

ARKANSAS DEPARTMENT OF TRANSPORTATION



SUBSURFACE INVESTIGATION

STATE JOB NO. 040861

FEDERAL AID PROJECT NO. STPF-91177(10)

HWY. 10 – HWY. 96 (GREENWOOD BYPASS) (S)

STATE HIGHWAY 10 SECTION 0 & 1

IN SEBASTIAN COUNTY

The information contained herein was obtained by the Department for design and estimating purposes only. It is being furnished with the express understanding that said information does not constitute a part of the Proposal or Contract and represents only the best knowledge of the Department as to the location, character and depth of the materials encountered. The information is only included and made available so that bidders may have access to subsurface information obtained by the Department and is not intended to be a substitute for personal investigation, interpretation and judgment of the bidder. The bidder should be cognizant of the possibility that conditions affecting the cost and/or quantities of work to be performed may differ from those indicated herein.



## ARKANSAS DEPARTMENT OF TRANSPORTATION

ARDOT.gov | IDriveArkansas.com | Lorie H. Tudor, P.E., Director

### MATERIALS DIVISION

11301 West Baseline Road | P.O. Box 2261 | Little Rock, AR 72203-2261 | Phone: 501.569.2185 | Fax: 501.569.2368

August 9, 2023

**TO:** Mr. Rick Ellis, Bridge Engineer

**SUBJECT:** Job No. 040861  
Sites 1, 4 and 5  
Hwy. 10 – Hwy. 96 (Greenwood Bypass) (S)  
Sebastian County  
Route 10, Sections 0 & 1

### Introduction

Submitted herein are the results of the subsurface investigation and geotechnical recommendations for the proposed bridges at Site 1, Site 4 and Site 5 planned on Arkansas Highway 10 in Sebastian County. Recommendations for Site 2 and Site 3 have been provided in a separate report dated August 1, 2023. The three (3) bridges included in this submittal are comprised of:

- Site 1 (Highway 10 Replacement Bridge over Heartsill Creek): five (5)-span, continuous W-beam unit with a structure length of 391 feet and out-to-out width of 73.5 feet; 2H:1V fill end slopes and 3H:1V fill side slopes (maximum 13 feet tall) at both bridge abutments.
- Site 4 (Highway 10 Replacement Bridge over Heartsill Creek): five (5)-span, continuous W-beam unit with a structure length of 345 feet and out-to-out width of 63 feet; 2H:1V cut end and side slopes (maximum 17 feet tall) at both bridge abutments.
- Site 5 (Highway 10 Bridge over Vache Grasse Creek): three (3)-span, continuous plate girder unit with a structure length of 260 feet and out-to-out width of 63 feet; 2H:1V fill end slopes and 3H:1V fill side slopes (maximum 16 feet tall) at both bridge abutments.

It is understood steel HP14x117 are tentatively planned at the abutment bents of each bridge and HP16x121 piles are planned at the intermediate bents of the bridges.

### Field Investigation

Request for Subsurface Investigation was received on January 27, 2023 to develop recommendations for bridge foundations and to verify suitability of bridge abutment slope configurations. Borings were drilled at accessible locations based on the Request for Subsurface Investigation memo. The approximate locations of the borings are presented in the Plan of Borings included in Attachments A1, A4 and A5 for Sites 1, 4 and 5, respectively.

The borings were advanced with a track-mounted Acker Renegade rotary drill rig using a combination of hollow-stem auger and diamond core method. The boring logs, showing the subsurface conditions encountered in the borings and the results of field and laboratory tests, are also included in Attachments A1, A4 and A5, immediately following the corresponding Plans of Borings. A Legend is included with the boring logs to interpret / explain the symbols, terms, and





## ARKANSAS DEPARTMENT OF TRANSPORTATION

ARDOT.gov | IDriveArkansas.com | Lorie H. Tudor, P.E., Director

### MATERIALS DIVISION

11301 West Baseline Road | P.O. Box 2261 | Little Rock, AR 72203-2261 | Phone: 501.569.2185 | Fax: 501.569.2368

conventions used on logs. Standard Penetration Tests (SPT) were conducted in accordance with ASTM D1586 for field testing and soil sampling. Liners were not used inside the standard split-barrel samplers. Drill rig hammer correction factor is shown on the logs.

The number of blows required to drive the standard split-barrel sampler for each 6-inch penetration of the total 18-inch drive are shown on the logs. SPT N-values are defined as the number of blows required to advance the split barrel the final 12 inches. The SPT N-values indicated on the logs are raw (uncorrected) blow counts as measured in the field.

Core samples of bedrock were retrieved by using NQ3-size triple-tube core barrels (rock core diameter of 1-3/4 in. and hole diameter of 3 in.). For each core run, Rock Quality Designation (RQD) was determined in the field by a logger and further evaluated by a licensed Professional Geologist (PG). RQD, expressed in percent, is defined as the sum of the intact core pieces that are longer than 4 inches divided by the total length of the core run. The RQD of each core run is indicated on each corresponding log. Core pictures for Sites 1, 4 and 5 are also included in Attachments A1, A4 and A5, respectively, following the corresponding boring logs. Groundwater observations were noted on the logs.

### Lab Investigation

All samples were brought to the Materials Division laboratory for further evaluation and testing. Soil samples were tested to evaluate index and engineering properties and to verify soil type and classification. Lab tests were performed on representative soil samples to determine moisture content, Atterberg limits, and gradation. Tested soils were classified by licensed PG in accordance with both USCS and AASHTO soil classification systems. Laboratory pH and soil electrical resistivity tests were also performed on representative soil samples to evaluate the corrosion potential of the subsurface soils on steel piles.

Rock cores were first examined by a licensed PG to verify Total Core Recovery (TCR) and Rock Quality Designation (RQD) measured in field and to obtain parameters for determination of Geological Strength Index (GSI) and Rock Mass Rating (RMR). Compressive strength of rock cores was then determined by laboratory uniaxial compressive test on intact rock cores in accordance with ASTM D7012, Method C.

The results of laboratory tests are either shown on corresponding logs or presented in Attachments B1, B4 and B5 for Sites 1, 4 and 5, respectively. The laboratory tests and their corresponding ASTM and/or AASHTO test methods are listed in Tables 1a and 1b for soil index property tests and other tests, respectively.

Table 1a: Summary of Laboratory Tests and Methods – Soil Index Properties

Laboratory Test	ASTM	AASHTO	Denotation on Logs
Moisture Content	D2216	T 265	Solid Circle Symbol (●)
Grain Size Analysis by Sieving	D6913	T 88	Whole Number in the “- No. 200 %” Column (e.g., 12)
Atterberg Limits	D4318	T 89	Plus Sign (+) on the Right for Liquid Limit
		T 90	Plus Sign (+) on the Left for Plastic Limit

Table 1b: Summary of Laboratory Tests and Methods – Corrosion Potential and Rock Strength

Laboratory Test	ASTM	AASHTO	Presentation
pH of Soil	D4972	T 289	Presented in Attachment B1, B4, and B5 for Sites 1, 4 and 5, respectively
Soil Electrical Resistivity	G57	T 288	
Uniaxial Compression of Rock Cores	D7012, Method C		

The particle size through which 50% of particles by weight passing,  $D_{50}$ , is summarized below in Table 2.

Table 2: Summary of  $D_{50}$  for Scour Analysis

Site No.	Hydraulic Feature Name	Station	Sample Type	Location	$D_{50}$ , mm
1, 2, 4	Heartsill Creek	505+72, 16 Lt.	Bulk	Creek Bank	< 0.075
3, 5	Vache Grasse Creek	522+14, 92 Rt.	Bulk	Creek Bank	< 0.075

### **Site Conditions and Site Geology**

Site conditions and site geology for all five (5) sites have been discussed in the prior report for Sites 2 and 3 dated August 1, 2023. Site pictures are included in Attachments C1, C4 and C5 for Sites 1, 4 and 5 respectively.

### **Generalized Subsurface Conditions**

To aid in visualizing subsurface conditions and stratigraphy, Generalized Subsurface Profiles are included in Attachments D1, D4 and D5 for Sites 1, 4 and 5, respectively. The horizontal axis represents stationing in feet while the vertical axis denotes elevation in feet. To fit borings, the drawings are not to scale though they are proportional in both horizontal direction and vertical direction.

The Generalized Subsurface Profiles divide the subsurface geotechnical materials into three (3) generalized strata: I. Overburden Soils; II. Incompetent Rock (highly weathered to weathered rock); and III. Competent Rock (slightly weathered to unweathered rock). The estimated elevation of the competent rock, as revealed by the borings, are indicated on the subsurface profiles. These elevations are also summarized below in Tables 3a, 3b and 3c, respectively. In light of the natural variations in stratigraphy and subsurface conditions, deviation from those illustrated on the profiles must be anticipated.





# ARKANSAS DEPARTMENT OF TRANSPORTATION

ARDOT.gov | IDriveArkansas.com | Lorie H. Tudor, P.E., Director

## MATERIALS DIVISION

11301 West Baseline Road | P.O. Box 2261 | Little Rock, AR 72203-2261 | Phone: 501.569.2185 | Fax: 501.569.2368

Table 3a: Estimated Elevation of Competent Rock – Site 1

Boring No.	Boring Location	Ground Surf. Elev. @ Boring Location, ft.	Depth to Competent Rock, ft.	Estimated Elev. of Competent Rock, ft.
1	Sta. 207+68, 34 Rt.	485.9	15.9	470.0
2	Sta. 207+86, 34 Lt.	487.2	20.0	467.2
3	Sta. 208+41, 27 Rt.	486.7	20.0	466.7
4	Sta. 208+41, 34 Lt.	487.0	15.9	471.1
5	Sta. 209+50, 23 Rt.	483.7	13.2	470.5
6	Sta. 209+62, 34 Lt.	485.2	13.6	471.6
7	Sta. 210+23, 34 Rt.	486.8	15.7	471.1
8	Sta. 210+41, 34 Lt.	487.2	15.4	471.8
9	Sta. 210+92, 34 Rt.	486.8	15.4	471.4
10	Sta. 211+10, 36 Lt.	486.7	13.6	473.1

Table 3b: Estimated Elevation of Competent Rock – Site 4

Boring No.	Boring Location	Ground Surf. Elev. @ Boring Location, ft.	Depth to Competent Rock, ft.	Estimated Elev. of Competent Rock, ft.
1	Sta. 503+96, 45 Rt.	485.0	20.1	464.9
2	Sta. 504+14, 44 Lt.	485.8	20.6	465.2
3	Sta. 504+72, 29 Rt.	483.1	15.8	467.3
4	Sta. 504+73, 29 Lt.	483.3	15.9	467.4
5	Sta. 505+26, 29 Rt.	480.8	19.2	461.6
6	Sta. 505+32, 36 Lt.	481.6	15.4	466.2
7	Sta. 506+07, 30 Rt.	477.8	15.3	462.5
8	Sta. 506+82, 51 Rt.	482.8	20.0	462.8
9	Sta. 507+42, 19 Rt.	490.4	30.0	460.4
10	Sta. 507+58, 20 Lt.	490.2	30.0	460.2

Table 3c: Estimated Elevation of Competent Rock – Site 5

Boring No.	Boring Location	Ground Surf. Elev. @ Boring Location, ft.	Depth to Competent Rock, ft.	Estimated Elev. of Competent Rock, ft.
1	Sta. 521+23, 50 Rt.	493.0	26.5	466.5
2	Sta. 521+26, 7 Rt.	483.5	20.1	463.4
3	Sta. 521+72, 19 Rt.	484.7	20.0	464.7
4	Sta. 522+98, 33 Lt.	487.4	16.3	471.1
5	Sta. 523+36, 49 Rt.	492.6	18.6	474.0
6	Sta. 523+65, 33 Lt.	488.7	15.0	473.7
7	Sta. 523+80, 49 Rt.	491.4	16.8	474.6

### **Seismic Conditions**

In light of the average subsurface conditions as revealed by the borings, a Seismic Site Class D (Stiff Soil Profile) is calculated for the five (5) project sites. Utilizing the Seismic Site Class D and the mid-point GPS coordinates of the project, the following design peak ground acceleration coefficient ( $A_s$ ), design short-period spectral acceleration coefficient ( $S_{DS}$ ), as well as design long-period spectral acceleration coefficient ( $S_{D1}$ ), are determined. These seismic coefficients are summarized in Table 4. Design Response Spectrum is presented in Attachment E.

Table 4: Summary of Design Ground Motion Acceleration Response Coefficients

Acceleration Coefficient	Value (g)
	All Sites (Sites 1 through 5)
$A_s$ (Site PGA)	0.089
$S_{DS}$ (0.2 sec)	0.210
$S_{D1}$ (1 sec)	0.127

For the design long-period spectral acceleration coefficient ( $S_{D1}$ ) of 0.127, a Seismic Performance Zone 1 is considered applicable to the five (5) bridge sites.

### **Approach Embankments**

Settlement Potential and Ground Improvements Design drawings provided by Bridge Division indicate up to 13 feet of fill will be placed at the bridge abutments of Site 1 and up to 16 feet of fill will be placed at Site 5 bridge abutments. Up to 17 feet of cut will be performed at the bridge abutments of Site 4. Based on the results of the borings performed at these bridge abutments, the subsurface soils are either granular soils or low-plasticity lean clay or silty clay. Consequently, settlement is expected to be predominantly immediate, elastic deformation that will be completed during the embankment construction phase.

The surface and near-surface soils at the planned fill slope abutments are weak and unstable. To provide a stable construction platform and to improve embankment stability, it is recommended the subgrade at the bridge abutments where fill slopes are planned (i.e., Bents 1





# ARKANSAS DEPARTMENT OF TRANSPORTATION

ARDOT.gov | IDriveArkansas.com | Lorie H. Tudor, P.E., Director

## MATERIALS DIVISION

11301 West Baseline Road | P.O. Box 2261 | Little Rock, AR 72203-2261 | Phone: 501.569.2185 | Fax: 501.569.2368

and 6 of Site 1 and Bents 1 and 4 of Site 5) be undercut at least 5 feet below the existing ground surface. For each fill slope abutment, undercut should extend at least 5 feet in front of the toe of the end slope, 5 feet beyond the toes of the side slopes, and 100 feet behind the crest of the end slope.

Bent 1 of Site 1 is planned in a pond / swampy area. In addition to the aforementioned undercut requirements, the entire embankment footprint within the pond area and the zone 5 feet outside the embankment footprint should be undercut at least 5 feet below the existing ground surface.

Undercut should be backfilled with Rock Fill. A project Special Provision for Rock Fill is included in Attachment F. Aggregate Base Coarse (Class 7), in accordance with ARDOT Standard Specifications Section 303, should be utilized in areas where piling is planned.

Embankment Stability Stability analyses have been performed to evaluate the design abutment configuration. Slope stability analyses were performed utilizing a commercial computer program Slide2 (Version 2021) developed by RocScience. Spencer analysis method was utilized to analyze the more critical 2H:1V end slopes at the abutments. Three (3) general loading conditions were analyzed with respect to slope stability: Short Term/End of Construction Condition, Long Term Condition, and Seismic/Pseudo-Static Condition. A horizontal acceleration coefficient ( $K_h$ ) of 0.045 ( $0.5A_s/g$ ) was utilized for analysis of the Seismic/Pseudo-Static Condition. A surcharge of 250 psf is included to model the live load under long term conditions.

The results of the analyses are presented in Tables 5a, 5b and 5c for Sites 1, 4 and 5, respectively. The graphic results of slope stability analyses are shown in Attachments G1, G2 and G5 for Sites 1, 4 and 5, respectively.

Undercut and Rock Fill were modeled in stability analyses of Bent 1 of Site 1 where embankment is planned in a lake area. Except for that bent, undercut and Rock Fill were not included in modeling and the analyses of the other embankments are considered conservative. These results of stability analyses indicate the plan abutment configurations are acceptable.

Table 5a: Results of Slope Stability Analyses - Site 1

Slope	Loading Condition	Calculated Minimum Factor of Safety	Recommended Minimum Factor of Safety
2H:1V End Slope – Bent 1 (Embankment)	Short Term	3.9	1.3
	Long Term	1.6	1.4
	Seismic ( $k_h = 0.045$ )	3.4	1.1
2H:1V End Slope – Bent 6 (Embankment)	Short Term	4.4	1.3
	Long Term	1.6	1.4
	Seismic ( $k_h = 0.045$ )	3.9	1.1

Table 5b: Results of Slope Stability Analyses - Site 4

Slope	Loading Condition	Calculated Minimum Factor of Safety	Recommended Minimum Factor of Safety
2H:1V End Slope – Bent 1 (Cut Slope)	Short Term	4.7	1.3
	Long Term	1.6	1.4
	Seismic ( $k_h = 0.045$ )	3.8	1.1
2H:1V End Slope – Bent 6 (Cut Slope)	Short Term	3.4	1.3
	Long Term	1.7	1.4
	Seismic ( $k_h = 0.045$ )	2.9	1.1

Table 5c: Results of Slope Stability Analyses – Site 5

Slope	Loading Condition	Calculated Minimum Factor of Safety	Recommended Minimum Factor of Safety
2H:1V End Slope – Bent 1 (Embankment)	Short Term	3.2	1.3
	Long Term	2.0	1.4
	Seismic ( $k_h = 0.045$ )	2.8	1.1
2H:1V End Slope – Bent 4 (Embankment)	Short Term	3.5	1.3
	Long Term	1.6	1.4
	Seismic ( $k_h = 0.045$ )	3.1	1.1

### Foundation Recommendations

Design and Construction Considerations Based on the most recent plans and discussions with Bridge Division, steel H piles will be utilized to support the foundation loads at all the end and intermediate bents of the bridges. Steel HP14x117 are tentatively planned at the abutment bents while HP16x121 piles are planned at the intermediate bents of the bridges.

Steel H-piles should be driven to practical refusal and should penetrate through embankment fill in the abutment areas, the overburden soils, highly weathered rock (if any) and weathered rock (if any), to bear in the competent slightly weathered to unweathered shale. Preboring is recommended to facilitate socketing the steel H piles into the competent shale as planned by the Structural Engineer. It is recommended prebores extend at least 1 foot below the competent rock surface.

Practical refusal is defined as a maximum penetration of 1.0 inch for 20 blows by a pile hammer. For the purpose of estimating prebore depth and pile length, an additional pile penetration of 6 inches, below the prebored depth, is expected. This estimated additional penetration below the prebored depth is based on the results of the borings and experience with similar foundation rock. The results of the borings indicate moderate to severe driving conditions are to be expected. Consequently, rock points are recommended for all H-piles driven to refusal.

A minimum pile penetration of 10 feet, measured below natural ground surface, is recommended. Based on the results of the borings and the above assumed penetration into the resistant rock, the recommended shallowest prebore elevation and estimated shallowest pile tip





# ARKANSAS DEPARTMENT OF TRANSPORTATION

ARDOT.gov | IDriveArkansas.com | Lorie H. Tudor, P.E., Director

## MATERIALS DIVISION

11301 West Baseline Road | P.O. Box 2261 | Little Rock, AR 72203-2261 | Phone: 501.569.2185 | Fax: 501.569.2368

elevation are summarized in Tables 6a, 6b and 6c for Sites 1, 4 and 5, respectively. Additional pile penetration may be required by lateral resistance as determined by the Structural Engineer.

The elevations summarized in Tables 6a, 6b and 6c are recommended shallowest prebore elevations utilizing boring results and engineering judgement. Actual subsurface conditions can vary from those encountered in the borings. As-constructed prebore elevation and pile tip elevation can vary and must be field verified. Greater pile length/penetration may be warranted by lateral resistance demand and/or by scour requirements.

Table 6a: Recommended Shallowest Prebore Elevation and Pile Tip Elevation – Site 1

Boring No.	Boring Location	Estimated Elev. of Competent Rock, ft.	Recommended Shallowest Prebore Elev., ft.	Expected Additional Penetration below Prebored Elev., ft.
1	Sta. 207+68, 34 Rt.	470.0	469.0	0.5
2	Sta. 207+86, 34 Lt.	467.2	466.2	
3	Sta. 208+41, 27 Rt.	466.7	465.7	
4	Sta. 208+41, 34 Lt.	471.1	470.1	
5	Sta. 209+50, 23 Rt.	470.5	469.5	
6	Sta. 209+62, 34 Lt.	471.6	470.6	
7	Sta. 210+23, 34 Rt.	471.1	470.1	
8	Sta. 210+41, 34 Lt.	471.8	470.8	
9	Sta. 210+92, 34 Rt.	471.4	470.4	
10	Sta. 211+10, 36 Lt.	473.1	472.1	

Table 6b: Recommended Shallowest Prebore Elevation and Pile Tip Elevation – Site 4

Boring No.	Boring Location	Estimated Elev. of Competent Rock, ft.	Recommended Shallowest Prebore Elev., ft.	Expected Additional Penetration below Prebored Elev., ft.
1	Sta. 503+96, 45 Rt.	464.9	463.9	0.5
2	Sta. 504+14, 44 Lt.	465.2	464.2	
3	Sta. 504+72, 29 Rt.	467.3	466.3	
4	Sta. 504+73, 29 Lt.	467.4	466.4	
5	Sta. 505+26, 29 Rt.	461.6	460.6	
6	Sta. 505+32, 36 Lt.	466.2	465.2	
7	Sta. 506+07, 30 Rt.	462.5	461.5	
8	Sta. 506+82, 51 Rt.	462.8	461.8	
9	Sta. 507+42, 19 Rt.	460.4	459.4	
10	Sta. 507+58, 20 Lt.	460.2	459.2	

Table 6c: Recommended Shallowest Prebore Elevation and Pile Tip Elevation – Site 5

Boring No.	Boring Location	Estimated Elev. of Competent Rock, ft.	Recommended Shallowest Prebore Elev., ft.	Expected Additional Penetration below Prebored Elev., ft.
1	Sta. 521+23, 50 Rt.	466.5	465.5	0.5
2	Sta. 521+26, 7 Rt.	463.4	462.4	
3	Sta. 521+72, 19 Rt.	464.7	463.7	
4	Sta. 522+98, 33 Lt.	471.1	470.1	
5	Sta. 523+36, 49 Rt.	474.0	473.0	
6	Sta. 523+65, 33 Lt.	473.7	472.7	
7	Sta. 523+80, 49 Rt.	474.6	473.6	

For steel piling driven to refusal in competent rock, long-term, post-construction settlement is expected to be negligible. It is recommended that wave equation analyses of piles (WEAP) be performed to evaluate suitable hammer system(s) to drive the piles to refusal. The hammer system should be adequately powerful to drive piles to refusal into rock as recommended but without overstressing the piles. At a minimum, two (2) analyses should be performed for each of the bridges included in the project, with a minimum of one (1) analysis performed on the shortest pile and the other on the longest pile.

Coal deposits and existing coal mines were not encountered in the borings. However, multiple abandoned coal mines are mapped surrounding the project location, including a strip mine and two small pits approximately 800 feet south of Site 1. **There is a possibility of encountering coal deposits and abandoned coal mines within the project limits.** If coal deposits or abandoned coal mines are encountered at the time of construction, preboring should penetrate through the coal deposits or coal mines and should extend at least 1 foot into the competent slightly weathered to unweathered shale.

**Axial Pile Capacities** Nominal axial resistance of steel H piles driven to refusal in competent rock is governed by the structural capacity of the piles. Therefore, the nominal resistance should be determined by the Structural Engineer utilizing applicable AASHTO LRFD design procedures. It is recommended nominal (ultimate) resistance of steel piles be determined based on the yield strength of steel piles ( $f_y$ ) and the net cross-sectional area of the steel section ( $A_s$ ). Selection of structural resistance factor for calculating factored structural bearing resistance of h-piles should be based on the expectation of moderate to severe driving conditions.





For steel H piles with  $f_y$  of 50 ksi, the following allowable structural compression pile capacities are recommended for preliminary design. These allowable capacities include a factor of safety (load factor divided by resistance factor) of 4.0. Use of these allowable capacities as factored structural compression pile capacities are considered conservatively reasonable.

Table 7: Recommended Allowable Structural Compression Pile Capacities -  $f_y = 50$  ksi

Pile Section	Net Cross-Sectional Area of Steel Section ( $A_s$ ), in <sup>2</sup>	Allowable Structural Compression Pile Capacity ( $P_{na}$ ), ton
HP14x117	34.4	215
HP16x121	35.8	224

Geotechnical Input Parameters for Lateral Load Analysis It is understood lateral load analysis will be performed by the Structural Engineer using commercial computer program LPile/Group. Recommended geotechnical input parameters are included in Attachments H1, H4 and H5 for Sites 1, 4 and 5, respectively.

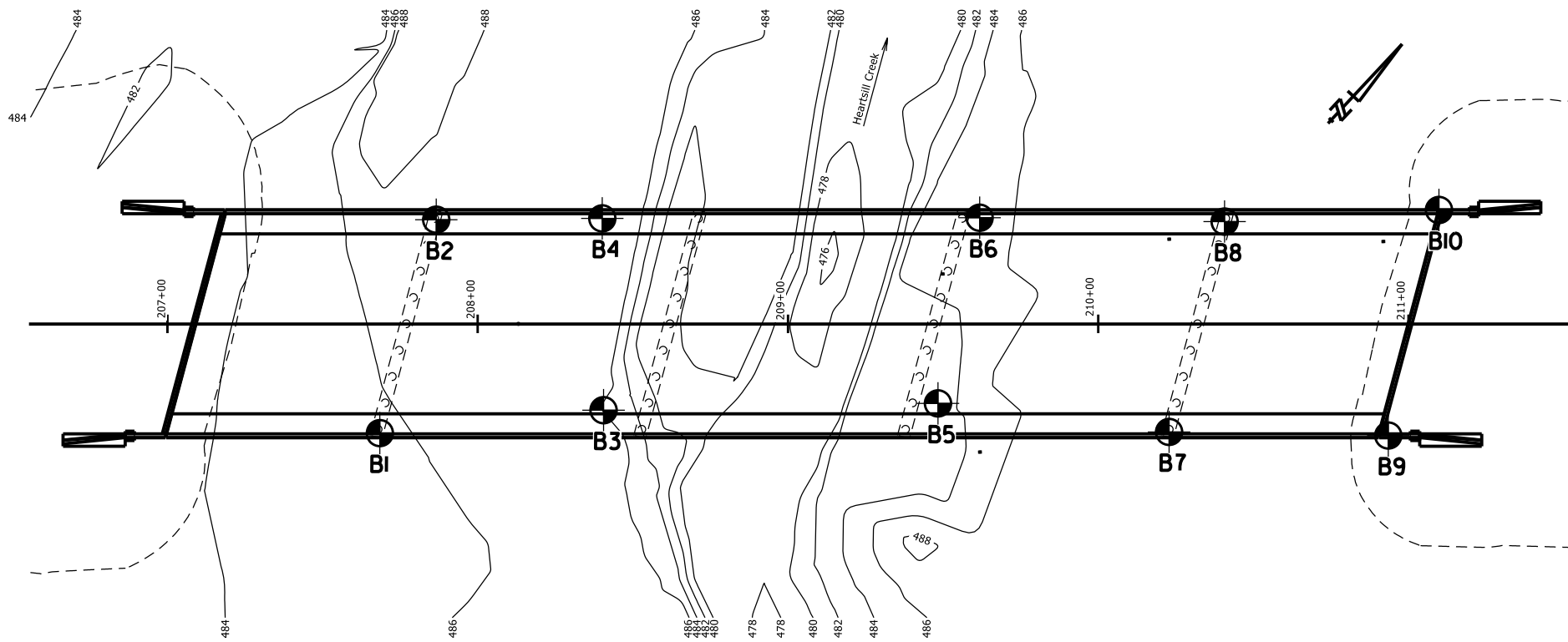
Paul Tinsley  
Materials Engineer

PT:dc:yz:mlg:mbb:pwc

cc: State Construction Engineer  
District 4 Engineer

## Attachment A1

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	AR			
JOB NO.		040861		
PLAN OF BORINGS				

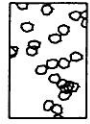


PLAN OF BORINGS	
HWY. 10- HWY. 96 (GREENWOOD BYPASS) (S)	
ROUTE 10, SECTIONS 0 & 1	
SEBASTIANCOUNTY	
FED. AID PROJECT	
JOB NO. 040861	SITE 1

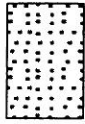
# LEGEND

## SOIL TYPES

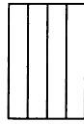
(SHOWN IN SYMBOL COLUMN)  
(PREDOMINANT TYPE SHOWN HEAVY)



GRAVEL



SAND



SILT



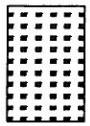
CLAY



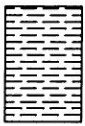
ORGANIC  
MATTER

## ROCK TYPES

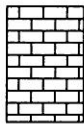
(SHOWN IN SYMBOL COLUMN)



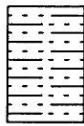
SANDSTONE



SHALE  
or  
SILTSTONE



LIMESTONE  
or  
DOLOMITE



ALTERNATING  
LAYERS of  
SHALE and  
SANDSTONE



OTHER

## SAMPLER TYPES

(SHOWN IN SAMPLE COLUMN)

### SHELBY TUBE



UNDISTURBED  
SAMPLE  
RECOVERY



DISTURBED  
SAMPLE  
RECOVERY



NO  
RECOVERY

### SPLIT SPOON



SAMPLE  
RECOVERY



NO  
RECOVERY

### ROCK CORING



% RECOVERY  
INDICATED ON LOGS

## TERMS DESCRIBING CONSISTENCY OR CONDITION

GRANULAR SOIL		CLAY		CLAY-SHALE		SHALE	
'N' Value	Density	'N' Value	Consistency	'N' Value	Consistency	'N' Value	Consistency
0-4	Very Loose	0-1	Very Soft	0-1	Very Soft		
5-10	Loose	2-4	Soft	2-4	Soft	31-60	Soft
11-30	Medium Dense	5-8	Medium Stiff	5-8	Medium Stiff	Over 60	
31-50	Dense	9-15	Stiff	9-15	Stiff	More than 2'	
Over 50	Very Dense	16-30	Very Stiff	16-30	Very Stiff	Penetration	
		31-60	Hard	31-60	Hard	in 60 Blows: Medium Hard	
		Over 60	Very Hard	Over 60	Very Hard	Less than 2'	
						Penetration	
						in 60 Blows: Hard	

1. Ground water elevations indicated on boring logs represent ground water elevations at date or time shown on boring log. Absence of water surface implies that no ground water data is available but does not necessarily mean that ground water will not be encountered at locations or within the vertical reaches of these borings.
2. Borings represent subsurface conditions at their respective locations for their respective depths. Variations in conditions between or adjacent to boring locations may be encountered.
3. Terms used for describing soils according to their texture or grain size distribution are in accordance with the Unified Soil Classification System.

Standard Penetration Test – Driving a 2.0" O.D., 1-3/8" I.D. sampler a distance of 1.0 foot into undisturbed soil with a 140 pound hammer free falling a distance of 30 inches. It is customary to drive the spoon 6.0 inches to seat into undisturbed soil, then perform the test. The number of hammer blows for seating the spoon and performing the test are recorded for each 6 inches of penetration on the drill log. The field "N" Value ( $N_f$ ) can be obtained by

adding the bottom two numbers for example:  $\frac{6}{8-9} \Rightarrow 8+9 = 17 \text{ blows/ft}$ . The "N" Value corrected to 60% efficiency ( $N_{60}$ ) can be obtained by multiplying  $N_f$  by the hammer correction factor published on the boring log.



**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. Site 1-B1

PAGE 1 OF 2

JOB NO. 040861 Sebastian County  
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10, Section 0  
STATION: 207+68  
LOCATION: 34' Right of Construction Centerline  
LOGGED BY: Guy King

DATE: July 12, 2023  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker 1  
HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 39.9

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)										PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
					PL	LL												
			SURFACE ELEVATION: 485.9															
5			Moist, Very Loose, Brown Sandy Silt	ML										50	2 2-1			
				-														
			Wet, Very Loose, Brown Silty Sand*	SM										41	0 0-0			
				-														
			Wet, Loose, Brown Silty Sand	SM										25	0 3-4			
10				-														
			Wet, Medium Dense, Silty Sand with Gravel (Sandstone Fragments)**	SM										15	3 5-7			
15																		
			SHALE - Highly Weathered, Medium Hard, Gray												50 (4")			
			SHALE - Weathered, Medium Hard, Gray													93	86	
20			SHALE - Unweathered, Medium Hard, Gray															
																88	88	
25			SHALE - Unweathered with Weathered Layers, Medium Hard, Gray															
			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweatherd, Medium Hard with Hard Layers, Frequent Fractures, Gray													80	54	
30																		
			SHALE - Unweathered, Medium Hard, Frequent Fractues, Gray													100	62	
35																		

REMARKS: \*A water stratum was encountered at approximately 7.2 feet below ground level (BGL). \*\*Running sand was encountered at approximately 14.1 (BGL)

<b>ARKANSAS DEPARTMENT OF TRANSPORTATION</b> <b>MATERIALS DIVISION - GEOTECHNICAL SEC.</b>						BORING NO. Site 1-B1 PAGE 2 OF 2											
JOB NO. 040861 Sebastian County JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S) Route 10, Section 0 STATION: 207+68 LOCATION: 34' Right of Construction Centerline LOGGED BY: Guy King						DATE: July 12, 2023 TYPE OF DRILLING: Hollow Stem Auger - Diamond Core EQUIPMENT: Acker 1 HAMMER CORRECTION FACTOR: 1.54											
COMPLETION DEPTH: 39.9																	
DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)								PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D	
					PL	10	20	30	40	50	60	70					LL
			SURFACE ELEVATION: 485.9														
40			SHALE INTERBEDDED WITH SANDSTONE - Unweathered, Medium Hard with Hard Layers, Gray												98	98	
45			Boring Terminated														
50																	
55																	
60																	
65																	
70																	
REMARKS: *A water stratum was encountered at approximately 7.2 feet below ground level (BGL). **Running sand was encountered at approximately 14.1 (BGL)																	

<b>ARKANSAS DEPARTMENT OF TRANSPORTATION</b> <b>MATERIALS DIVISION - GEOTECHNICAL SEC.</b>					BORING NO. Site 1-B2 PAGE 1 OF 2										
JOB NO. 040861 Sebastian County JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S) Route 10, Section 0 STATION: 207+86 LOCATION: 34' Left of Construction Centerline LOGGED BY: Guy King					DATE: July 18 and 19, 2023 TYPE OF DRILLING: Hollow Stem Auger - Diamond Core EQUIPMENT: Acker 1 HAMMER CORRECTION FACTOR: 1.54										
COMPLETION DEPTH: 35															
DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)						PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D	
					PL ————— LL 10 20 30 40 50 60 70										
SURFACE ELEVATION: 487.2															
5	X	X	Moist, Very Stiff, Brown Silty Clay with Sand	CL-ML	●							84	9 10-7		
			-												
			CL-ML		●						84	3 3-3			
10	X	X	Wet, Medium Stiff, Brown Silty Clay with Sand*	CL		●						64	1 5-5		
			-												
			CL		●										
15	X	X	Moist, Stiff, Sandy Lean Clay	SC		●						43	6 8-7		
			-												
			SC		●										
20	X	X	Moist, Medium Dense, Brown Clayey Sand with Some Gravel (Sandstone Fragments)												
25	X	X	SHALE - Highly Weathered, Medium Hard, Gray										50 (10")		
			SHALE - Weathered, Medium Hard, Frequent Vertical Fractures, Occasional Slickensides, Gray										84	70	
			SHALE - Unweathered with Weathered Layers, Medium Hard, Gray	-									88	66	
30	X	X	SHALE INTERBEDDED WITH SANDSTONE - Unweathered with Weathered Layers, Medium Hard with Hard Layers, Gray											100	78
35	X	X	SHALE WITH INTERBEDDED SANDSTONE - Unweathered with Weathered Layers, Medium Hard with Hard Layers, Occasional Fractures, Gray**											100	98

REMARKS: \*The water level at a 168 hour reading was 5.4 feet below ground level. \*\*Partial water loss at approximately 33.8 feet below ground level.

<b>ARKANSAS DEPARTMENT OF TRANSPORTATION</b> <b>MATERIALS DIVISION - GEOTECHNICAL SEC.</b>					BORING NO. Site 1-B2 PAGE 2 OF 2											
JOB NO. 040861 Sebastian County JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S) Route 10, Section 0 STATION: 207+86 LOCATION: 34' Left of Construction Centerline LOGGED BY: Guy King					DATE: July 18 and 19, 2023 TYPE OF DRILLING: Hollow Stem Auger - Diamond Core EQUIPMENT: Acker 1 HAMMER CORRECTION FACTOR: 1.54											
COMPLETION DEPTH: 35																
D E P T H  FT.	S Y M B O L	S A M P L E S	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)							PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D	
					PL	10	20	30	40	50	60					70
			SURFACE ELEVATION: 487.2													
			Boring Terminated													
40																
45																
50																
55																
60																
65																
70																
REMARKS: *The water level at a 168 hour reading was 5.4 feet below ground level. **Partial water loss at approximately 33.8 feet below ground level.																



<b>ARKANSAS DEPARTMENT OF TRANSPORTATION</b> <b>MATERIALS DIVISION - GEOTECHNICAL SEC.</b>					BORING NO. Site 1-B3 PAGE 1 OF 2								
JOB NO. 040861 Sebastian County JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S) Route 10, Section 0 STATION: 208+41 LOCATION: 27' Right of Construction Centerline LOGGED BY: Guy King					DATE: July 25, 2023 TYPE OF DRILLING: Hollow Stem Auger - Diamond Core EQUIPMENT: Acker 1 HAMMER CORRECTION FACTOR: 1.54								
COMPLETION DEPTH: 35													
D E P T H	S Y M B O L	S A M P L E S	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%) PL  -----  LL 10 20 30 40 50 60 70					PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 486.7										
5	X	X	No sample								0 0-0		
	X	X	Moist, Very Loose, Brown Silty Sand								0 0-0		
10	X	X	Wet, Very Loose, Brown Silty Sand			•					0 0-0		
	X	X	Wet, Very Loose, Brown Silty Sand with Some Gravel*				•				2 2-2		
15	X	X	SHALE - Highly Weathered, Medium Hard, Gray			•					35 40 (4")		
20			SHALE - Weathered with Highly Weathered Layers, Medium Hard with Soft Layers, Frequent Fractures and Slickensides, Gray**									88	12
25			SHALE - Slightly Weathered with Weathered Layers, Medium Hard, Frequent Fractures, Gray*									100	24
30			SHALE - Unweathered, Medium Hard, Occasional Fractures, Gray									100	78
35			SANDSTONE INTERBEDDED WITH SHALE - Unweathered, Well Cemented, Gray										
			SHALE INTERBEDDED WITH SANDSTONE - Unweathered, Medium Hard with Hard Layers,									96	88
REMARKS: *A water stratum was encountered at approximately 12.5 feet below ground level (BGL). **A 1.8 feet thick slickensided vertical fractures was encountered at approximately 16.8 feet (BGL).													

<b>ARKANSAS DEPARTMENT OF TRANSPORTATION</b> <b>MATERIALS DIVISION - GEOTECHNICAL SEC.</b>					BORING NO. Site 1-B3 PAGE 2 OF 2								
JOB NO. 040861 Sebastian County JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S) Route 10, Section 0 STATION: 208+41 LOCATION: 27' Right of Construction Centerline LOGGED BY: Guy King					DATE: July 25, 2023 TYPE OF DRILLING: Hollow Stem Auger - Diamond Core EQUIPMENT: Acker 1 HAMMER CORRECTION FACTOR: 1.54								
COMPLETION DEPTH: 35													
D E P T H  FT.	S Y M B O L	S A M P L E S	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)					PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
					PL	10	20	30	40				
			SURFACE ELEVATION: 486.7 Gray Boring Terminated										
40													
45													
50													
55													
60													
65													
70													
REMARKS: *A water stratum was encountered at approximately 12.5 feet below ground level (BGL). **A 1.8 feet thick slickensided vertical fractures was encountered at approximately 16.8 feet (BGL).													

**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. Site 1-B4

PAGE 1 OF 1

JOB NO. 040861 Sebastian County  
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10, Section 0  
STATION: 208+41  
LOCATION: 34' Left of Construction Centerline  
LOGGED BY: Guy King

DATE: July 24, 2023  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker 1  
HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 34.1

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%) PL ————— LL	PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 487.0						
5			Moist, Loose, Brown Silty Sand	SM	•	49	3 3-3		
				-					
			Moist, Soft, Brown Sandy Silty Clay*	CL-ML	H •	69	2 2-2		
				-					
10			Moist, Very Soft, Brown Lean Clay with Sand	CL	H •	77	0 0-0		
				-					
			Wet, Medium Dense, Brown Poorly Graded Sand with Silt and Gravel (Sandstone Fragments)	SP-SM	H •	7	3 9-7		
15									
			SHALE - Highly Weathered, Medium Hard, Gray				15		
			SHALE - Slightly Weathered, Medium Hard, Occasional Fractures, Gray				35 (5")	100	90
20									
			SHALE - Unweathered, Medium Hard, Gray					100	88
25									
			SHALE - Unweathered with Occasional Weathered Layers, Medium Hard, Gray					88	68
30									
			SHALE INTERBEDDED WITH SANDSTONE - Unweathered, Medium Hard with Hard Layers, Gray						
			SANDSTONE WITH FREQUENT SHALE PARTINGS AND SEAMS - Unweathered, Well Cemented, Gray					100	80
35			Boring Terminated						

REMARKS: \*The water level at a 18 hour reading was 7.2 feet below ground level.

**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. Site 1-B5

PAGE 1 OF 1

JOB NO. 040861 Sebastian County  
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10, Section 0  
STATION: 209+50  
LOCATION: 23' Right of Construction Centerline  
LOGGED BY: Tracy Henderson

DATE: June 21, 2023  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker 1

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 28.2

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)												PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
					PL											LL				
			SURFACE ELEVATION: 483.7																	
5			Moist, Loose, Brown Sand													1 2-3				
																2 2-3				
			Wet, Loose, Brown Silty Sand													0 6-10				
			Wet, Medium Dense, Brown Silty Sand*													11 16-45 (9")				
10			Wet, Very Stiff, Brown Clay																	
			SHALE - Highly Weathered, Medium Hard, Gray																	
			SHALE - Weathered, Medium Hard, Gray													95	0			
15			SHALE - Slightly Weathered, Medium Hard, Occasional Fractures, Gray													98	66			
20			SHALE - Slightly Weathered, Medium Hard, Frequent Fractures, Gray													98	56			
25			SHALE - Slightly Weathered, Medium Hard, Frequent Fractures and Slickensides, Gray													100	26			
30			Boring Terminated																	
35																				

REMARKS: \*The water level at a 100 hour reading was 7.7 feet below ground level.

**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. Site 1-B6

PAGE 1 OF 1

JOB NO. 040861 Sebastian County  
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10, Section 0  
STATION: 209+62  
LOCATION: 34' Left of Construction Centerline  
LOGGED BY: Tracy Henderson

DATE: June 21, 2023  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker 1

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 28.6

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)										PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
					PL	● LL												
			SURFACE ELEVATION: 485.2		10	20	30	40	50	60	70							
			Moist, Loose, Brown Sandy Silt	ML	●								50	$\frac{3}{4-4}$				
5				-										62	$\frac{2}{2-3}$			
				ML	●									40	$\frac{2}{4-11}$			
			Wet, Medium Dense, Brown Silty Clayey Sand	SC-SM	●													
10			SHALE - Highly Weathered, Soft, Gray											$\frac{11}{28-56}$				
			SHALE - Weathered, Medium Hard, Frequent Fractures, Gray													95	0	
15			SHALE - Slightly Weathered, Medium Hard, Frequent Fractures, Gray													98	50	
20			SHALE - Unweathered, Medium Hard, Occasional Fractures, Gray	-														
																92	66	
25																90	82	
30			Boring Terminated															
35																		

REMARKS:

<b>ARKANSAS DEPARTMENT OF TRANSPORTATION</b> <b>MATERIALS DIVISION - GEOTECHNICAL SEC.</b>						BORING NO. Site 1-B7 PAGE 1 OF 1											
JOB NO. 040861 Sebastian County JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S) Route 10, Section 0 STATION: 210+23 LOCATION: 34' Right of Construction Centerline LOGGED BY: Tracy Henderson						DATE: June 27, 2023 TYPE OF DRILLING: Hollow Stem Auger - Diamond Core EQUIPMENT: Acker 1 HAMMER CORRECTION FACTOR: 1.54											
COMPLETION DEPTH: 34.1																	
D E P T H	S Y M B O L	S A M P L E S	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%) PL  -----  LL 10 20 30 40 50 60 70							PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D		
			SURFACE ELEVATION: 486.8														
5	X	X	Moist, Loose, Brown Silt with Sand	ML	•								74	3 5-4			
			-										60	5 5-8			
			Moist, Medium Dense, Brown Sandy Silt	ML	•									50	5 7-8		
10			-											40	5 7-7		
15	X	X	Moist, Medium Dense, Brown Silty Sand	SM	•												
			Wet, Dense, Brown Sand												26 40 (2")	100	85
			SHALE - Weathered, Medium Hard, Gray														
20	X	X	SHALE - Slightly Weathered, Medium Hard, Gray														
			SHALE - Unweathered, Medium Hard, Gray													96	92
25			-													92	92
30	X	X	SHALE - Unweathered with Weathered Layers, Medium Hard with Soft Layers, Frequent Fractures and Slickensides, Gray*														
																98	46
35			Boring Terminated														
REMARKS: A 2.0 feet slickensided vertical fracture was encountered at 29.4 to 31.4 feet below ground level.																	

