1.0	2.3								
					2.0	5.2	15.3							
					4.0		17.7							2
19	15-16	SC	99	5.0										
20	5-6	SC-SM	100	3.9										
20	10-11	SC	113	1.5										
20	15-16	SC	109	2.7										
21	5-6	SC-SM	106	2.6										
21	10-11	SC	100	3.0										
21	15-16	SC	115	2.7										
22	5-6	SC	101	6.6										
22	10-11	GC	103	2.6										
22	15-16	GC	113	3.0										

Note: Initial Dry Density and Initial Water Content are in-situ values unless otherwise noted.											
NP = Non-Plastic											
Remarks											
1. Compacted density (approx. 95% of ASTM D698 max. density at moisture content slightly below optimum.)											
2. Submerged to approximate saturation.											
3. Slight rebound after saturation.											
4. Sample disturbance observed.											
DAVIS ROAD REALIGNMENT											
Soil Properties											
WESTERN TECHNOLOGIES INC.											
Job No. 2929JH074-B								Plate: 33			

SOIL PROPERTIES														
Boring No.	Depth (ft.)	Soil Class.	Initial Dry Density (pcf)	Initial Water Content (%)	Compression Properties			Expansion Properties		Plasticity		Percent Passing #200	R-Value	Remarks
					Surcharge (ksf)	Total Compression (%)		Surcharge (ksf)	Expansion (%)	Liquid Limit	Plasticity Index			
						In-Situ	After Saturation							
24	2-3	SC	78	14.2										2
24	5-6	SC	112	11.9	1.0	1.6								2
					2.0	2.3	3.6							
					4.0		4.2							
24	10-11	SC	118	9.8										

Note: Initial Dry Density and Initial Water Content are in-situ values unless otherwise noted.										
NP = Non-Plastic										
Remarks										
1. Compacted density (approx. 95% of ASTM D698 max. density at moisture content slightly below optimum.)										
2. Submerged to approximate saturation.										
3. Slight rebound after saturation.										
4. Sample disturbance observed.										
DAVIS ROAD REALIGNMENT										
Soil Properties										
WESTERN TECHNOLOGIES INC.										
Job No. 2929JH074-B								Plate: 34		

PHYSICAL PROPERTIES

Boring No.	Depth (ft)	Soil Class.	Particle Size Distribution (%) Passing by Weight						Atterberg Limits		Moisture-Density Relationship			Expansion Properties			Remarks
			3"	¾"	#4	#10	#40	#200	LL	PI	Dry Density (pcf)	Optimum Moisture (%)	Method	Surcharge (ksf)	Expansion (%)	EI	
15	0-5	CL	100	100	99	98	92	64	26	13	109.1	14.4	A				2,4
16	5-10	SC	100	100	98	93	79	46	29	13	114.6	14.0	A				2,4
17	10-15	SC	87	85	82	75	58	33	25	11							2
20	0-5	SC-SM	100	99	93	82	56	23	20	5	126.1	9.2	A				2,4
21	5-10	SC-SM	100	90	76	60	35	15	21	7							2
22	10-15	GC	100	80	47	36	28	17	25	10	135.5	7.0	C				2,4