**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. Site 1-B8

PAGE 1 OF 2

JOB NO. 040861 Sebastian County  
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10, Section 0  
STATION: 210+41  
LOCATION: 34' Left of Construction Centerline  
LOGGED BY: Guy King

DATE: July 11, 2023  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker 1

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 34.4

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)										PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
					PL	10	20	30	40	50	60	70	LL					
			SURFACE ELEVATION: 487.2															
5			Moist, Medium Dense, Light Brown Sandy Silt													6 8-7		
																6 8-9		
10			Moist, Medium Dense, Brown Sandy Silt													4 6-8		
			Moist, Very Stiff, Brown Sandy Silty Clay with Sandstone Fragments													4 8-16		
			Sandy Clay															
15			SHALE - Highly Weathered, Soft, Gray													50 (4")		
			SHALE - Highly Weathered, Medium Hard, Gray														95 90	
			SHALE - Slightly Weathered, Medium Hard, Gray															
20			SHALE - Unweathered, Medium Hard, Gray															
			SHALE - Unweathered, Medium Hard, Occasional Fractures, Gray														100 88	
25																		
			SHALE - Unweathered with Weathered Layers, Medium Hard, Frequent to Occasional Fractures, Gray														94 56	
30																		
																	100 64	
35																		

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION MATERIALS DIVISION - GEOTECHNICAL SEC.					BORING NO. Site 1-B8 PAGE 2 OF 2								
JOB NO. 040861 Sebastian County JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S) Route 10, Section 0 STATION: 210+41 LOCATION: 34' Left of Construction Centerline LOGGED BY: Guy King					DATE: July 11, 2023 TYPE OF DRILLING: Hollow Stem Auger - Diamond Core EQUIPMENT: Acker 1 HAMMER CORRECTION FACTOR: 1.54								
COMPLETION DEPTH: 34.4													
DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%) PL  -----  LL 10 20 30 40 50 60 70					PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 487.2 Boring Terminated										
40													
45													
50													
55													
60													
65													
70													
REMARKS:													



**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. Site 1-B9

PAGE 1 OF 1

JOB NO. 040861 Sebastian County  
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10, Section 0  
STATION: 210+92  
LOCATION: 34' Right of Construction Centerline  
LOGGED BY: Tracy Henderson

DATE: June 28, 2023  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker 1  
HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 34.2

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)										PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
					PL	● LL												
			SURFACE ELEVATION: 486.8		10	20	30	40	50	60	70							
			Moist, Medium Dense, Brown Silt with Sand and Organic Matter (Wood)										73	$\frac{5}{5-7}$				
				ML	●													
5				-														
			Moist, Medium Dense, Brown Sandy Silt										67	$\frac{5}{7-8}$				
				ML	●													
				-														
				ML	●													
10				-									52	$\frac{4}{6-7}$				
			Moist, Medium Dense, Brown Silty Sand with Rock Fragments	SM	●	—							41	$\frac{4}{7-7}$				
15			Moist, Very Dense, Brown Sand	-									40 (5")		86	36		
			SHALE - Weathered, Medium Hard, Gray															
20			SHALE - Slightly Weathered, Medium Hard, Gray															
25			SHALE - Unweathered with Weathered Layers, Medium Hard, Gray										100	62				
30			SHALE - Unweathered with Weathered Layers, Medium Hard, Frequent Fractures, Gray										100	62				
35			Boring Terminated															

REMARKS:



## ROCK CORE PHOTO

Job No.: 040861 Site 1

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))





## ROCK CORE PHOTO

Job No.: 040861 Site 1

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
207+68, 34' RT  
Depth: 24.9 - 34.9





## ROCK CORE PHOTO

Job No.: 040861 Site 1

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))





## ROCK CORE PHOTO

Job No.: 040861 Site 1

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
207+86, 34' LT  
Depth: 15.8 - 25.0





## ROCK CORE PHOTO

Job No.: 040861 Site 1

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))





## ROCK CORE PHOTO

Job No.: 040861 Site 1

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))







## ROCK CORE PHOTO

Job No.: 040861 Site 1

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
208+41, 27' RT  
Depth: 25.0 - 35.0





## ROCK CORE PHOTO

Job No.: 040861 Site 1

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))





## ROCK CORE PHOTO

Job No.: 040861 Site 1

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
208+41, 34' LT  
Depth: 24.1 - 34.1

ARKANSAS DEPARTMENT OF TRANSPORTATION  
GEOTECHNICAL FIELD LOGS

JOB NO.	BORING NO.
JOB NAME	DATE
LAT/LONG	TYPE OF DRILLING
LOCATION	EQUIPMENT
CREW	LOGGED BY
DRILLER	

SP. 102

208+41, 34' LT

24.1 - 34.1

040861





## ROCK CORE PHOTO

Job No.: 040861 Site 1

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))

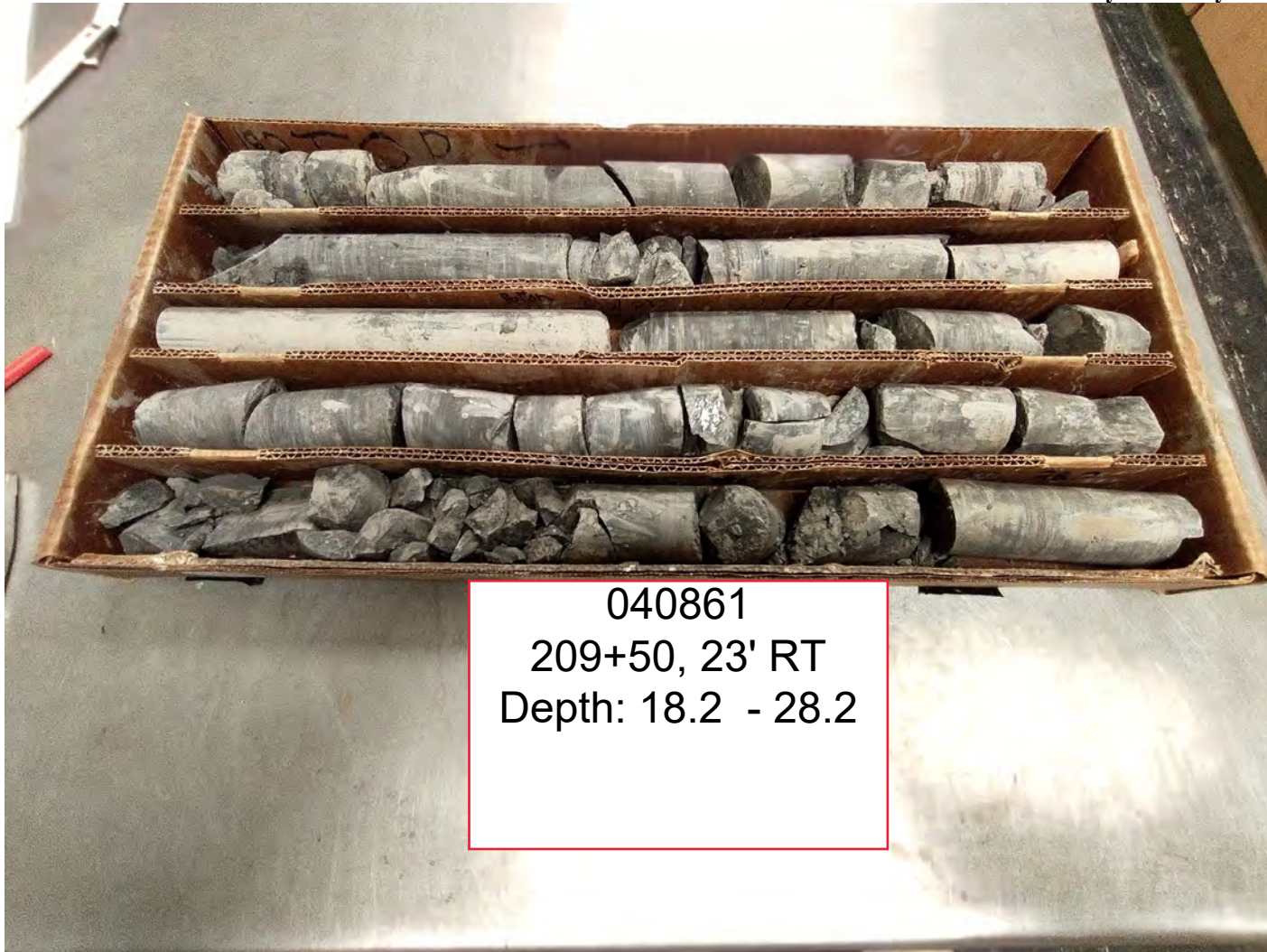




## ROCK CORE PHOTO

Job No.: 040861 Site 1

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
209+50, 23' RT  
Depth: 18.2 - 28.2





## ROCK CORE PHOTO

Job No.: 040861 Site 1

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))







## ROCK CORE PHOTO

Job No.: 040861 Site 1

Job Name: Hwy. 10 - Hwy. 96 (Greenwood Bypass (S))





# ROCK CORE PHOTO

Job No.: 040861 Site 1

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
210+23, 34' RT  
Depth:15.7 - 24.1





## ROCK CORE PHOTO

Job No.: 040861 Site 1

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))







## ROCK CORE PHOTO

Job No.: 040861 Site 1

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
210+41, 34' LT  
Depth: 15.3 - 24.4



## ROCK CORE PHOTO

Job No.: 040861 Site 1

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))







## ROCK CORE PHOTO

Job No.: 040861 Site 1

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
210+92, 34' RT  
Depth: 15.4 - 24.4



## ROCK CORE PHOTO

Job No.: 040861 Site 1

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))







## ROCK CORE PHOTO

Job No.: 040861 Site 1

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
211+10, 36' LT  
Depth: 13.0 - 22.5





## ROCK CORE PHOTO

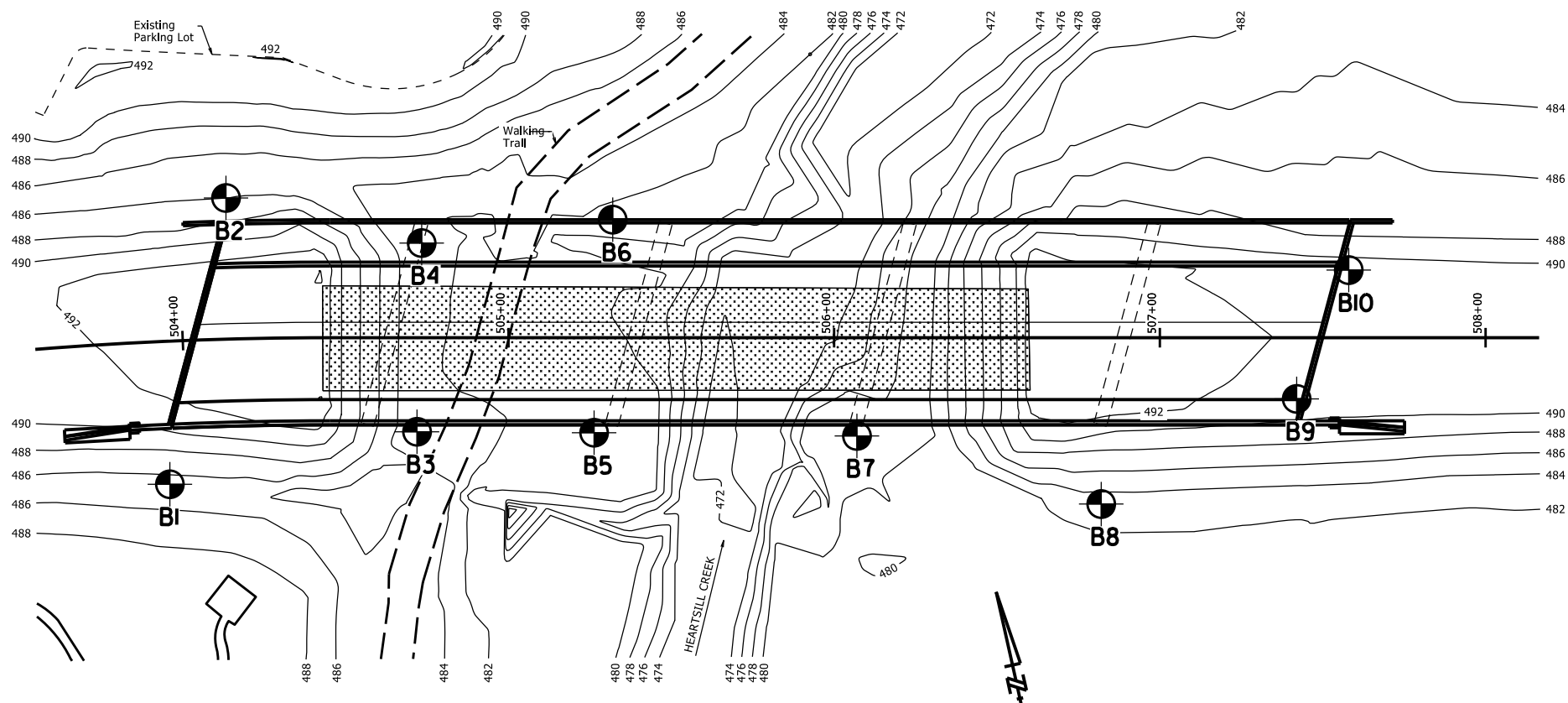
Job No.: 040861 Site 1

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



## Attachment A4

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	AR			
JOB NO.		040861		
PLAN OF BORINGS				

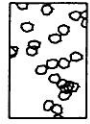


PLAN OF BORINGS	
HWY. 10- HWY. 96 (GREENWOOD BYPASS) (S)	
ROUTE 10, SECTIONS 0 & 1	
SEBASTIANCOUNTY	
FED. AID PROJECT	
JOB NO. 040861	SHEET 1/1

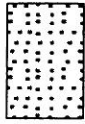
# LEGEND

## SOIL TYPES

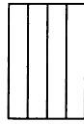
(SHOWN IN SYMBOL COLUMN)  
(PREDOMINANT TYPE SHOWN HEAVY)



GRAVEL



SAND



SILT



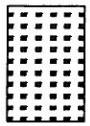
CLAY



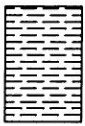
ORGANIC  
MATTER

## ROCK TYPES

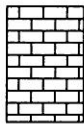
(SHOWN IN SYMBOL COLUMN)



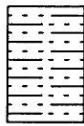
SANDSTONE



SHALE  
or  
SILTSTONE



LIMESTONE  
or  
DOLOMITE



ALTERNATING  
LAYERS of  
SHALE and  
SANDSTONE



OTHER

## SAMPLER TYPES

(SHOWN IN SAMPLE COLUMN)

### SHELBY TUBE



UNDISTURBED  
SAMPLE  
RECOVERY



DISTURBED  
SAMPLE  
RECOVERY



NO  
RECOVERY

### SPLIT SPOON



SAMPLE  
RECOVERY



NO  
RECOVERY

### ROCK CORING



% RECOVERY  
INDICATED ON LOGS

## TERMS DESCRIBING CONSISTENCY OR CONDITION

GRANULAR SOIL		CLAY		CLAY-SHALE		SHALE	
'N' Value	Density	'N' Value	Consistency	'N' Value	Consistency	'N' Value	Consistency
0-4	Very Loose	0-1	Very Soft	0-1	Very Soft		
5-10	Loose	2-4	Soft	2-4	Soft	31-60	Soft
11-30	Medium Dense	5-8	Medium Stiff	5-8	Medium Stiff	Over 60	
31-50	Dense	9-15	Stiff	9-15	Stiff	More than 2'	
Over 50	Very Dense	16-30	Very Stiff	16-30	Very Stiff	Penetration	
		31-60	Hard	31-60	Hard	in 60 Blows: Medium Hard	
		Over 60	Very Hard	Over 60	Very Hard	Less than 2'	
						Penetration	
						in 60 Blows: Hard	

1. Ground water elevations indicated on boring logs represent ground water elevations at date or time shown on boring log. Absence of water surface implies that no ground water data is available but does not necessarily mean that ground water will not be encountered at locations or within the vertical reaches of these borings.
2. Borings represent subsurface conditions at their respective locations for their respective depths. Variations in conditions between or adjacent to boring locations may be encountered.
3. Terms used for describing soils according to their texture or grain size distribution are in accordance with the Unified Soil Classification System.

Standard Penetration Test – Driving a 2.0" O.D., 1-3/8" I.D. sampler a distance of 1.0 foot into undisturbed soil with a 140 pound hammer free falling a distance of 30 inches. It is customary to drive the spoon 6.0 inches to seat into undisturbed soil, then perform the test. The number of hammer blows for seating the spoon and performing the test are recorded for each 6 inches of penetration on the drill log. The field "N" Value ( $N_f$ ) can be obtained by

adding the bottom two numbers for example:  $\frac{6}{8-9} \Rightarrow 8+9 = 17 \text{ blows/ft}$ . The "N" Value corrected to 60% efficiency ( $N_{60}$ ) can be obtained by multiplying  $N_f$  by the hammer correction factor published on the boring log.



<b>ARKANSAS DEPARTMENT OF TRANSPORTATION</b> <b>MATERIALS DIVISION - GEOTECHNICAL SEC.</b>					BORING NO. Site 4-B1 PAGE 1 OF 2											
JOB NO. 040861 Sebastian County JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S) Route 10, Section 0 STATION: 503+96 LOCATION: 45' Right of Construction Centerline LOGGED BY: Anthony Nicholson					DATE: May 31, 2023 TYPE OF DRILLING: Hollow Stem Auger - Diamond Core EQUIPMENT: Acker 1 HAMMER CORRECTION FACTOR: 1.54											
COMPLETION DEPTH: 39.6																
D E P T H	S Y M B O L	S A M P L E S	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)					PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D			
FT.					PL	10	20	30	40	50	60	70	LL			
			SURFACE ELEVATION: 485.0													
5			Moist, Very Soft, Brown Silty Clay												0 0-0	
															1 2-4	
10			Moist, Medium Stiff, Brown Silty Clay												0 1-4	
															2 5-7	
15			Moist, Stiff, Brown Silty Clay													
															3 4-8	
			Wet, Stiff, Sandy Silty Clay with Trace Gravel (Shale Fragments)*													
20			SHALE - Weathered, Medium Hard, Gray												12 (1")	
																100 71
25			SHALE - Slightly Weathered, Medium Hard with Soft Layers, Gray**													
																92 80
30			SHALE - Unweathered, Medium Hard, Gray													
																100 68
35			SHALE - Unweathered, Medium													
REMARKS: *A water stratum was encountered at approximately 15.0 feet below ground level (BGL). **A core inner barrel malfunction occurred between 20.1 and 24.6 feet (BGL).																

ARKANSAS DEPARTMENT OF TRANSPORTATION MATERIALS DIVISION - GEOTECHNICAL SEC.						BORING NO. Site 4-B1 PAGE 2 OF 2											
JOB NO. 040861 Sebastian County JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S) Route 10, Section 0 STATION: 503+96 LOCATION: 45' Right of Construction Centerline LOGGED BY: Anthony Nicholson						DATE: May 31, 2023 TYPE OF DRILLING: Hollow Stem Auger - Diamond Core EQUIPMENT: Acker 1 HAMMER CORRECTION FACTOR: 1.54											
COMPLETION DEPTH: 39.6																	
DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)							PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D		
					PL	10	20	30	40	50	60					70	LL
			SURFACE ELEVATION: 485.0														
			Hard, Occasional Fractures, Gray												100	86	
40			Boring Terminated														
45																	
50																	
55																	
60																	
65																	
70																	

REMARKS: \*A water stratum was encountered at approximately 15.0 feet below ground level (BGL). \*\*A core inner barrel malfunction occurred between 20.1 and 24.6 feet (BGL).

**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. Site 4-B2

PAGE 1 OF 2

JOB NO. 040861 Sebastian County  
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10, Section 0  
STATION: 504+14  
LOCATION: 44' Left of Construction Centerline  
LOGGED BY: Anthony Nicholson

DATE: May 24, 2023  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker 1  
HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 39.3

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)										PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
					PL	10	20	30	40	50	60	70	LL					
			SURFACE ELEVATION: 485.8															
5			Moist, Very Loose, Brown Sandy Silt												2			
															1-1			
			Moist, Medium Stiff, Brown Lean Clay	CL										91	0			
				-											3-2			
			Moist, Soft, Brown Lean Clay	CL										93	0			
10				-											0-3			
			Moist, Medium Stiff, Brown Silty Clay with Sand	CL-ML										78	0			
															2-3			
15				-														
			Moist, Stiff, Brown Sandy Lean Clay	CL										57	3			
20															5-8			
			SHALE - Weathered, Medium Hard, Gray													11 (1")		
			SHALE - Unweathered, Medium Hard, Gray														100 100	
25																		
			SHALE - Unweathered, Medium Hard, Frequent Fractures and Slickensides, Gray													70	42	
30																		
			SHALE - Unweathered with Weathered Layers, Medium Hard with Soft Layers. Frequent Fractures													94	0	
35																		

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION MATERIALS DIVISION - GEOTECHNICAL SEC.					BORING NO. Site 4-B2 PAGE 2 OF 2								
JOB NO. 040861 Sebastian County JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S) Route 10, Section 0 STATION: 504+14 LOCATION: 44' Left of Construction Centerline LOGGED BY: Anthony Nicholson					DATE: May 24, 2023 TYPE OF DRILLING: Hollow Stem Auger - Diamond Core EQUIPMENT: Acker 1 HAMMER CORRECTION FACTOR: 1.54								
COMPLETION DEPTH: 39.3													
DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%) PL  -----  LL 10 20 30 40 50 60 70					PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 485.8 and Slickensides, Gray										
											66	24	
40			Boring Terminated										
45													
50													
55													
60													
65													
70													
REMARKS:													



**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. Site 4-B3

PAGE 1 OF 2

JOB NO. 040861 Sebastian County  
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10, Section 0  
STATION: 504+72  
LOCATION: 29' Right of Construction Centerline  
LOGGED BY: Anthony Nicholson

DATE: May 31, 2023  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker 1  
HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 34.4

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%) PL ————— LL	PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 483.1						
5			Moist, Medium Stiff, Brown Sandy Silty Clay		20		2 3-3		
			Moist, Medium Stiff, Brown Silty Clay		20		2 3-2		
10			Moist, Soft, Brown Sandy Silty Clay		20		0 0-3		
			Wet, Soft, Brown Sandy Silty Clay		20		0 0-4		
15			SHALE - Weathered, Medium Hard, Gray				36 22 (1")	68	42
20			SHALE - Slightly Weathered, Medium Hard, Gray						
			SHALE - Unweathered, Medium Hard, Occasional Fractures and Slickensides, Gray					96	72
25									
			SHALE - Unweathered with Highly Weathered Layers, Medium Hard with Soft Layers, Frequent Fractures and Slickensides, Gray					100	58
30									
								98	50
35									

REMARKS: \*Drill bit blocked off during the 19.4 to 24.4 feet core run.

ARKANSAS DEPARTMENT OF TRANSPORTATION MATERIALS DIVISION - GEOTECHNICAL SEC.					BORING NO. Site 4-B3 PAGE 2 OF 2								
JOB NO. 040861 Sebastian County JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S) Route 10, Section 0 STATION: 504+72 LOCATION: 29' Right of Construction Centerline LOGGED BY: Anthony Nicholson					DATE: May 31, 2023 TYPE OF DRILLING: Hollow Stem Auger - Diamond Core EQUIPMENT: Acker 1 HAMMER CORRECTION FACTOR: 1.54								
COMPLETION DEPTH: 34.4													
DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%) PL  -----  LL 10 20 30 40 50 60 70					PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 483.1 Boring Terminated										
40													
45													
50													
55													
60													
65													
70													
REMARKS: *Drill bit blocked off during the 19.4 to 24.4 feet core run.													

**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. Site 4-B4

PAGE 1 OF 1

JOB NO. 040861 Sebastian County  
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10, Section 0  
STATION: 504+73  
LOCATION: 29' Left of Construction Centerline  
LOGGED BY: Anthony Nicholson

DATE: May 24, 2023  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker 1  
HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 34

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)										PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
					PL	LL												
SURFACE ELEVATION: 483.3					<div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div>&lt;/</div></div>													

REMARKS: \*A water stratum was encountered at approximately 15.0 feet below ground level.



**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. Site 4-B5

PAGE 1 OF 1

JOB NO. 040861 Sebastian County  
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10, Section 0  
STATION: 505+26  
LOCATION: 29' Right of Construction Centerline  
LOGGED BY: Anthony Nicholson

DATE: June 6, 2023  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker 1

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 34.2

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%) PL LL	PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 480.8						
5			Moist, Very Loose, Brown Silt		25		1 2-2		
			Moist, Very Loose, Brown Sandy Silt		30		0 0-0		
10			Wet, Very Soft, Brown Sandy Silty Clay		32		0 0-0		
			Wet, Very Loose, Brown Sandy Silt		32		0 0-0		
15			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Weathered with Highly Weathered Layers, Medium Hard with Soft Layers, Frequent Fractures, Gray				40 (5")	37	0
20			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Slightly Weathered with Weathered Layers, Medium Hard, Frequent Fractures, Gray					76	22
25			SHALE WITH FREQUENT TO OCCASIONAL SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard, Occasional Fractures and Slickensides, Trace Pyrite, Gray					84	64
30								98	86
35			Boring Terminated						

REMARKS:

**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. Site 4-B6





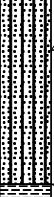

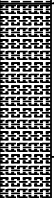

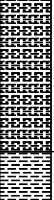

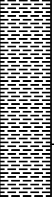

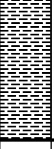

PAGE 1 OF 2

JOB NO. 040861 Sebastian County  
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10, Section 0  
STATION: 505+32  
LOCATION: 36' Left of Construction Centerline  
LOGGED BY: Tracy Henderson

DATE: May 23, 2023  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker 1

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 34.4

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)										PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
					PL  -----  LL													
			SURFACE ELEVATION: 481.6		10	20	30	40	50	60	70							
5			Moist, Soft, Brown Sandy Silty Clay	CL-ML									68	0 0-2				
			-															
			ML											62	0 1-2			
10			Moist, Very Loose, Brown Sandy Silt	-														
			ML										65	0 0-0				
			-															
15			Wet, Very Loose, Brown Sandy Silt	CL-ML									71	0 0-0				
			-															
			Moist, Very Soft, Brown Silty Clay with Sand															
20			SHALE - Weathered, Medium Hard, Gray										38 (5")		100	80		
25			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard with Hard Layers, Gray	-											100	78		
30			SHALE WITH OCCASIONAL SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard, Gray												100	92		
35															100	100		

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION MATERIALS DIVISION - GEOTECHNICAL SEC.					BORING NO. Site 4-B6 PAGE 2 OF 2										
JOB NO. 040861 Sebastian County JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S) Route 10, Section 0 STATION: 505+32 LOCATION: 36' Left of Construction Centerline LOGGED BY: Tracy Henderson					DATE: May 23, 2023 TYPE OF DRILLING: Hollow Stem Auger - Diamond Core EQUIPMENT: Acker 1 HAMMER CORRECTION FACTOR: 1.54										
COMPLETION DEPTH: 34.4															
D E P T H  FT.	S Y M B O L	S A M P L E S	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)							PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
					PL										
			SURFACE ELEVATION: 481.6												
			Boring Terminated												
40															
45															
50															
55															
60															
65															
70															
REMARKS:															



**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. Site 4-B7

PAGE 1 OF 1

JOB NO. 040861 Sebastian County  
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10, Section 0  
STATION: 506+07  
LOCATION: 30' Right of Construction Centerline  
LOGGED BY: Tracy Henderson

DATE: May 17, 2023  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker 1

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 33.9

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)										PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
					PL	● LL												
			SURFACE ELEVATION: 477.8															
			Moist, Very Soft, Brown Sandy Silty Clay with Organic Matter*	CL-ML										66	1 0-1			
5																		
			Wet, Very Soft, Brown Sandy Silty Clay	-											0 1-0			
			Wet, Medium Stiff, Gray Sandy Lean Clay with Gravel	CL										55	2 4-4			
10				-														
			Wet, Very Stiff, Gray Sandy Lean Clay	CL										56	4 3-14			
			SHALE - Highly Weathered, Very Soft, Gray															
15																		
			SHALE - Weathered, Medium Hard, Gray											38 (4")		100	56	
			SHALE - Slightly Weathered, Medium Hard, Occasional Fractures, Gray															
20																		
			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard with Hard Layers, Gray	-												98	88	
25																		
			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard with Hard Layers, Gray													100	92	
30																		
			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard with Hard Layers, Gray													98	88	
35			Boring Terminated															

REMARKS: \*24 hour water level reading was 3.8 feet below ground level.

**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. Site 4-B8

PAGE 1 OF 2

JOB NO. 040861 Sebastian County  
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10, Section 0  
STATION: 506+82  
LOCATION: 51' Right of Construction Centerline  
LOGGED BY: Tracy Henderson

DATE: May 17, 2023  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker 1

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 38.7

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)										PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
					PL	LL												
SURFACE ELEVATION: 482.8																		
			Moist, Loose, Brown Silty Sand													1 2-3		
5			Moist, Loose, Brown Sandy Silt													1 6-3		
			Wet, Very Loose, Brown Sandy Silt													0 0-0		
10			Wet, Very Loose, Brown Silty Sand													2 2-1		
			Wet, Very Stiff, Brown Sandy Silty Clay*													4 8-18		
			SHALE - Highly Weathered, Very Soft, Gray															
20			SHALE - Slightly Weathered, Medium Hard, Gray													20 (0")	97 48	
			SHALE - Unweathered, Medium Hard, Gray														98 82	
25																		
30																		
35																		

REMARKS: \*A water stratum was encountered at approximately 15.5 feet below water ground level.

<b>ARKANSAS DEPARTMENT OF TRANSPORTATION</b> <b>MATERIALS DIVISION - GEOTECHNICAL SEC.</b>						BORING NO. Site 4-B8 PAGE 2 OF 2												
JOB NO. 040861 Sebastian County JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S) Route 10, Section 0 STATION: 506+82 LOCATION: 51' Right of Construction Centerline LOGGED BY: Tracy Henderson						DATE: May 17, 2023 TYPE OF DRILLING: Hollow Stem Auger - Diamond Core EQUIPMENT: Acker 1 HAMMER CORRECTION FACTOR: 1.54												
COMPLETION DEPTH: 38.7																		
D E P T H  FT.	S Y M B O L	S A M P L E S	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)										PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
					PL	10	20	30	40	50	60	70	LL					
			SURFACE ELEVATION: 482.8															
			SHALE WITH INTERBEDDED SANDSTONE - Unweathered, Medium Hard with Hard Layers, Gray														100 84	
40			Boring Terminated															
45																		
50																		
55																		
60																		
65																		
70																		

REMARKS: \*A water stratum was encountered at approximately 15.5 feet below water ground level.

**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. Site 4-B9

PAGE 1 OF 2

JOB NO. 040861 Sebastian County  
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10, Section 0  
STATION: 507+42  
LOCATION: 19' Right of Construction Centerline  
LOGGED BY: Tracy Henderson

DATE: May 3, 2023  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker 1  
HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 48.8

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)										PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D	
					<div>PL  -----  LL</div> <div>10203040506070</div>														
			SURFACE ELEVATION: 490.4																
5			Moist, Medium Stiff, Brown Sandy Lean Clay												63	$\frac{3}{4-4}$			
				CL															
				-															
			Wet, Loose, Brown Sandy Silt											61	$\frac{2}{2-3}$				
				ML															
				-															
10			Wet, Medium Stiff, Brown Silty Clay with Sand											82	$\frac{2}{3-3}$				
				CL-ML															
				-															
15			Wet, Soft, Brown Silty Clay											70	$\frac{3}{2-2}$				
				CL-ML															
				-															
20			Wet, Very Loose, Brown Silt											90	$\frac{0}{0-0}$				
				ML															
				-															
25			Wet, Loose, Light Gray Sandy Silt											67	$\frac{1}{2-3}$				
				ML															
30			SHALE - Highly Weathered, Soft, Gray												$\frac{16}{18-18}$				
35			SHALE - Unweathered, Medium												30 (0")	47	10		

REMARKS:



**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. Site 4-B9

PAGE 2 OF 2

JOB NO. 040861 Sebastian County  
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10, Section 0  
STATION: 507+42  
LOCATION: 19' Right of Construction Centerline  
LOGGED BY: Tracy Henderson

DATE: May 3, 2023  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker 1

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 48.8

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)										PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
					PL	10	20	30	40	50	60	70	LL					
			SURFACE ELEVATION: 490.4															
			Hard, Occasional Slickensides, Gray	-												96	84	
40			SANDSTONE WITH INTERBEDDED SHALE - Unweathered, Cemented, Gray													98	82	
45			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard with Hard Layers, Gray													100	86	
50			Boring Terminated															
55																		
60																		
65																		
70																		

REMARKS:

**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. Site 4-B10

PAGE 1 OF 2

JOB NO. 040861 Sebastian County  
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10, Section 0  
STATION: 507+58  
LOCATION: 20' Left of Construction Centerline  
LOGGED BY: Tracy Henderson

DATE: May 23, 2023  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker 1

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 48.8

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)										PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
					PL	10	20	30	40	50	60	70	LL					
			SURFACE ELEVATION: 490.2															
5			Moist, Medium Stiff, Brown Silty Clay with Sand													2 3-3		
10			Moist, Soft, Brown Silty Clay													0 0-2		
15			Wet, Soft, Light Gray Silty Clay													0 1-2		
20			Wet, Very Soft, Light Gray Silty Clay													0 0-0		
25			SHALE - Highly Weathered, Very Soft, Gray													2 9-18		
30			SHALE - Unweathered, Medium													20 (0")	76 37	
35																		

REMARKS: \*Poor TCR and RQD between 30.0 and 33.8 feet below ground level are likely due to a core barrel malfunction.

**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. Site 4-B10

PAGE 2 OF 2

JOB NO. 040861 Sebastian County  
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10, Section 0  
STATION: 507+58  
LOCATION: 20' Left of Construction Centerline  
LOGGED BY: Tracy Henderson

DATE: May 23, 2023  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker 1

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 48.8

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)										PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
					PL	<div><div></div></div>												
			SURFACE ELEVATION: 490.2		10	20	30	40	50	60	70							
			Hard, Gray*													100	58	
40			SHALE WITH INTERBEDDED SANDSTONE - Unweathered, Medium Hard with Hard Layers, Gray													100	78	
45																	100	96
50			Boring Terminated															
55																		
60																		
65																		
70																		

REMARKS: \*Poor TCR and RQD between 30.0 and 33.8 feet below ground level are likely due to a core barrel malfunction.



## ROCK CORE PHOTO

Job No.: 040861 Site 4

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
503+96, 45' RT  
Depth: 20.1 - 29.6





## ROCK CORE PHOTO

Job No.: 040861 Site 4

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
503+96, 45' RT  
Depth: 29.6 - 39.6



## ROCK CORE PHOTO

Job No.: 040861 Site 4

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
504+14, 44' LT  
Depth: 20.6 - 29.3





## ROCK CORE PHOTO

Job No.: 040861 Site 4

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
504+14, 44' LT  
Depth: 29.3 - 39.3



## ROCK CORE PHOTO

Job No.: 040861 Site 4

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
504+72, 29' RT  
Depth: 15.6 - 24.4





## ROCK CORE PHOTO

Job No.: 040861 Site 4

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
504+72, 29' RT  
Depth: 24.4 - 34.4



## ROCK CORE PHOTO

Job No.: 040861 Site 4

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
504+73, 29' LT  
Depth: 17.0 - 24.0





## ROCK CORE PHOTO

Job No.: 040861 Site 4

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
504+73, 29' LT  
Depth: 24.0 - 34.0



## ROCK CORE PHOTO

Job No.: 040861 Site 4

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
505+26, 29' RT  
Depth: 16.5 - 24.2





## ROCK CORE PHOTO

Job No.: 040861 Site 4

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861

505+26, 29' RT

Depth: 24.2 - 34.2



## ROCK CORE PHOTO

Job No.: 040861 Site 4

Job Name: Hwy. 10 - Hwy. 96 (Greenwood Bypass (S))



040861  
505+32, 36' LT  
Depth: 15.4 - 24.4





## ROCK CORE PHOTO

Job No.: 040861 Site 4

Job Name: Hwy. 10 - Hwy. 96 (Greenwood Bypass (S))



040861  
505+32, 36' LT  
Depth: 24.4 - 34.4



## ROCK CORE PHOTO

Job No.: 040861 Site 4

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
506+07, 30' RT  
Depth: 15.3 - 23.9





## ROCK CORE PHOTO

Job No.: 040861 Site 4

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))





## ROCK CORE PHOTO

Job No.: 040861 Site 4

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
506+82, 51' RT  
Depth: 20.0 - 28.7





## ROCK CORE PHOTO

Job No.: 040861 Site 4

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
506+82, 51' RT  
Depth: 28.7 - 38.7



## ROCK CORE PHOTO

Job No.: 040861 Site 4

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))







## ROCK CORE PHOTO

Job No.: 040861 Site 4

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



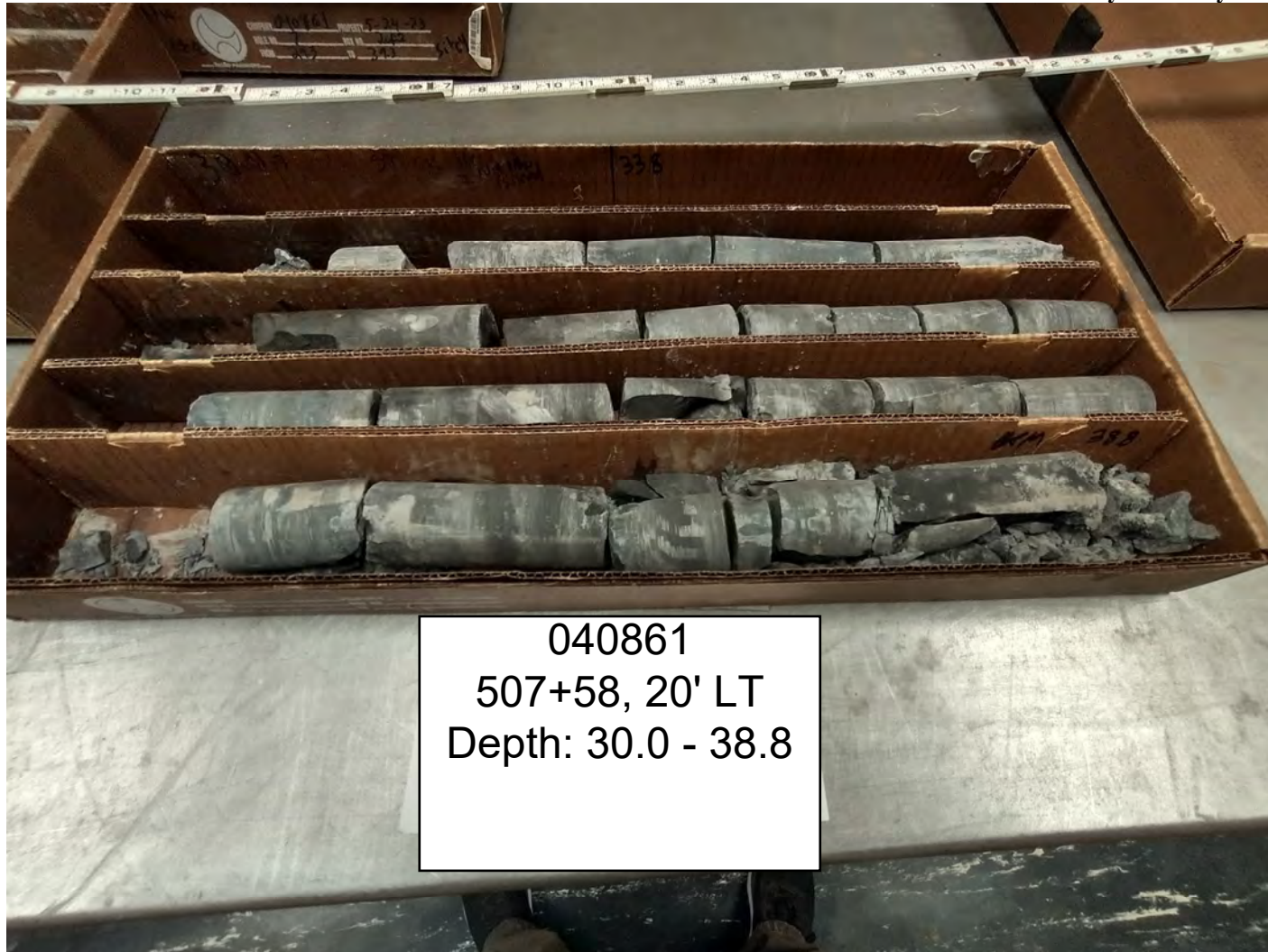
040861  
507+42, 19' RT  
Depth: 38.8 - 48.8



## ROCK CORE PHOTO

Job No.: 040861 Site 4

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
507+58, 20' LT  
Depth: 30.0 - 38.8





## ROCK CORE PHOTO

Job No.: 040861 Site 4

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))

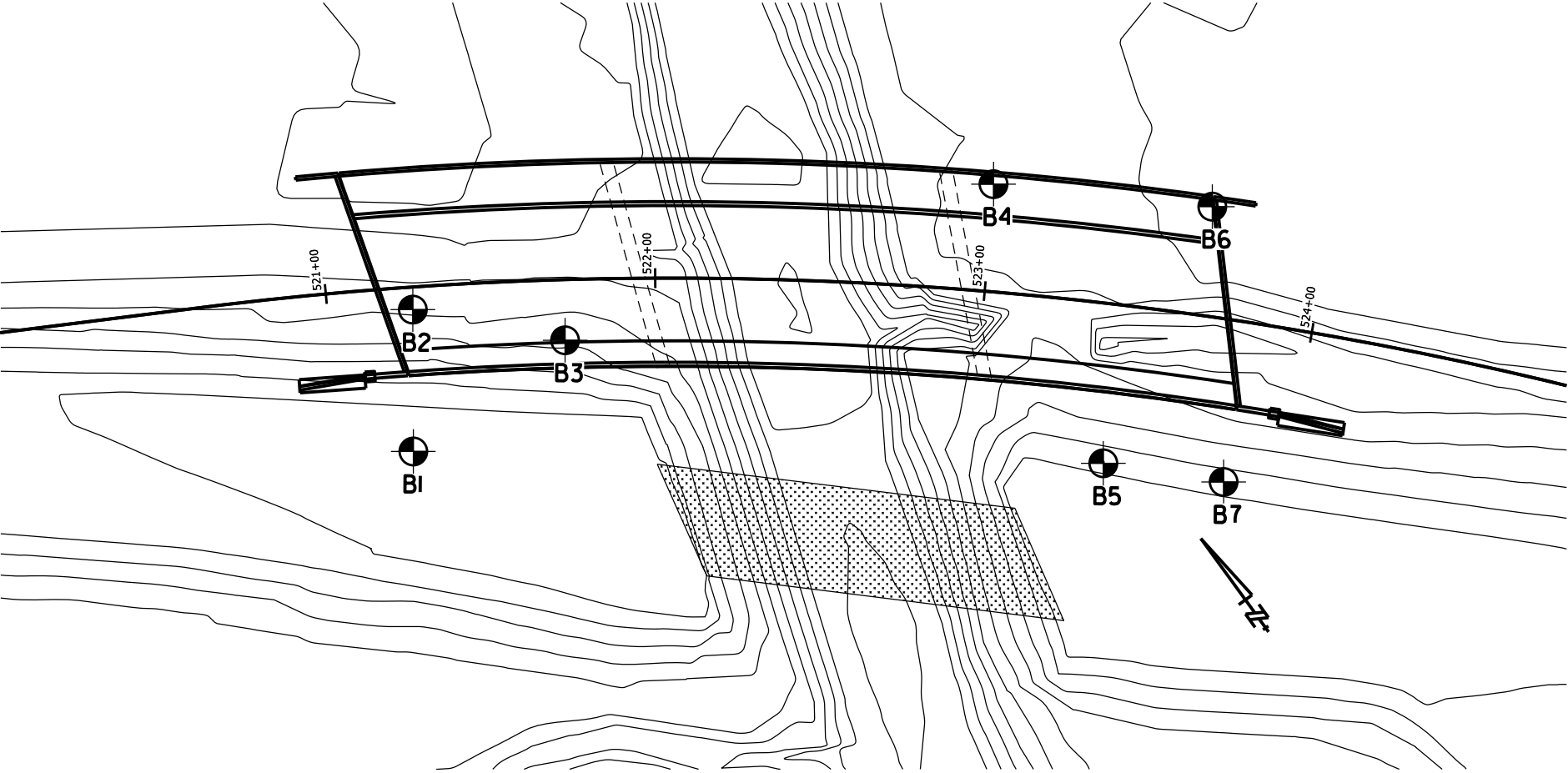


040861  
507+58, 20' LT  
Depth: 38.8 - 48.8

## Attachment A5



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	AR			
JOB NO.		040861		
PLAN OF BORINGS				

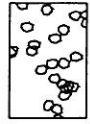


PLAN OF BORINGS	
HWY. 10- HWY. 96 (GREENWOOD BYPASS) (S) ROUTE 10, SECTIONS 0 & 1 SEBASTIANCOUNTY FED. AID PROJECT	
JOB NO. 040861	SHEET 1/1

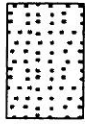
# LEGEND

## SOIL TYPES

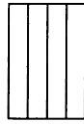
(SHOWN IN SYMBOL COLUMN)  
(PREDOMINANT TYPE SHOWN HEAVY)



GRAVEL



SAND



SILT



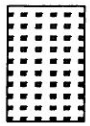
CLAY



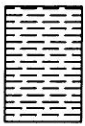
ORGANIC  
MATTER

## ROCK TYPES

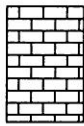
(SHOWN IN SYMBOL COLUMN)



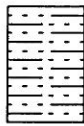
SANDSTONE



SHALE  
or  
SILTSTONE



LIMESTONE  
or  
DOLOMITE



ALTERNATING  
LAYERS of  
SHALE and  
SANDSTONE



OTHER

## SAMPLER TYPES

(SHOWN IN SAMPLE COLUMN)

### SHELBY TUBE



UNDISTURBED  
SAMPLE  
RECOVERY

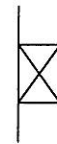


DISTURBED  
SAMPLE  
RECOVERY



NO  
RECOVERY

### SPLIT SPOON



SAMPLE  
RECOVERY



NO  
RECOVERY

### ROCK CORING



% RECOVERY  
INDICATED ON LOGS

## TERMS DESCRIBING CONSISTENCY OR CONDITION

GRANULAR SOIL		CLAY		CLAY-SHALE		SHALE	
'N' Value	Density	'N' Value	Consistency	'N' Value	Consistency	'N' Value	Consistency
0-4	Very Loose	0-1	Very Soft	0-1	Very Soft		
5-10	Loose	2-4	Soft	2-4	Soft	31-60	Soft
11-30	Medium Dense	5-8	Medium Stiff	5-8	Medium Stiff	Over 60	
31-50	Dense	9-15	Stiff	9-15	Stiff	More than 2'	
Over 50	Very Dense	16-30	Very Stiff	16-30	Very Stiff	Penetration	
		31-60	Hard	31-60	Hard	in 60 Blows Medium Hard	
		Over 60	Very Hard	Over 60	Very Hard	Less than 2'	
						Penetration	
						in 60 Blows Hard	

1. Ground water elevations indicated on boring logs represent ground water elevations at date or time shown on boring log. Absence of water surface implies that no ground water data is available but does not necessarily mean that ground water will not be encountered at locations or within the vertical reaches of these borings.
2. Borings represent subsurface conditions at their respective locations for their respective depths. Variations in conditions between or adjacent to boring locations may be encountered.
3. Terms used for describing soils according to their texture or grain size distribution are in accordance with the Unified Soil Classification System.

Standard Penetration Test – Driving a 2.0" O.D., 1-3/8" I.D. sampler a distance of 1.0 foot into undisturbed soil with a 140 pound hammer free falling a distance of 30 inches. It is customary to drive the spoon 6.0 inches to seat into undisturbed soil, then perform the test. The number of hammer blows for seating the spoon and performing the test are recorded for each 6 inches of penetration on the drill log. The field "N" Value ( $N_f$ ) can be obtained by

adding the bottom two numbers for example:  $\frac{6}{8-9} \Rightarrow 8+9 = 17 \text{ blows/ft}$ . The "N" Value corrected to 60% efficiency ( $N_{60}$ ) can be obtained by multiplying  $N_f$  by the hammer correction factor published on the boring log.

**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. Site 5-B1

PAGE 1 OF 2

JOB NO. 040861 Sebastian County  
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10, Section 0  
STATION: 521+23  
LOCATION: 50' Right of Construction Centerline  
LOGGED BY: Anthony Nicholson

DATE: April 4, 2023  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker 1

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 39.1

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)										PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
					PL	MOISTURE CONTENT (%)												
SURFACE ELEVATION: 493.0																		
			Gravel and Cobbles*	-														
5			Moist, Soft, Brown Sandy Silty Clay	CL-ML										64	1	2-2		
				-														
			Moist, Medium Stiff, Brown Silty Clay with Sand	CL-ML										80	1	2-4		
10				-														
			Moist, Medium Stiff, Brown Silty Clay	CL-ML										87	4	3-5		
				-														
15			Moist, Soft, Wet Sandy Silty Clay	CL-ML										53	0	2-2		
				-														
20			Wet, Very Loose, Brown Silty Sand	SM										47	1	1-3		
25			SHALE - Weathered, Medium Hard, Gray												60 (5")			
			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard, Occasional Fractures and Slickensides, Gray	-												100	96	
30																		
																100	66	
35																		

REMARKS: \*No sample could be taken above 5.0 feet below ground level due to auger movement.

ARKANSAS DEPARTMENT OF TRANSPORTATION MATERIALS DIVISION - GEOTECHNICAL SEC.						BORING NO. Site 5-B1 PAGE 2 OF 2										
JOB NO. 040861 Sebastian County JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S) Route 10, Section 0 STATION: 521+23 LOCATION: 50' Right of Construction Centerline LOGGED BY: Anthony Nicholson						DATE: April 4, 2023 TYPE OF DRILLING: Hollow Stem Auger - Diamond Core EQUIPMENT: Acker 1 HAMMER CORRECTION FACTOR: 1.54										
COMPLETION DEPTH: 39.1																
DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)								PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
					PL	10	20	30	40	50	60	70				
			SURFACE ELEVATION: 493.0													
			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard, Gray												100	86
40			Boring Terminated													
45																
50																
55																
60																
65																
70																
REMARKS: *No sample could be taken above 5.0 feet below ground level due to auger movement.																



**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. Site 5-B2

PAGE 1 OF 2

JOB NO. 040861 Sebastian County  
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10, Section 0  
STATION: 521+26  
LOCATION: 7' Right of Construction Centerline  
LOGGED BY: Tracy Henderson

DATE: May 2, 2023  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker 1

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 39.1

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)						PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
					PL					LL				
			SURFACE ELEVATION: 483.5											
5			Moist, Very Loose, Light Brown Silty Sand									1 2-2		
												0 0-3		
10												0 0-0		
			Wet, Very Loose, Light Brown Silty Sand									0 0-1		
15														
			Moist, Very Hard, Light Gray Clay									2 30-30 (7")		
20			SHALE - Highly Weathered, Medium Hard with Soft Layers, Gray											
			SHALE - Weathered, Medium Hard, Gray									30 (1")	88	88
25														
													100	84
30			SHALE WITH OCCASIONAL SANDSTONE PARTINGS - Unweathered, Medium Hard, Occasional Fractures, Gray											
													100	78
35														

REMARKS:

<b>ARKANSAS DEPARTMENT OF TRANSPORTATION</b> <b>MATERIALS DIVISION - GEOTECHNICAL SEC.</b>						BORING NO. Site 5-B2 PAGE 2 OF 2										
JOB NO. 040861 Sebastian County JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S) Route 10, Section 0 STATION: 521+26 LOCATION: 7' Right of Construction Centerline LOGGED BY: Tracy Henderson						DATE: May 2, 2023 TYPE OF DRILLING: Hollow Stem Auger - Diamond Core EQUIPMENT: Acker 1 HAMMER CORRECTION FACTOR: 1.54										
COMPLETION DEPTH: 39.1																
D E P T H  FT.	S Y M B O L	S A M P L E S	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)							PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D	
					PL	10	20	30	40	50	60					70
			SURFACE ELEVATION: 483.5													
															98	98
40			Boring Terminated													
45																
50																
55																
60																
65																
70																
REMARKS:																

**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. Site 5-B3

PAGE 1 OF 2

JOB NO. 040861 Sebastian County  
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10, Section 0  
STATION: 521+72  
LOCATION: 19' Right of Construction Centerline  
LOGGED BY: Tracy Henderson

DATE: May 2, 2023  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker 1  
HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 39

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)						PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
					PL					LL				
			SURFACE ELEVATION: 484.7											
5			Moist, Very Loose, Light Brown Silty Sand									1 1-3		
												1 2-2		
10			Wet, Very Loose, Light Brown Silty Sand									0 0-0		
												0 0-0		
15			Wet, Medium Stiff, Light Brown Silty Clay with Sand									3 4-4		
20												30 (0")	100	78
25			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard, Gray										96	90
30														
35			SHALE - Unweathered, Medium										100	84

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION MATERIALS DIVISION - GEOTECHNICAL SEC.					BORING NO. Site 5-B3 PAGE 2 OF 2													
JOB NO. 040861 Sebastian County					DATE: May 2, 2023													
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S) Route 10, Section 0					TYPE OF DRILLING: Hollow Stem Auger - Diamond Core													
STATION: 521+72					EQUIPMENT: Acker 1													
LOCATION: 19' Right of Construction Centerline					HAMMER CORRECTION FACTOR: 1.54													
LOGGED BY: Tracy Henderson																		
COMPLETION DEPTH: 39																		
D E P T H  FT.	S Y M B O L	S A M P L E S	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)										PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
					PL	10	20	30	40	50	60	70	LL					
			SURFACE ELEVATION: 484.7															
			Hard, Gray												98	86		
40			Boring Terminated															
45																		
50																		
55																		
60																		
65																		
70																		
REMARKS:																		



**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. Site 5-B4

PAGE 1 OF 2

JOB NO. 040861 Sebastian County  
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10, Section 0  
STATION: 522+98  
LOCATION: 33' Left of Construction Centerline  
LOGGED BY: Anthony Nicholson

DATE: March 15, 2023  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker 1  
HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 34.3

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)						PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 487.4		PL	10	20	30	40	50	60	70	LL	
5			Moist, Very Loose, Reddish Brown Silt with Sand	- ML -									72	1 1-2
			Moist, Soft, Reddish Brown Silty Clay with Sand	CL-ML -									80	0 1-3
10			Moist, Loose, Reddish Brown Clayey Sand with Gravel (Rock Fragments)	NT									64	3 3-4
			SHALE - Highly Weathered, Soft, Dark Brown										14 40-47	
15			SHALE WITH INTERBEDDED SANDSTONE - Highly Weathered, Medium Hard, Frequent Fractures, Gray											34 0
20			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard, Gray	-										72 36
25														
30			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard, Occasional Fractures, Gray*											100 88
														96 80
														100 54
35														

REMARKS: \*Vertical Fracture from 33.2' to 34.3' Below ground level.

<b>ARKANSAS DEPARTMENT OF TRANSPORTATION</b> <b>MATERIALS DIVISION - GEOTECHNICAL SEC.</b>						BORING NO. Site 5-B4 PAGE 2 OF 2										
JOB NO. 040861 Sebastian County JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S) Route 10, Section 0 STATION: 522+98 LOCATION: 33' Left of Construction Centerline LOGGED BY: Anthony Nicholson						DATE: March 15, 2023 TYPE OF DRILLING: Hollow Stem Auger - Diamond Core EQUIPMENT: Acker 1 HAMMER CORRECTION FACTOR: 1.54										
COMPLETION DEPTH: 34.3																
D E P T H  FT.	S Y M B O L	S A M P L E S	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)								PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
					PL	10	20	30	40	50	60	70				
			SURFACE ELEVATION: 487.4													
			Boring Terminated													
40																
45																
50																
55																
60																
65																
70																
REMARKS: *Vertical Fracture from 33.2' to 34.3' Below ground level.																

**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. Site 5-B5

PAGE 1 OF 1

JOB NO. 040861 Sebastian County  
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10, Section 0  
STATION: 523+36  
LOCATION: 49' Right of Construction Centerline  
LOGGED BY: Anthony Nicholson

DATE: March 13 and 14, 2023  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker 1  
HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 27.1

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)												PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
					PL											LL				
			SURFACE ELEVATION: 492.6		10	20	30	40	50	60	70									
			Moist, Medium Stiff, Brown Sandy Silty Clay	-																
				CL-ML	●	—								56	0 4-4					
5				-																
				Moist, Medium Stiff, Brown Sandy Lean Clay	CL	●	—							53	2 3-4					
				-																
				Moist, Loose, Brown Sandy Silt	ML	●								63	4 5-2					
10				-																
				Wet, Medium Dense, Brown Silty Clayey Sand with Some Gravel	SC-SM	●	—							44	1 5-6					
15																				
			SHALE - Highly Weathered, Soft, Gray											40 20 (1")						
20				-												88	80			
			SHALE WITH INTERBEDDED SANDSTONE - Unweathered, Medium Hard, Gray*																	
25																96	36			
			Boring Terminated																	
30																				
35																				

REMARKS: \*Poor core recovery on final core run due to drill rig malfunction.

**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. Site 5-B6

PAGE 1 OF 2

JOB NO. 040861 Sebastian County  
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10, Section 0  
STATION: 523+65  
LOCATION: 33' Left of Construction Centerline  
LOGGED BY: Don McCollom and Donnie Thornton

DATE: March 15, 2023  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker 1  
HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 34.6

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%) PL  -----  LL	PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 488.7						
5			Moist, Medium Stiff, Brown Silty Clay with Traces of Gravel		20		2 2-3		
			Moist, Very Soft, Brown Silty Clay		20		0 0-1		
10			Moist, Dense, Brown Silty Sand		10		9 13-20		
			Moist, Very Dense, Brown Sand				16 25-34		
15			SHALE - Weathered, Medium Hard, Gray				10 (0")		
20			SHALE WITH FREQUENT SANDSTONE PARTINGS - Unweathered, Medium Hard, Gray					98	78
25			SHALE WITH INTERBEDDED SANDSTONE - Unweathered, Medium Hard, Occasional Fractures, Gray					96	75
			SHALE WITH INTERBEDDED SANDSTONE - Unweathered, Medium Hard, Gray					100	82
30			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard, Occasional Fractures, Gray					100	78
35									

REMARKS:



<b>ARKANSAS DEPARTMENT OF TRANSPORTATION</b> <b>MATERIALS DIVISION - GEOTECHNICAL SEC.</b>					BORING NO. Site 5-B6 PAGE 2 OF 2											
JOB NO. 040861 Sebastian County JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S) Route 10, Section 0 STATION: 523+65 LOCATION: 33' Left of Construction Centerline LOGGED BY: Don McCollom and Donnie Thornton					DATE: March 15, 2023 TYPE OF DRILLING: Hollow Stem Auger - Diamond Core EQUIPMENT: Acker 1 HAMMER CORRECTION FACTOR: 1.54											
COMPLETION DEPTH: 34.6																
D E P T H  FT.	S Y M B O L	S A M P L E S	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)							PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D	
					PL	10	20	30	40	50	60					70
			SURFACE ELEVATION: 488.7													
			Boring Terminated													
40																
45																
50																
55																
60																
65																
70																
REMARKS:																

**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. Site 5-B7

PAGE 1 OF 2

JOB NO. 040861 Sebastian County  
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10, Section 0  
STATION: 523+80  
LOCATION: 49' Right of Construction Centerline  
LOGGED BY: Anthony Nicholson

DATE: March 14, 2023  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker 1

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 35.6

DEPTH FT.	S Y M B O L	S A M P L E S	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)										PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 491.4		PL	10	20	30	40	50	60	70	LL					
5			Moist, Medium Stiff, Brown Silty Clay												2			
															3-5			
			Moist, Very Loose, Brown Silty Sand												2			
															2-1			
10			Moist, Medium Stiff, Brown Silty Clay												1			
															3-4			
			Moist, Medium Dense, Brown Sand with Silt and Traces of Gravel (Shale Fragments)												4			
15															5-8			
			SHALE - Weathered, Medium Hard, Gray												60 (6")			
20			SHALE WITH FREQUENT TO OCCASIONAL SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard, Occasional Fractures, Gray													67	61	
25																96	66	
			SHALE WITH INTERBEDDED SANDSTONE - Unweathered, Medium Hard, Gray															
30																100	84	
			SHALE WITH INTERBEDDED SANDSTONE - Unweathered, Medium Hard, Frequent Fractures, Gray*															
35																100	62	

REMARKS: \*Vertical Fracture from 31.9' to 32.6' Below ground level.

ARKANSAS DEPARTMENT OF TRANSPORTATION MATERIALS DIVISION - GEOTECHNICAL SEC.					BORING NO. Site 5-B7 PAGE 2 OF 2											
JOB NO. 040861 Sebastian County JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S) Route 10, Section 0 STATION: 523+80 LOCATION: 49' Right of Construction Centerline LOGGED BY: Anthony Nicholson					DATE: March 14, 2023 TYPE OF DRILLING: Hollow Stem Auger - Diamond Core EQUIPMENT: Acker 1 HAMMER CORRECTION FACTOR: 1.54											
COMPLETION DEPTH: 35.6																
D E P T H  FT.	S Y M B O L	S A M P L E S	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)							PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D	
					PL	10	20	30	40	50	60					70
			SURFACE ELEVATION: 491.4													
			Boring Terminated													
40																
45																
50																
55																
60																
65																
70																
REMARKS: *Vertical Fracture from 31.9' to 32.6' Below ground level.																



## ROCK CORE PHOTO

Job No.: 040861

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
521+23, 50' RT  
Depth: 26.5 - 34.1





## ROCK CORE PHOTO

Job No.: 040861

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))





## ROCK CORE PHOTO

Job No.: 040861

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
521+26, 7' RT  
Depth: 20.1 - 29.1





## ROCK CORE PHOTO

Job No.: 040861

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
521+26, 7' RT  
Depth: 29.1 - 39.1



## ROCK CORE PHOTO

Job No.: 040861

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
521+72, 19' RT  
Depth: 20.0 - 29.0





## ROCK CORE PHOTO

Job No.: 040861

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
521+72, 19' RT  
Depth: 29.0 - 39.0



## ROCK CORE PHOTO

Job No.: 040861

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))







## ROCK CORE PHOTO

Job No.: 040861

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))





## ROCK CORE PHOTO

Job No.: 040861

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))







## ROCK CORE PHOTO

Job No.: 040861

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))





## ROCK CORE PHOTO

Job No.: 040861

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))







## ROCK CORE PHOTO

Job No.: 040861

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
523+80, 49' RT  
Depth: 16.8 - 25.6

ho  
PRO  
www.hole.pho



## ROCK CORE PHOTO

Job No.: 040861

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))





## Attachment B1

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS  
MATERIALS DIVISION  
PAUL TINSLEY, MATERIALS ENGINEER  
\*\*\* SOIL ANALYSIS TEST REPORT \*\*\*

DATE	- 07/20/2023	SEQUENCE NO.	- 8
JOB NUMBER	- 040861	MATERIAL CODE	- 14620L
FEDERAL AID NO.	- TO BE ASSIGNED	SPEC. YEAR	- 2014
PURPOSE	- INFORMATION ONLY SAMPLE	SUPPLIER ID.	- 1
SPEC. REMARKS	- NO SPECIFICATION CHECK	COUNTY/STATE	- 65
SUPPLIER NAME	- STATE	DISTRICT NO.	- 04
NAME OF PROJECT	- HWY.10-HWY.96 (GREENWOOD BYPASS) (S)		
PROJECT ENGINEER	- NOT APPLICABLE		
PIT/QUARRY	- ARKANSAS	SAMPLED	- 06/21/2023
LOCATION	- SEBASTIAN, COUNTY	RECEIVED	- 06/26/2023
SAMPLED BY	- T. HENDERSON	TESTED	- 06/29/2023
SAMPLE FROM	- AUGER CUTTINGS		
MATERIAL DESC.	- SOIL FOR SEEDING - LIME/REQ.		

DESCRIPTIONS	- SAMPLE 1	- SAMPLE 2	- SAMPLE 3
LAB NUMBER	- 20230987	-	-
SAMPLE ID	- SM11	-	-
TEST STATUS	- INFORMATION ONLY	-	-
STATION	- 209+50	-	-
LOCATION	- 23'RT	-	-
DEPTH IN FEET	-	-	-
COLOR	-	-	-
% PASS 2 IN.	-	-	-
1 1/2 IN.	-	-	-
3/4 IN.	-	-	-
3/8 IN.	-	-	-
NO. 4	- 100	-	-
NO. 10	- 98	-	-
NO. 40	- 97	-	-
NO. 80	- 84	-	-
NO. 200	- 53	-	-
LIQUID LIMIT	- 19	-	-
PLASTICITY INDEX	- 5	-	-
AASHTO SOIL CLS.	- A-4 (1)	-	-
UNIFIED SOIL CLS.	-	-	-
SOIL PH	( N) 6.0	( )	( )
LIME (TONS/ACRE)	-	-	-
SPECIFIC GRAVITY	-	-	-
% ABSORPTION	-	-	-
MAX. DEN. #/CF	-	-	-
% OPT. MOISTURE	-	-	-
% MOISTURE CONT.	-	-	-

REMARKS - SOIL RESISTIVITY 3.31 Ohm\*cm

- CC: GEOTECH, CHEMISTRY, SOILS

AASHTO TESTS : AASHTO T11, T27, T85, T88, T89, T90, T99, T100, T134, T180, T265, M145, AHTD357

# Summary of Rock Core Uniaxial Compression Test Results

Project Number: 040861 Site 1  
 Project Name: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
 Date Tested: 7/28/2023

Station	Location	Sample No.	Depth (ft.)	Diameter (in.)	Height (in.)	Weight g	Unit Weight pcf	Total Load (lbs.)	Correction Factor	Stress (psi)	Remarks
207+68	34' RT	1	15.8	1.68	3.50	322.62	158	5,600		2,328	
207+68	34' RT	2	20.1	1.75	3.45	347.19	159	5,270		2,191	
207+86	34' LT	3	19.8	1.75	3.39	334.59	156	6,070		2,523	
207+86	34' LT	4	26.5	1.75	3.48	359.52	164	8,470		3,521	
208+41	34' LT	5	16.6	1.75	3.21	326.98	161	4,700	0.955	1,866	
208+41	34' LT	6	21.2	1.75	3.52	356.75	161	6,110		2,540	
208+41	34' LT	7	30.3	1.75	3.57	371.35	165	19,000		7,899	Sandstone
208+41	27' RT	8	23.7	1.73	3.29	328.16	162	10,980	0.965	4,508	Sandstone
208+41	27' RT	9	25.7	1.74							Broke in Saw
209+50	23' RT	10	14.9	1.75	3.54	354.02	158	5,610		2,332	
209+50	23' RT	11	17.0	1.75	3.42	346.4	160	6,730		2,798	
209+50	23' RT	12	20.4	1.75	3.51	359.39	162	6,840		2,843	
209+62	34' LT	13	15.6								Broke in Saw
210+23	34' RT	14	17.5	1.74	3.63	373.54	165	8,860		3,683	
210+41	34' LT	15	16.3								Broke in Saw
210+92	34' RT	16	16.1	1.74	3.62	360.42	160	8,830		3,671	
211+10	36' LT	17	17.2	1.74	3.48	343.97	158	7,900		3,284	
Average, $\mu$ :							161			3,285	
Standard Deviation, s:							3			1513	
Average - Standard Deviation/2, $\mu-s/2$ :										2528	

# ROCK MASS RATING SUMMARY

JOB # 040861 Site 1

GSI 55

**SAMPLE #1**

Station/Location	207+68, 34' RT
Depth (ft)	15.8
Relative Rating	
Uniaxial Compressive Strength	2
RQD	17
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	66
Class Number	II
Description	GOOD ROCK

**SAMPLE #2**

Station/Location	207+68, 34' RT
Depth (ft)	20.1
Relative Rating	
Uniaxial Compressive Strength	2
RQD	17
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	66
Class Number	II
Description	GOOD ROCK

**SAMPLE #3**

Station/Location	207+86, 34' LT
Depth (ft)	19.8
Relative Rating	
Uniaxial Compressive Strength	2
RQD	13
Spacing of Joints	20
Condition of Joints	6
Groundwater Conditions	7
Sum	48
Class Number	III
Description	FAIR ROCK

**SAMPLE #4**

Station/Location	207+86, 34' LT
Depth (ft)	26.5
Relative Rating	
Uniaxial Compressive Strength	2
RQD	17
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	66
Class Number	II
Description	GOOD ROCK

**SAMPLE #5**

Station/Location	208+41, 34" LT
Depth (ft)	16.6
Relative Rating	
Uniaxial Compressive Strength	2
RQD	20
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	69
Class Number	II
Description	GOOD ROCK

**SAMPLE #6**

Station/Location	208+41, 34" LT
Depth (ft)	21.2
Relative Rating	
Uniaxial Compressive Strength	4
RQD	20
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	71
Class Number	II
Description	GOOD ROCK

**SAMPLE #7**

Station/Location	208+41, 27" RT
Depth (ft)	23.7
Relative Rating	
Uniaxial Compressive Strength	4
RQD	8
Spacing of Joints	10
Condition of Joints	12
Groundwater Conditions	7
Sum	41
Class Number	III
Description	FAIR ROCK

**SAMPLE #8**

Station/Location	208+41, 27" RT
Depth (ft)	25.7
Relative Rating	
Uniaxial Compressive Strength	Broke in saw
RQD	17
Spacing of Joints	20
Condition of Joints	25
Groundwater Conditions	7
Sum	69
Class Number	II
Description	GOOD ROCK



**SAMPLE #9**

Station/Location	208+41, 34" LT
Depth (ft)	30.3
	Relative Rating
Uniaxial Compressive Strength	7
RQD	17
Spacing of Joints	25
Condition of Joints	20
Groundwater Conditions	7
Sum	76
Class Number	II
Description	GOOD ROCK

**SAMPLE #10**

Station/Location	209+50, 23' RT
Depth (ft)	14.9
	Relative Rating
Uniaxial Compressive Strength	2
RQD	13
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	62
Class Number	II
Description	GOOD ROCK

**SAMPLE #11**

Station/Location	209+50, 23' RT
Depth (ft)	17.0
	Relative Rating
Uniaxial Compressive Strength	2
RQD	13
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	62
Class Number	II
Description	GOOD ROCK

**SAMPLE #12**

Station/Location	209+50, 23' RT
Depth (ft)	20.4
	Relative Rating
Uniaxial Compressive Strength	4
RQD	8
Spacing of Joints	10
Condition of Joints	6
Groundwater Conditions	7
Sum	35
Class Number	IV
Description	POOR ROCK

**SAMPLE #13**

Station/Location	209+62, 34' LT
Depth (ft)	15.6
	Relative Rating
Uniaxial Compressive Strength	Broke in saw
RQD	13
Spacing of Joints	10
Condition of Joints	6
Groundwater Conditions	7
Sum	36
Class Number	IV
Description	POOR ROCK

**SAMPLE #14**

Station/Location	210+23, 34' RT
Depth (ft)	17.5
	Relative Rating
Uniaxial Compressive Strength	4
RQD	17
Spacing of Joints	25
Condition of Joints	20
Groundwater Conditions	7
Sum	73
Class Number	II
Description	GOOD ROCK

**SAMPLE #15**

Station/Location	210+41, 34' LT
Depth (ft)	16.3
	Relative Rating
Uniaxial Compressive Strength	Broke in saw
RQD	17
Spacing of Joints	10
Condition of Joints	20
Groundwater Conditions	7
Sum	54
Class Number	III
Description	FAIR ROCK

**SAMPLE #16**

Station/Location	210+92, 34' RT
Depth (ft)	16.1
	Relative Rating
Uniaxial Compressive Strength	4
RQD	8
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	59
Class Number	III
Description	FAIR ROCK

**SAMPLE #17**

Station/Location	211+10, 36' LT
Depth (ft)	17.2
	Relative Rating
Uniaxial Compressive Strength	4
RQD	13
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	64
Class Number	II
Description	GOOD ROCK

## Attachment B4

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS

MATERIALS DIVISION

PAUL TINSLEY, MATERIALS ENGINEER

\*\*\* SOIL ANALYSIS TEST REPORT \*\*\*

DATE	- 06/27/2023	SEQUENCE NO.	- 6
JOB NUMBER	- 040861	MATERIAL CODE	- 14620L
FEDERAL AID NO.	- TO BE ASSIGNED	SPEC. YEAR	- 2014
PURPOSE	- INFORMATION ONLY SAMPLE	SUPPLIER ID.	- 1
SPEC. REMARKS	- NO SPECIFICATION CHECK	COUNTY/STATE	- 65
SUPPLIER NAME	- STATE	DISTRICT NO.	- 04
NAME OF PROJECT	- HWY.10-HWY.96 (GREENWOOD BYPASS) (S)		
PROJECT ENGINEER	- NOT APPLICABLE		
PIT/QUARRY	- ARKANSAS	SAMPLED	- 06/06/2023
LOCATION	- SEBASTIAN, COUNTY	RECEIVED	- 06/14/2023
SAMPLED BY	- T.HENDERSON	TESTED	- 06/19/2023
SAMPLE FROM	- JOBSITE		
MATERIAL DESC.	- SOIL FOR SEEDING - LIME/REQ.		

DESCRIPTIONS	- SAMPLE 1	- SAMPLE 2	- SAMPLE 3
LAB NUMBER	- 20230867	-	-
SAMPLE ID	- SM8	-	-
TEST STATUS	- INFORMATION ONLY	-	-
STATION	- 505+26	-	-
LOCATION	- 29'RT	-	-
DEPTH IN FEET	-	-	-
COLOR	-	-	-
% PASS 2 IN.	-	-	-
1 1/2 IN.	-	-	-
3/4 IN.	-	-	-
3/8 IN.	-	-	-
NO. 4	-	-	-
NO. 10	- 100	-	-
NO. 40	- 99	-	-
NO. 80	- 93	-	-
NO. 200	- 71	-	-
LIQUID LIMIT	- 23	-	-
PLASTICITY INDEX	- 6	-	-
AASHTO SOIL CLS.	-	-	-
UNIFIED SOIL CLS.	-	-	-
SOIL PH ( N )	6.1	( )	( )
LIME (TONS/ACRE)	- 0.0	-	-
SPECIFIC GRAVITY	-	-	-
% ABSORPTION	-	-	-
MAX. DEN. #/CF	-	-	-
% OPT. MOISTURE	-	-	-
% MOISTURE CONT.	-	-	-

REMARKS - SOIL RESISTIVITY 3.9K **Ohm\*cm**

- CC: GEOTECH, CHEMISTRY, SOILS

AASHTO TESTS : AASHTO T11, T27, T85, T88, T89, T90, T99, T100, T134, T180, T265, M145, AHTD357



ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS

MATERIALS DIVISION

PAUL TINSLEY, MATERIALS ENGINEER

\*\*\* SOIL ANALYSIS TEST REPORT \*\*\*

DATE	- 06/20/2023	SEQUENCE NO.	- 5
JOB NUMBER	- 040861	MATERIAL CODE	- 14620L
FEDERAL AID NO.	- TO BE ASSIGNED	SPEC. YEAR	- 2014
PURPOSE	- INFORMATION ONLY SAMPLE	SUPPLIER ID.	- 1
SPEC. REMARKS	- NO SPECIFICATION CHECK	COUNTY/STATE	- 65
SUPPLIER NAME	- STATE	DISTRICT NO.	- 04
NAME OF PROJECT	- HWY.10-HWY.96 (GREENWOOD BYPASS) (S)		
PROJECT ENGINEER	- NOT APPLICABLE		
PIT/QUARRY	- ARKANSAS		
LOCATION	- SEBASTIAN, COUNTY	SAMPLED	- 05/24/2023
SAMPLED BY	- ANTHONY NICHOLSON	RECEIVED	- 05/30/2023
SAMPLE FROM	- 505+72 16' LT OF CL	TESTED	- 06/01/2023
MATERIAL DESC.	- SOIL FOR SEEDING - LIME/REQ.		

DESCRIPTIONS	- SAMPLE 1	- SAMPLE 2	- SAMPLE 3
LAB NUMBER	- 20230761	-	-
SAMPLE ID	- SM-4	-	-
TEST STATUS	- INFORMATION ONLY	-	-
STATION	- 505+72	-	-
LOCATION	- 16' LT	-	-
DEPTH IN FEET	-	-	-
COLOR	-	-	-
% PASS 2 IN.	-	-	-
1 1/2 IN.	-	-	-
3/4 IN.	-	-	-
3/8 IN.	- 100	-	-
NO. 4	- 99	-	-
NO. 10	- 99	-	-
NO. 40	- 99	-	-
NO. 80	- 95	-	-
NO. 200	- 75	-	-
LIQUID LIMIT	- 23	-	-
PLASTICITY INDEX	- 7	-	-
AASHTO SOIL CLS.	- A-4 (3)	-	-
UNIFIED SOIL CLS.	-	-	-
SOIL PH ( N)	- 7.3	- ( )	- ( )
LIME (TONS/ACRE)	- 0.0	-	-
SPECIFIC GRAVITY	-	-	-
% ABSORPTION	-	-	-
MAX. DEN. #/CF	-	-	-
% OPT. MOISTURE	-	-	-
% MOISTURE CONT.	-	-	-

REMARKS - SOIL RESISTIVITY 3.80K **Ohm\*cm**

- CC: RE 99, CHEMISTRY, SOILS

AASHTO TESTS : AASHTO T11, T27, T85, T88, T89, T90, T99, T100, T134, T180, T265, M145, AHTD357

:

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS

MATERIALS DIVISION

PAUL TINSLEY, MATERIALS ENGINEER

\*\*\* SOIL ANALYSIS TEST REPORT \*\*\*

DATE	- 06/20/2023	SEQUENCE NO.	- 4
JOB NUMBER	- 040861	MATERIAL CODE	- 14620L
FEDERAL AID NO.	- TO BE ASSIGNED	SPEC. YEAR	- 2014
PURPOSE	- INFORMATION ONLY SAMPLE	SUPPLIER ID.	- 1
SPEC. REMARKS	- NO SPECIFICATION CHECK	COUNTY/STATE	- 65
SUPPLIER NAME	- STATE	DISTRICT NO.	- 04
NAME OF PROJECT	- HWY.10-HWY.96(GREENWOOD BYPASS) (S)		
PROJECT ENGINEER	- NOT APPLICABLE		
PIT/QUARRY	- ARKANSAS	SAMPLED	- 05/17/2023
LOCATION	- SEBASTIAN, COUNTY	RECEIVED	- 05/19/2023
SAMPLED BY	- T HENDERSON	TESTED	- 05/23/2023
SAMPLE FROM	- AUGER CUTTINGS		
MATERIAL DESC.	- SOIL FOR SEEDING - LIME/REQ.		

DESCRIPTIONS	- SAMPLE 1	- SAMPLE 2	- SAMPLE 3
LAB NUMBER	- 20230677	-	-
SAMPLE ID	- S141	-	-
TEST STATUS	- INFORMATION ONLY	-	-
STATION	- 506+07	-	-
LOCATION	- 30'RT	-	-
DEPTH IN FEET	-	-	-
COLOR	-	-	-
% PASS 2 IN.	-	-	-
1 1/2 IN.	-	-	-
3/4 IN.	-	-	-
3/8 IN.	-	-	-
NO. 4	-	-	-
NO. 10	-	-	-
NO. 40	-	-	-
NO. 80	-	-	-
NO. 200	-	-	-
LIQUID LIMIT	-	-	-
PLASTICITY INDEX	-	-	-
AASHTO SOIL CLS.	-	-	-
UNIFIED SOIL CLS.	-	-	-
SOIL PH ( B) 6.4	( )	( )	( )
LIME (TONS/ACRE) - 3.0	-	-	-
SPECIFIC GRAVITY	-	-	-
% ABSORPTION	-	-	-
MAX. DEN. #/CF	-	-	-
% OPT. MOISTURE	-	-	-
% MOISTURE CONT.	-	-	-

REMARKS - SOIL RESISTIVITY 5.01K **Ohm\*cm**  
 - MAE BUFFER PH: 7.5, MAE LIME ADDITION: 1.95 TONS  
 - CC: RE 99, CHEMISTRY, SOILS

AASHTO TESTS : AASHTO T11, T27, T85, T88, T89, T90, T99, T100, T134, T180, T265, M145, AHTD357

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS

MATERIALS DIVISION

PAUL TINSLEY, MATERIALS ENGINEER

\*\*\* SOIL ANALYSIS TEST REPORT \*\*\*

DATE	- 06/27/2023	SEQUENCE NO.	- 4
JOB NUMBER	- 040861	MATERIAL CODE	- 14620L
FEDERAL AID NO.	- TO BE ASSIGNED	SPEC. YEAR	- 2014
PURPOSE	- INFORMATION ONLY SAMPLE	SUPPLIER ID.	- 1
SPEC. REMARKS	- NO SPECIFICATION CHECK	COUNTY/STATE	- 65
SUPPLIER NAME	- STATE	DISTRICT NO.	- 04
NAME OF PROJECT	- HWY.10-HWY.96 (GREENWOOD BYPASS) (S)		
PROJECT ENGINEER	- NOT APPLICABLE		
PIT/QUARRY	- ARKANSAS		
LOCATION	- SEBASTIAN, COUNTY	SAMPLED	- 05/17/2023
SAMPLED BY	- T HENDERSON	RECEIVED	- 05/19/2023
SAMPLE FROM	- AUGER CUTTINGS	TESTED	- 05/23/2023
MATERIAL DESC.	- SOIL FOR SEEDING - LIME/REQ.		

DESCRIPTIONS	SAMPLE 1	SAMPLE 2	SAMPLE 3
LAB NUMBER	- 20230677	-	-
SAMPLE ID	- S141	-	-
TEST STATUS	- INFORMATION ONLY	-	-
STATION	- 506+07	-	-
LOCATION	- 30'RT	-	-
DEPTH IN FEET	-	-	-
COLOR	-	-	-
% PASS 2 IN.	-	-	-
1 1/2 IN.	-	-	-
3/4 IN.	-	-	-
3/8 IN.	-	-	-
NO. 4	-	-	-
NO. 10	-	-	-
NO. 40	-	-	-
NO. 80	-	-	-
NO. 200	-	-	-
LIQUID LIMIT	-	-	-
PLASTICITY INDEX	-	-	-
AASHTO SOIL CLS.	-	-	-
UNIFIED SOIL CLS.	-	-	-
SOIL PH ( N) 5.7	( )	( )	( )
LIME (TONS/ACRE)	-	-	-
SPECIFIC GRAVITY	-	-	-
% ABSORPTION	-	-	-
MAX. DEN. #/CF	-	-	-
% OPT. MOISTURE	-	-	-
% MOISTURE CONT.	-	-	-

REMARKS - SOIL RESISTIVITY 5.01K Ohm\*cm

- CC: GEOTECH, CHEMISTRY, SOILS

AASHTO TESTS : AASHTO T11, T27, T85, T88, T89, T90, T99, T100, T134, T180, T265, M145, AHTD357

:



# Summary of Rock Core Uniaxial Compression Test Results

Project Number: 040861 Site 4  
 Project Name: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
 Date Tested:

Station	Location	Sample No.	Depth (ft.)	Diameter (in.)	Height (in.)	Weight g	Unit Weight pcf	Total Load (lbs.)	Correction Factor	Stress (psi)	Remarks
503+96	45' RT	1	22.3	1.74	3.48						sample broke after cutting
503+96	45' RT	2	28.6	1.74	3.48						sample broke
504+14	44' LT	3	28.4	1.74	3.48	350.64	161	6,730		2,830	
504+72	29' RT	4	20.0	1.75	3.50	345.04	156	8,410		3,496	
504+73	29' LT	5	20.4	1.75	3.50						sample broke
504+73	29' LT	6	28.8	1.75	3.50	369.97	167	13,050		5,426	
505+32	36' LT	7	18.2	1.75	3.50	353.43	160	8,530		3,546	
505+32	36' LT	8	30.2	1.75	3.50	361.28	163	13,200		5,488	
506+07	30' RT	9	17.1	1.7	3.55	331.15	157	8,170		3,599	
506+07	30' RT	10	20.7	1.75	3.77	378.30	159	6,900		2,869	sandstone
506+82	51' RT	11	21.3	1.74	3.54	359.38	163	10,650		4,479	
506+82	51' RT	12	35.3	1.75	3.44	354.54	163	13,310		5,534	
507+42	19' RT	13	33.9	1.75	3.21	329.01	162	8,070		3,355	
507+42	19' RT	14	37.5	1.74	3.40						sample broke
507+58	20' LT	15	35.0	1.75	3.39	350.53	164	11,820		4,914	
Average, $\mu$ :							161			4,140	
Standard Deviation, s:							3			1055	
Average - Standard Deviation/2, $\mu-s/2$ :										3612	



# ROCK MASS RATING SUMMARY

JOB # 040861 Site 4

GS1 90

**SAMPLE #1**

Station/Location	503+96, 45' RT
Depth (ft)	22.3
	Relative Rating
Uniaxial Compressive Strength	
RQD	13
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	60
Class Number	III
Description	FAIR ROCK

**SAMPLE #2**

Station/Location	503+96, 45' RT
Depth (ft)	28.6
	Relative Rating
Uniaxial Compressive Strength	
RQD	17
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	64
Class Number	II
Description	GOOD ROCK

**SAMPLE #3**

Station/Location	504+14, 44' LT
Depth (ft)	28.4
	Relative Rating
Uniaxial Compressive Strength	
RQD	3
Spacing of Joints	10
Condition of Joints	20
Groundwater Conditions	7
Sum	40
Class Number	IV
Description	POOR ROCK

**SAMPLE #4**

Station/Location	504+72, 29' RT
Depth (ft)	20
	Relative Rating
Uniaxial Compressive Strength	
RQD	13
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	60
Class Number	III
Description	FAIR ROCK

**SAMPLE #5**

Station/Location	504+73, 29' LT
Depth (ft)	20.3
	Relative Rating
Uniaxial Compressive Strength	
RQD	13
Spacing of Joints	10
Condition of Joints	20
Groundwater Conditions	7
Sum	50
Class Number	III
Description	FAIR ROCK

**SAMPLE #6**

Station/Location	504+73, 29' LT
Depth (ft)	28.8
	Relative Rating
Uniaxial Compressive Strength	
RQD	17
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	64
Class Number	II
Description	GOOD ROCK

**SAMPLE #7**

Station/Location	505+32, 36' LT
Depth (ft)	18.2
	Relative Rating
Uniaxial Compressive Strength	
RQD	17
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	64
Class Number	II
Description	GOOD ROCK

**SAMPLE #8**

Station/Location	505+32, 36' LT
Depth (ft)	30.2
	Relative Rating
Uniaxial Compressive Strength	
RQD	20
Spacing of Joints	25
Condition of Joints	20
Groundwater Conditions	7
Sum	72
Class Number	II
Description	GOOD ROCK

**SAMPLE #9**

Station/Location	506+07, 30' RT
Depth (ft)	17.1
Relative Rating	
Uniaxial Compressive Strength	
RQD	13
Spacing of Joints	10
Condition of Joints	20
Groundwater Conditions	7
Sum	50
Class Number	III
Description	FAIR ROCK

**SAMPLE #10**

Station/Location	506+07, 30' RT
Depth (ft)	20.7
Relative Rating	
Uniaxial Compressive Strength	
RQD	17
Spacing of Joints	10
Condition of Joints	20
Groundwater Conditions	7
Sum	54
Class Number	III
Description	FAIR ROCK

**SAMPLE #11**

Station/Location	506+82, 51' RT
Depth (ft)	21.3
Relative Rating	
Uniaxial Compressive Strength	
RQD	13
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	60
Class Number	III
Description	FAIR ROCK

**SAMPLE #12**

Station/Location	506+82, 51' RT
Depth (ft)	35.3
Relative Rating	
Uniaxial Compressive Strength	
RQD	17
Spacing of Joints	10
Condition of Joints	20
Groundwater Conditions	7
Sum	54
Class Number	III
Description	FAIR ROCK

**SAMPLE #13**

Station/Location	507+42, 19' RT
Depth (ft)	33.9
Relative Rating	
Uniaxial Compressive Strength	
RQD	17
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	64
Class Number	II
Description	GOOD ROCK

**SAMPLE #14**

Station/Location	507+42, 19' RT
Depth (ft)	37.5
Relative Rating	
Uniaxial Compressive Strength	
RQD	17
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	64
Class Number	II
Description	GOOD ROCK

**SAMPLE #15**

Station/Location	507+58, 20' LT
Depth (ft)	35
Relative Rating	
Uniaxial Compressive Strength	
RQD	13
Spacing of Joints	10
Condition of Joints	20
Groundwater Conditions	7
Sum	50
Class Number	III
Description	FAIR ROCK

## Attachment B5

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS

MATERIALS DIVISION

PAUL TINSLEY, MATERIALS ENGINEER

\*\*\* SOIL ANALYSIS TEST REPORT \*\*\*

DATE	- 06/20/2023	SEQUENCE NO.	- 3
JOB NUMBER	- 040861	MATERIAL CODE	- 14620L
FEDERAL AID NO.	- TO BE ASSIGNED	SPEC. YEAR	- 2014
PURPOSE	- INFORMATION ONLY SAMPLE	SUPPLIER ID.	- 1
SPEC. REMARKS	- NO SPECIFICATION CHECK	COUNTY/STATE	- 65
SUPPLIER NAME	- STATE	DISTRICT NO.	- 04
NAME OF PROJECT	- HWY.10-HWY.96 (GREENWOOD BYPASS) (S)		
PROJECT ENGINEER	- NOT APPLICABLE		
PIT/QUARRY	- ARKANSAS	SAMPLED	- 05/02/2023
LOCATION	- SEBASTIAN, COUNTY	RECEIVED	- 05/08/2023
SAMPLED BY	- TRACEY HENDERSON	TESTED	- 05/11/2023
SAMPLE FROM	- AUGER CULTINGS		
MATERIAL DESC.	- SOIL FOR SEEDING - LIME/REQ.		