NOTE: NP = Non-plastic

REMARKS

Classification / Particle Size

Moisture-Density Relationship

1. Visual

4. Tested ASTM D698/AASHTO T99

2. Laboratory Tested

5. Tested ASTM D1557/AASHTO T180

3. Minus #200 Only

6. From ADOT Family of Curves for Maricopa County

7. Expansion Index (EI) test in accordance with ASTM D4829.

DAVIS ROAD REALIGNMENT

Soil Properties

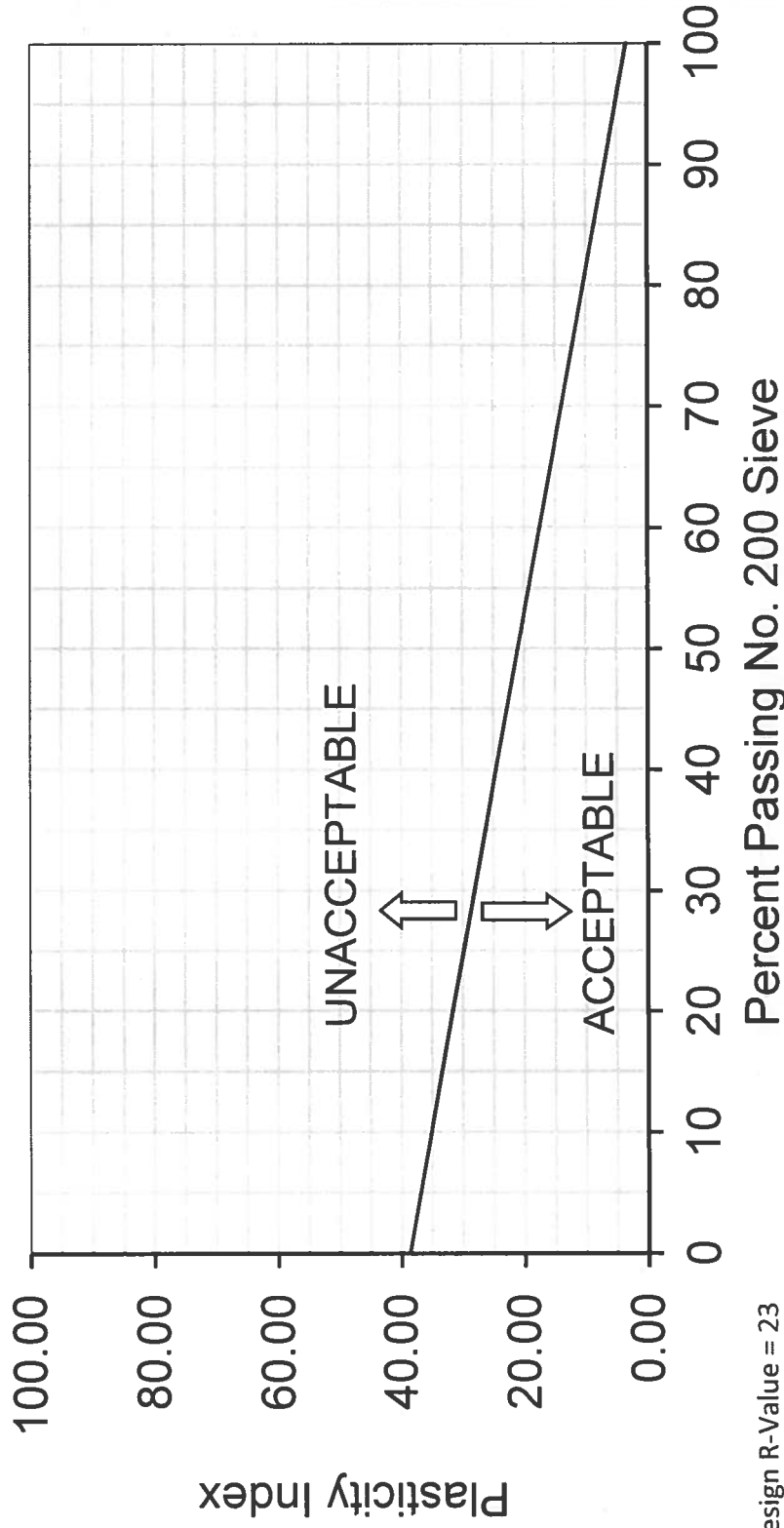
Western Technologies Inc.

Job No.: 2929JH074-B

Plate: 35

PHYSICAL PROPERTIES					
Boring No.	Depth (ft)	pH	Soluble Salts (ppm)		Minimum Resistivity (Ohm-Cm)
			Sulfate	Chloride	
5	0-5	7.8	29	22	4592
10	0-5	7.4	171	28	1509
12	0-5	8.2	46	22	4002
PH & Minimum Resistivity (ARIZ 236) Sulfate content (ARIZ 733) Chloride content (ARIZ 736) DAVIS ROAD REALIGNMENT Physical Properties Western Technologies Inc. Job No.: 2929JH074-B Plate: 36					