DESCRIPTIONS	- SAMPLE 1	- SAMPLE 2	- SAMPLE 3
LAB NUMBER	- 20230615	-	-
SAMPLE ID	- S104	-	-
TEST STATUS	- INFORMATION ONLY	-	-
STATION	- 521+26	-	-
LOCATION	- 7'RT	-	-
DEPTH IN FEET	-	-	-
COLOR	-	-	-
% PASS 2 IN.	-	-	-
1 1/2 IN.	-	-	-
3/4 IN.	-	-	-
3/8 IN.	-	-	-
NO. 4	-	-	-
NO. 10	-	-	-
NO. 40	-	-	-
NO. 80	-	-	-
NO. 200	-	-	-
LIQUID LIMIT	-	-	-
PLASTICITY INDEX	-	-	-
AASHTO SOIL CLS.	-	-	-
UNIFIED SOIL CLS.	-	-	-
SOIL PH ( B) 6.4	( )	( )	( )
LIME (TONS/ACRE) - 3.0	-	-	-
SPECIFIC GRAVITY	-	-	-
% ABSORPTION	-	-	-
MAX. DEN. #/CF	-	-	-
% OPT. MOISTURE	-	-	-
% MOISTURE CONT.	-	-	-

REMARKS - SOIL RESISTIVITY 18.3K **Ohm\*cm**

- MAE BUFFER: 7.73 PH, MAE LIME ADDITION: 1.7 TONS

- CC: RE 99, CHEMISTRY, SOILS

AASHTO TESTS : AASHTO T11, T27, T85, T88, T89, T90, T99, T100, T134, T180, T265, M145, AHTD357



040861 Site 5  
Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)

040861 Site 5

Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)

Station	Location	Sample No.	Depth (ft.)	Diameter (in.)	Height (in.)	Weight g	Unit Weight pcf	Total Load (lbs.)	Correction Factor	Stress (psi)	Remarks
521+23	50' RT	1	27.5	1.74	3.48	358.64	165	14,740		6,199	
521+23	50' RT	2	32.1	1.74	3.48	367.15	169	12,070		5,076	
521+26	7' RT	3	20.3	1.74	3.48	347.41	160	12,930		5,438	
521+26	7' RT	4	22.9	1.75	3.50	360.44	163	7,880		3,276	
521+72	19' RT	5	20.3	1.74	3.48	380.15	175	14,968		6,295	
521+72	19' RT	6	27.8	1.74	3.48	355.21	164	19,450		8,180	
522+98	33' LT	7	20.6	1.74	3.48	345.15	159	14,990		6,304	
523+36	49' RT	8	19.2	1.75	3.50	348.84	158	21,670		9,009	
523+36	49' RT	9	22.7	1.75	3.50	364.80	165	18,290		7,604	
523+65	33' LT	10	15.2	1.75	3.50	362.93	164	14,930		6,207	
523+65	33' LT	11	23.5	1.74	3.48	323.40	149	13,220		5,560	
523+80	49' RT	12	17.0	1.74	3.48	361.65	166				
Average, μ:							163			6,286	
Standard Deviation, s:							6			1566	
Average - Standard Deviation/2, μ-s/2:										5503	

# ROCK MASS RATING SUMMARY

JOB # 040861 Site 5

GS1 90

**SAMPLE #1**

Station/Location	521+23, 50' RT
Depth (ft)	27.5
	Relative Rating
Uniaxial Compressive Strength	
RQD	17
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	64
Class Number	II
Description	GOOD ROCK

**SAMPLE #2**

Station/Location	521+23, 50' RT
Depth (ft)	32.1
	Relative Rating
Uniaxial Compressive Strength	
RQD	17
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	64
Class Number	II
Description	GOOD ROCK

**SAMPLE #3**

Station/Location	521+26, 7' RT
Depth (ft)	20.3
	Relative Rating
Uniaxial Compressive Strength	
RQD	17
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	64
Class Number	II
Description	GOOD ROCK

**SAMPLE #4**

Station/Location	521+26, 7' RT
Depth (ft)	22.9
	Relative Rating
Uniaxial Compressive Strength	
RQD	17
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	64
Class Number	II
Description	GOOD ROCK

**SAMPLE #5**

Station/Location	521+72, 19' RT
Depth (ft)	20.3
	Relative Rating
Uniaxial Compressive Strength	
RQD	17
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	64
Class Number	II
Description	GOOD ROCK

**SAMPLE #6**

Station/Location	521+72, 19' RT
Depth (ft)	27.8
	Relative Rating
Uniaxial Compressive Strength	
RQD	17
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	64
Class Number	II
Description	GOOD ROCK

**SAMPLE #7**

Station/Location	522+98, 33' LT
Depth (ft)	20.6
	Relative Rating
Uniaxial Compressive Strength	
RQD	17
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	64
Class Number	II
Description	GOOD ROCK

**SAMPLE #8**

Station/Location	523+36, 49' RT
Depth (ft)	19.2
	Relative Rating
Uniaxial Compressive Strength	
RQD	13
Spacing of Joints	10
Condition of Joints	20
Groundwater Conditions	7
Sum	50
Class Number	III
Description	FAIR ROCK

## Attachment C1

**SITE PICTURES**

**Job No.: 040861 Site 1**

**Job Name: Hwy 10 – Hwy. 96 (Greenwood Bypass) (S)**



**Heartsill Creek channel looking downstream to the southwest where the bridge is to be located (June 2023).**





## SITE PICTURES

Job No.: 040861 Site 1

Job Name: Hwy 10 – Hwy. 96 (Greenwood Bypass) (S)



Proposed northeast bridge end location looking east (June 2023).





## **SITE PICTURES**

**Job No.: 040861 Site 1**

**Job Name: Hwy 10 – Hwy. 96 (Greenwood Bypass) (S)**



**Northeast bridge end location looking towards the channel (June 2023).**





## **SITE PICTURES**

**Job No.: 040861 Site 1**

**Job Name: Hwy 10 – Hwy. 96 (Greenwood Bypass) (S)**



**Looking south at the field where the proposed southwest bridge end is to be located (June 2023).**





## **SITE PICTURES**

**Job No.: 040861 Site 1**

**Job Name: Hwy 10 – Hwy. 96 (Greenwood Bypass) (S)**



**Looking north towards the pond located east of the proposed bridge end (June 2023).**





## **SITE PICTURES**

**Job No.: 040861 Site 1**

**Job Name: Hwy 10 – Hwy. 96 (Greenwood Bypass) (S)**



**Looking south at sandstone exposed at the surface of the west bridge end (June 2023).**

## Attachment C4



## **SITE PICTURES**

**Job No.: 040861 Site 4**

**Job Name: Hwy 10 – Hwy. 96 (Greenwood Bypass) (S)**



**Looking east at existing bridge end embankment.**





## SITE PICTURES

Job No.: 040861 Site 4

Job Name: Hwy 10 – Hwy. 96 (Greenwood Bypass) (S)



Looking north at downstream Heartsill Creek.



**SITE PICTURES**

**Job No.: 040861 Site 4**

**Job Name: Hwy 10 – Hwy. 96 (Greenwood Bypass) (S)**



**Looking south at upstream Heartsill Creek.**





## **SITE PICTURES**

**Job No.: 040861 Site 4**

**Job Name: Hwy 10 – Hwy. 96 (Greenwood Bypass) (S)**



**Looking north at scour on the northwest Heartsill Creek bank.**





## SITE PICTURES

Job No.: 040861 Site 4

Job Name: Hwy 10 – Hwy. 96 (Greenwood Bypass) (S)



Looking east at the existing bridge.

## Attachment C5





## SITE PICTURES

Job No.: 040861 Site 5

Job Name: Hwy 10 – Hwy. 96 (Greenwood Bypass) (S)



Existing bridge looking west.



## SITE PICTURES

Job No.: 040861 Site 5

Job Name: Hwy 10 – Hwy. 96 (Greenwood Bypass) (S)



Looking west at bridge end embankment.



**SITE PICTURES**

**Job No.: 040861 Site 5**

**Job Name: Hwy 10 – Hwy. 96 (Greenwood Bypass) (S)**



**Looking east at bridge end embankment.**



**SITE PICTURES**

**Job No.: 040861 Site 5**

**Job Name: Hwy 10 – Hwy. 96 (Greenwood Bypass) (S)**



**Looking southeast at downstream Vache Grasse Creek.**



**SITE PICTURES**

**Job No.: 040861 Site 5**

**Job Name: Hwy 10 – Hwy. 96 (Greenwood Bypass) (S)**



**Looking north at upstream Vache Grasse Creek**



## **SITE PICTURES**

**Job No.: 040861 Site 5**

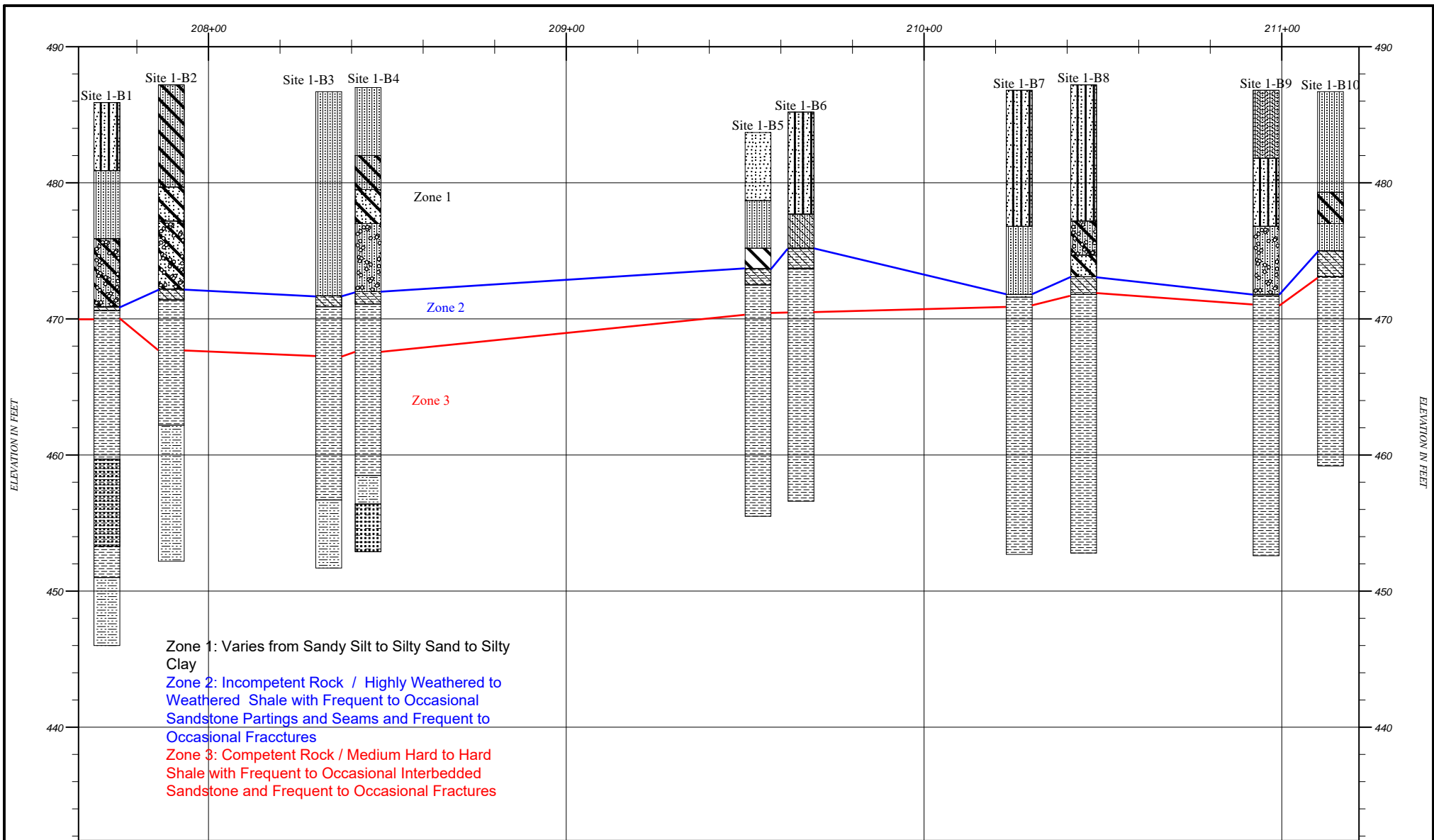
**Job Name: Hwy 10 – Hwy. 96 (Greenwood Bypass) (S)**



**Looking south at shale exposed under southeast bridge end.**

## Attachment D1

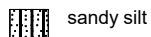




Plan View



Strata symbols



sandy silt



silty sand



sandy, silty clay with gravel



shale with clay seams



shale/siltstone



shale with sandstone seams



sandstone interbedded with shale



sandy, silty clay



sandy clay



sandy clay with gravel



silty sand with gravel



sandstone with shale seams



sand



clay

# ARDOT GENERALIZED SUBSURFACE PROFILE

HORIZONTAL  
SCALE: NOT TO SCALE  
VERTICAL  
SCALE: NOT TO SCALE

DRAWN BY/APPROVED BY

DATE DRAWN

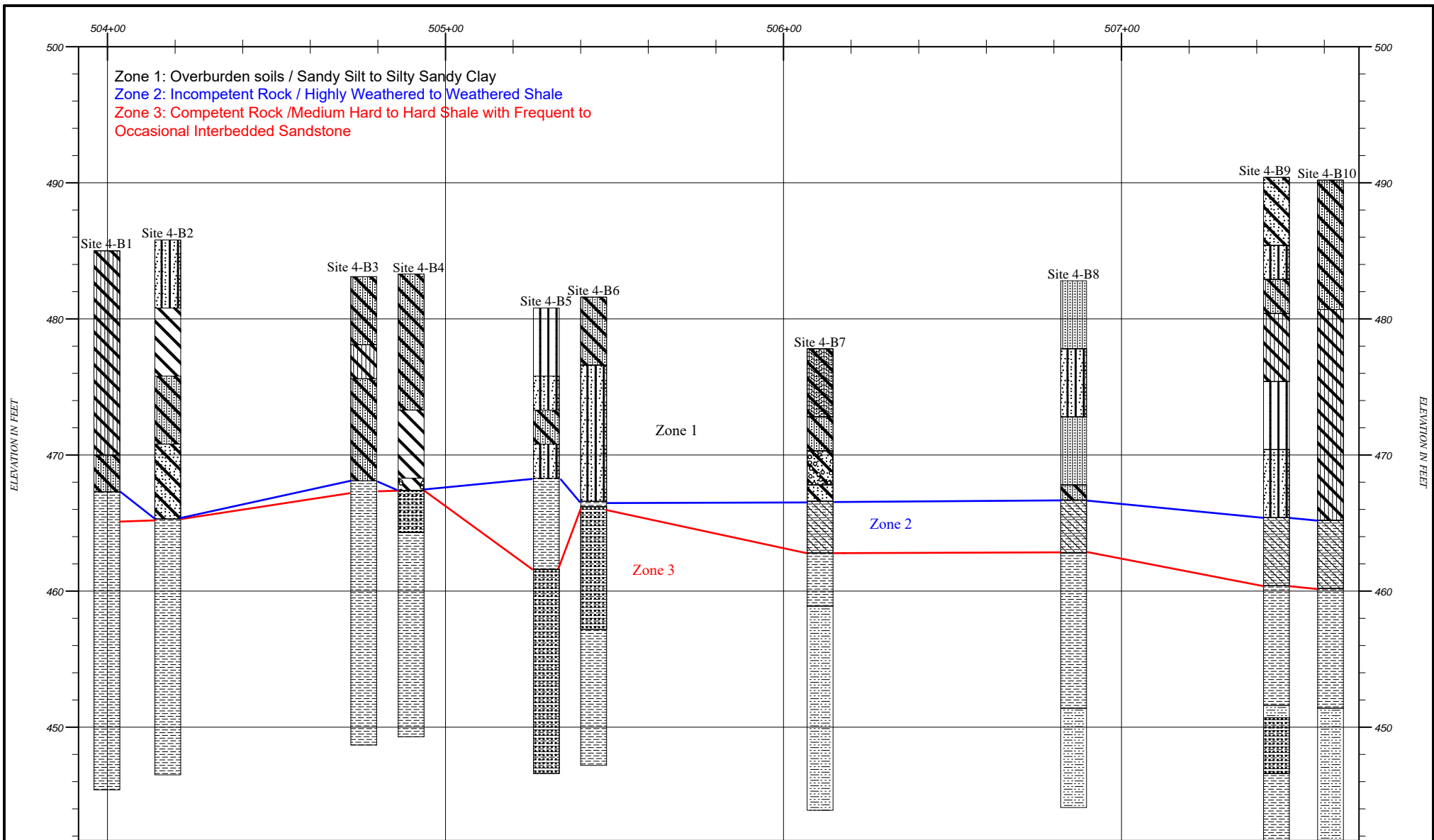
8/7/2023

Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)

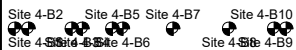
PROJECT NO. 040861  
Sebastian County

SITE 1

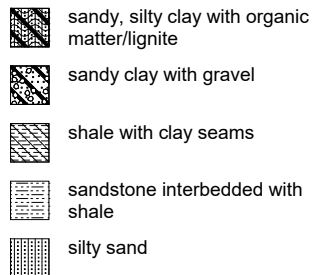
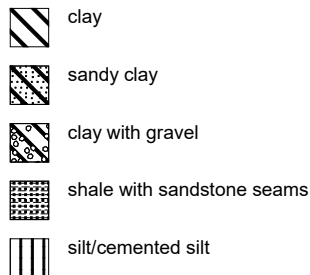
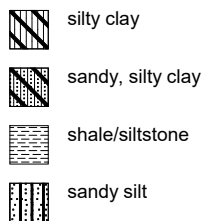
## Attachment D4



Plan View



Strata symbols



ARDOT GENERALIZED  
SUBSURFACE PROFILE

HORIZONTAL  
SCALE: NOT TO SCALE  
VERTICAL  
SCALE: NOT TO SCALE

DRAWN BY/APPROVED BY

DATE DRAWN

7/26/2023

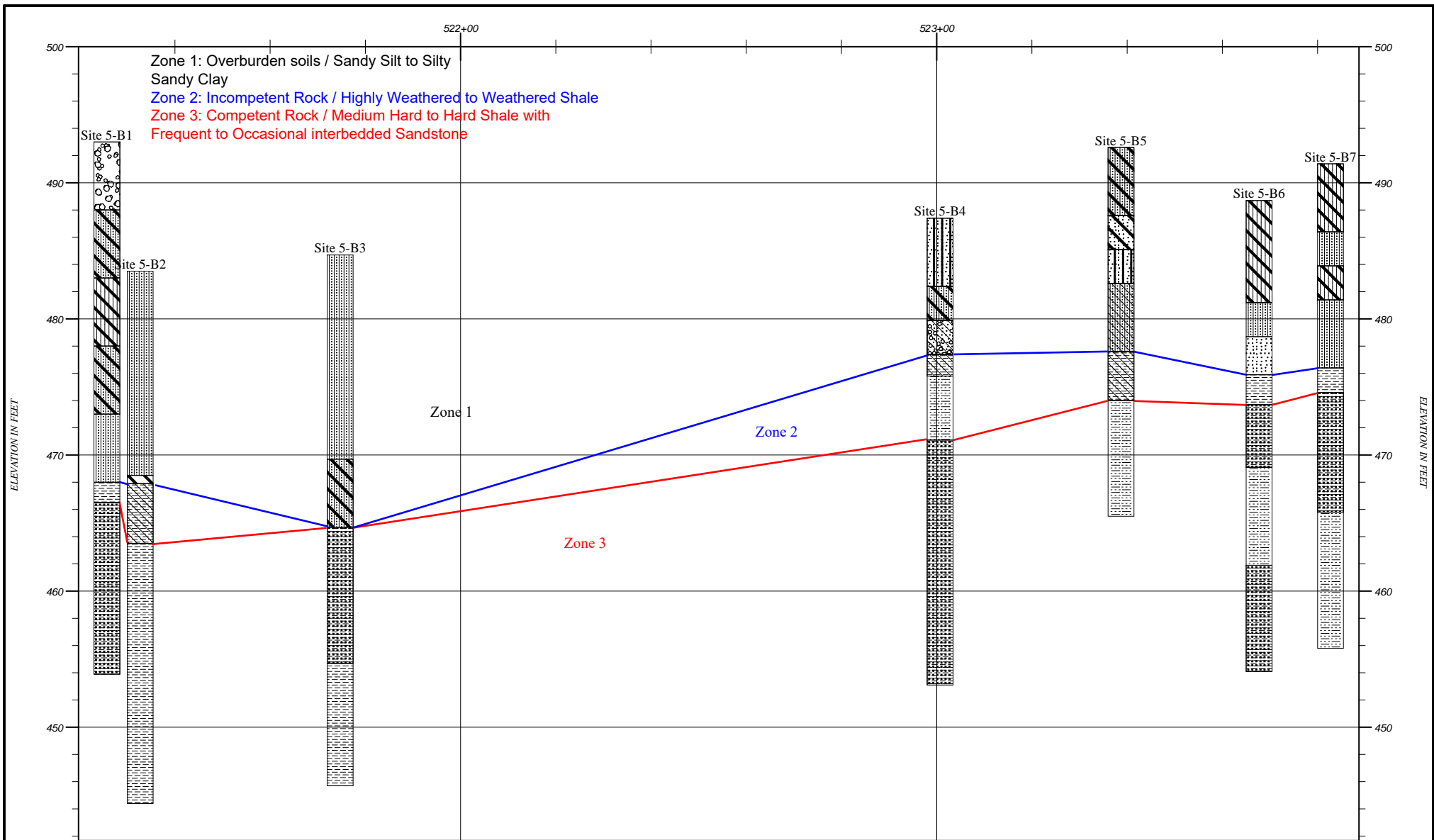
Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)

PROJECT NO. 040861  
Sebastian County

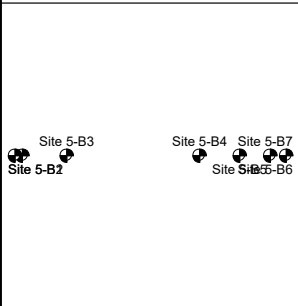
SITE 4



## Attachment D5



Plan View



Strata symbols

	cobbles and boulders		shale/siltstone		clayey sand and gravel
	sandy, silty clay		shale with sandstone seams		sandstone interbedded with shale
	silty clay		clay		sandy clay
	silty sand		shale with clay seams		silty, clayey sand
			sandy silt		sand

## ARDOT GENERALIZED SUBSURFACE PROFILE

HORIZONTAL  
SCALE: NOT TO SCALE  
VERTICAL  
SCALE: NOT TO SCALE

DRAWN BY/APPROVED BY

DATE DRAWN

7/25/2023

Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)

PROJECT NO. 040861  
Sebastian County

Site 5

## Attachment E

Title: 040861

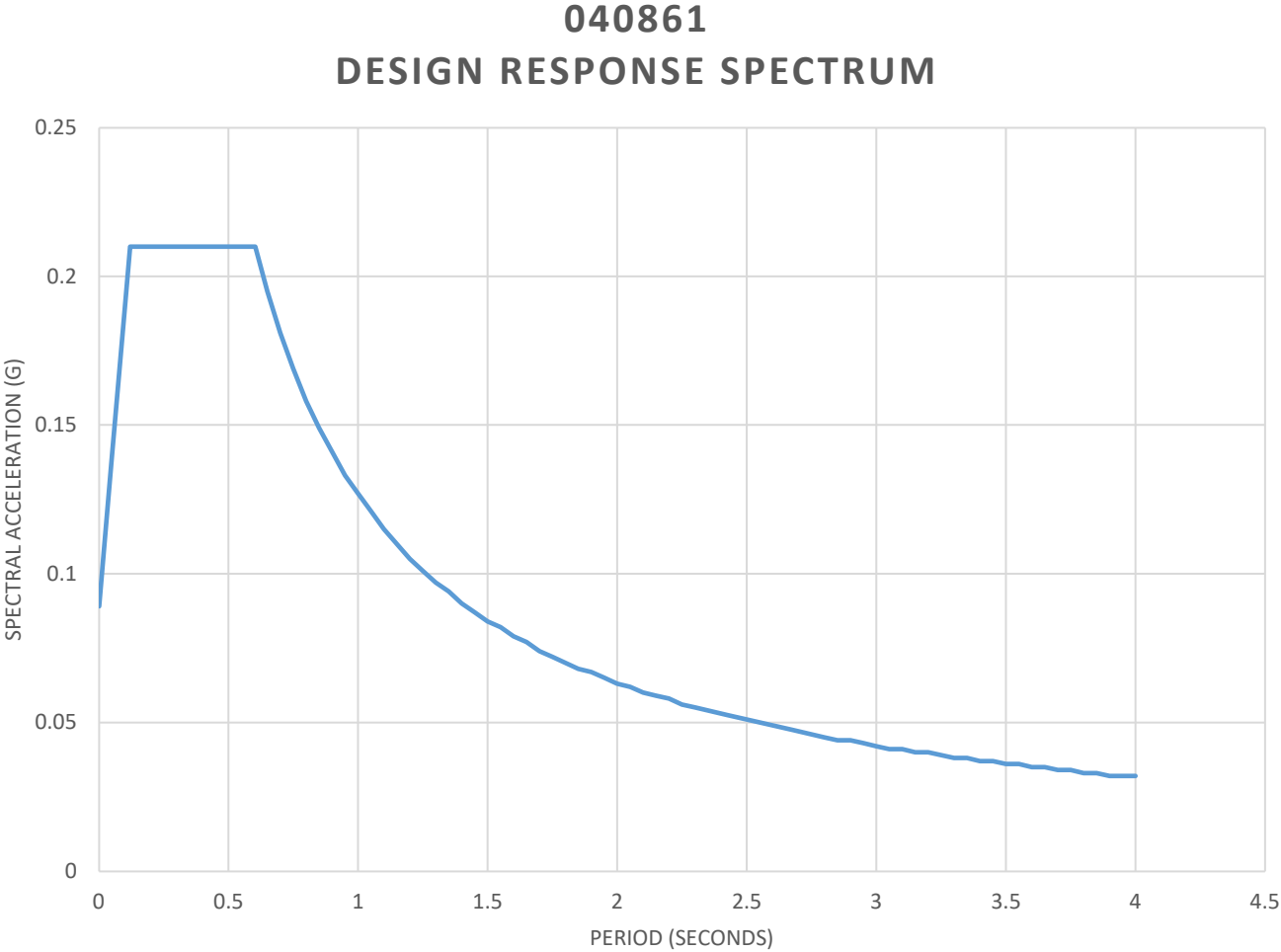
Latitude: 35.2105556

Longitude: -94.253889

Site Class: D

Get USGS Data

PGA:	0.056
F <sub>PGA</sub> :	1.6
A <sub>S</sub> :	0.089
S <sub>S</sub> :	0.131
F <sub>A</sub> :	1.6
S <sub>DS</sub> :	0.21
S <sub>1</sub> :	0.053
F <sub>V</sub> :	2.4
S <sub>D1</sub> :	0.127
S <sub>DC</sub> :	A
T <sub>S</sub> :	0.603
T <sub>0</sub> :	0.121





## Attachment F

**ARKANSAS DEPARTMENT OF TRANSPORTATION****SPECIAL PROVISION****JOB NO. 040861****ROCK FILL**

**Description.** This item shall consist of constructing embankments at the locations shown on the Plans or as directed by the Engineer as Rock Fill. Rock Fill shall comply with Section 210, Excavation and Embankment, of the Standard Specifications, Edition of 2014. Where there is a conflict between this Special Provision and Section 210, this Special Provision shall govern.

**Materials.** Rock Fill shall comply with the following requirements:

- (1) Material for Rock Fill shall include stone obtained from an approved source and shall consist of hard and durable limestone, sandstone, dolomite, or rock-like shale. Shale shall have a minimum slake durability index (SDI) of 95% as tested according to ARDOT Test Method 399. The SDI shall be determined by the Engineer using the above method at a minimum frequency of once per 3000 cubic yards. The stone shall be greater than 1½" and less than 30", reasonably well-graded and angular, with fractured faces on at least 75% of the surface and shall not contain more than 10% overburden or fines less than 1½" in maximum cross-section. The stone shall weigh not less than 140 pounds per solid cubic foot and shall have a percent of wear not greater than 45 by Los Angeles Abrasion Test (AASHTO T 96).

The top layer of Rock Fill shall be reduced in size to meet the gradation requirements of SubSection 802.02(c) for Class B Concrete. The minimum thickness of this layer shall be 1 foot.

- (2) The following shall be added to the third paragraph of Section 801.08 of the Standard Specifications. Rock Fill placed immediately adjacent to Pipe Culverts or Box Culverts including a minimum of 6 inches on top of the culverts, shall meet the gradation requirements of 802.02(c) of the Standard Specifications for Class S concrete coarse aggregate.
- (3) Material placed in the vicinity of piling shall be constructed in accordance with SubSections 303.02, 303.03, and 303.04 of the Standard Specifications, Edition of 2014. It shall meet the material and construction requirements of Aggregate Base Course (Class 7).
- (4) Geotextile Fabric (Type 9) complying with SubSection 625.02 of the Standard Specifications shall be used between Rock Fill and overlying embankment material.

**Construction Requirements.** Embankments requiring Rock Fill to be placed in water or extremely soft areas shall be placed by end dumping and advancing rock placement. All displaced material as it accumulates ahead of the advancing embankment toe shall be removed by excavation. Removal and disposal of displaced material will not be measured and shall be considered subsidiary to the item Rock Fill.

**ARKANSAS DEPARTMENT OF TRANSPORTATION****SPECIAL PROVISION****JOB NO. 040861****ROCK FILL**

**Method of Measurement.** Rock Fill, which includes all aggregate material types described above, including concrete coarse aggregate and/or Aggregate Base Course (Class 7), will be measured in vehicles by the Ton and paid as Rock Fill. Displaced material removal and disposal will not be measured and shall be considered subsidiary to the item Rock Fill.

**Basis of Payment.** Placement and construction of Rock Fill embankment material shall be paid for under the item “Rock Fill”, which price shall be full compensation for all costs involved in furnishing all materials for constructing the embankments in accordance with Section 210 and this Special Provision; and for all labor, tools, equipment, quality control sampling and testing, and for incidentals necessary to complete the work.

Payment will be made under:

**Pay Item**

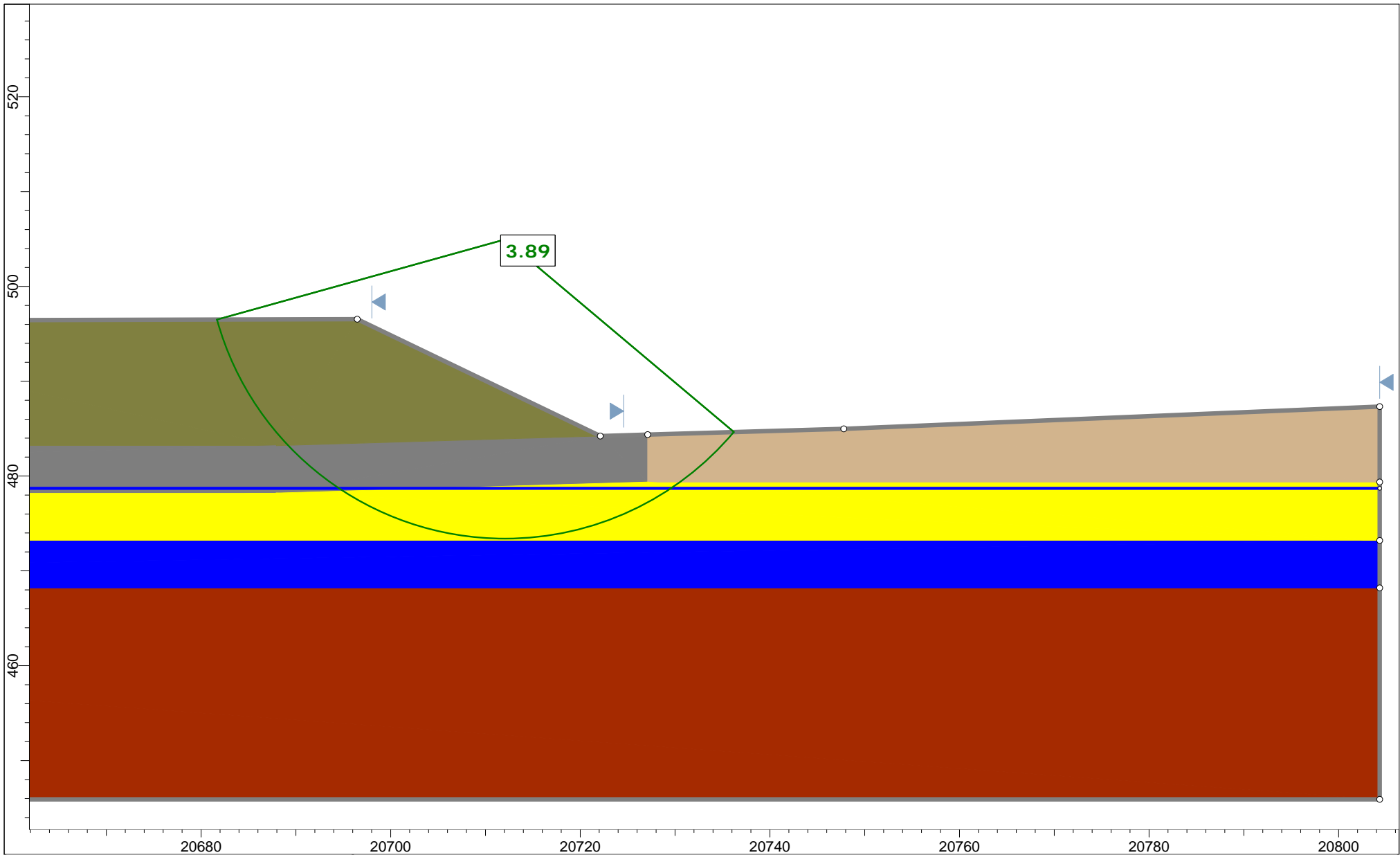
Rock Fill  
Geotextile Fabric (Type 9)


**Pay Unit**

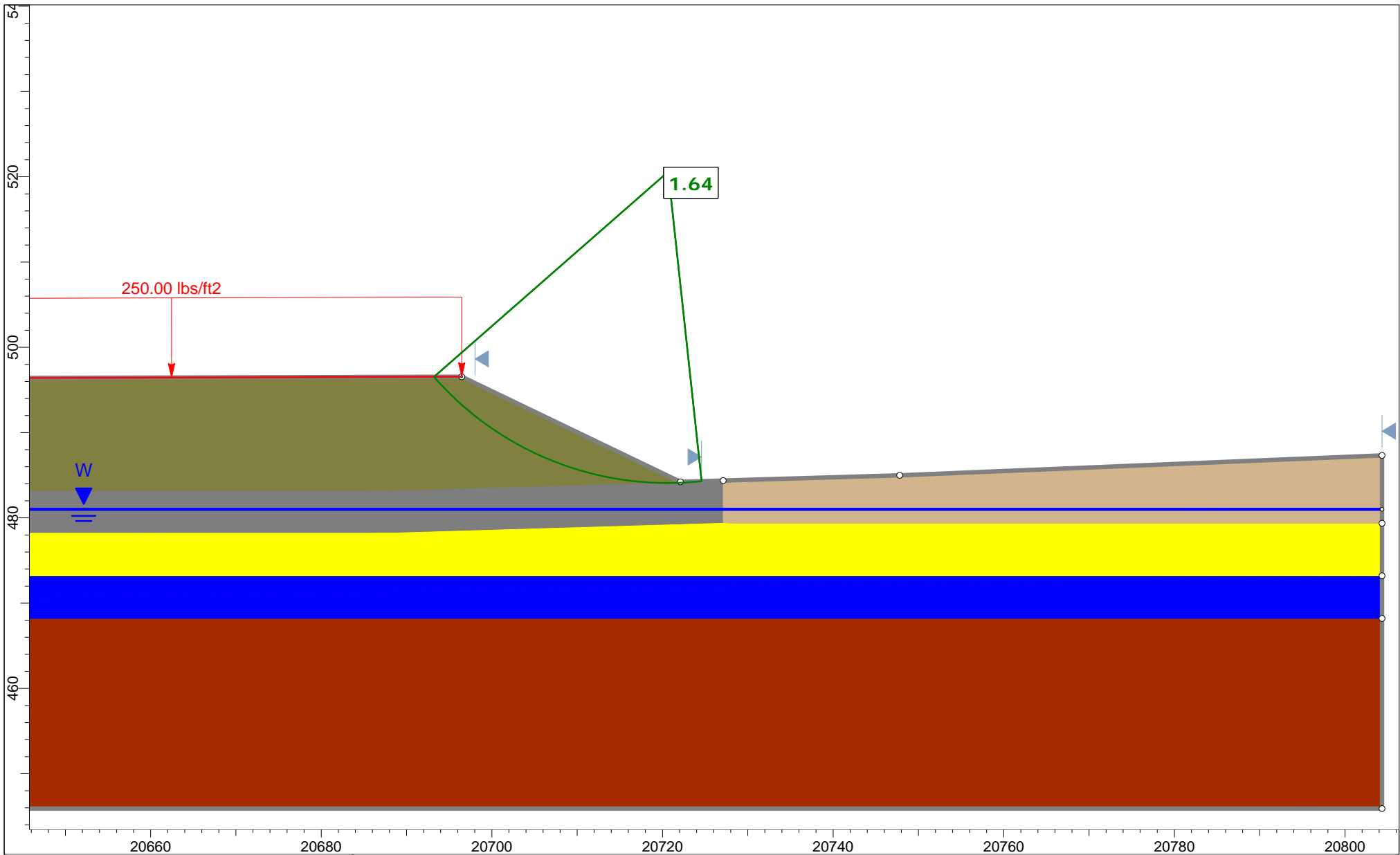
Ton  
Square Yard

## Attachment G1

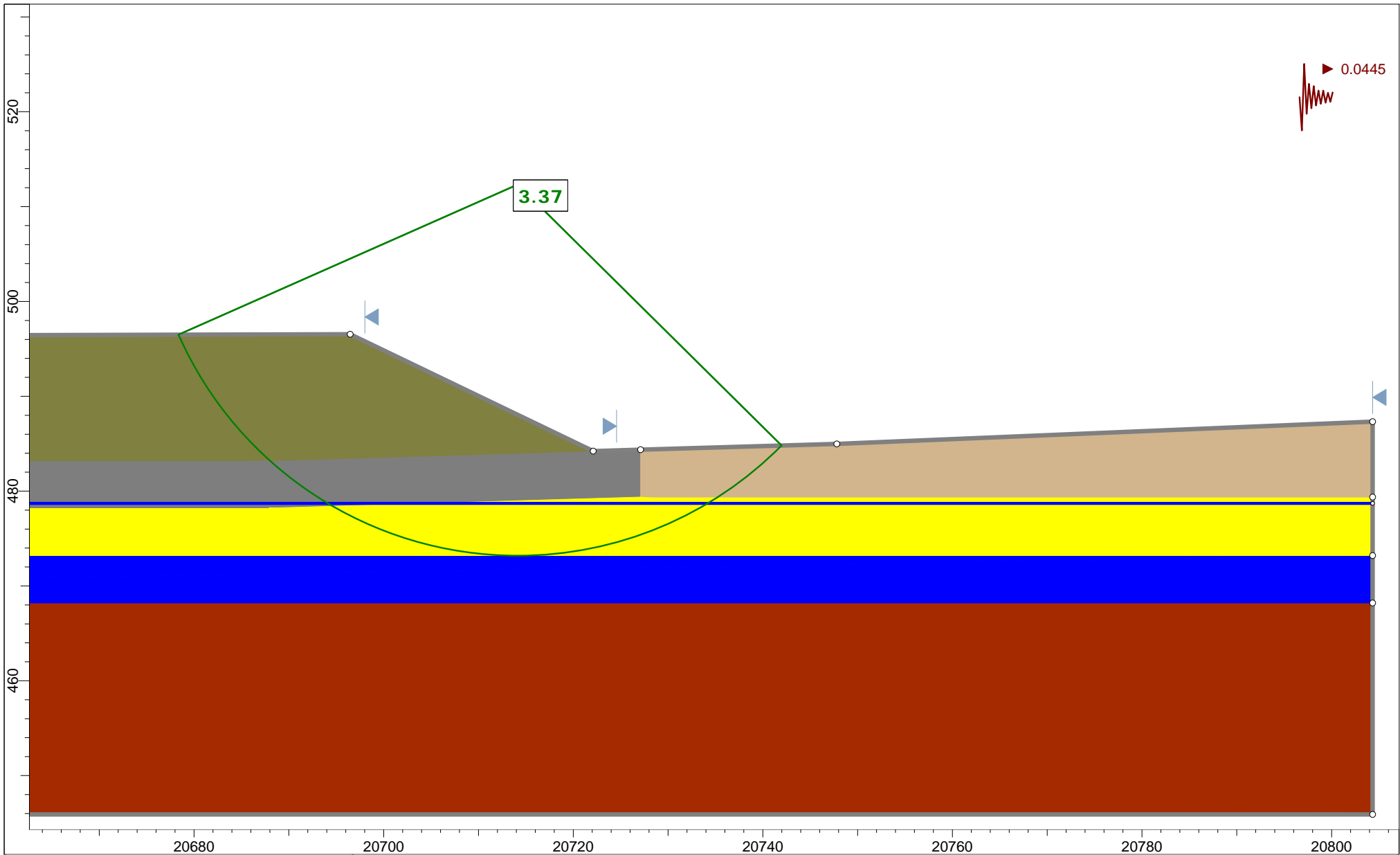




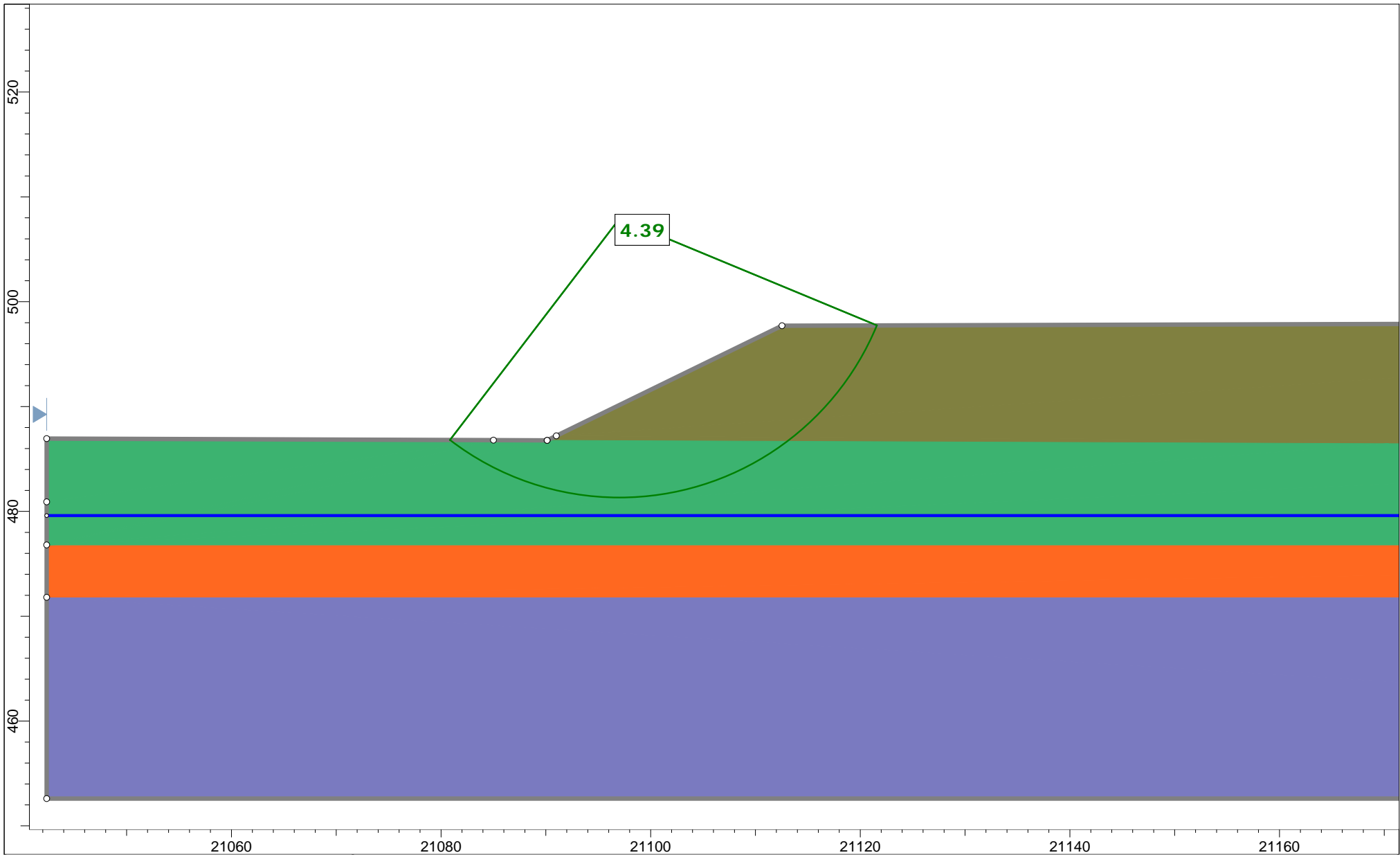
 <b>rocscience</b>	Project 040861 Hwy. 10-Hwy. 96 (Greenwood Bypass)		
	Site	Site 1	Analysis Type Short Term
	Analyzed By	MBB	Configuration West Bridge End, 1V : 2H End Slope
	Date	8/3/2023	



Project	040861 Hwy. 10-Hwy. 96 (Greenwood Bypass)		
Site	Site 1	Analysis Type	Long Term
Analyzed By	MBB	Configuration	West Bridge End, 1V : 2H End Slope
Date	8/3/2023		

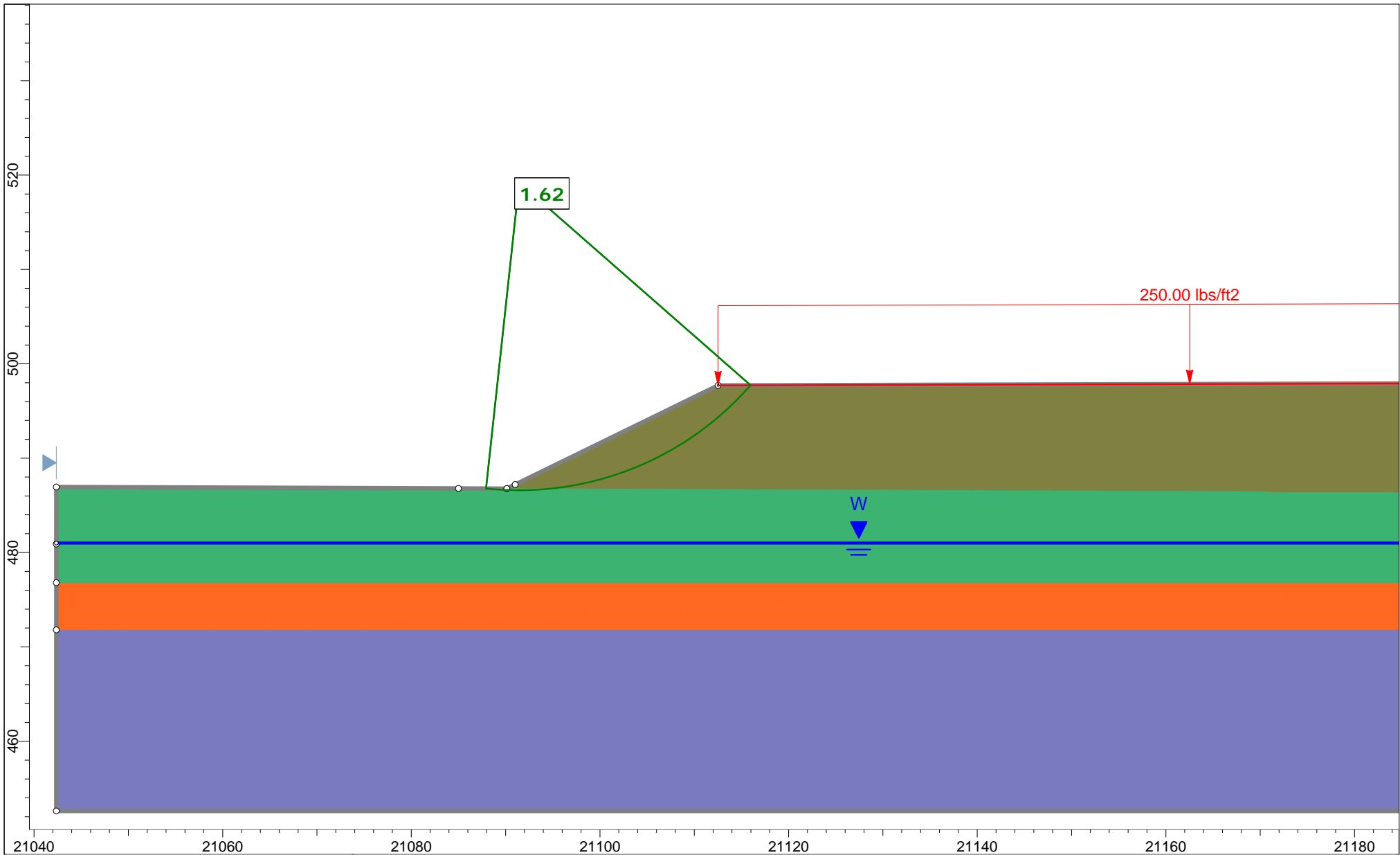


Project	040861 Hwy. 10-Hwy. 96 (Greenwood Bypass)		
Site	Site 1	Analysis Type	Seismic Condition
Analyzed By	MBB	Configuration	West Bridge End, 1V : 2H End Slope
Date	8/3/2023		

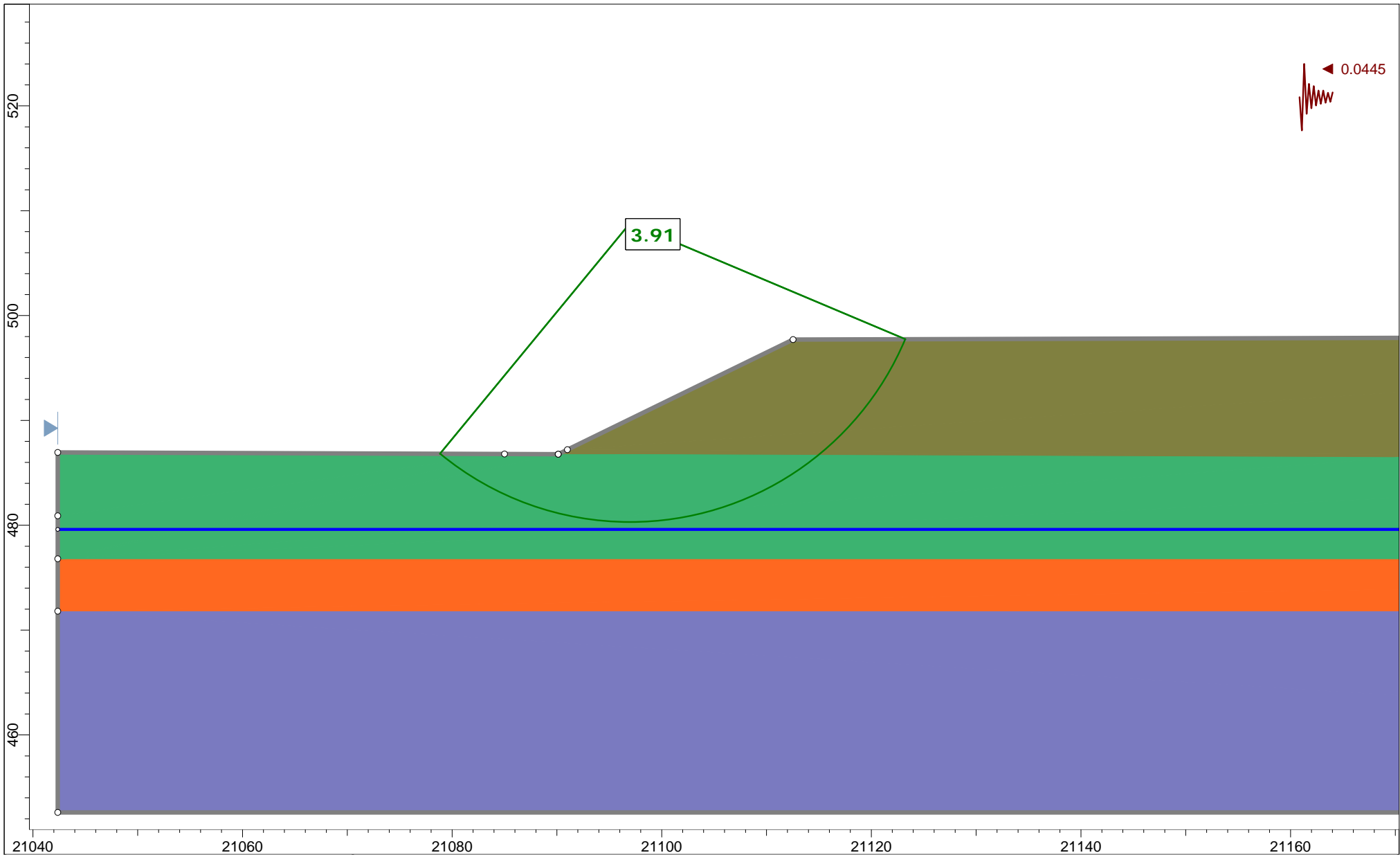


Project	040861 Hwy. 10-Hwy. 96 (Greenwood Bypass)		
Site	Site 1	Analysis Type	Short Term
Analyzed By	MBB	Configuration	East Bridge End, 1V : 2H End Slope
Date	8/3/2023		



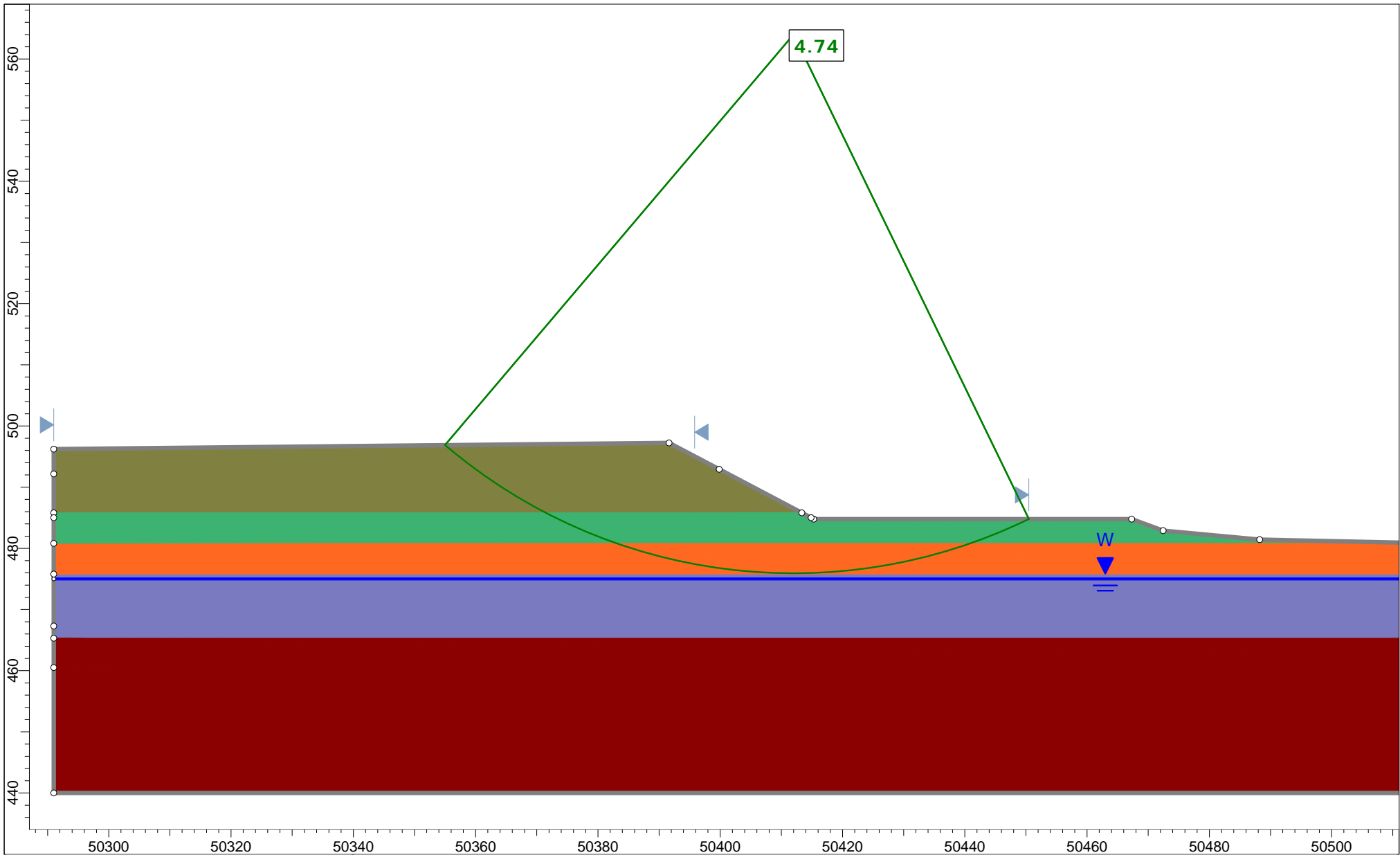


Project	040861 Hwy. 10-Hwy. 96 (Greenwood Bypass)		
Site	Site 1	Analysis Type	Seismic Condition
Analyzed By	MBB	Configuration	East Bridge End, 1V : 2H End Slope
Date	8/3/2023		



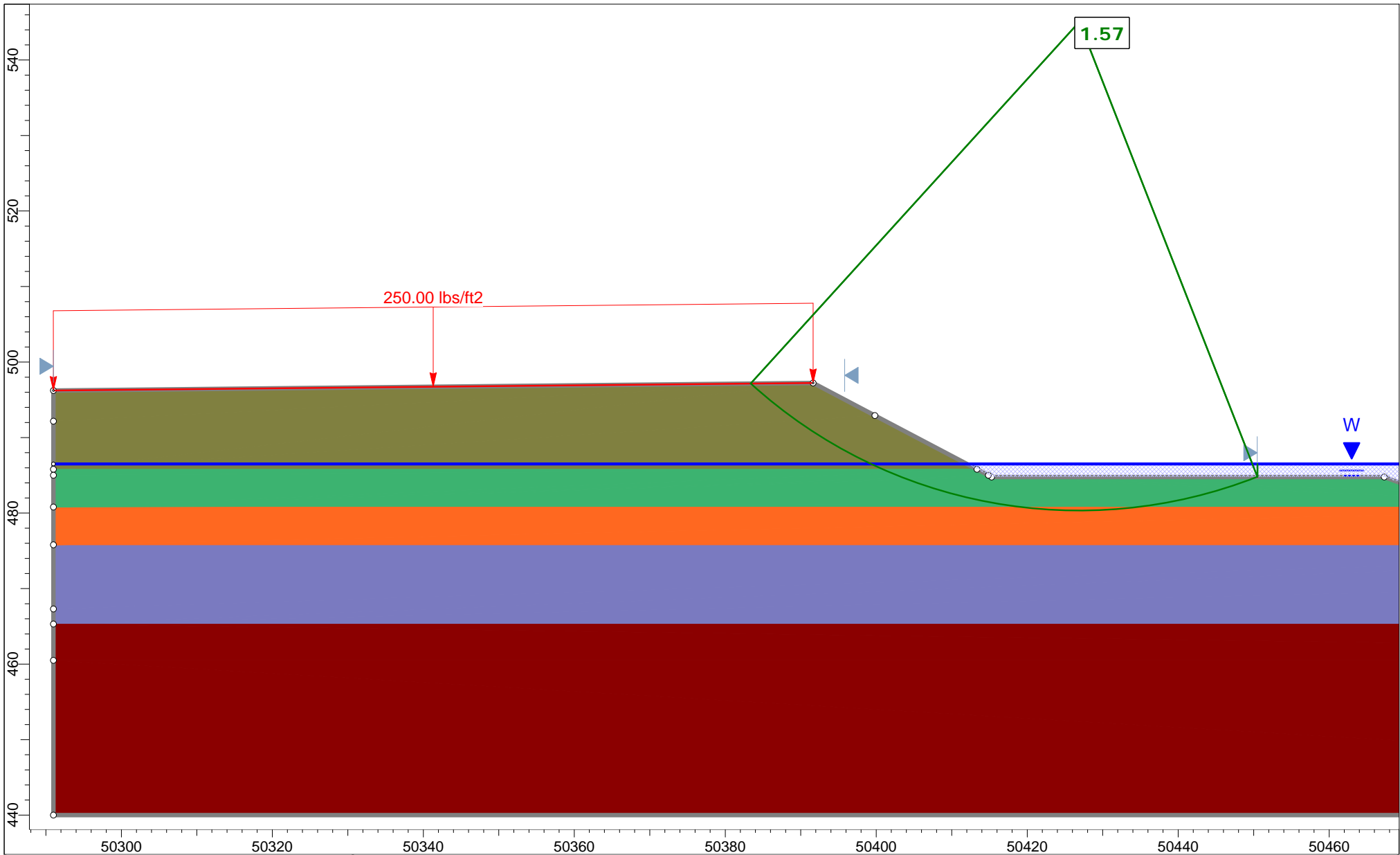
Project	040861 Hwy. 10-Hwy. 96 (Greenwood Bypass)		
Site	Site 1	Analysis Type	Seismic Condition
Analyzed By	MBB	Configuration	East Bridge End, 1V : 2H End Slope
Date	8/3/2023		

## Attachment G4

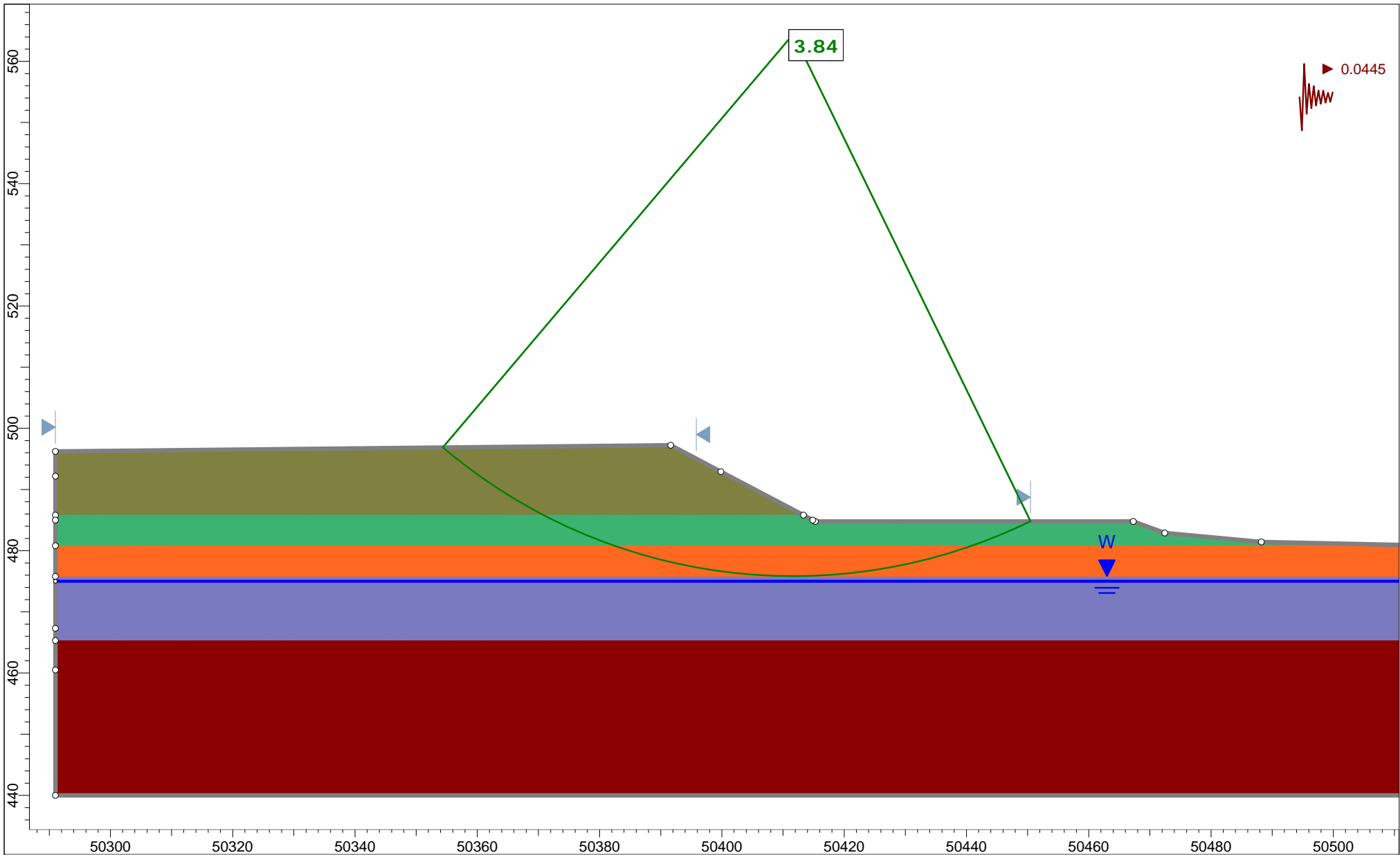


Project	040861 Hwy. 10-Hwy. 96 (Greenwood Bypass)		
Site	Site 4	Analysis Type	Short Term
Analyzed By	MBB	Configuration	West Bridge End, 1V : 2H End Slope
Date	8/2/2023		

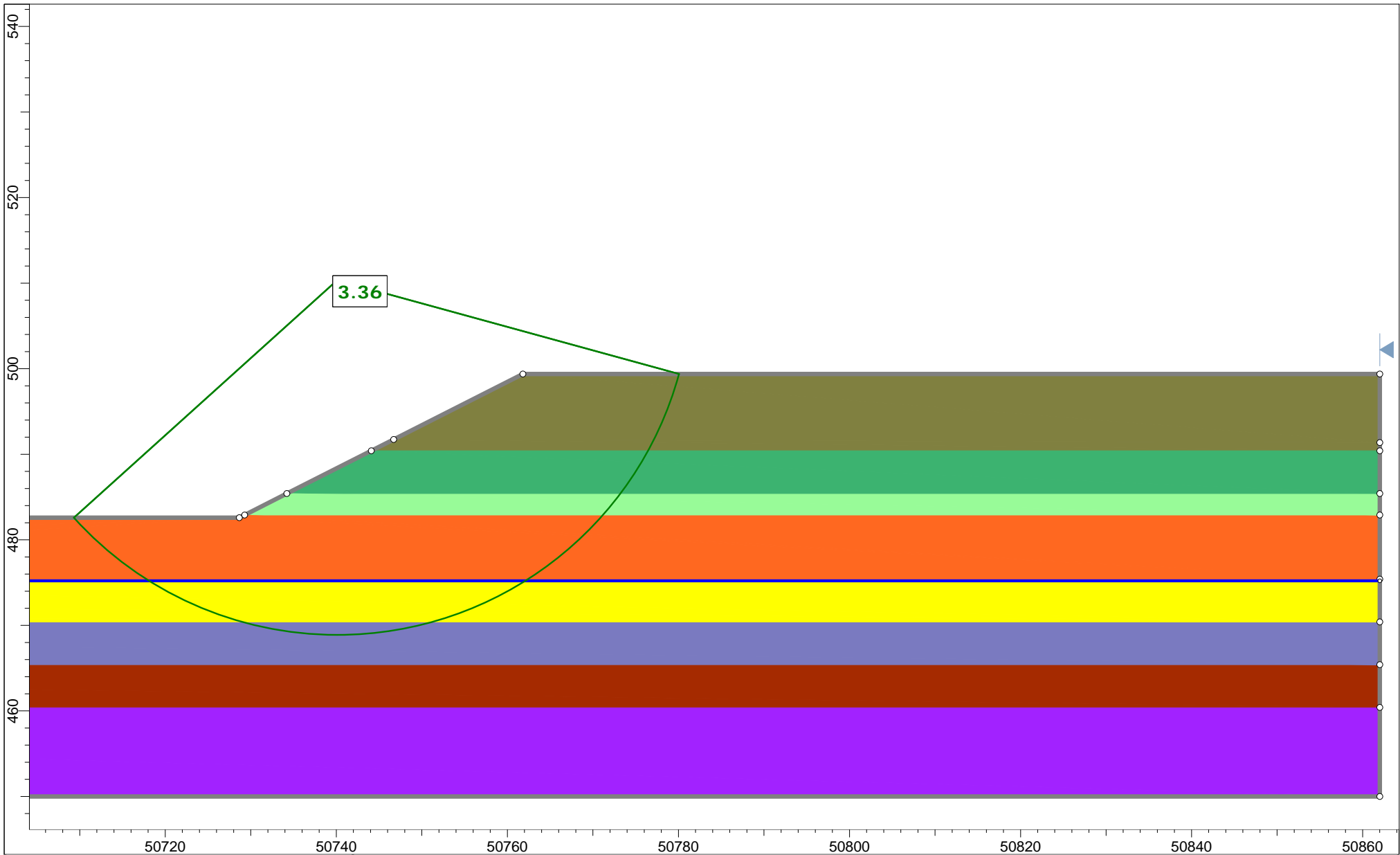





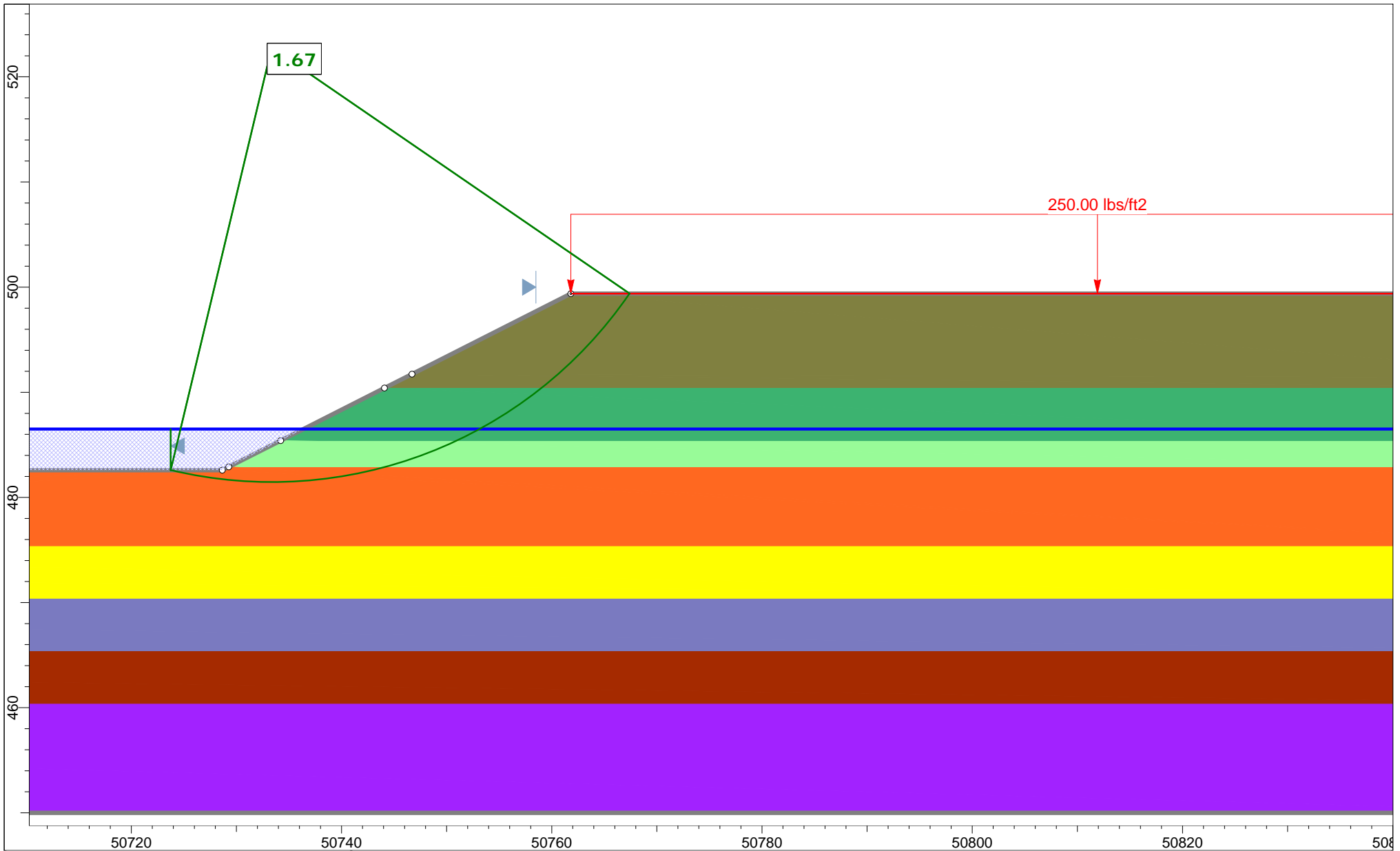
Project	040861 Hwy. 10-Hwy. 96 (Greenwood Bypass)		
Site	Site 4	Analysis Type	Long Term
Analyzed By	MBB	Configuration	West Bridge End, 1V : 2H End Slope
Date	8/2/2023		




Project	040861 Hwy. 10-Hwy. 96 (Greenwood Bypass)		
Site	Site 4	Analysis Type	Seismic Condition
Analyzed By	MBB	Configuration	West Bridge End, 1V : 2H End Slope
Date	8/2/2023		

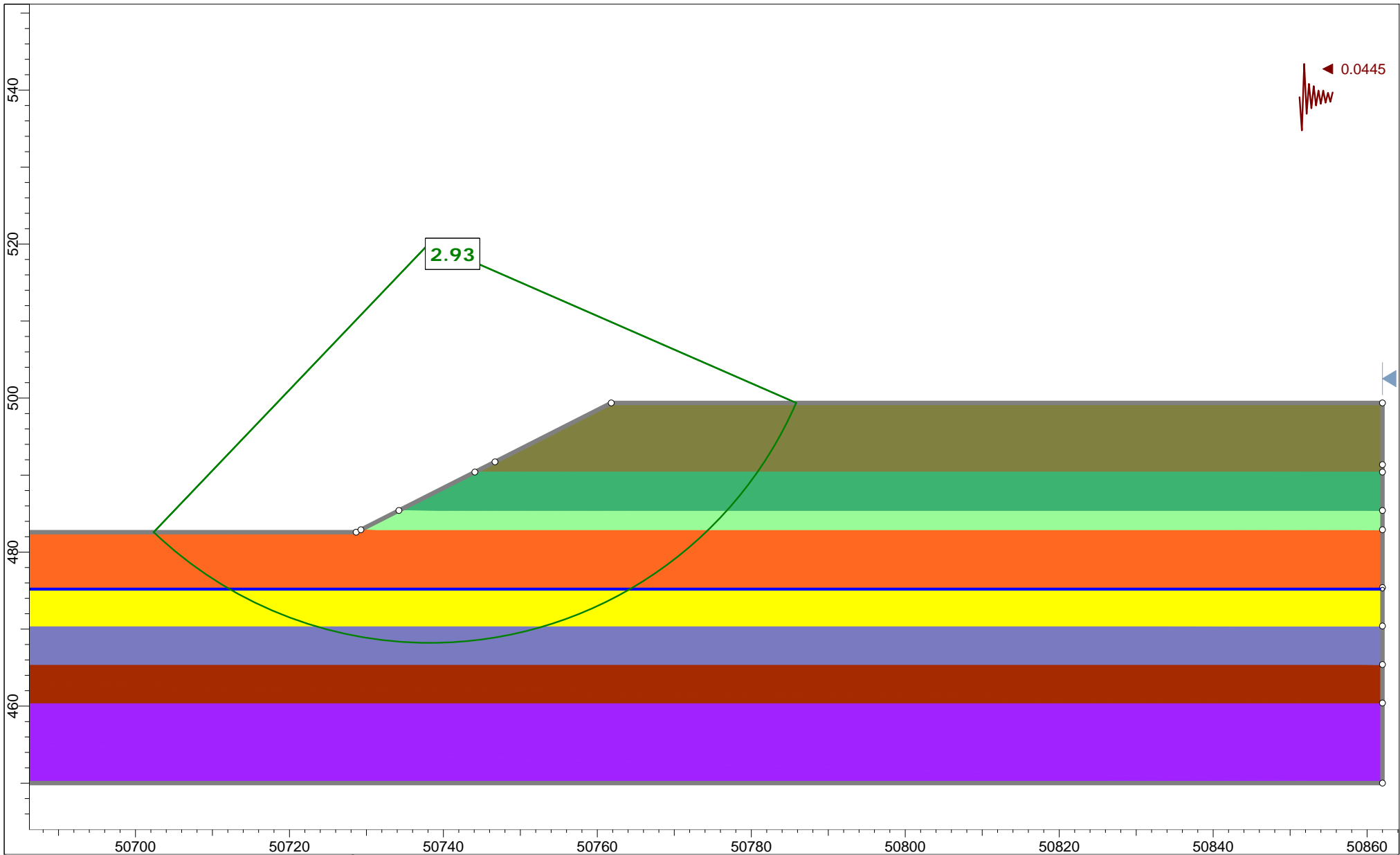



 <b>rocscience</b> <small>SLIDEINTERPRET 9.019</small>	Project040861 Hwy. 10-Hwy. 96 (Greenwood Bypass)		
	Site	Site 4	Analysis TypeShort Term
	Analyzed By	MBB	ConfigurationEast Bridge End, 1V : 2H End Slope
	Date	8/2/2023	



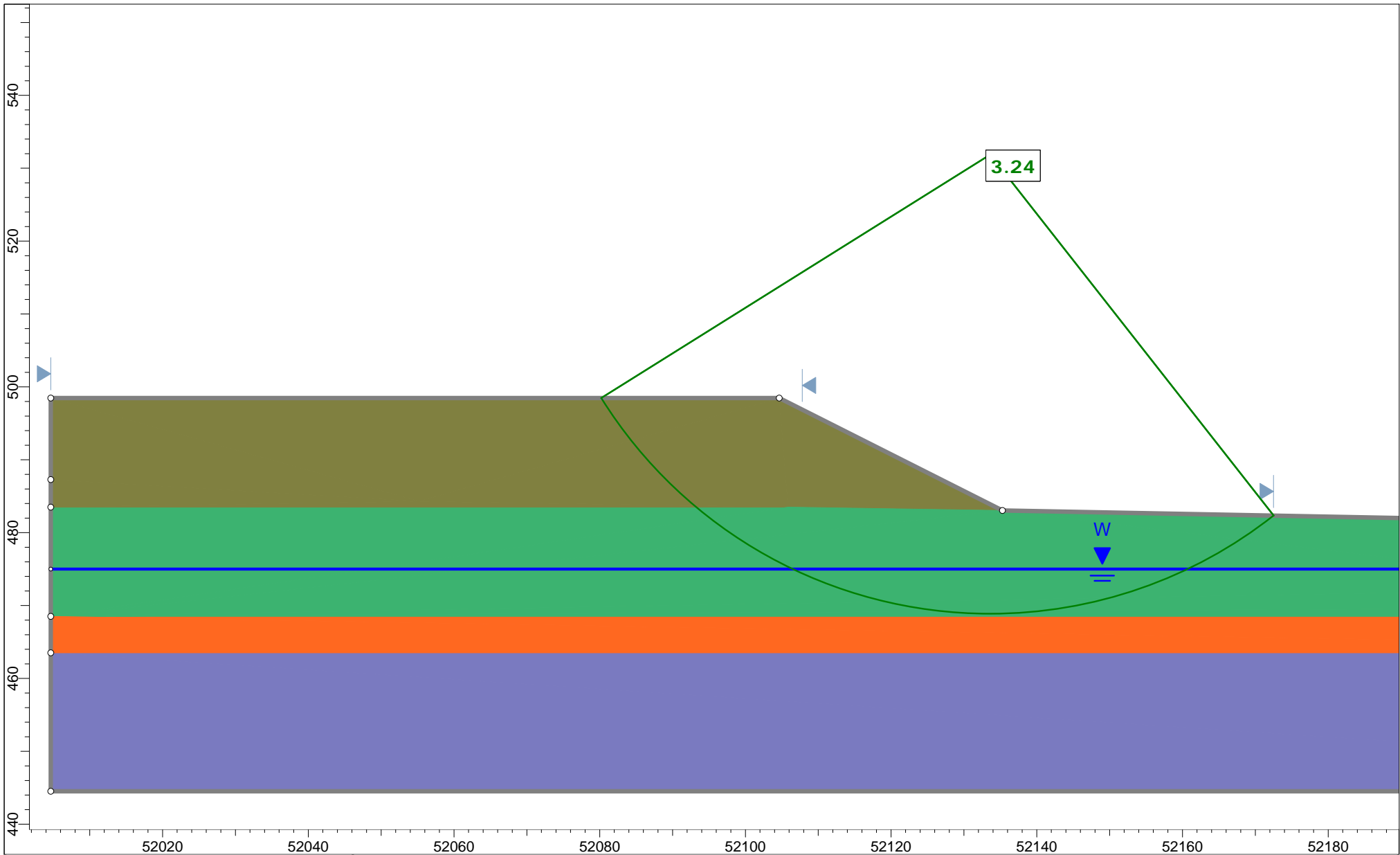
	Project 040861 Hwy. 10-Hwy. 96 (Greenwood Bypass)		
	Site	Site 4	Analysis Type Long Term
	Analyzed By	MBB	Configuration East Bridge End, 1V : 2H End Slope
	Date	8/3/2023	



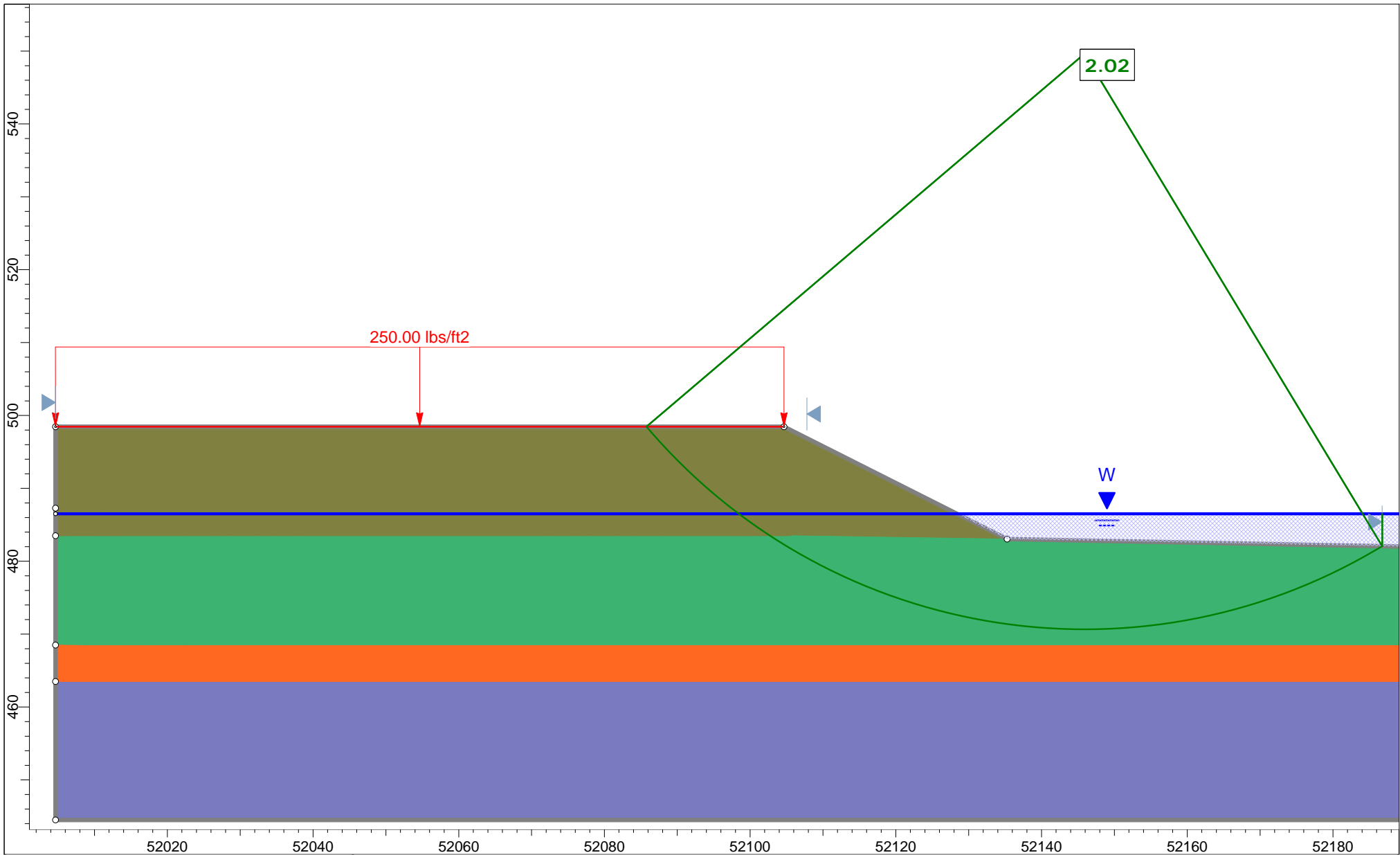



	Project040861 Hwy. 10-Hwy. 96 (Greenwood Bypass)		
	Site	Site 4	Analysis TypeSeismic Condition
	Analyzed By	MBB	ConfigurationEast Bridge End, 1V : 2H End Slope
	Date	8/2/2023	