Materials Subgrade Acceptance Chart Davis Road Milepost 4.79 to 5.40



DAVIS ROAD MILEPOST 4.79 to 5.40

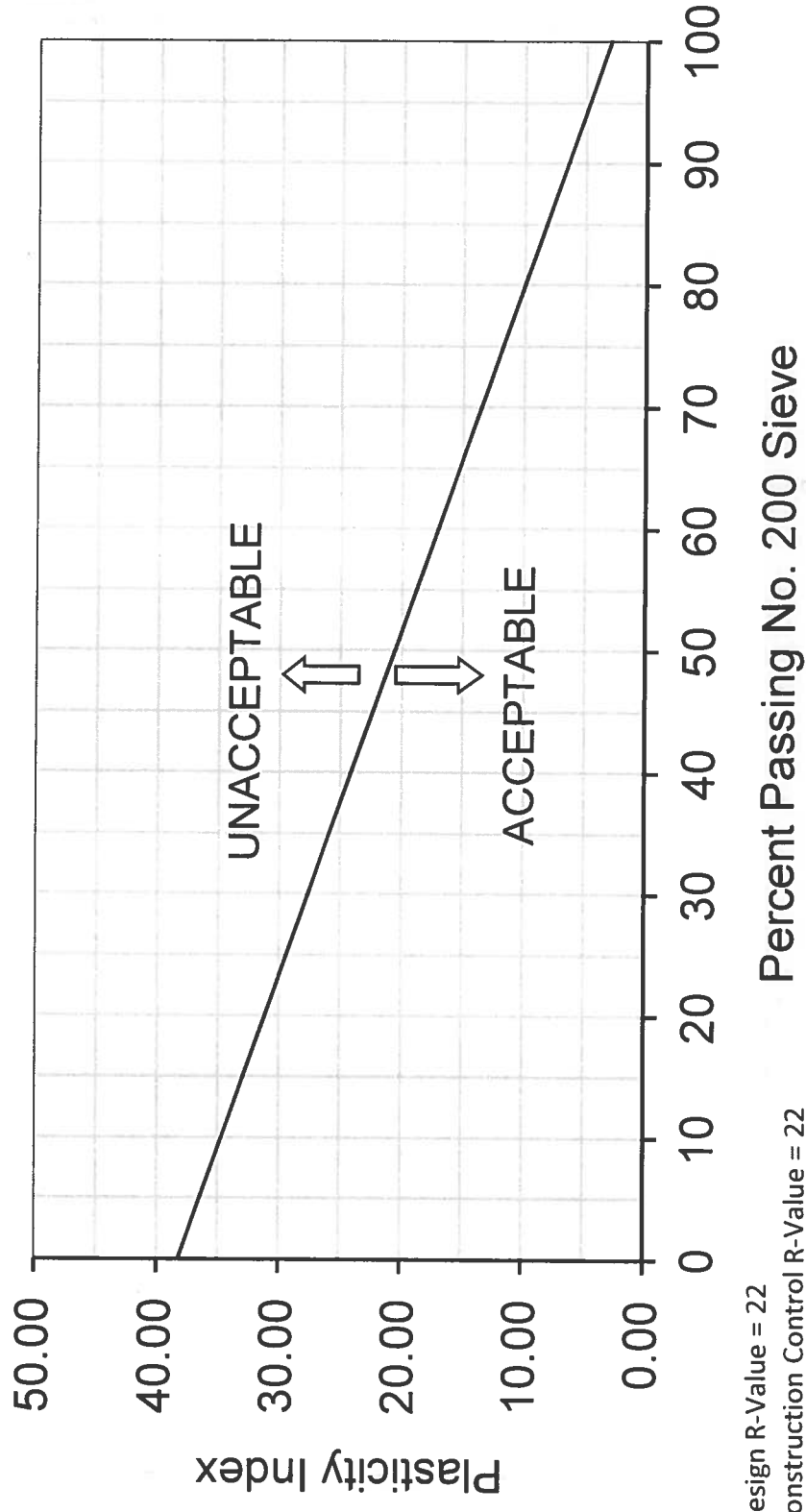
Material Subgrade Acceptance Chart

WESTERN TECHNOLOGIES INC.

Project No. 2929JH074-B

Plate: 37

Materials Subgrade Acceptance Chart Davis Road Milepost 12.97 to 13.28



DAVIS ROAD MILEPOST 12.97 to 13.28	
Material Subgrade Acceptance Chart	
WESTERN TECHNOLOGIES INC.	
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