## Attachment G5

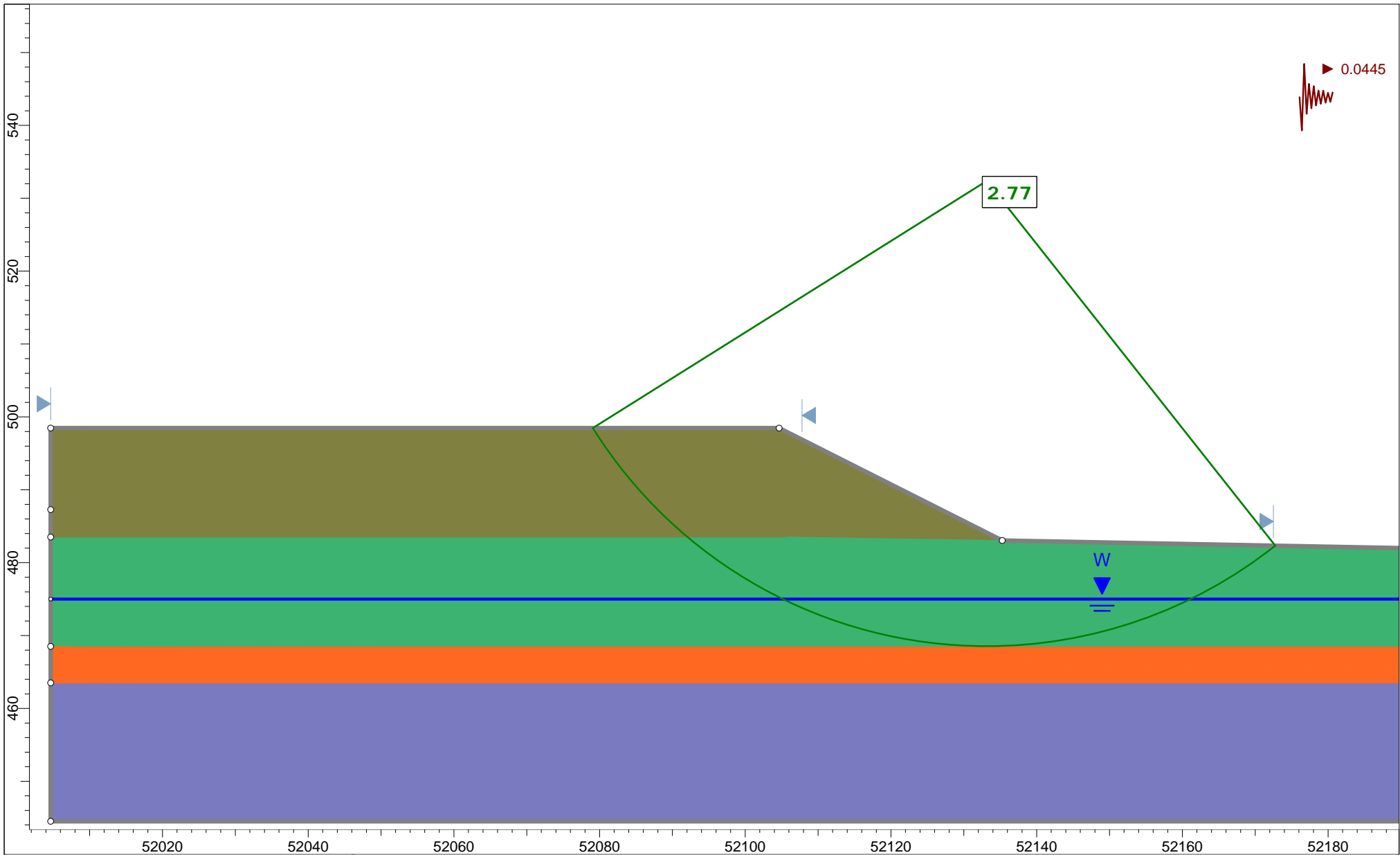



Project	040861 Hwy. 10-Hwy. 96 (Greenwood Bypass)		
Site	Site 5	Analysis Type	Short Term
Analyzed By	MBB	Configuration	West Bridge End, 1V : 2H End Slope
Date	8/2/2023		

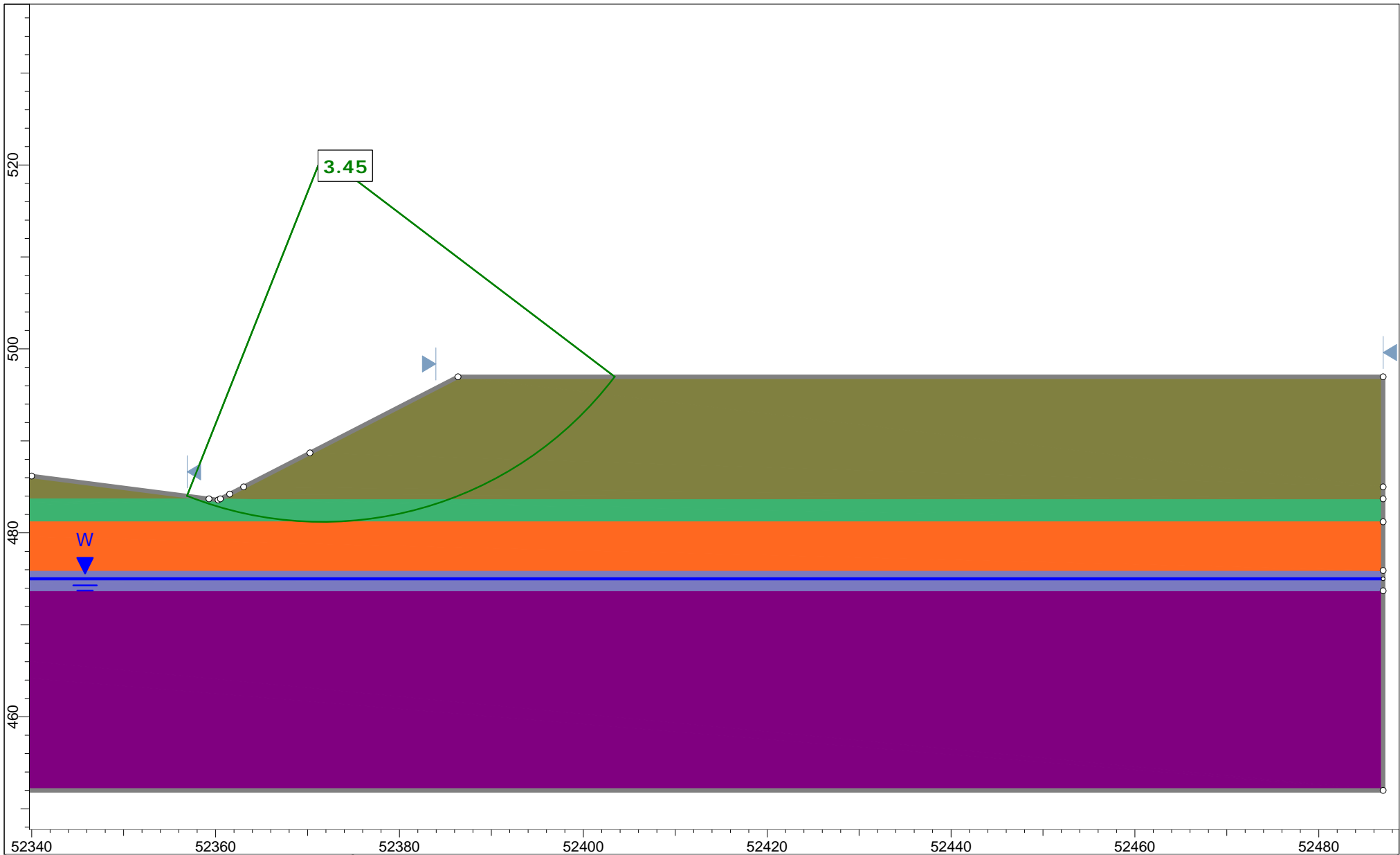


 <b>rocscience</b>	Project 040861 Hwy. 10-Hwy. 96 (Greenwood Bypass)		
	Site	Site 5	Analysis Type Long Term
	Analyzed By	MBB	Configuration West Bridge End, 1V : 2H End Slope
	Date	8/2/2023	

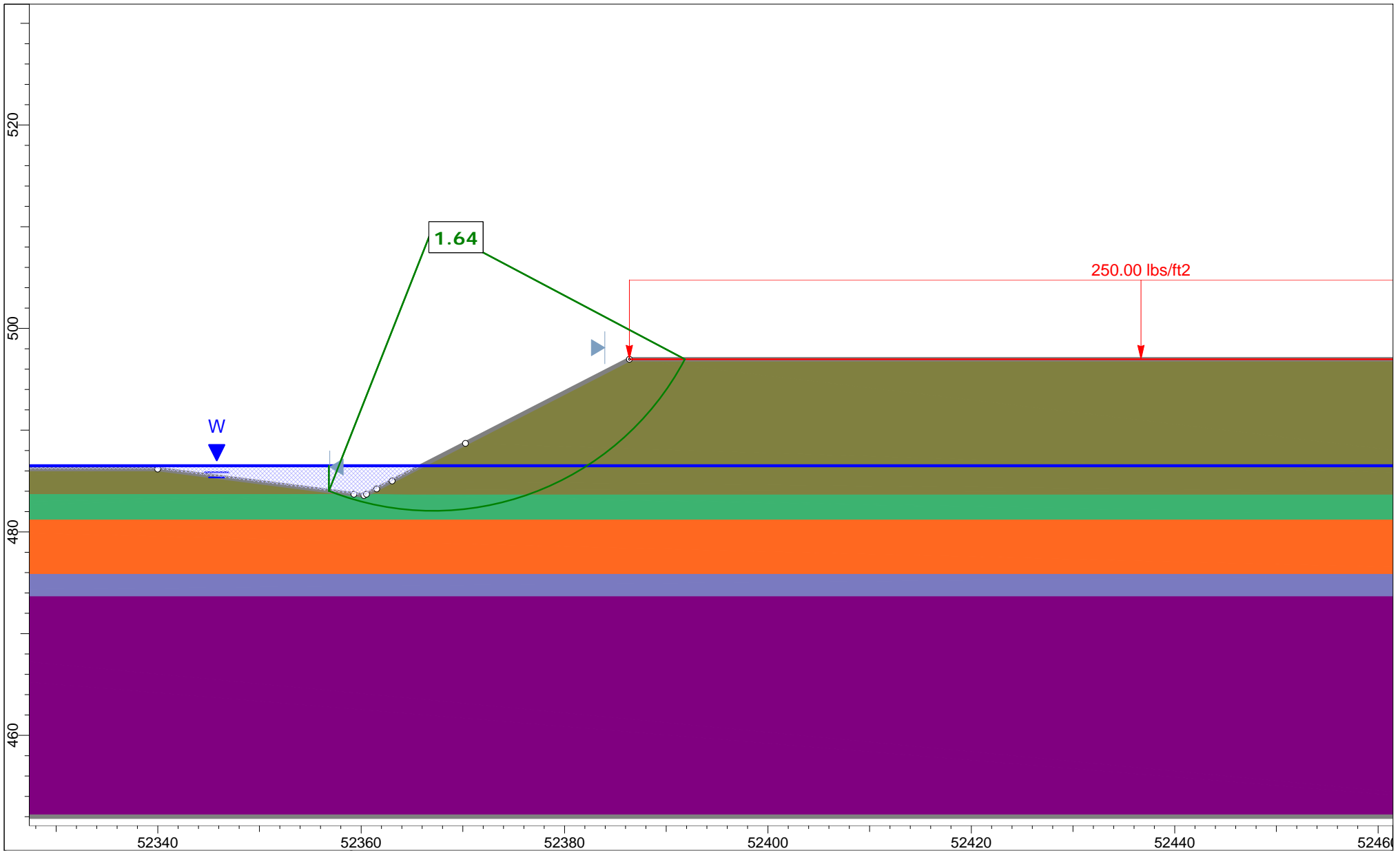





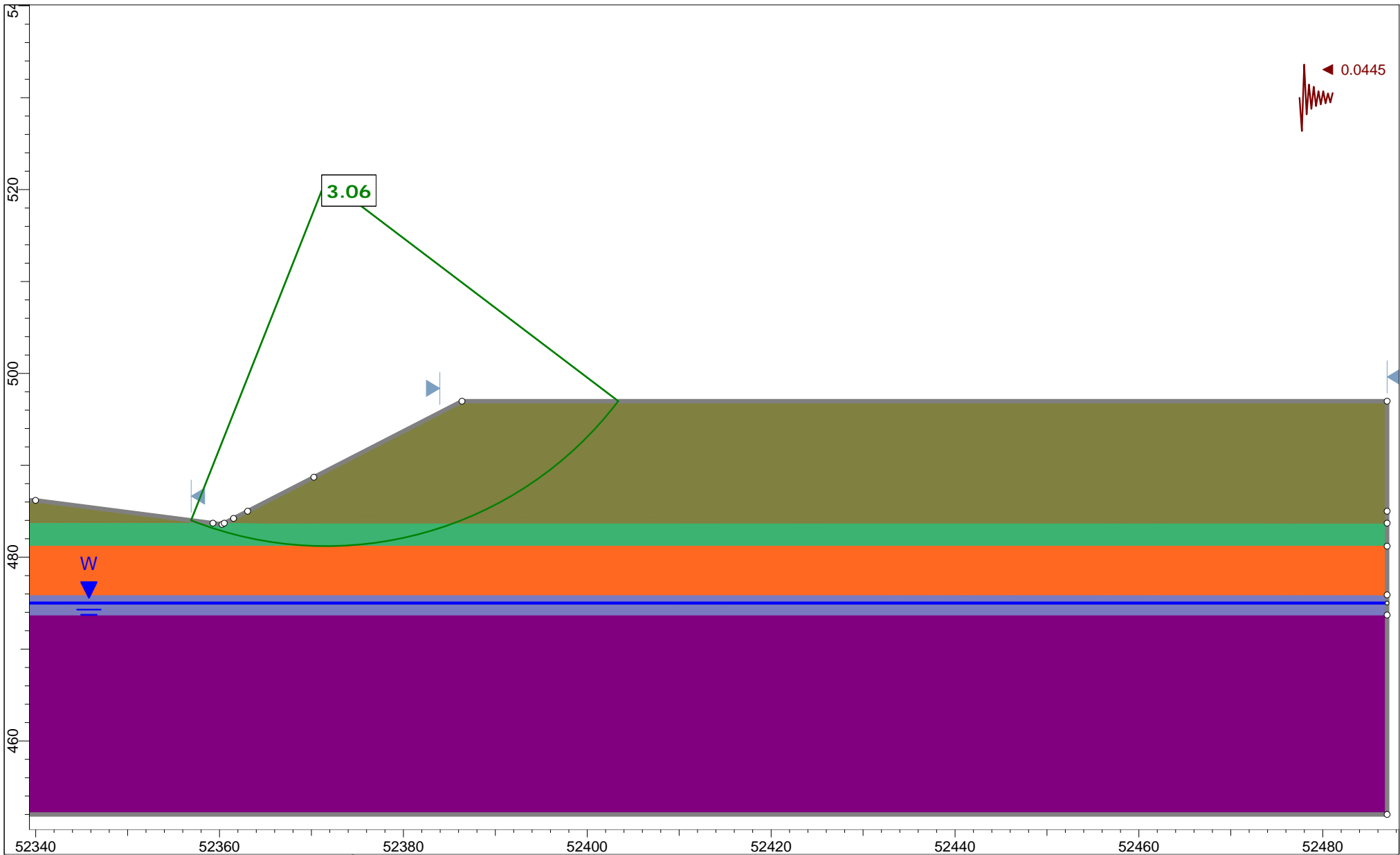
	Project 040861 Hwy. 10-Hwy. 96 (Greenwood Bypass)		
	Site	Site 5	Analysis Type Seismic Condition
	Analyzed By	MBB	Configuration West Bridge End, 1V : 2H End Slope
	Date	8/2/2023	



Project	040861 Hwy. 10-Hwy. 96 (Greenwood Bypass)		
Site	Site 5	Analysis Type	Short Term
Analyzed By	MBB	Configuration	East Bridge End, 1V : 2H End Slope
Date	8/2/2023		



	Project 040861 Hwy. 10-Hwy. 96 (Greenwood Bypass)		
	Site	Site 5	Analysis Type Long Term
	Analyzed By	MBB	Configuration East Bridge End, 1V : 2H End Slope
	Date	8/3/2023	



Project	040861 Hwy. 10-Hwy. 96 (Greenwood Bypass)		
Site	Site 5	Analysis Type	Seismic Condition
Analyzed By	MBB	Configuration	East Bridge End, 1V : 2H End Slope
Date	8/2/2023		



## Attachment H1



Job No.:	040861
Site No.:	1

Input by:	YZ	8/7/2023
Checked by:	MBB	8/8/2023
Back-checked by:	YZ	8/8/2023

Bent 1 - Borings 1

Elevation, ft		Material	Model	Effective Unit Weight, $\gamma'$ , pcf	Undrained Shear Strength of Soil ( $C_u$ ) (psf)	Strain Factor ( $\epsilon_{50}$ for Soil) / $k_m$ for Rock)	Friction Angle, $\phi$ , °	Soil Modulus, k, pci	Uniaxial Compressive Strength, $q_u$ , psi	Rock Mass Modulus, $E_{rm}$ , $10^6$ psi	RQD, %
Top	Bottom										
Above Ground Surface		Fill	Soft Clay (Matlock)	120	750	0.0100	NA	NA	NA	NA	NA
Ground	471	Overburden Soil	Sand (Reese)	55	NA	NA	29.0	20	NA	NA	NA
471	470	Highly Weathered to Weathered Shale	Stiff Clay with Free Water (Reese)	85	10000	0.0010	NA	2000	NA	NA	NA
below 470		Competent Slightly Weathered to Unweathered Shale	Weak Rock	95	NA	0.0005	NA	NA	2500	1.5	70

Bent 1 - Boring 2

Elevation, ft		Material	Model	Effective Unit Weight, $\gamma'$ , pcf	Undrained Shear Strength of Soil ( $C_u$ ) (psf)	Strain Factor ( $\epsilon_{50}$ for Soil) / $k_m$ for Rock)	Friction Angle, $\phi$ , °	Soil Modulus, k, pci	Uniaxial Compressive Strength, $q_u$ , psi	Rock Mass Modulus, $E_{rm}$ , $10^6$ psi	RQD, %
Top	Bottom										
Above Ground Surface		Fill	Soft Clay (Matlock)	120	750	0.010	NA	NA	NA	NA	NA
Ground	472	Overburden Soil	Stiff Clay with Free Water (Reese)	55	1500	0.007	NA	500	NA	NA	NA
472	467	Highly Weathered to Weathered Shale	Stiff Clay with Free Water (Reese)	85	10000	0.0010	NA	2000	NA	NA	NA
below 467		Competent Slightly Weathered to Unweathered Shale	Weak Rock	95	NA	0.0005	NA	NA	2500	1.5	70

Bent 2 - Boring 1

Elevation, ft		Material	Model	Effective Unit Weight, $\gamma'$ , pcf	Undrained Shear Strength of Soil ( $C_u$ ) (psf)	Strain Factor ( $\epsilon_{50}$ for Soil) / $k_m$ for Rock)	Friction Angle, $\phi$ , °	Soil Modulus, k, pci	Uniaxial Compressive Strength, $q_u$ , psi	Rock Mass Modulus, $E_{rm}$ , $10^6$ psi	RQD, %
Top	Bottom										
Ground	471	Overburden Soil	Sand (Reese)	55	NA	NA	29.0	20	NA	NA	NA
471	470	Highly Weathered to Weathered Shale	Stiff Clay with Free Water (Reese)	85	10000	0.0010	NA	2000	NA	NA	NA
below 470		Competent Slightly Weathered to Unweathered Shale	Weak Rock	95	NA	0.0005	NA	NA	2500	1.5	70

Bent 2 - Boring 2

Elevation, ft		Material	Model	Effective Unit Weight, $\gamma'$ , pcf	Undrained Shear Strength of Soil ( $C_u$ ) (psf)	Strain Factor ( $\epsilon_{50}$ for Soil) / $k_m$ for Rock)	Friction Angle, $\phi$ , °	Soil Modulus, k, pci	Uniaxial Compressive Strength, $q_u$ , psi	Rock Mass Modulus, $E_{rm}$ , $10^6$ psi	RQD, %
Top	Bottom										
Ground	472	Overburden Soil	Stiff Clay with Free Water (Reese)	55	1500	0.007	NA	500	NA	NA	NA
472	467	Highly Weathered to Weathered Shale	Stiff Clay with Free Water (Reese)	85	10000	0.0010	NA	2000	NA	NA	NA
below 467		Competent Slightly Weathered to Unweathered Shale	Weak Rock	95	NA	0.0005	NA	NA	2500	1.5	70

Bent 3 - Boring 3

Elevation, ft		Material	Model	Effective Unit Weight, $\gamma'$ , pcf	Undrained Shear Strength of Soil ( $C_u$ ) (psf)	Strain Factor ( $\epsilon_{50}$ for Soil) / $k_m$ for Rock)	Friction Angle, $\phi$ , °	Soil Modulus, k, pci	Uniaxial Compressive Strength, $q_u$ , psi	Rock Mass Modulus, $E_{rm}$ , $10^6$ psi	RQD, %
Top	Bottom										
Ground	476.5	Overburden Soil - Weaker	Sand (Reese)	55	NA	NA	27.0	20	NA	NA	NA
476.5	471.5	Overburden Soil - Stiffer	Sand (Reese)	55	NA	NA	30.0	20	NA	NA	NA
471.5	466.5	Highly Weathered to Weathered Shale	Stiff Clay with Free Water (Reese)	85	10000	0.0010	NA	2000	NA	NA	NA
below 466.5		Competent Slightly Weathered to Unweathered Shale	Weak Rock	95	NA	0.0005	NA	NA	2500	1.5	60

Bent 3 - Boring 4

Elevation, ft		Material	Model	Effective Unit Weight, $\gamma'$ , pcf	Undrained Shear Strength of Soil ( $C_u$ ) (psf)	Strain Factor ( $\epsilon_{50}$ for Soil) / $k_m$ for Rock)	Friction Angle, $\phi$ , °	Soil Modulus, k, pci	Uniaxial Compressive Strength, $q_u$ , psi	Rock Mass Modulus, $E_{rm}$ , $10^6$ psi	RQD, %
Top	Bottom										
Ground	472	Overburden Soil - Sand	Sand (Reese)	55	NA	NA	30.0	20	NA	NA	NA
472	471	Highly Weathered to Weathered Shale	Stiff Clay with Free Water (Reese)	85	10000	0.0010	NA	2000	NA	NA	NA
below 471		Competent Slightly Weathered to Unweathered Shale	Weak Rock	95	NA	0.0005	NA	NA	2500	1.5	60

Bent 4 - Borings 5 and 6

Elevation, ft		Material	Model	Effective Unit Weight, $\gamma'$ , pcf	Undrained Shear Strength of Soil ( $C_u$ ) (psf)	Strain Factor ( $\epsilon_{50}$ for Soil) / $k_m$ for Rock)	Friction Angle, $\phi$ , °	Soil Modulus, k, pci	Uniaxial Compressive Strength, $q_u$ , psi	Rock Mass Modulus, $E_{rm}$ , $10^6$ psi	RQD, %
Top	Bottom										
Ground	474	Overburden Soil - Sand	Sand (Reese)	60	NA	NA	32.0	40	NA	NA	NA
474	470.5	Highly Weathered to Weathered Shale	Stiff Clay with Free Water (Reese)	85	10000	0.0010	NA	2000	NA	NA	NA
below 470.5		Competent Slightly Weathered to Unweathered Shale	Weak Rock	95	NA	0.0005	NA	NA	2500	1.5	50

Bent 5 - Borings 7 and 8

Elevation, ft		Material	Model	Effective Unit Weight, $\gamma'$ , pcf	Undrained Shear Strength of Soil ( $C_u$ ) (psf)	Strain Factor ( $\epsilon_{50}$ for Soil) / $k_m$ for Rock)	Friction Angle, $\phi$ , °	Soil Modulus, k, pci	Uniaxial Compressive Strength, $q_u$ , psi	Rock Mass Modulus, $E_{rm}$ , $10^6$ psi	RQD, %
Top	Bottom										
Ground	471.5	Overburden Soil - Sand	Sand (Reese)	65	NA	NA	36.0	92	NA	NA	NA
471.5	471	Highly Weathered to Weathered Shale	Stiff Clay with Free Water (Reese)	85	10000	0.0010	NA	2000	NA	NA	NA
below 471		Competent Slightly Weathered to Unweathered Shale	Weak Rock	95	NA	0.0005	NA	NA	2500	1.5	65

Bent 6 - Borings 9 and 10

Elevation, ft		Material	Model	Effective Unit Weight, $\gamma'$ , pcf	Undrained Shear Strength of Soil ( $C_u$ ) (psf)	Strain Factor ( $\epsilon_{50}$ for Soil) / $k_m$ for Rock)	Friction Angle, $\phi$ , °	Soil Modulus, k, pci	Uniaxial Compressive Strength, $q_u$ , psi	Rock Mass Modulus, $E_{rm}$ , $10^6$ psi	RQD, %
Top	Bottom										
Above Ground Surface		Fill	Soft Clay (Matlock)	120	750	0.0100	NA	NA	NA	NA	NA
Ground	471.5	Overburden Soil	Sand (Reese)	65	NA	NA	37.0	105	NA	NA	NA
below 471.5		Competent Slightly Weathered to Unweathered Shale	Weak Rock	95	NA	0.0005	NA	NA	2500	1.5	40

## Attachment H4



Job No.:	040861
Site No.:	4

Input by:	YZ	7/31/2023
Checked by:	PT	08/02/223
Back-checked by:	YZ	8/2/2023

Bent 1 - Borings 1 and 2

Elevation, ft		Material	Model	Effective Unit Weight, $\gamma'$ ,pcf	Undrained Shear Strength of Soil ( $C_u$ ) (psf)	Strain Factor ( $\epsilon_{50}$ for Soil) / $k_m$ for Rock)	Friction Angle, $\phi$ , °	Soil Modulus, k, pci	Uniaxial Compressive Strength, $q_u$ , psi	Rock Mass Modulus, $E_{rm}$ , $10^6$ psi	RQD, %
Top	Bottom										
Above Ground Surface		Fill	Soft Clay (Matlock)	120	750	0.0100	NA	NA	NA	NA	NA
Ground	465	Overburden Soil	Soft Clay (Matlock)	50	750	0.0100	NA	NA	NA	NA	NA
below 465		Competent Slightly Weathered to Unweathered Shale	Weak Rock	95	NA	0.0005	NA	NA	3500	3.0	40

Bent 2 - Borings 3 and 4

Elevation, ft		Material	Model	Effective Unit Weight, $\gamma'$ ,pcf	Undrained Shear Strength of Soil ( $C_u$ ) (psf)	Strain Factor ( $\epsilon_{50}$ for Soil) / $k_m$ for Rock)	Friction Angle, $\phi$ , °	Soil Modulus, k, pci	Uniaxial Compressive Strength, $q_u$ , psi	Rock Mass Modulus, $E_{rm}$ , $10^6$ psi	RQD, %
Top	Bottom										
Ground	467	Overburden Soil	Soft Clay (Matlock)	50	750	0.0100	NA	NA	NA	NA	NA
below 467		Competent Slightly Weathered to Unweathered Shale	Weak Rock	95	NA	0.0005	NA	NA	3500	3.0	50

Bent 3 - Borings 5 and 6

Elevation, ft		Material	Model	Effective Unit Weight, $\gamma'$ ,pcf	Undrained Shear Strength of Soil ( $C_u$ ) (psf)	Strain Factor ( $\epsilon_{50}$ for Soil) / $k_m$ for Rock)	Friction Angle, $\phi$ , °	Soil Modulus, k, pci	Uniaxial Compressive Strength, $q_u$ , psi	Rock Mass Modulus, $E_{rm}$ , $10^6$ psi	RQD, %
Top	Bottom										
Ground	466.5	Overburden Soil	Sand (Reese)	55	NA	NA	27.0	20	NA	NA	NA
466.5	461.5	Highly Weathered to Weathered Shale	Stiff Clay with Free Water (Reese)	85	10000	0.0010	NA	2000	NA	NA	NA
below 461.5		Competent Slightly Weathered to Unweathered Shale	Weak Rock	95	NA	0.0005	NA	NA	3500	3.0	45

Bent 4 - Boring 7

Elevation, ft		Material	Model	Effective Unit Weight, $\gamma'$ ,pcf	Undrained Shear Strength of Soil ( $C_u$ ) (psf)	Strain Factor ( $\epsilon_{50}$ for Soil) / $k_m$ for Rock)	Friction Angle, $\phi$ , °	Soil Modulus, k, pci	Uniaxial Compressive Strength, $q_u$ , psi	Rock Mass Modulus, $E_{rm}$ , $10^6$ psi	RQD, %
Top	Bottom										
Ground	466.5	Overburden Soils	Soft Clay (Matlock)	45	550	0.0100	NA	NA	NA	NA	NA
466.5	462	Highly Weathered to Weathered Shale	Stiff Clay with Free Water (Reese)	85	10000	0.001	NA	2000	NA	NA	NA
below 462		Competent Slightly Weathered to Unweathered Shale	Weak Rock	95	NA	0.0005	NA	NA	3500	3.0	85

Bent 5 - Boring 8

Elevation, ft		Material	Model	Effective Unit Weight, $\gamma'$ ,pcf	Undrained Shear Strength of Soil ( $C_u$ ) (psf)	Strain Factor ( $\epsilon_{50}$ for Soil) / $k_m$ for Rock)	Friction Angle, $\phi$ , °	Soil Modulus, k, pci	Uniaxial Compressive Strength, $q_u$ , psi	Rock Mass Modulus, $E_{rm}$ , $10^6$ psi	RQD, %
Top	Bottom										
Ground	466.5	Overburden Soil	Sand (Reese)	55	NA	NA	30.0	20	NA	NA	NA
466.5	462.5	Highly Weathered to Weathered Shale	Stiff Clay with Free Water (Reese)	85	10000	0.001	NA	2000	NA	NA	NA
below 462.5		Competent Slightly Weathered to Unweathered Shale	Weak Rock	95	NA	0.0005	NA	NA	3500	3.0	55

Bent 6 - Borings 9 and 10

Elevation, ft		Material	Model	Effective Unit Weight, $\gamma'$ ,pcf	Undrained Shear Strength of Soil ( $C_u$ ) (psf)	Strain Factor ( $\epsilon_{50}$ for Soil) / $k_m$ for Rock)	Friction Angle, $\phi$ , °	Soil Modulus, k, pci	Uniaxial Compressive Strength, $q_u$ , psi	Rock Mass Modulus, $E_{rm}$ , $10^6$ psi	RQD, %
Top	Bottom										
Above Ground Surface		Fill	Soft Clay (Matlock)	120	750	0.010	NA	NA	NA	NA	NA
Ground	465	Overburden Soils	Soft Clay (Matlock)	45	500	0.0200	NA	NA	NA	NA	NA
465	460	Highly Weathered to Weathered Shale	Stiff Clay with Free Water (Reese)	85	10000	0.001	NA	2000	NA	NA	NA
below 460		Competent Slightly Weathered to Unweathered Shale	Weak Rock	95	NA	0.0005	NA	NA	3500	3.0	50



## Attachment H5



Job No.:	040861
Site No.:	5

Input by:	YZ	7/31/2023
Checked by:	MBB	8/3/2023
Back-checked by:	YZ	8/8/2023

Bent 1 - Boring 1

Elevation, ft		Material	Model	Effective Unit Weight, $\gamma'$ ,pcf	Undrained Shear Strength of Soil ( $C_u$ ) (psf)	Strain Factor ( $\epsilon_{50}$ for Soil) / $k_m$ for Rock)	Friction Angle, $\phi$ , °	Soil Modulus, k, pci	Uniaxial Compressive Strength, $q_u$ , psi	Rock Mass Modulus, $E_{rm}$ , $10^6$ psi	RQD, %
Top	Bottom										
Above Ground Surface		Fill	Soft Clay (Matlock)	120	750	0.0100	NA	NA	NA	NA	NA
Ground	473	Overburden Soil - Clay	Soft Clay (Matlock)	50	900	0.0100	NA	NA	NA	NA	NA
473	468	Overburden Soil - Sand	Sand (Reese)	55	NA	NA	29.0	20	NA	NA	NA
468	466.5	Highly Weathered to Weathered Shale	Stiff Clay with Free Water (Reese)	85	10000	0.0010	NA	2000	NA	NA	NA
below 466.5		Competent Slightly Weathered to Unweathered Shale	Weak Rock	100	NA	0.0005	NA	NA	5500	3.5	80

Bent 1 - Boring 2

Elevation, ft		Material	Model	Effective Unit Weight, $\gamma'$ ,pcf	Undrained Shear Strength of Soil ( $C_u$ ) (psf)	Strain Factor ( $\epsilon_{50}$ for Soil) / $k_m$ for Rock)	Friction Angle, $\phi$ , °	Soil Modulus, k, pci	Uniaxial Compressive Strength, $q_u$ , psi	Rock Mass Modulus, $E_{rm}$ , $10^6$ psi	RQD, %
Top	Bottom										
Ground	468	Overburden Soil - Sand	Sand (Reese)	55	NA	NA	27.0	20	NA	NA	NA
468	463	Highly Weathered to Weathered Shale	Stiff Clay with Free Water (Reese)	85	10000	0.0010	NA	2000	NA	NA	NA
below 463		Competent Slightly Weathered to Unweathered Shale	Weak Rock	100	NA	0.0005	NA	NA	5500	3.5	80

Bent 2 - Borings 3

Elevation, ft		Material	Model	Effective Unit Weight, $\gamma'$ ,pcf	Undrained Shear Strength of Soil ( $C_u$ ) (psf)	Strain Factor ( $\epsilon_{50}$ for Soil) / $k_m$ for Rock)	Friction Angle, $\phi$ , °	Soil Modulus, k, pci	Uniaxial Compressive Strength, $q_u$ , psi	Rock Mass Modulus, $E_{rm}$ , $10^6$ psi	RQD, %
Top	Bottom										
Ground	469.5	Overburden Soil - Sand	Sand (Reese)	55	NA	NA	27.0	20	NA	NA	NA
469.5	464.5	Overburden Soil - Clay	Stiff Clay with Free Water (Reese)	55	1500	0.0070	NA	500	NA	NA	NA
below 464.5		Competent Slightly Weathered to Unweathered Shale	Weak Rock	100	NA	0.0005	NA	NA	5500	3.5	80

Bent 3 - Borings 4 and 5

Elevation, ft		Material	Model	Effective Unit Weight, $\gamma'$ ,pcf	Undrained Shear Strength of Soil ( $C_u$ ) (psf)	Strain Factor ( $\epsilon_{50}$ for Soil) / $k_m$ for Rock)	Friction Angle, $\phi$ , °	Soil Modulus, k, pci	Uniaxial Compressive Strength, $q_u$ , psi	Rock Mass Modulus, $E_{rm}$ , $10^6$ psi	RQD, %
Top	Bottom										
Ground	477.5	Overburden Soil	Sand (Reese)	55	NA	NA	32.0	40	NA	NA	NA
477.5	471	Highly Weathered to Weathered Shale	Stiff Clay with Free Water (Reese)	85	10000	0.0010	NA	2000	NA	NA	NA
below 471		Competent Slightly Weathered to Unweathered Shale	Weak Rock	100	NA	0.0005	NA	NA	5500	3.5	50

Bent 4 - Borings 6 and 7

Elevation, ft		Material	Model	Effective Unit Weight, $\gamma'$ ,pcf	Undrained Shear Strength of Soil ( $C_u$ ) (psf)	Strain Factor ( $\epsilon_{50}$ for Soil) / $k_m$ for Rock)	Friction Angle, $\phi$ , °	Soil Modulus, k, pci	Uniaxial Compressive Strength, $q_u$ , psi	Rock Mass Modulus, $E_{rm}$ , $10^6$ psi	RQD, %
Top	Bottom										
Above Ground Surface		Fill	Soft Clay (Matlock)	120	750	0.010	NA	NA	NA	NA	NA
Ground	481	Overburden Soils - Clay	Soft Clay (Matlock)	45	650	0.0100	NA	NA	NA	NA	NA
481	476	Overburden Soil - Sand	Sand (Reese)	70	NA	NA	38.0	119	NA	NA	NA
476	474	Highly Weathered to Weathered Shale	Stiff Clay with Free Water (Reese)	85	10000	0.0010	NA	2000	NA	NA	NA
below 474		Competent Slightly Weathered to Unweathered Shale	Weak Rock	100	NA	0.0005	NA	NA	5500	3.5	70



## ARKANSAS DEPARTMENT OF TRANSPORTATION

ArDOT.gov | IDriveArkansas.com | Lorie H. Tudor, P.E., Director

### MATERIALS DIVISION

11301 West Baseline Road | P.O. Box 2261 | Little Rock, AR 72203-2261 | Phone: 501.569.2185 | Fax: 501.569.2368

August 1, 2023

**TO:** Mr. Rick Ellis, Bridge Engineer  
**SUBJECT:** Job No. 040861  
Sites 2 and 3  
Hwy. 10 – Hwy. 96 (Greenwood Bypass) (S)  
Sebastian County  
Route 10, Sections 0 & 1

### Introduction

Submitted herein are the results of the subsurface investigation and geotechnical recommendations for the proposed replacement bridges at Site 2 and Site 3 planned on Arkansas Highway 10 in Sebastian County. Recommendations for the other three (3) sites (Sites 1, 4, and 5) will be provided in a separate report. The two (2) bridges included in this submittal are comprised of:

- Site 2 (Highway 10 Replacement Bridge over Heartsill Creek): five (5)-span, continuous plate girder unit with a structure length of 420 feet and out-to-out width of 73.5 feet; 2H:1V fill slopes (maximum 16 feet tall) at both bridge ends.
- Site 3 (Highway 10 Replacement Bridge over Vache Grasse Creek): three (3)-span, continuous plate girder unit with a structure length of 273 feet and out-to-out width of 73.5 feet; 2H:1V fill slopes (maximum 23 feet tall) at both bridge ends.

It is understood steel HP14x117 are tentatively planned at the abutment bents of each bridge and HP16x121 piles planned at the intermediate bents of the bridges.

### Field Investigation

Request for Subsurface Investigation was received on January 27, 2023 to develop recommendations for bridge foundations and to verify suitability of bridge abutment slope configurations. Borings were drilled at accessible locations based on the Request for Subsurface Investigation memo. The approximate locations of the borings are presented in the Plan of Borings included in Attachments A2 and A3 for Sites 2 and 3, respectively.

The borings were advanced with a track-mounted Acker Renegade rotary drill rig using a combination of hollow-stem auger and diamond core method. The boring logs, showing the subsurface conditions encountered in the borings and the results of field and laboratory tests, are also included in Attachments A2 and A3, immediately following the corresponding Plans of Borings. A Legend is included with the boring logs to interpret / explain the symbols, terms, and conventions used on logs. Standard Penetration Tests (SPT) were conducted in accordance with ASTM D1586 for field testing and soil sampling. Liners were not used inside the standard split-barrel samplers. Drill rig hammer correction factor is shown on the logs.

The number of blows required to drive the standard split-barrel sampler for each 6-inch penetration of the total 18-inch drive are shown on the logs. SPT N-values are defined as the



number of blows required to advance the split barrel the final 12 inches. The SPT N-values indicated on the logs are raw (uncorrected) blow counts as measured in field.

Core samples of bedrock were retrieved by using NQ3-size triple-tube core barrels (rock core diameter of 1-3/4 in. and hole diameter of 3 in.). For each core run, Rock Quality Designation (RQD) was determined in the field by a logger and further evaluated by a licensed Professional Geologist (PG). RQD, expressed in percent, is defined as the sum of the intact core pieces that are longer than 4 inches divided by the total length of the core run. The RQD of each core run is indicated on corresponding log. Core pictures for Sites 2 and 3 are also included in Attachments A2 and A3, respectively, following the corresponding boring logs. Groundwater was also observed during the drilling process. Groundwater observations were noted on the logs.

### **Lab Investigation**

All samples were brought to the Materials Division laboratory for further evaluation and testing. Soil samples were tested to evaluate index and engineering properties and to verify soil type and classification. Lab tests were performed on representative soil samples to determine moisture content, Atterberg limits, and gradation. Tested soils are classified by licensed Geologists in accordance with both USCS and AASHTO soil classification systems. To evaluate the corrosion potential of the subsurface soils to steel piles, laboratory pH and soil electrical resistivity tests were also performed on representative soil samples.

Rock cores were first examined by a licensed Professional Geologist to verify Total Core Recovery (TCR) and Rock Quality Designation (RQD) measured in field and to obtain parameters for determination of Geological Strength Index (GSI) and Rock Mass Rating (RMR). Compressive strength of rock cores was then determined by laboratory uniaxial compressive test on intact rock cores in accordance with ASTM D7012, Method C.

The results of laboratory tests are either shown on corresponding logs or presented in Attachment B. The laboratory tests and their corresponding ASTM and/or AASHTO test methods are listed in Table 1.

Table 1: Summary of Laboratory Tests and Methods

Laboratory Test	ASTM	AASHTO	Denotation on Logs
Moisture Content	D2216	T 265	Solid Circle Symbol (●)
Grain Size Analysis by Sieving	D6913	T 88	Whole Number in the "- No. 200 %" Column (e.g., 12)
Atterberg Limits	D4318	T 89	Plus Sign (+) on the Right for Liquid Limit
		T 90	Plus Sign (+) on the Left for Plastic Limit
pH of Soil	D4972	T 289	Presented in Attachment B2 for Site 2 (samples not obtained for Site 3)
Soil Resistivity	G57	T 288	
Uniaxial Compression of Rock Cores	D7012, Method C		Presented in Attachment B2 and B3 for Site 2 and Site 3, respectively





The particle size through which 50% of particles by weight passing,  $D_{50}$ , is summarized below in Table 2.

Table 2: Summary of  $D_{50}$  for Scour Analysis

Site No.	Hydraulic Feature Name	Station	Sample Type	Location	$D_{50}$ , mm
1, 2, 4	Heartsill Creek	505+72, 16 Lt.	Bulk	Creek Bank	< 0.075
3, 5	Vache Grasse Creek	522+14, 92 Rt.	Bulk	Creek Bank	< 0.075

### **Site Conditions**

There are five (5) sites for the proposed Greenwood Bypass. Sites 1, 2, and 4 will span Heartsill Creek, which flows from the southwest to the northeast through the project alignment. Sites 3 and 5 will span the Vache Grasse Creek, which flows from the south to north and may receive discharge from a water treatment facility that is located approximately 600 feet to the south of Site 3. Some of the embankments along both creeks show signs of scour. The embankment end slopes under the existing Route 10 bridge have been plated with riprap in the past to reduce erosion. Selected pictures for Site 2 are included in Attachment C2.

### **Site Geology**

The project sites overlie Pennsylvanian aged McAlester Formation, which consists primarily of shale with thin interbedded sandstone and coal layers. This formation rests conformably over the Hartshorne Sandstone. Coal is common in this formation and has been locally mined in the past. Multiple abandoned coal mines are mapped near the project location, including a strip mine and two (2) small pits approximately 800 feet south of site 1. Coal was not observed in any of the core retrieved for this project, but encountering unmapped coal and or abandoned mines around the project site is possible. There are numerous faults mapped to the northwest and to the south of the project location and unmapped faults are possible.

The geology across all five (5) sites is consistent with only slight variations in overburden soils and rock type. Weak soil is common in the top 11.5 feet of some of the borings. At Site 4, weak soils were encountered at depths of up to 21.5 feet. Shale at all (5) sites is consistent with varying amounts of interbedded sandstone, fractures, and slickensides. Core samples of shale with interbedded sandstone had higher compressive strengths than samples of shale with no sandstone. In some of the borings, the fractures and slickensides increased in frequency with depth. Slickensided vertical fractures were encountered during drilling in several of the borings for Sites 1 and 5. At Site 5, the fractures varied from 0.6 to 1.1 feet thick and were located between 31.9 to 33.2 feet below ground level. At Site 1, the fractures varied from 1.8 to 2.5 feet thick and were located between 16.8 and 29.4 feet below ground level.

### **Generalized Subsurface Conditions**

To aid in visualizing subsurface conditions and stratigraphy, Generalized Subsurface Profiles are included in Attachments D2 and D3 for Sites 2 and 3, respectively. The horizontal axis represents stationing in feet while the vertical axis denotes elevation in feet. To fit borings,



the drawings are not to scale though they are proportional in both horizontal direction and vertical direction.

The Generalized Subsurface Profiles divide the subsurface geotechnical materials into three (3) generalized strata: I. Overburden Soils; II. Incompetent Rock (highly weathered to weathered rock); and III. Competent Rock (slightly weathered to unweathered rock). The estimated elevation of the competent rock, as revealed by the borings, are indicated on the subsurface profiles. These elevations are also summarized below in Tables 3a and 3b, respectively. In light of the natural variations in stratigraphy and subsurface conditions, deviation from those illustrated on the profiles must be anticipated.

Table 3a: Estimated Elevation of Competent Rock – Site 2

Boring No.	Boring Location	Ground Surf. Elev. @ Boring Location, ft.	Depth to Competent Rock, ft.	Estimated Elev. of Competent Rock, ft.
1	Sta. 219+36, 34 Rt.	484.4	25.1	459.3
2	Sta. 219+90, 34 Lt.	483.9	16.5	467.4
3	Sta. 219+93, 34 Rt.	484.5	16.5	468.0
4	Sta. 220+45, 34 Lt.	485.1	19.4	465.7
5	Sta. 221+08, 34 Rt.	482.2	16.0	466.2
6	Sta. 221+59, 19 Lt.	482.9	17.0	465.9
7	Sta. 222+01, 34 Rt.	483.5	20.1	463.4
8	Sta. 222+38, 34 Lt.	482.7	20.1	462.6
9	Sta. 222+94, 10 Rt.	482.5	20.2	462.3
10	Sta. 223+25, 34 Lt.	482.9	20.1	462.8
11	Sta. 223+72, 34 Rt.	483.6	24.0	459.6
12	Sta. 223+99, 34 Lt.	483.6	20.4	463.2

Table 3b: Estimated Elevation of Competent Rock – Site 3

Boring No.	Boring Location	Ground Surf. Elev. @ Boring Location, ft.	Depth to Competent Rock, ft.	Estimated Elev. of Competent Rock, ft.
1	Sta. 236+64, 34 Lt.	484.6	17.0	467.6
2	Sta. 237+36, 38 Lt.	485.3	20.7	464.5
3	Sta. 238+35, 25 Rt.	487.4	12.0	475.4
4	Sta. 238+54, 34 Lt.	486.7	12.5	474.2
5	Sta. 239+14, 34 Lt.	484.6	12.5	472.1
6	Sta. 239+20, 34 Rt.	485.3	12.0	473.3



## **Seismic Conditions**

In light of the average subsurface conditions as revealed by the borings, a **Seismic Site Class D (Stiff Soil Profile)** is calculated for the five (5) project sites. Utilizing the Seismic Site Class D and the mid-point GPS coordinates of the project, the following design peak ground acceleration coefficient ( $A_S$ ), design short-period spectral acceleration coefficient ( $S_{DS}$ ), as well as design long-period spectral acceleration coefficient ( $S_{D1}$ ), are determined. These seismic coefficients are summarized in Table 4. Design Response Spectrum is presented in Attachment E.

Table 4: Summary of Design Ground Motion Acceleration Response Coefficients

Acceleration Coefficient	Value (g)
	All Sites (Sites 1 through 5)
$A_S$ (Site PGA)	0.089
$S_{DS}$ (0.2 sec)	0.210
$S_{D1}$ (1 sec)	0.127

For the design long-period spectral acceleration coefficient ( $S_{D1}$ ) of 0.127, a **Seismic Performance Zone 1** is considered applicable to the five (5) bridge sites.

## **Approach Embankments**

Settlement Potential and Ground Improvements Design drawings provided by Bridge Division indicate up to 16 feet of fill will be placed at the bridge abutments of Site 2 and up to 23 feet of fill will be placed at Site 3 bridge abutments. Based on the results of the borings performed at these bridge abutments, the subsurface soils are primarily granular soils with some areas / zones of low-plasticity lean clay or silty clay. Consequently, settlement is expected to be predominantly immediate, elastic deformation that will be completed during the embankment construction phase.

The surface and near-surface soils at the planned bridge abutments are weak and unstable. To provide a stable construction platform and to stabilize the embankments, it is recommended the subgrade at the bridge abutments be undercut at least 5 feet below the existing ground surface. For each abutment, undercut should extend at least 5 feet in front of the toe of the end slope, 5 feet beyond the toes of the side slopes, and 100 feet behind the crest of the end slope.

Undercut should be backfilled with Rock Fill. A project Special Provision for Rock Fill is included in Attachment F. Aggregate Base Coarse (Class 7), in accordance with ARDOT Standard Specifications Section 303, should be utilized in areas where piling is planned.

Embankment Stability Stability analyses have been performed to evaluate the design abutment configuration. Slope stability analyses were performed utilizing a commercial computer program Slide2 (Version 2021) developed by RocScience. Spencer analysis method was utilized to analyze the more critical 2H:1V end slopes at the abutments. Three (3) general loading conditions were analyzed with respect to slope stability: Short Term/End of Construction Condition, Long Term Condition, and Seismic/Pseudo-Static Condition. A horizontal acceleration

coefficient ( $K_h$ ) of 0.045 ( $0.5A_s/g$ ) was utilized for analysis of the Seismic/Pseudo-Static Condition. A surcharge of 250 psf is included to model the live load under long term conditions.

The results of the analyses are presented in Tables 5a and 5b for Sites 2 and 3, respectively. The graphic results of slope stability analyses are shown in Attachments G2 and G3 for Sites 2 and 3, respectively. Undercut and Rock Fill were not included in modeling and the analyses are considered conservative. These results of stability analyses indicate the plan abutment configurations are acceptable.

Table 5a: Results of Slope Stability Analyses - Site 2

Slope	Loading Condition	Calculated Minimum Factor of Safety	Recommended Minimum Factor of Safety
2H:1V End Slope – Bent 1	Short Term	5.81	1.3
	Long Term	1.73	1.4
	Seismic ( $k_h = 0.045$ )	4.92	1.1
2H:1V End Slope – Bent 6	Short Term	2.14	1.3
	Long Term	1.43	1.4
	Seismic ( $k_h = 0.045$ )	1.88	1.1

Table 5b: Results of Slope Stability Analyses - Site 3

Slope	Loading Condition	Calculated Minimum Factor of Safety	Recommended Minimum Factor of Safety
2H:1V End Slope – Bent 1	Short Term	2.37	1.3
	Long Term	2.52	1.4
	Seismic ( $k_h = 0.045$ )	2.13	1.1
2H:1V End Slope – Bent 4	Short Term	8.33	1.3
	Long Term	1.83	1.4
	Seismic ( $k_h = 0.045$ )	7.27	1.1

### **Foundation Recommendations**

Design and Construction Considerations Based on the most recent plans and discussions with Bridge Division, steel H piles will be utilized to support the foundation loads at all the end and intermediate bents of the bridges. Steel HP14x117 are tentatively planned at the abutment bents while HP16x121 piles are planned at the intermediate bents of the bridges.

Steel H-piles should be driven to practical refusal and should penetrate through embankment fill in the abutment areas, the overburden soils, highly weathered rock (if any) and weathered rock (if any), to bear in the competent slightly weathered to unweathered shale. Preboring is recommended to facilitate socketing the steel H piles into the competent shale as planned by the Structural Engineer. It is recommended prebores extend at least 1 foot below the competent rock surface.





# ARKANSAS DEPARTMENT OF TRANSPORTATION

ARDOT.gov | IDriveArkansas.com | Lorie H. Tudor, P.E., Director

## MATERIALS DIVISION

11301 West Baseline Road | P.O. Box 2261 | Little Rock, AR 72203-2261 | Phone: 501.569.2185 | Fax: 501.569.2368

Practical refusal is defined as a maximum penetration of 1.0 inch for 20 blows by a pile hammer. For the purpose of estimating prebore depth and pile length, an additional pile penetration of 6 inches, below the prebored depth, is expected. This estimated additional penetration below the prebored depth is based on the results of the borings and our experience with similar foundation rock. The results of the borings indicate moderate to severe driving conditions are to be expected. Consequently, rock points are recommended for all H-piles driven to refusal.

A minimum pile penetration of 10 feet, measured below natural ground surface, is recommended. Based on the results of the borings and the above assumed penetration into the resistant rock, the recommended shallowest prebore elevation and estimated shallowest pile tip elevation are summarized below in Tables 6a and 6b for Sites 2 and 3, respectively. Additional pile penetration may be required by lateral resistance as determined by the Structural Engineer.

The elevations summarized in Tables 6a and 6b are recommended shallowest prebore elevation utilizing borings results and our engineering judgement. Actual subsurface conditions can vary from those encountered in the borings. As-constructed prebore elevation and pile tip elevation can vary and must be field verified. Greater pile length/penetration may be warranted by lateral resistance demand and/or by scour requirements.

Table 6a: Recommended Shallowest Prebore Elevation and Pile Tip Elevation – Site 2

Boring No.	Boring Location	Estimated Elev. of Competent Rock, ft.	Recommended Shallowest Prebore Elev., ft.	Expected Additional Penetration below Prebored Elev., ft.
1	Sta. 219+36, 34 Rt.	459.3	458.3	0.5
2	Sta. 219+90, 34 Lt.	467.4	466.4	
3	Sta. 219+93, 34 Rt.	468.0	467.0	
4	Sta. 220+45, 34 Lt.	465.7	464.7	
5	Sta. 221+08, 34 Rt.	466.2	465.2	
6	Sta. 221+59, 19 Lt.	465.9	464.9	
7	Sta. 222+01, 34 Rt.	463.4	462.4	
8	Sta. 222+38, 34 Lt.	462.6	461.6	
9	Sta. 222+94, 10 Rt.	462.3	461.3	
10	Sta. 223+25, 34 Lt.	462.8	461.8	
11	Sta. 223+72, 34 Rt.	459.6	458.6	
12	Sta. 223+99, 34 Lt.	463.2	462.2	



Table 6b: Recommended Shallowest Prebore Elevation and Pile Tip Elevation – Site 3

Boring No.	Boring Location	Estimated Elev. of Competent Rock, ft.	Recommended Shallowest Prebore Elev., ft.	Estimated Elev. of Competent Rock, ft.
1	Sta. 236+64, 34 Lt.	467.6	466.6	0.5
2	Sta. 237+36, 38 Lt.	464.5	463.6	
3	Sta. 238+35, 25 Rt.	475.4	474.4	
4	Sta. 238+54, 34 Lt.	474.2	473.2	
5	Sta. 239+14, 34 Lt.	472.1	471.1	
6	Sta. 239+20, 34 Rt.	473.3	472.3	

For steel piling driven to refusal in competent rock, long-term, post-construction settlement is expected to be negligible. It is recommended that wave equation analyses of piles (WEAP) be performed to evaluate suitable hammer system(s) to drive the piles to refusal. The hammer system should be adequately powerful to drive piles to refusal into rock as recommended but without overstressing the piles. As a minimum, two (2) analyses should be performed for each of the bridges included in the project, with minimum one (1) analysis performed on the shortest pile and the other on the longest pile.

Coal deposits and existing coal mines were not encountered in the borings. However, multiple abandoned coal mines are mapped surrounding the project location, including a strip mine and two small pits approximately 800 feet south of Site 1. **There is a possibility of encountering coal deposits and abandoned coal mines within the project limits.** If coal deposits or abandoned coal mines are encountered at the time of construction, preboring should penetrate through the coal deposits or coal mines and should extend at least 1 foot into the competent slightly weathered to unweathered shale.

Axial Pile Capacities Nominal axial resistance of steel H piles driven to refusal in competent rock is governed by the structural capacity of the piles. Therefore, the nominal resistance should be determined by the Structural Engineer utilizing applicable AASHTO LRFD design procedures. It is recommended nominal (ultimate) resistance of steel piles be determined based on the yield strength of steel piles ( $f_y$ ) and the net cross-sectional area of the steel section ( $A_s$ ). Selection of the structural resistance factor for calculating factored structural bearing resistance of H-piles should be based on the expectation of moderate to severe driving conditions.

For steel H piles with  $f_y$  of 50 ksi, the following allowable structural compression pile capacities are recommended for preliminary design (Table 7). These allowable capacities include a factor of safety (load factor divided by resistance factor) of 4.0. Use of these allowable capacities as factored structural compression pile capacities are considered conservatively reasonable.



ARKANSAS DEPARTMENT OF TRANSPORTATION

ArDOT.gov | IDriveArkansas.com | Lorie H. Tudor, P.E., Director

MATERIALS DIVISION

11301 West Baseline Road | P.O. Box 2261 | Little Rock, AR 72203-2261 | Phone: 501.569.2185 | Fax: 501.569.2368

Table 7: Recommended Allowable Structural Compression Pile Capacities -  $f_y = 50$  ksi

Pile Section	Net Cross-Sectional Area of Steel Section ( $A_s$ ), in <sup>2</sup>	Allowable Structural Compression Pile Capacity ( $P_{na}$ ), ton
HP14x117	34.4	215
HP16x121	35.8	224

Geotechnical Input Parameters for Lateral Load Analysis It is understood lateral load analysis will be performed by the Structural Engineer using commercial computer program LPILE/Group. Recommended geotechnical input parameters are included in Attachments H2 and H3 for Sites 2 and 3, respectively.

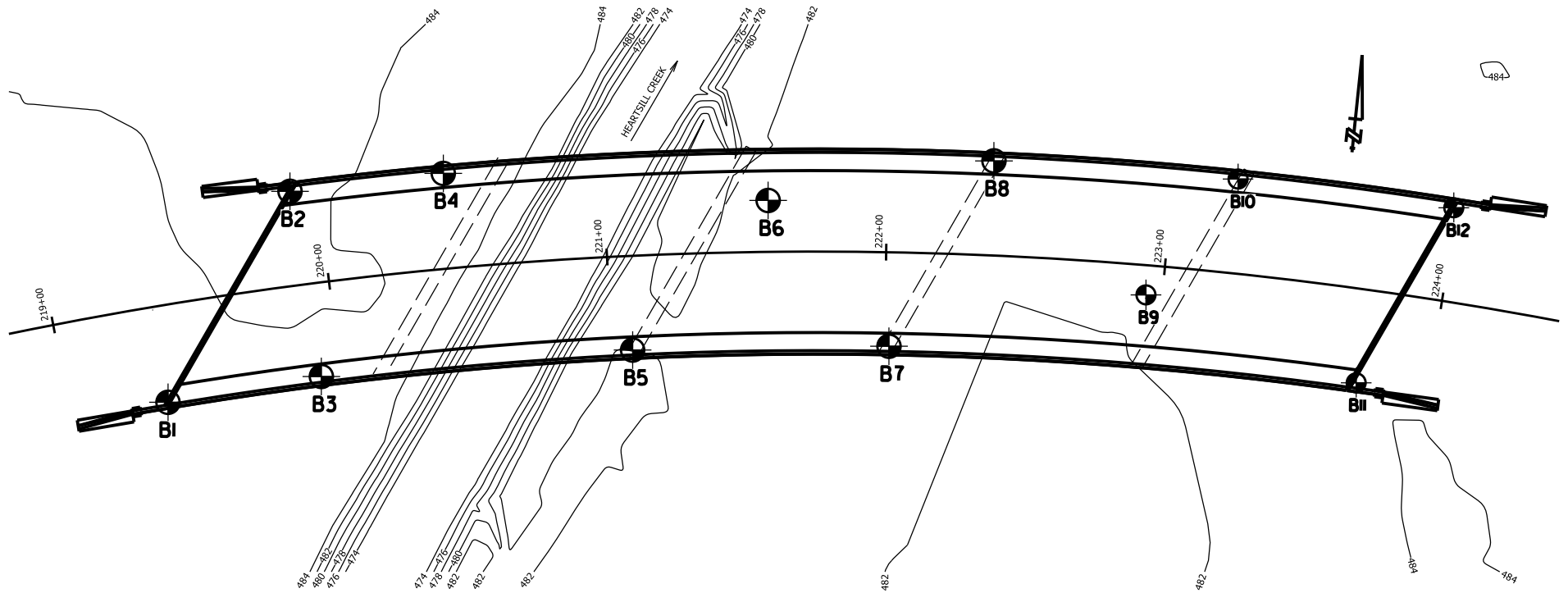
Paul Tinsley  
Materials Engineer

PT:dc:yz:mlg:mbb:pwc  
cc: State Construction Engineer  
District 4 Engineer

## Attachment A2



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	AR			
PLAN OF BORINGS				040861

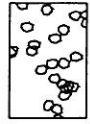


PLAN OF BORINGS	
HWY. 10- HWY. 96 (GREENWOOD BYPASS) (S) ROUTE 10, SECTIONS 0 & 1 SEBASTIAN COUNTY FED. AID PROJECT	
JOB NO. 040861	SITE 2

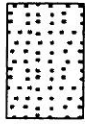
# LEGEND

## SOIL TYPES

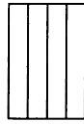
(SHOWN IN SYMBOL COLUMN)  
(PREDOMINANT TYPE SHOWN HEAVY)



GRAVEL



SAND



SILT



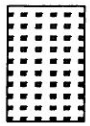
CLAY



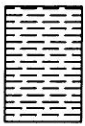
ORGANIC  
MATTER

## ROCK TYPES

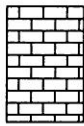
(SHOWN IN SYMBOL COLUMN)



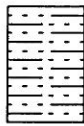
SANDSTONE



SHALE  
or  
SILTSTONE



LIMESTONE  
or  
DOLOMITE



ALTERNATING  
LAYERS of  
SHALE and  
SANDSTONE



OTHER

## SAMPLER TYPES

(SHOWN IN SAMPLE COLUMN)

### SHELBY TUBE



UNDISTURBED  
SAMPLE  
RECOVERY

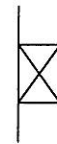


DISTURBED  
SAMPLE  
RECOVERY



NO  
RECOVERY

### SPLIT SPOON



SAMPLE  
RECOVERY



NO  
RECOVERY

### ROCK CORING



% RECOVERY  
INDICATED ON LOGS

## TERMS DESCRIBING CONSISTENCY OR CONDITION

GRANULAR SOIL		CLAY		CLAY-SHALE		SHALE	
'N' Value	Density	'N' Value	Consistency	'N' Value	Consistency	'N' Value	Consistency
0-4	Very Loose	0-1	Very Soft	0-1	Very Soft		
5-10	Loose	2-4	Soft	2-4	Soft	31-60	Soft
11-30	Medium Dense	5-8	Medium Stiff	5-8	Medium Stiff	Over 60	
31-50	Dense	9-15	Stiff	9-15	Stiff	More than 2'	
Over 50	Very Dense	16-30	Very Stiff	16-30	Very Stiff	Penetration	
		31-60	Hard	31-60	Hard	in 60 Blows Medium Hard	
		Over 60	Very Hard	Over 60	Very Hard	Less than 2'	
						Penetration	
						in 60 Blows Hard	

1. Ground water elevations indicated on boring logs represent ground water elevations at date or time shown on boring log. Absence of water surface implies that no ground water data is available but does not necessarily mean that ground water will not be encountered at locations or within the vertical reaches of these borings.
2. Borings represent subsurface conditions at their respective locations for their respective depths. Variations in conditions between or adjacent to boring locations may be encountered.
3. Terms used for describing soils according to their texture or grain size distribution are in accordance with the Unified Soil Classification System.

Standard Penetration Test – Driving a 2.0" O.D., 1-3/8" I.D. sampler a distance of 1.0 foot into undisturbed soil with a 140 pound hammer free falling a distance of 30 inches. It is customary to drive the spoon 6.0 inches to seat into undisturbed soil, then perform the test. The number of hammer blows for seating the spoon and performing the test are recorded for each 6 inches of penetration on the drill log. The field "N" Value ( $N_f$ ) can be obtained by

adding the bottom two numbers for example:  $\frac{6}{8-9} \Rightarrow 8+9 = 17 \text{ blows/ft}$ . The "N" Value corrected to 60% efficiency ( $N_{60}$ ) can be obtained by multiplying  $N_f$  by the hammer correction factor published on the boring log.

**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. Site 2-B1

PAGE 1 OF 2

JOB NO. 040861 Sebastian County  
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10, Section 0  
STATION: 219+36  
LOCATION: 34' Right of Construction Centerline  
LOGGED BY: Anthony Nicholson

DATE: June 13, 2023  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker 1  
HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 35.1

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)						PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 484.4		PL					LL				
					10	20	30	40	50	60	70			
5			Moist, Stiff, Brown Lean Clay	CL								95	3 5-7	
				-										
				CL								95	4 6-8	
				-										
10			Moist, Medium Stiff, Bown Lean Clay	CL								89	1 2-4	
				-										
15			Wet, Stiff, Brown Sandy Silty Clay	CL-ML								70	3 5-4	
			SHALE - Highly Weathered, Medium Hard with Soft Layers, Brown											
20			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Highly Weathered, Medium Hard with Soft Layers, Frequent Fractures, Gray											77 0
			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Weathered, Medium Hard with Hard Layers, Frequent Fractures, Gray	-										100 60
25														
30			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard with Hard Layers, Gray											100 82
35														94 86

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION MATERIALS DIVISION - GEOTECHNICAL SEC.					BORING NO. Site 2-B1 PAGE 2 OF 2								
JOB NO. 040861 Sebastian County JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S) Route 10, Section 0 STATION: 219+36 LOCATION: 34' Right of Construction Centerline LOGGED BY: Anthony Nicholson					DATE: June 13, 2023 TYPE OF DRILLING: Hollow Stem Auger - Diamond Core EQUIPMENT: Acker 1 HAMMER CORRECTION FACTOR: 1.54								
COMPLETION DEPTH: 35.1													
DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%) PL  -----  LL 10 20 30 40 50 60 70					PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 484.4										
			Boring Terminated										
40													
45													
50													
55													
60													
65													
70													
REMARKS:													



**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. Site 2-B2

PAGE 1 OF 1

JOB NO. 040861 Sebastian County  
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10, Section 0  
STATION: 219+90  
LOCATION: 34' Left of Construction Centerline  
LOGGED BY: Anthony Nicholson

DATE: June 13, 2023  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker 1  
HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 34.2

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)										PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 483.9		PL	10	20	30	40	50	60	70	LL					
5			Moist, Loose, Brown Silt													1 3-6		
			Moist, Medium Dense, Brown Silt													3 5-6		
10			Wet, Medium Stiff, Brown Sandy Silty Clay													3 3-4		
			Moist, Medium Stiff, Brown Silty Clay													4 5-3		
15			SHALE - Highly Weathered, Medium Hard, Gray													8 60 (6")		
20			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Slightly Weathered, Medium Hard with Hard Layers, Gray														85	55
			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard with Hard Layers, Gray														100	76
25																	94	76
30			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard with Hard Layers, Occasional Fractures, Gray														100	72
35			Boring Terminated															

REMARKS:

**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. Site 2-B3

PAGE 1 OF 1

JOB NO. 040861 Sebastian County  
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10, Section 0  
STATION: 219+93  
LOCATION: 34' Right of Construction Centerline  
LOGGED BY: Anthony Nicholson

DATE: June 14 and 20, 2023  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker 1  
HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 33.7

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%) PL ————— LL	PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 484.5		10 20 30 40 50 60 70				
5			Moist, Stiff, Brown Lean Clay with Sand	CL	● ———	81	6 7-7		
			Moist, Stiff, Brown Lean Clay	CL	● ———	93	4 7-8		
10			Moist, Medium Stiff, Brown Lean Clay	CL	——— ●	94	1 3-4		
			Moist, Stiff, Brown Silty Clay*	CL-ML	——— ●	86	2 5-8		
15			Moist, Medium Dense, Brown Clayey Sand	SC	●	30	3 11-14		
20			SHALE - Highly Weathered, Very Soft, Brown					100	66
			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Slightly Weathered, Medium Hard with Hard Layers, Gray					98	80
25			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard with Hard Layers, Gray	-				98	90
30								94	78
35			Boring Terminated						

REMARKS: \*The water level at a 102 hour reading was 13.4 feet below ground level.

**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. Site 2-B4

PAGE 1 OF 2

JOB NO. 040861 Sebastian County  
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10, Section 0  
STATION: 220+45  
LOCATION: 34' Left of Construction Centerline  
LOGGED BY: Anthony Nicholson

DATE: June 14, 2023  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker 1  
HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 34.4

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	<div> MOISTURE CONTENT (%) <div> ● </div> </div> <div> PL 10 20 30 40 50 60 70 LL </div>						PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 485.1											
5			Moist, Stiff, Brown Silty Clay	-										
				CL-ML							92	2 5-8		
				-										
			Moist, Stiff, Brown Lean Clay	CL							93	5 6-8		
				-										
10			Moist, Stiff, Brown Lean Clay with Some Sand	CL							90	3 5-6		
				-										
				CL-ML							69	4 4-5		
15			Moist, Stiff, Brown Sandy Silty Clay											
			Moist, Stiff, Brown Sandy Silty Clay with Gravel (Shale Fragments)									1 5-10		
			SHALE - Highly Weathered, Very Soft, Brown and Gray										83	46
20			SHALE - Weathered, Medium Hard, Gray											
													100	78
25				-										
			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard with Hard Layers, Gray										100	94
30														
													100	90
35														

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION MATERIALS DIVISION - GEOTECHNICAL SEC.					BORING NO. Site 2-B4 PAGE 2 OF 2								
JOB NO. 040861 Sebastian County JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S) Route 10, Section 0 STATION: 220+45 LOCATION: 34' Left of Construction Centerline LOGGED BY: Anthony Nicholson					DATE: June 14, 2023 TYPE OF DRILLING: Hollow Stem Auger - Diamond Core EQUIPMENT: Acker 1 HAMMER CORRECTION FACTOR: 1.54								
COMPLETION DEPTH: 34.4													
DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%) PL  -----  LL 10 20 30 40 50 60 70					PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 485.1 Boring Terminated										
40													
45													
50													
55													
60													
65													
70													
REMARKS:													



**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. Site 2-B5

PAGE 1 OF 1

JOB NO. 040861 Sebastian County  
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10, Section 0  
STATION: 221+08  
LOCATION: 34' Right of Construction Centerline  
LOGGED BY: Tracey Henderson

DATE: April 11, 2023  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker 1

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 33.2

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%) PL  -----  LL										PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 482.2		10	20	30	40	50	60	70							
				-														
			Moist, Medium Stiff, Brown Silty Clay	CL-ML									96	0 3-5				
5				-														
			Moist, Stiff, Brown Silty Clay	CL-ML									90	3 4-5				
				-														
				CL-ML									87	3 5-8				
10				-														
			Wet, Medium Stiff, Brown Silty Clay with Sand	CL-ML									85	3 3-4				
15			SHALE - Weathered, Medium Hard, Dark Gray											17 48 (2")				
			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard with Hard Layers, Occasional Fractures, Gray												86	36		
20																100	78	
				-														
25			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard with Hard Layers, Gray													100	76	
30																100	98	
35			Boring Terminated															

REMARKS:

**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. Site 2-B6

PAGE 1 OF 1

JOB NO. 040861 Sebastian County  
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10, Section 0  
STATION: 221+59  
LOCATION: 19' Left of Construction Centerline  
LOGGED BY: Tracy Henderson

DATE: April 11, 2023  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker 1  
HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 34

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)						PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 482.9		PL					LL				
					10	20	30	40	50	60	70			
			Moist, Stiff, Brown and Gray Silty Clay	-										
				CL-ML								89	5	
5				-									6-9	
			Moist, Stiff, Light Brown Silty Clay	CL-ML								99	5	
			Wet, Stiff, Light Brown Silty Clay	-									7-5	
			Wet, Medium Stiff, Light Brown Silty Clay	CL-ML								93	2	
10				-									2-3	
			Wet, Very Loose, Light Brown Lean Clay	CL								92	0	
													0-0	
15			SHALE - Highly Weathered, Medium Hard, Dark Gray										58	
			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard, Frequent Fractures, Gray										38 (1")	
20			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard, Gray	-										90 40
														98 70
25			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard, Occasional Fractures, Gray											100 78
30			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard, Gray											100 100
35			Boring Terminated											

REMARKS:

**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. Site 2-B7

PAGE 1 OF 2

JOB NO. 040861 Sebastian County  
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10, Section 0  
STATION: 222+01  
LOCATION: 34' Right of Construction Centerline  
LOGGED BY: Tracy Henderson

DATE: April 10, 2023  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker 1  
HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 39

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)										PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
					PL	LL												
			SURFACE ELEVATION: 483.5		10	20	30	40	50	60	70							
5			Wet, Very Loose, Light Brown Silty, Clayey Sand	-														
			SC-SM											41	0 0-0			
			-															
10			Wet, Very Soft, Light Brown Silty Clay with Sand and Some Organic Matter (Wood)	CL-ML														
			-															
			CL											95	0 0-1			
15			Wet, Very Soft, Light Brown Lean Clay with Some Organic Matter (Wood)	-														
			ML											72	1 4-6			
20			Wet, Loose, Light Brown Silt with Sand															
25			Wet, Medium Dense, Light Brown and Gray Clayey Sand with Rock Fragments															
30			SHALE - Highly Weathered, Soft, Gray															
35			SHALE - Unweathered, Medium Hard with Hard Layers, Gray															
40			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard with Hard Layers, Frequent Fractures, Trace Slickensides, Gray	-														
45			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard with Hard Layers, Frequent Fractures, Trace Slickensides, Gray															
50			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard with Hard Layers, Frequent Fractures, Trace Slickensides, Gray															

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION MATERIALS DIVISION - GEOTECHNICAL SEC.					BORING NO. Site 2-B7 PAGE 2 OF 2													
JOB NO. 040861 Sebastian County JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S) Route 10, Section 0 STATION: 222+01 LOCATION: 34' Right of Construction Centerline LOGGED BY: Tracy Henderson					DATE: April 10, 2023 TYPE OF DRILLING: Hollow Stem Auger - Diamond Core EQUIPMENT: Acker 1 HAMMER CORRECTION FACTOR: 1.54													
COMPLETION DEPTH: 39																		
D E P T H  FT.	S Y M B O L	S A M P L E S	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)										PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
					PL	10	20	30	40	50	60	70	LL					
			SURFACE ELEVATION: 483.5															
			SEAMS - Unweathered, Medium Hard with Hard Layers, Gray													100 96		
40			Boring Terminated															
45																		
50																		
55																		
60																		
65																		
70																		
REMARKS:																		



**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. Site 2-B8

PAGE 1 OF 2

JOB NO. 040861 Sebastian County  
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10, Section 0  
STATION: 222+38  
LOCATION: 34' Left of Construction Centerline  
LOGGED BY: Tracy Henderson

DATE: April 12 and 13, 2023  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker 1  
HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 39

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%) PL ————— LL						PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 482.7		10	20	30	40	50	60	70			
5			Wet, Very Soft, Brown Silty Clay with Some Manganese Nodules	- CL-ML								82	0 0-0	
			Wet, Very Soft, Brown Lean Clay	CL								97	0 0-0	
10			Wet, Very Loose, Light Brown and Gray Silt with Manganese Nodules	ML								69	0 0-0	
			Wet, Very Soft, Light Brown and Gray Silty Clay	CL-ML								55	0 0-1	
15			Wet, Medium Dense, Brown Silty Clay with Rock Fragments	CL-ML								64	1 5-14	
20			SHALE - Highly Weathered, Soft, Dark Gray											
25														
30			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard with Hard Layers, Gray											
35														

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION MATERIALS DIVISION - GEOTECHNICAL SEC.					BORING NO. Site 2-B8 PAGE 2 OF 2													
JOB NO. 040861 Sebastian County JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S) Route 10, Section 0 STATION: 222+38 LOCATION: 34' Left of Construction Centerline LOGGED BY: Tracy Henderson					DATE: April 12 and 13, 2023 TYPE OF DRILLING: Hollow Stem Auger - Diamond Core EQUIPMENT: Acker 1 HAMMER CORRECTION FACTOR: 1.54													
COMPLETION DEPTH: 39																		
D E P T H  FT.	S Y M B O L	S A M P L E S	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%) •										PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
					PL	10	20	30	40	50	60	70	LL					
			SURFACE ELEVATION: 482.7															
															100	100		
40			Boring Terminated															
45																		
50																		
55																		
60																		
65																		
70																		
REMARKS:																		

**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**





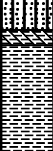

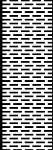

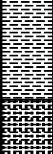


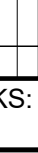
BORING NO. Site 2-B9

PAGE 1 OF 2

JOB NO. 040861 Sebastian County  
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10, Section 0  
STATION: 222+94  
LOCATION: 10' Right of Construction Centerline  
LOGGED BY: Tracy Henderson

DATE: April 18, 2023  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker 1  
HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 39.2

DEPTH FT.	S Y M B O L	S A M P L E S	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%) PL  -----  LL										PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 482.5		10	20	30	40	50	60	70							
5			Wet, Very Soft, Brown Silty Clay	CL-ML			●						88	0 0-0				
			-															
			CL			●								92	0 0-0			
10			Wet, Very Soft, Brown Lean Clay	-														
			CL			●												
15			Wet, Medium Dense, Brown Silt with Sand	ML		●							75	2 6-5				
			-															
20			Wet, Loose, Brown Silt with Sand	ML		●							83	1 4-6				
			-															
			ML															
25			SHALE - Highly Weathered, Soft, Gray											6 16-60 (11")				
			SHALE - Weathered, Medium Hard, Gray															
30			SHALE - Slightly Weathered, Medium Hard, Slickensided, Gray	-										60 (2")		86 33		
			SHALE - Slightly Weathered, Medium Hard, Slickensided, Gray														100 58	
35			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Slightly Weathered,													98 90		

REMARKS: Water stratum encountered at approximately 13.8 feet below ground level.

<b>ARKANSAS DEPARTMENT OF TRANSPORTATION</b> <b>MATERIALS DIVISION - GEOTECHNICAL SEC.</b>						BORING NO. Site 2-B9 PAGE 2 OF 2										
JOB NO. 040861 Sebastian County JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S) Route 10, Section 0 STATION: 222+94 LOCATION: 10' Right of Construction Centerline LOGGED BY: Tracy Henderson						DATE: April 18, 2023 TYPE OF DRILLING: Hollow Stem Auger - Diamond Core EQUIPMENT: Acker 1 HAMMER CORRECTION FACTOR: 1.54										
COMPLETION DEPTH: 39.2																
D E P T H  FT.	S Y M B O L	S A M P L E S	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)								PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
					PL	10	20	30	40	50	60	70				
			SURFACE ELEVATION: 482.5													
			Medium Hard with Hard Layers, Slickensided, Gray												100	92
40			Boring Terminated													
45																
50																
55																
60																
65																
70																
REMARKS: Water stratum encountered at approximately 13.8 feet below ground level.																



**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. Site 2-B10

PAGE 1 OF 2

JOB NO. 040861 Sebastian County  
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10, Section 0  
STATION: 223+25  
LOCATION: 34' Left of Construction Centerline  
LOGGED BY: Tracy Henderson

DATE: April 18, 2023  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker 1  
HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 39.1

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)										PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
					PL	LL												
SURFACE ELEVATION: 482.9																		
			Moist, Very Loose, Light Brown Silt with Sand															
5			Moist, Very Soft, Light Brown Silty Clay	CL-ML										88	0 0-0			
			Wet, Very Loose, Brown Silt with Sand	ML										85	0 1-3			
10			Wet, Medium Dense, Brown Silt with Sand*	ML										71	2 6-7			
15			SHALE - Highly Weathered, Very Soft, Gray												6 13-13			
20			SHALE - Weathered, Medium Hard, Gray												30 (1")	100	83	
25			SHALE - Unweathered, Medium Hard, Gray															
30			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard with Hard Layers, Gray													100	92	
35			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium													100	86	

REMARKS: \*A water stratum was encountered at approximately 15.7 feet below ground level.

<b>ARKANSAS DEPARTMENT OF TRANSPORTATION</b> <b>MATERIALS DIVISION - GEOTECHNICAL SEC.</b>						BORING NO. Site 2-B10 PAGE 2 OF 2										
JOB NO. 040861 Sebastian County JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S) Route 10, Section 0 STATION: 223+25 LOCATION: 34' Left of Construction Centerline LOGGED BY: Tracy Henderson						DATE: April 18, 2023 TYPE OF DRILLING: Hollow Stem Auger - Diamond Core EQUIPMENT: Acker 1 HAMMER CORRECTION FACTOR: 1.54										
COMPLETION DEPTH: 39.1																
D E P T H  FT.	S Y M B O L	S A M P L E S	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)								PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
					PL	10	20	30	40	50	60	70				
			SURFACE ELEVATION: 482.9													
			Hard with Hard Layers, Occasional Slickensides, Gray												98	66
40			Boring Terminated													
45																
50																
55																
60																
65																
70																
REMARKS: *A water stratum was encountered at approximately 15.7 feet below ground level.																

**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. Site 2-B11

PAGE 1 OF 2

JOB NO. 040861 Sebastian County  
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10, Section 0  
STATION: 223+72  
LOCATION: 34' Right of Construction Centerline  
LOGGED BY: Tracy Henderson

DATE: April 19, 2023  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker 1  
HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 39

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)											PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
					PL	MOISTURE CONTENT (%)													
SURFACE ELEVATION: 483.6					<div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div>&lt;/</div></div>														

REMARKS:

<b>ARKANSAS DEPARTMENT OF TRANSPORTATION</b> <b>MATERIALS DIVISION - GEOTECHNICAL SEC.</b>						BORING NO. Site 2-B11 PAGE 2 OF 2									
JOB NO. 040861 Sebastian County JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S) Route 10, Section 0 STATION: 223+72 LOCATION: 34' Right of Construction Centerline LOGGED BY: Tracy Henderson						DATE: April 19, 2023 TYPE OF DRILLING: Hollow Stem Auger - Diamond Core EQUIPMENT: Acker 1 HAMMER CORRECTION FACTOR: 1.54									
COMPLETION DEPTH: 39															
D E P T H	S Y M B O L	S A M P L E S	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%) • PL  -----  LL 10 20 30 40 50 60 70						PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D	
FT.			SURFACE ELEVATION: 483.6												
			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard with Hard Layers, Gray Boring Terminated											100	78
40															
45															
50															
55															
60															
65															
70															
REMARKS:															



**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. Site 2-B12

PAGE 1 OF 2

JOB NO. 040861 Sebastian County  
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10, Section 0  
STATION: 223+99  
LOCATION: 34' Left of Construction Centerline  
LOGGED BY: Tracy Henderson

DATE: April 24, 2023  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker 1

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 39.4

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)										PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D	
					PL	● LL													
			SURFACE ELEVATION: 483.6																
			Moist, Very Loose, Brown Silt with Sand																
				ML															
5				-															
			Moist, Very Soft, Brown Lean Clay	CL															
				-															
			Moist, Very Soft, Brown Silty Clay	CL-ML															
10				-															
			Moist, Loose, Brown Sandy Silt	ML															
				-															
15			Wet, Loose, Brown Sandy Lean Clay	CL															
				-															
20			SHALE - Weathered with Highly Weathered Layers, Medium Hard with Soft Layers, Gray	-															
			SHALE - Unweathered, Medium Hard with Soft Layers, Occasional Fractures, Slickensided, Gray*	-															
25																			
30			SHALE - Unweathered, Medium Hard, Occasional Fractures, Gray	-															
35																			

REMARKS: \*Low TCR and RQD partially due to inner barrel malfunctions from 24.4 to 29.4 feet below ground level.

<b>ARKANSAS DEPARTMENT OF TRANSPORTATION</b> <b>MATERIALS DIVISION - GEOTECHNICAL SEC.</b>						BORING NO. Site 2-B12 PAGE 2 OF 2										
JOB NO. 040861 Sebastian County JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S) Route 10, Section 0 STATION: 223+99 LOCATION: 34' Left of Construction Centerline LOGGED BY: Tracy Henderson						DATE: April 24, 2023 TYPE OF DRILLING: Hollow Stem Auger - Diamond Core EQUIPMENT: Acker 1 HAMMER CORRECTION FACTOR: 1.54										
COMPLETION DEPTH: 39.4																
D E P T H  FT.	S Y M B O L	S A M P L E S	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)								PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
					PL	10	20	30	40	50	60	70				
			SURFACE ELEVATION: 483.6													
			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard with Hard Layers, Gray												100	96
40			Boring Terminated													
45																
50																
55																
60																
65																
70																
REMARKS: *Low TCR and RQD partially due to inner barrel malfunctions from 24.4 to 29.4 feet below ground level.																



## ROCK CORE PHOTO

Job No.: 040861 Site 2

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
219+36, 34' RT  
Depth: 17.0 - 25.1





## ROCK CORE PHOTO

Job No.: 040861 Site 2

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861

219+36, 34' RT

Depth: 25.1 - 35.1





## ROCK CORE PHOTO

Job No.: 040861 Site 2

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
219+90, 34' LT  
Depth: 16.5 - 24.2





## ROCK CORE PHOTO

Job No.: 040861 Site 2

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))







## ROCK CORE PHOTO

Job No.: 040861 Site 2

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
219+93, 34' RT  
Depth: 16.5 - 23.7





# ROCK CORE PHOTO

Job No.: 040861 Site 2

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
219+93, 34' RT  
Depth: 23.7 - 28.7





## ROCK CORE PHOTO

Job No.: 040861 Site 2

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))







## ROCK CORE PHOTO

Job No.: 040861 Site 2

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
220+45, 34' LT  
Depth: 24.4 - 34.4





## ROCK CORE PHOTO

Job No.: 040861 Site 2

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
221+08, 34' RT  
Depth: 17.0 - 24.2



## ROCK CORE PHOTO

Job No.: 040861 Site 2

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
221+08, 34' RT  
Depth: 24.2 - 34.2





## ROCK CORE PHOTO

Job No.: 040861 Site 2

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))





## ROCK CORE PHOTO

Job No.: 040861 Site 2

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
221+59, 19' LT  
Depth: 24.0 - 34.0





## ROCK CORE PHOTO

Job No.: 040861 Site 2

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
222+01, 34' RT  
Depth: 20.1 - 29.0



## ROCK CORE PHOTO

Job No.: 040861 Site 2

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
222+01, 34' RT  
Depth: 29.0 - 39.0





## ROCK CORE PHOTO

Job No.: 040861 Site 2

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
222+38, 34' LT  
Depth: 20.1 - 29.0



## ROCK CORE PHOTO

Job No.: 040861 Site 2

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))







## ROCK CORE PHOTO

Job No.: 040861 Site 2

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
222+94, 10' RT  
Depth: 20.2 - 29.2



## ROCK CORE PHOTO

Job No.: 040861 Site 2

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
222+94, 10' RT  
Depth: 29.2 - 39.0





## ROCK CORE PHOTO

Job No.: 040861 Site 2

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
223+25, 34' LT  
Depth: 20.1 - 29.1



## ROCK CORE PHOTO

Job No.: 040861 Site 2

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
223+25, 34' LT  
Depth: 29.1 - 39.1





## ROCK CORE PHOTO

Job No.: 040861 Site 2

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
223+72, 34' RT  
Depth: 20.6 - 29.0



## ROCK CORE PHOTO

Job No.: 040861 Site 2

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
223+72, 34' RT  
Depth: 29.0 - 39.0





## ROCK CORE PHOTO

Job No.: 040861 Site 2

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
223+99, 34' LT  
Depth: 20.4 - 29.4



## ROCK CORE PHOTO

Job No.: 040861 Site 2

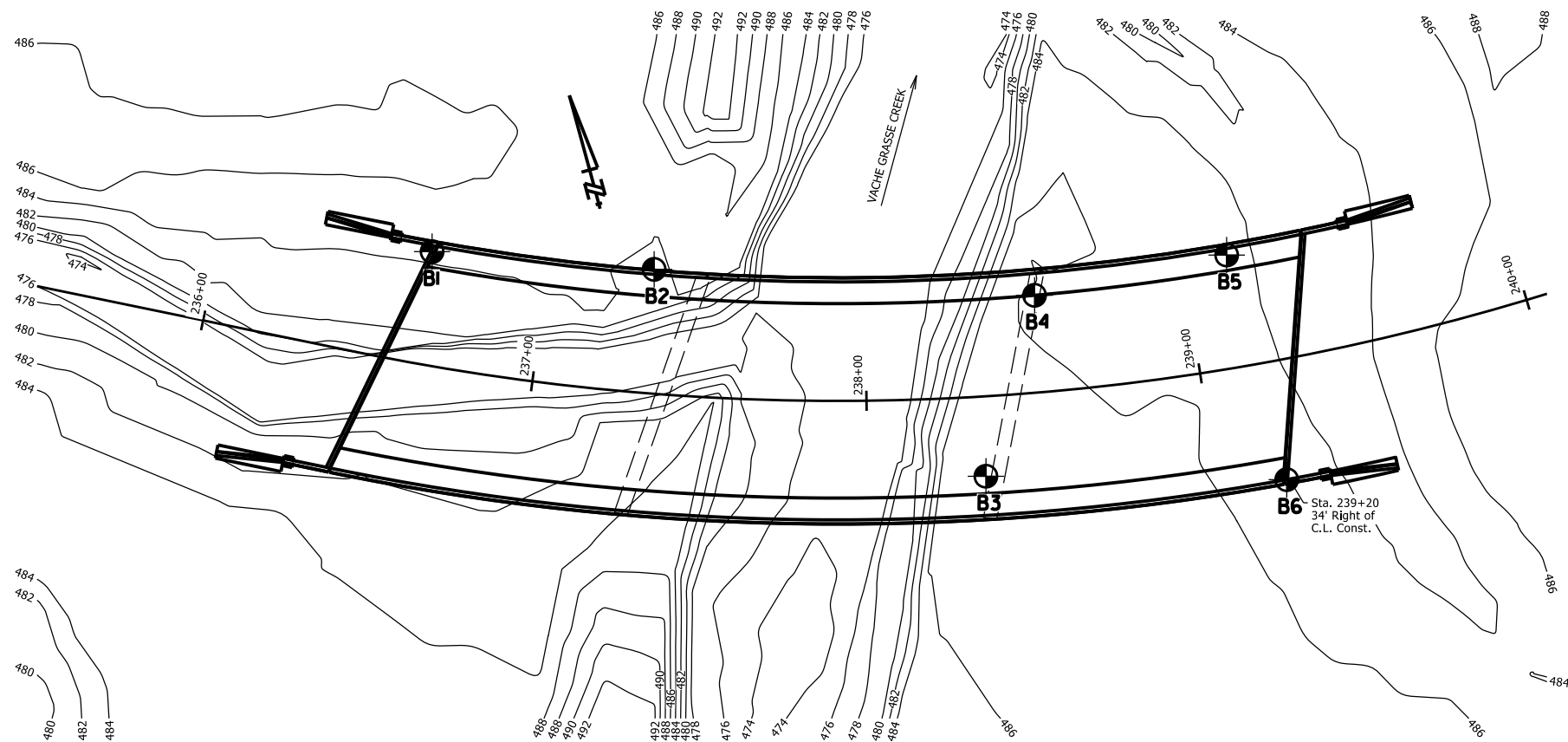
Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
223+99, 34' LT  
Depth: 29.4 - 39.4

## Attachment A3

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
5	AR			
JOB NO.		040861		
PLAN OF BORINGS				



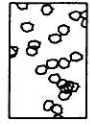
PLAN OF BORINGS	
HWY. 10- HWY. 96 (GREENWOOD BYPASS) (S)	
ROUTE 10, SECTIONS 0 & 1	
SEBASTIANCOUNTY	
FED. AID PROJECT	
JOB NO. 040861	SITE 3



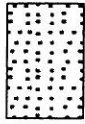
# LEGEND

## SOIL TYPES

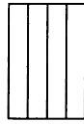
(SHOWN IN SYMBOL COLUMN)  
(PREDOMINANT TYPE SHOWN HEAVY)



GRAVEL



SAND



SILT



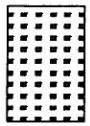
CLAY



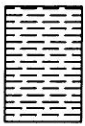
ORGANIC  
MATTER

## ROCK TYPES

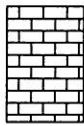
(SHOWN IN SYMBOL COLUMN)



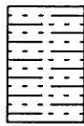
SANDSTONE



SHALE  
or  
SILTSTONE



LIMESTONE  
or  
DOLOMITE



ALTERNATING  
LAYERS of  
SHALE and  
SANDSTONE



OTHER

## SAMPLER TYPES

(SHOWN IN SAMPLE COLUMN)

### SHELBY TUBE



UNDISTURBED  
SAMPLE  
RECOVERY

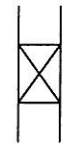


DISTURBED  
SAMPLE  
RECOVERY

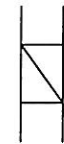


NO  
RECOVERY

### SPLIT SPOON

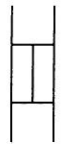


SAMPLE  
RECOVERY



NO  
RECOVERY

### ROCK CORING



% RECOVERY  
INDICATED ON LOGS

## TERMS DESCRIBING CONSISTENCY OR CONDITION

GRANULAR SOIL		CLAY		CLAY-SHALE		SHALE	
'N' Value	Density	'N' Value	Consistency	'N' Value	Consistency	'N' Value	Consistency
0-4	Very Loose	0-1	Very Soft	0-1	Very Soft		
5-10	Loose	2-4	Soft	2-4	Soft	31-60	Soft
11-30	Medium Dense	5-8	Medium Stiff	5-8	Medium Stiff	Over 60	
31-50	Dense	9-15	Stiff	9-15	Stiff	More than 2'	
Over 50	Very Dense	16-30	Very Stiff	16-30	Very Stiff	Penetration	
		31-60	Hard	31-60	Hard	in 60 Blows Medium Hard	
		Over 60	Very Hard	Over 60	Very Hard	Less than 2'	
						Penetration	
						in 60 Blows Hard	

1. Ground water elevations indicated on boring logs represent ground water elevations at date or time shown on boring log. Absence of water surface implies that no ground water data is available but does not necessarily mean that ground water will not be encountered at locations or within the vertical reaches of these borings.
2. Borings represent subsurface conditions at their respective locations for their respective depths. Variations in conditions between or adjacent to boring locations may be encountered.
3. Terms used for describing soils according to their texture or grain size distribution are in accordance with the Unified Soil Classification System.

Standard Penetration Test – Driving a 2.0" O.D., 1-3/8" I.D. sampler a distance of 1.0 foot into undisturbed soil with a 140 pound hammer free falling a distance of 30 inches. It is customary to drive the spoon 6.0 inches to seat into undisturbed soil, then perform the test. The number of hammer blows for seating the spoon and performing the test are recorded for each 6 inches of penetration on the drill log. The field "N" Value ( $N_f$ ) can be obtained by

adding the bottom two numbers for example:  $\frac{6}{8-9} \Rightarrow 8+9 = 17 \text{ blows/ft}$ . The "N" Value corrected to 60% efficiency ( $N_{60}$ ) can be obtained by multiplying  $N_f$  by the hammer correction factor published on the boring log.

**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. Site 3-B1

PAGE 1 OF 1

JOB NO. 040861 Sebastian County  
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10, Section 0  
STATION: 236+64  
LOCATION: 34' Left of Construction Centerline  
LOGGED BY: Anthony Nicholson

DATE: April 3, 2023  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker 1

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 34.2

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%) PL  -----  LL										PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 484.6		10	20	30	40	50	60	70							
5			Wet, Very Loose, Brown Sandy Silt	ML			●						64	0 0-0				
				-														
			Wet, Very Loose, Brown Silt with Sand	ML			●						77	0 0-0				
				-														
			Wet, Very Loose, Brown Sandy Silt	ML			●						69	0 0-0				
				-														
10				CL-ML		├─	●						55	0 1-2				
			Wet, Very Soft, Brown Sandy Silty Clay															
15																		
			SHALE - Weathered, Medium Hard, Gray											35 40 (1")				
			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard with Hard Layers, Gray													86	54	
20																		
			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard with Hard Layers, Occasional Fractures, Gray	-												100	92	
25																		
																100	80	
30																		
			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard with Hard Layers, Gray*													74	70	
35			Boring Terminated															

REMARKS: \*Poor core recovery at 29.2 feet below ground level due to inner barrel malfunction.

**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. Site 3-B2

PAGE 1 OF 2

JOB NO. 040861 Sebastian County  
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10, Section 0  
STATION: 237+36  
LOCATION: 38' Left of Construction Centerline  
LOGGED BY: Don McCollum

DATE: March 29, 2023  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker 1

HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 39.6

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)										PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
					PL	LL												
SURFACE ELEVATION: 485.3																		
5			Wet, Very Soft, Brown Silty Clay with Sand	-										84	0 0-0			
			Wet, Very Loose, Reddish Brown Sandy Silt	ML										52	0 0-1			
				-														
			Wet, Very Loose, Reddish Brown Silty Sand	SM										49	0 1-3			
10				-														
				ML										50	0 0-1			
			Wet, Very Loose, Reddish Brown Sandy Silt	-														
15																		
				CL										63	0 3-7			
			Moist, Medium Stiff, Brown and Gray Sandy Lean Clay with Trace Rock Fragments															
20																		
			SHALE - Weathered, Medium Hard, Gray												40 (2")			
			SHALE WITH FREQUENT SANDSTONE PARTINGS - Unweathered, Medium, Occasional Fractures, Gray													100	58	
25																		
				-												100	88	
30																		
			SHALE WITH FREQUENT SANDSTONE PARTINGS - Unweathered, Medium Hard, Gray													100	92	
35																		

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION MATERIALS DIVISION - GEOTECHNICAL SEC.						BORING NO. Site 3-B2 PAGE 2 OF 2										
JOB NO. 040861 Sebastian County JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S) Route 10, Section 0 STATION: 237+36 LOCATION: 38' Left of Construction Centerline LOGGED BY: Don McCollum						DATE: March 29, 2023 TYPE OF DRILLING: Hollow Stem Auger - Diamond Core EQUIPMENT: Acker 1 HAMMER CORRECTION FACTOR: 1.54										
COMPLETION DEPTH: 39.6																
D E P T H  FT.	S Y M B O L	S A M P L E S	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)								PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
					PL	LL										
			SURFACE ELEVATION: 485.3		10	20	30	40	50	60	70					
															100	90
40			Boring Terminated													
45																
50																
55																
60																
65																
70																
REMARKS:																



**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. Site 3-B3

PAGE 1 OF 1

JOB NO. 040861 Sebastian County  
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10, Section 0  
STATION: 238+35  
LOCATION: 25' Right of Construction Centerline  
LOGGED BY: Anthony Nicholson

DATE: March 7, 2023  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker 1  
HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 29.5

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)										PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
					PL													
			SURFACE ELEVATION: 487.4															
			Moist, Stiff, Reddish Brown Sandy Silty Clay with Some Gravel	-										50	1 4-5			
				CL-ML														
5				-														
			Moist, Medium Dense, Reddish Brown Silty Sand with Some Rock Fragments	SM										45	2 4-8			
			Moist, Very Dense, Reddish Brown Sandy Silt with Some Rock Fragments												18 38-40 (8")			
			SHALE - Highly Weathered, Medium Hard, Gray															
10																		
			SHALE WITH INTERBEDDED SANDSTONE - Unweathered, Hard, Gray												50 40 (1")			
15																		
20			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard with Hard Layers, Gray													100	100	
25																100	100	
30			Boring Terminated															
35																		

REMARKS:

**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. Site 3-B4

PAGE 1 OF 1

JOB NO. 040861 Sebastian County  
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10, Section 0  
STATION: 238+54  
LOCATION: 34' Left of Construction Centerline  
LOGGED BY: Anthony Nicholson

DATE: March 7, 2023  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker 1  
HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 30

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%) PL  -----  LL										PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 486.7		10	20	30	40	50	60	70							
				-														
			Moist, Medium Stiff, Reddish Brown Sandy Silty Clay	CL-ML									53	1 3-4				
5				-									21	6 10-11				
			Moist, Medium Dense, Reddish Brown Silty Clayey Sand with Gravel (Rock Fragments)	SC-SM										21 36-45				
			Moist, Medium Dense, Reddish Brown Sandy Silt with Gravel (Rock Fragments)											60 (6")				
10			SHALE - Highly Weathered, Medium Hard, Gray															
			SHALE - Highly Weathered, Medium Hard, Gray															
			SHALE WITH INTERBEDDED SANDSTONE - Unweathered, Medium Hard with Hard Layers, Gray												100	72		
15			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard with Hard Layers, Occasional Fractures, Gray															
				-											100	86		
20																		
			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard with Hard Layers, Gray												100	98		
25																		
															100	94		
30																		
			Boring Terminated															
35																		

REMARKS:

**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. Site 3-B5

PAGE 1 OF 1

JOB NO. 040861 Sebastian County  
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10, Section 0  
STATION: 239+14  
LOCATION: 34' Left of Construction Centerline  
LOGGED BY: Don McCollum

DATE: March 8, 2023  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker 1  
HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 29.7

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	<div> MOISTURE CONTENT (%) <div> ● </div> <div> PL 10 20 30 40 50 60 70 LL </div> </div>						PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 484.6											
5			Moist, Stiff, Brown Lean Clay with Sand	- CL -							79	0 3-8		
			Moist, Very Stiff, Reddish Brown Sandy Lean Clay with Some Gravel	CL							50	11 13-9		
10			SHALE - Highly Weathered, Medium Hard, Gray									30 40-54		
15			SHALE WITH INTERBEDDED SANDSTONE - Unweathered, Medium Hard with Hard Layers, Gray									45 (6")	100	54
20				-									100	72
25			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard with Hard Layers, Gray										100	94
30													100	98
			Boring Terminated											
35														

REMARKS:

**ARKANSAS DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION - GEOTECHNICAL SEC.**

BORING NO. Site 3-B6

PAGE 1 OF 1

JOB NO. 040861 Sebastian County  
JOB NAME: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10, Section 0  
STATION: 239+20  
LOCATION: 34' Right of Construction Centerline  
LOGGED BY: Don McCollum

DATE: March 8, 2023  
TYPE OF DRILLING:  
Hollow Stem Auger - Diamond Core  
EQUIPMENT: Acker 1  
HAMMER CORRECTION FACTOR: 1.54

COMPLETION DEPTH: 29.3

DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%)										PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
					PL	LL												
			SURFACE ELEVATION: 485.3		10	20	30	40	50	60	70							
			Moist, Medium Dense, Brown Silty Sand with Trace Rock Fragments	-									47	4 5-7				
				SM														
5				-														
			Moist, Dense, Reddish Brown Silty Clayey Gravel with Sand	GC-GM									32	7 14-27				
			SHALE - Highly Weathered, Medium Hard, Brown and Gray											14 65 (6")				
10																		
			No Sample Recovered											30 (1")				
			SHALE WITH FREQUENT SANDSTONE PARTINGS - Unweathered, Medium Hard with Hard Layers, Gray													100	100	
15			SANDSTONE WITH INTERBEDDED SHALE - Unweathered, Medium Hard with Hard Layers, Gray													94	84	
20																		
			SHALE WITH FREQUENT SANDSTONE PARTINGS AND SEAMS - Unweathered, Medium Hard with Hard Layers, Gray												100	90		
25																		
30			Boring Terminated															
35																		

REMARKS:





## ROCK CORE PHOTO

Job No.: 040861 Site 3

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))





## ROCK CORE PHOTO

Job No.: 040861 Site 3

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
236+64, 34' LT  
Depth: 24.2 - 34.2





## ROCK CORE PHOTO

Job No.: 040861 Site 3

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))





## ROCK CORE PHOTO

Job No.: 040861 Site 3

Job Name: Hwy. 10 - Hwy. 96 (Greenwood Bypass (S))







## ROCK CORE PHOTO

Job No.: 040861 Site 3

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))







## ROCK CORE PHOTO

Job No.: 040861 Site 3

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))







## ROCK CORE PHOTO

Job No.: 040861 Site 3

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))



040861  
238+54, 34' LT  
Depth: 12.5 - 20.0





## ROCK CORE PHOTO

Job No.: 040861 Site 3

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))







**ROCK CORE PHOTO**

**Job No.: 040861 Site 3**

**Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))**





## ROCK CORE PHOTO

Job No.: 040861 Site 3

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))







## ROCK CORE PHOTO

Job No.: 040861 Site 3

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))







# ROCK CORE PHOTO

Job No.: 040861 Site 3

Job Name: Hwy. 10 – Hwy. 96 (Greenwood Bypass (S))





## Attachment B2

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS

MATERIALS DIVISION

PAUL TINSLEY, MATERIALS ENGINEER

\*\*\* SOIL ANALYSIS TEST REPORT \*\*\*

DATE	- 07/06/2023	SEQUENCE NO.	- 7
JOB NUMBER	- 040861	MATERIAL CODE	- 14620L
FEDERAL AID NO.	- TO BE ASSIGNED	SPEC. YEAR	- 2014
PURPOSE	- INFORMATION ONLY SAMPLE	SUPPLIER ID.	- 1
SPEC. REMARKS	- NO SPECIFICATION CHECK	COUNTY/STATE	- 65
SUPPLIER NAME	- STATE	DISTRICT NO.	- 04
NAME OF PROJECT	- HWY.10-HWY.96 (GREENWOOD BYPASS) (S)		
PROJECT ENGINEER	- NOT APPLICABLE		
PIT/QUARRY	- ARKANSAS		
LOCATION	- SEBASTIAN, COUNTY	SAMPLED	- 06/16/2023
SAMPLED BY	- T HENDERSON	RECEIVED	- 06/19/2023
SAMPLE FROM	- JOBSITE	TESTED	- 06/21/2023
MATERIAL DESC.	- SOIL FOR SEEDING - LIME/REQ.		

DESCRIPTIONS	- SAMPLE 1	- SAMPLE 2	- SAMPLE 3
LAB NUMBER	- 20230892	-	-
SAMPLE ID	- SM9	-	-
TEST STATUS	- INFORMATION ONLY	-	-
STATION	- 219+93	-	-
LOCATION	- 34'RT	-	-
DEPTH IN FEET	-	-	-
COLOR	-	-	-
% PASS 2 IN.	-	-	-
1 1/2 IN.	-	-	-
3/4 IN.	-	-	-
3/8 IN.	-	-	-
NO. 4	-	-	-
NO. 10	- 100	-	-
NO. 40	- 99	-	-
NO. 80	- 94	-	-
NO. 200	- 73	-	-
LIQUID LIMIT	- 33	-	-
PLASTICITY INDEX	- 15	-	-
AASHTO SOIL CLS.	- A-6(9)	-	-
UNIFIED SOIL CLS.	-	-	-
SOIL PH	( N) 6.5	( )	( )
LIME (TONS/ACRE)	- 0.0	-	-
SPECIFIC GRAVITY	-	-	-
% ABSORPTION	-	-	-
MAX. DEN. #/CF	-	-	-
% OPT. MOISTURE	-	-	-
% MOISTURE CONT.	-	-	-

REMARKS - SOIL RESISTIVITY 1.75 K OHMS

- CC: GEOTECH, CHEMISTRY, SOILS

AASHTO TESTS : AASHTO T11, T27, T85, T88, T89, T90, T99, T100, T134, T180, T265, M145, AHTD357

# Rock Core Unconfined Compression Test Summary

Project Number: 040861 - Site 2  
Project Name: Hwy. 10 - Hwy. 96 (Greenwood Bypass)(S)  
Date Tested:

Station	Location	Sample No.	Depth (ft.)	Diameter (in)	Height (in)	Total Load (lbs.)	Correction Factor	Stress (psi)	Remarks
221+59	19' LT	4	19.7	1.75	3.50	8,960		3,725	
221+59	19' LT	5	23.5	1.75	3.50	12,820		5,329	
221+59	19' LT	6	28.7	1.75	3.50	12,750		5,300	
222+01	34' RT	1	21.6	1.73	3.46				BROKE
222+01	34' RT	2	26.2	1.74	3.48	15,790		6,564	
222+01	34' RT	3	31.3	1.75	3.50	13,770		5,724	
223+25	34' LT	7	21.3	1.75	3.50	11,800		4,905	
223+25	34' LT	8	27.7	1.74	3.48	8,530		3,546	
223+72	34' RT	9	26.3	1.75	3.50				BROKE
223+72	34' RT	10	28.7	1.75	3.50	8,160		3,392	
223+72	34' RT	11	31.3	1.74	3.48				BROKE
223+72	34' RT	12	38.5	1.75	3.50	9,030		3,754	

\* Please note any broken samples, fractures or other characteristics of sample in Remarks.

**ROCK MASS RATING SUMMARY**  
**JOB # 40861 Site 2**

**GSi: 90**

**SAMPLE #1**

Station/Location	222+01, 34' RT
Depth (ft)	21.6
	Relative Rating
Uniaxial Compressive Strength	Broke
RQD	13
Spacing of Joints	20
Condition of Joints	25
Groundwater Conditions	7
Sum	65
Class Number	II
Description	GOOD ROCK

**SAMPLE #2**

Station/Location	222+01, 34' RT
Depth (ft)	26.2
	Relative Rating
Uniaxial Compressive Strength	4
RQD	13
Spacing of Joints	25
Condition of Joints	25
Groundwater Conditions	7
Sum	74
Class Number	II
Description	GOOD ROCK

**SAMPLE #3**

Station/Location	222+01, 34' RT
Depth (ft)	31.3
	Relative Rating
Uniaxial Compressive Strength	4
RQD	17
Spacing of Joints	20
Condition of Joints	25
Groundwater Conditions	7
Sum	73
Class Number	II
Description	GOOD ROCK

**SAMPLE #4**

Station/Location	221+59, 19' LT
Depth (ft)	19.7
	Relative Rating
Uniaxial Compressive Strength	4
RQD	13
Spacing of Joints	20
Condition of Joints	25
Groundwater Conditions	7
Sum	69
Class Number	II
Description	GOOD ROCK

**SAMPLE #5**

Station/Location	221+59, 19' LT
Depth (ft)	23.5
	Relative Rating
Uniaxial Compressive Strength	4
RQD	13
Spacing of Joints	20
Condition of Joints	25
Groundwater Conditions	7
Sum	69
Class Number	II
Description	GOOD ROCK

**SAMPLE #6**

Station/Location	221+59, 19' LT
Depth (ft)	28.7
	Relative Rating
Uniaxial Compressive Strength	4
RQD	17
Spacing of Joints	25
Condition of Joints	25
Groundwater Conditions	7
Sum	78
Class Number	II
Description	GOOD ROCK

**SAMPLE #7**

Station/Location	223+25, 34' LT
Depth (ft)	21.3
	Relative Rating
Uniaxial Compressive Strength	4
RQD	17
Spacing of Joints	20
Condition of Joints	25
Groundwater Conditions	7
Sum	73
Class Number	II
Description	GOOD ROCK

**SAMPLE #8**

Station/Location	223+25, 34' LT
Depth (ft)	27.7
	Relative Rating
Uniaxial Compressive Strength	2
RQD	17
Spacing of Joints	20
Condition of Joints	25
Groundwater Conditions	7
Sum	71
Class Number	II
Description	GOOD ROCK



# **ROCK MASS RATING SUMMARY** **JOB # 40792**

**SAMPLE #9**

Station/Location	223+72, 34' RT
Depth (ft)	26.3
	Relative Rating
Uniaxial Compressive Strength	<b>Broke</b>
RQD	13
Spacing of Joints	10
Condition of Joints	12
Groundwater Conditions	7
Sum	42
Class Number	III
Description	<b>FAIR ROCK</b>

**SAMPLE #10**

Station/Location	223+72, 34' RT
Depth (ft)	28.7
	Relative Rating
Uniaxial Compressive Strength	2
RQD	13
Spacing of Joints	10
Condition of Joints	12
Groundwater Conditions	7
Sum	44
Class Number	III
Description	<b>FAIR ROCK</b>

**SAMPLE #11**

Station/Location	223+72, 34' RT
Depth (ft)	31.3
	Relative Rating
Uniaxial Compressive Strength	<b>Broke</b>
RQD	17
Spacing of Joints	25
Condition of Joints	20
Groundwater Conditions	7
Sum	69
Class Number	II
Description	<b>GOOD ROCK</b>

**SAMPLE #12**

Station/Location	223+72, 34' RT
Depth (ft)	38.5
	Relative Rating
Uniaxial Compressive Strength	4
RQD	17
Spacing of Joints	25
Condition of Joints	25
Groundwater Conditions	7
Sum	78
Class Number	II
Description	<b>GOOD ROCK</b>

## Attachment B3

# Rock Core Unconfined Compression Test Summary

Project Number: 040861 - Site 3  
Project Name: Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Date Tested:

Station	Location	Sample No.	Depth (ft.)	Diameter (in)	Height (in)	Total Load (lbs.)	Correction Factor	Stress (psi)	Remarks
236+64	34' LT	11	17.6	1.74	3.48	19,370		8,053	
236+64	34' LT	12	21.0	1.74	3.48	19,720		8,198	
236+64	34' LT	13	28.9	1.75	3.50	10,420		4,332	
237+36	38' LT	8	23.0	1.75	3.50	10,190		4,236	
237+36	38' LT	9	28.7	1.75	3.50	13,660		5,679	
237+36	38' LT	10	31.9	1.75	3.50	18,210		7,570	
238+54	34' LT	1	14.0	1.75	3.50	16,450		6,839	
238+54	34' LT	2	16.7	1.75	3.50	16,470		6,847	
238+54	34' LT	3	21.6	1.75	3.50	16,590		6,897	
239+20	34' RT	4	20.5	1.75	3.50	15,370		6,390	
239+20	34' RT	5	25.9	1.75	3.50	15,560		6,469	
239+20	34' RT	6	12.3	1.75	3.50	18,850		7,836	
239+20	34' RT	7	15.8	1.75	3.50	13,360		5,554	

\* Please note any broken samples, fractures or other characteristics of sample in Remarks.

**ROCK MASS RATING SUMMARY**  
**JOB # 040861 Site 3**

**GSI: 90**

**SAMPLE #1**

Station/Location	238+54, 34' LT
Depth (ft)	14
Uniaxial Compressive Strength	4
RQD	17
Spacing of Joints	20
Condition of Joints	25
Groundwater Conditions	7
Sum	73
Class Number	II
Description	GOOD ROCK

**SAMPLE #2**

Station/Location	238+54, 34' LT
Depth (ft)	16.7
Uniaxial Compressive Strength	4
RQD	17
Spacing of Joints	20
Condition of Joints	25
Groundwater Conditions	7
Sum	73
Class Number	II
Description	GOOD ROCK

**SAMPLE #3**

Station/Location	238+54, 34' LT
Depth (ft)	21.6
Uniaxial Compressive Strength	4
RQD	20
Spacing of Joints	25
Condition of Joints	25
Groundwater Conditions	7
Sum	81
Class Number	I
Description	VERY GOOD ROCK

**SAMPLE #4**

Station/Location	239+20, 34' RT
Depth (ft)	20.5
Uniaxial Compressive Strength	4
RQD	20
Spacing of Joints	25
Condition of Joints	25
Groundwater Conditions	7
Sum	81
Class Number	I
Description	VERY GOOD ROCK

**SAMPLE #5**

Station/Location	239+20, 34' RT
Depth (ft)	25.9
	Relative Rating
Uniaxial Compressive Strength	4
RQD	20
Spacing of Joints	25
Condition of Joints	25
Groundwater Conditions	7
Sum	81
Class Number	I
Description	VERY GOOD ROCK

**SAMPLE #6**

Station/Location	239+20, 34' RT
Depth (ft)	12.3
	Relative Rating
Uniaxial Compressive Strength	7
RQD	20
Spacing of Joints	20
Condition of Joints	25
Groundwater Conditions	7
Sum	79
Class Number	II
Description	GOOD ROCK

**SAMPLE #7**

Station/Location	239+20, 34' RT
Depth (ft)	15.8
	Relative Rating
Uniaxial Compressive Strength	4
RQD	17
Spacing of Joints	20
Condition of Joints	25
Groundwater Conditions	7
Sum	73
Class Number	II
Description	GOOD ROCK

**SAMPLE #8**

Station/Location	237+36, 38' LT
Depth (ft)	23
	Relative Rating
Uniaxial Compressive Strength	4
RQD	17
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	68
Class Number	II
Description	GOOD ROCK



**ROCK MASS RATING SUMMARY**  
**JOB # 040861 Site 3**

**GSI: 90**

**SAMPLE #9**

Station/Location	237+36, 38' LT
Depth (ft)	28.7
	Relative Rating
Uniaxial Compressive Strength	4
RQD	17
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	68
Class Number	II
Description	GOOD ROCK

**SAMPLE #10**

Station/Location	237+36, 38' LT
Depth (ft)	31.9
	Relative Rating
Uniaxial Compressive Strength	7
RQD	17
Spacing of Joints	25
Condition of Joints	25
Groundwater Conditions	7
Sum	81
Class Number	I
Description	VERY GOOD ROCK

**SAMPLE #11**

Station/Location	236+64, 34' LT
Depth (ft)	17.6
	Relative Rating
Uniaxial Compressive Strength	7
RQD	13
Spacing of Joints	20
Condition of Joints	25
Groundwater Conditions	7
Sum	72
Class Number	II
Description	GOOD ROCK

**SAMPLE #12**

Station/Location	236+64, 34' LT
Depth (ft)	21
	Relative Rating
Uniaxial Compressive Strength	7
RQD	17
Spacing of Joints	20
Condition of Joints	20
Groundwater Conditions	7
Sum	71
Class Number	II
Description	GOOD ROCK

**SAMPLE #13**

Station/Location	236+64, 34' LT
Depth (ft)	28.9
	Relative Rating
Uniaxial Compressive Strength	4
RQD	13
Spacing of Joints	20
Condition of Joints	25
Groundwater Conditions	7
Sum	69
Class Number	II
Description	GOOD ROCK

## Attachment C2



## SITE PICTURES

Job No.: 040861 Site 2

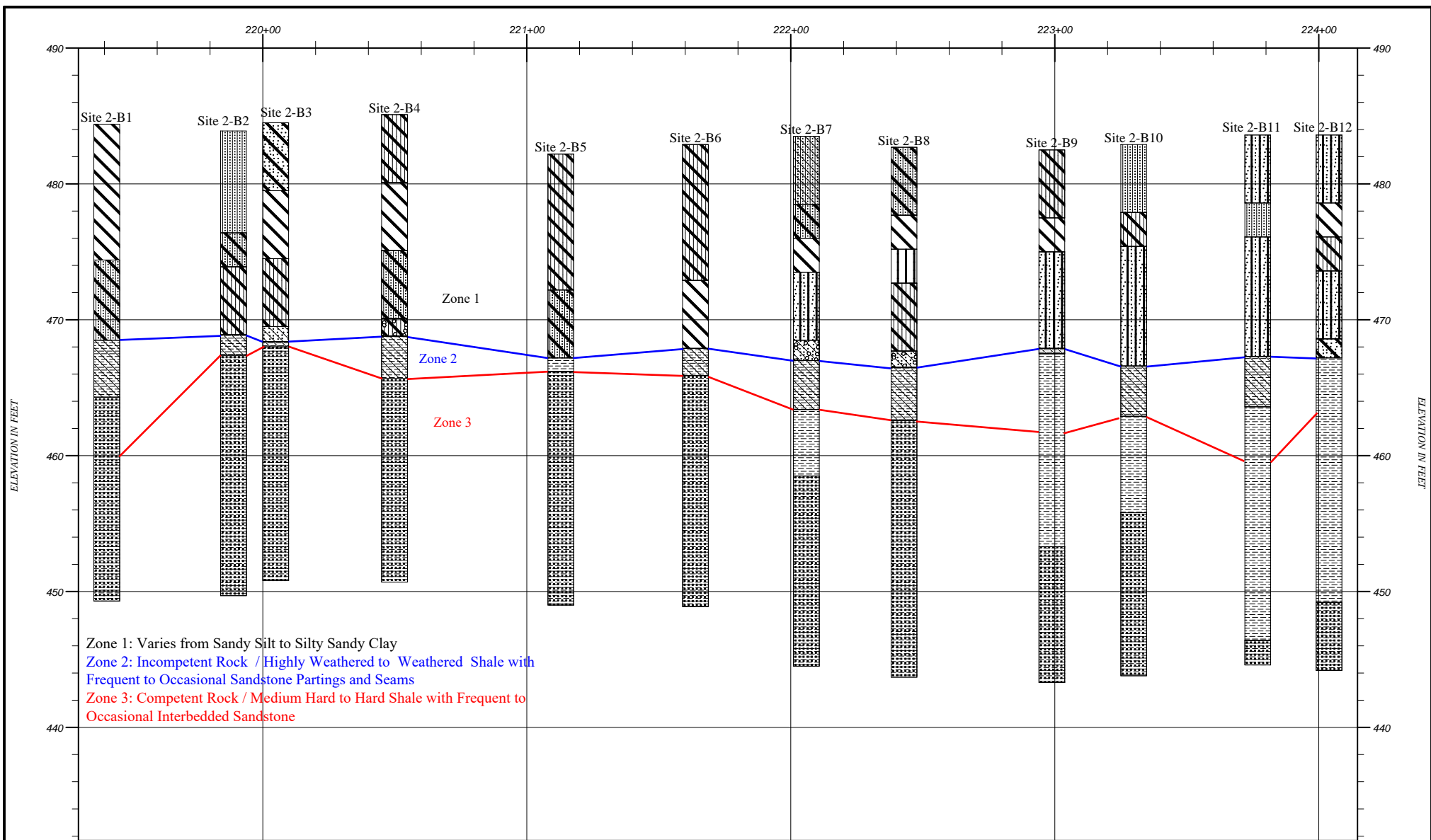
Job Name: Hwy 10 – Hwy. 96 (Greenwood Bypass) (S)



Looking northeast at proposed west bridge end.

## Attachment D2





#### Plan View

Site 2-B3 Site 2-B4 Site 2-B5 Site 2-B6 Site 2-B7 Site 2-B8 Site 2-B9 Site 2-B10 Site 2-B11 Site 2-B12

#### Strata symbols

	clay		silty sand		shale/siltstone
	sandy, silty clay		silty clay		silty, clayey sand
	shale with clay seams		sandy clay		sandy silt
	shale with sandstone seams		clayey sand		clayey sand and gravel
			silty clay with gravel		silt/cemented silt

### ARDOT GENERALIZED SUBSURFACE PROFILE

HORIZONTAL  
SCALE: NOT TO SCALE  
VERTICAL  
SCALE: NOT TO SCALE

DRAWN BY/APPROVED BY

DATE DRAWN

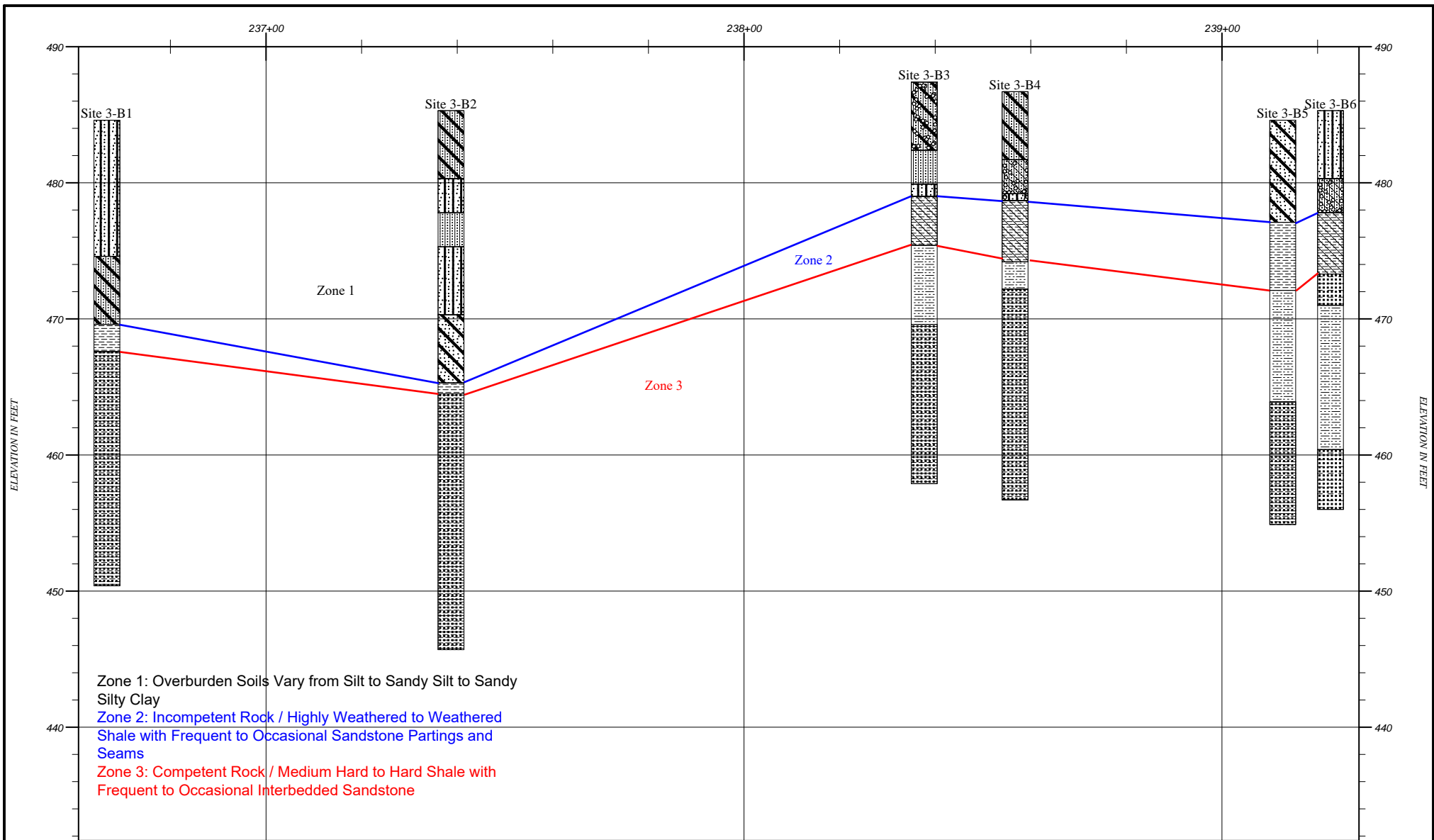
7/24/2023

Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)

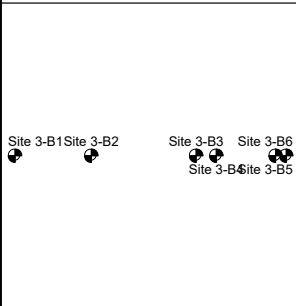
PROJECT NO. 040861  
Sebastian County

Site 2

## Attachment D3



Plan View



Strata symbols



sandy silt



sandy, silty clay



shale/siltstone



shale with sandstone seams



silty sand



sandy clay



sandy, silty clay with gravel



shale with clay seams



sandstone interbedded with shale



silty clayey sand and gravel



sandy silt and gravel



sandstone with shale seams

## ARDOT GENERALIZED SUBSURFACE PROFILE

HORIZONTAL  
SCALE: NOT TO SCALE  
VERTICAL  
SCALE: NOT TO SCALE

DRAWN BY/APPROVED BY

DATE DRAWN

7/28/2023

Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)

PROJECT NO. 040861  
Sebastian County

SITE 3

## Attachment E



Title: 040861

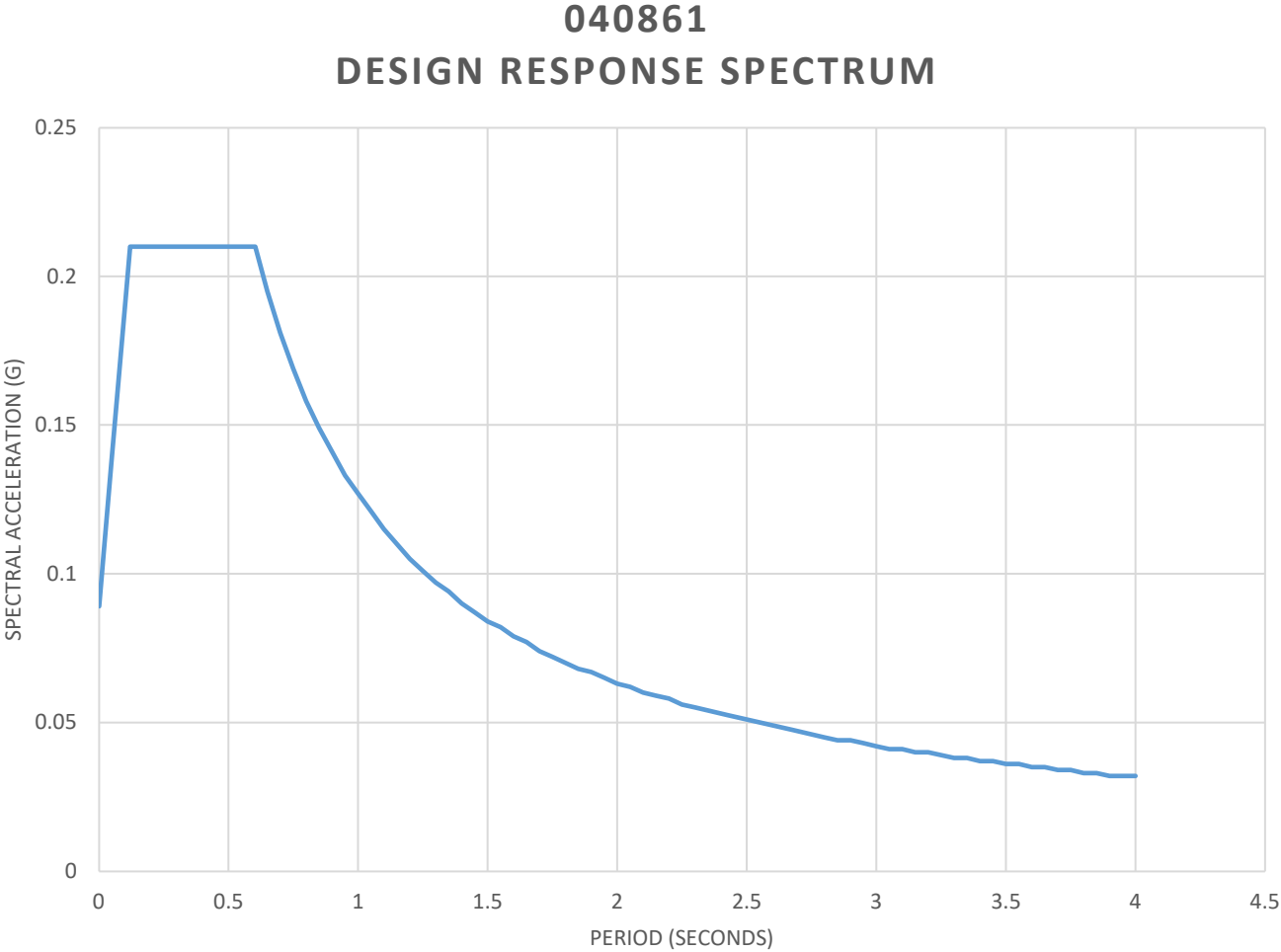
Latitude: 35.2105556

Longitude: -94.253889

Site Class: D

Get USGS Data

PGA:	0.056
F <sub>PGA</sub> :	1.6
A <sub>S</sub> :	0.089
S <sub>S</sub> :	0.131
F <sub>A</sub> :	1.6
S <sub>DS</sub> :	0.21
S <sub>1</sub> :	0.053
F <sub>V</sub> :	2.4
S <sub>D1</sub> :	0.127
S <sub>DC</sub> :	A
T <sub>S</sub> :	0.603
T <sub>0</sub> :	0.121



## Attachment F

**ARKANSAS DEPARTMENT OF TRANSPORTATION****SPECIAL PROVISION****JOB NO. 040861****ROCK FILL**

**Description.** This item shall consist of constructing embankments at the locations shown on the Plans or as directed by the Engineer as Rock Fill. Rock Fill shall comply with Section 210, Excavation and Embankment, of the Standard Specifications, Edition of 2014. Where there is a conflict between this Special Provision and Section 210, this Special Provision shall govern.

**Materials.** Rock Fill shall comply with the following requirements:

- (1) Material for Rock Fill shall include stone obtained from an approved source and shall consist of hard and durable limestone, sandstone, dolomite, or rock-like shale. Shale shall have a minimum slake durability index (SDI) of 95% as tested according to ARDOT Test Method 399. The SDI shall be determined by the Engineer using the above method at a minimum frequency of once per 3000 cubic yards. The stone shall be greater than 1½" and less than 30", reasonably well-graded and angular, with fractured faces on at least 75% of the surface and shall not contain more than 10% overburden or fines less than 1½" in maximum cross-section. The stone shall weigh not less than 140 pounds per solid cubic foot and shall have a percent of wear not greater than 45 by Los Angeles Abrasion Test (AASHTO T 96).

The top layer of Rock Fill shall be reduced in size to meet the gradation requirements of SubSection 802.02(c) for Class B Concrete. The minimum thickness of this layer shall be 1 foot.

- (2) The following shall be added to the third paragraph of Section 801.08 of the Standard Specifications. Rock Fill placed immediately adjacent to Pipe Culverts or Box Culverts including a minimum of 6 inches on top of the culverts, shall meet the gradation requirements of 802.02(c) of the Standard Specifications for Class S concrete coarse aggregate.
- (3) Material placed in the vicinity of piling shall be constructed in accordance with SubSections 303.02, 303.03, and 303.04 of the Standard Specifications, Edition of 2014. It shall meet the material and construction requirements of Aggregate Base Course (Class 7).
- (4) Geotextile Fabric (Type 9) complying with SubSection 625.02 of the Standard Specifications shall be used between Rock Fill and overlying embankment material.

**Construction Requirements.** Embankments requiring Rock Fill to be placed in water or extremely soft areas shall be placed by end dumping and advancing rock placement. All displaced material as it accumulates ahead of the advancing embankment toe shall be removed by excavation. Removal and disposal of displaced material will not be measured and shall be considered subsidiary to the item Rock Fill.

**ARKANSAS DEPARTMENT OF TRANSPORTATION****SPECIAL PROVISION****JOB NO. 040861****ROCK FILL**

**Method of Measurement.** Rock Fill, which includes all aggregate material types described above, including concrete coarse aggregate and/or Aggregate Base Course (Class 7), will be measured in vehicles by the Ton and paid as Rock Fill. Displaced material removal and disposal will not be measured and shall be considered subsidiary to the item Rock Fill.

**Basis of Payment.** Placement and construction of Rock Fill embankment material shall be paid for under the item “Rock Fill”, which price shall be full compensation for all costs involved in furnishing all materials for constructing the embankments in accordance with Section 210 and this Special Provision; and for all labor, tools, equipment, quality control sampling and testing, and for incidentals necessary to complete the work.

Payment will be made under:

**Pay Item**

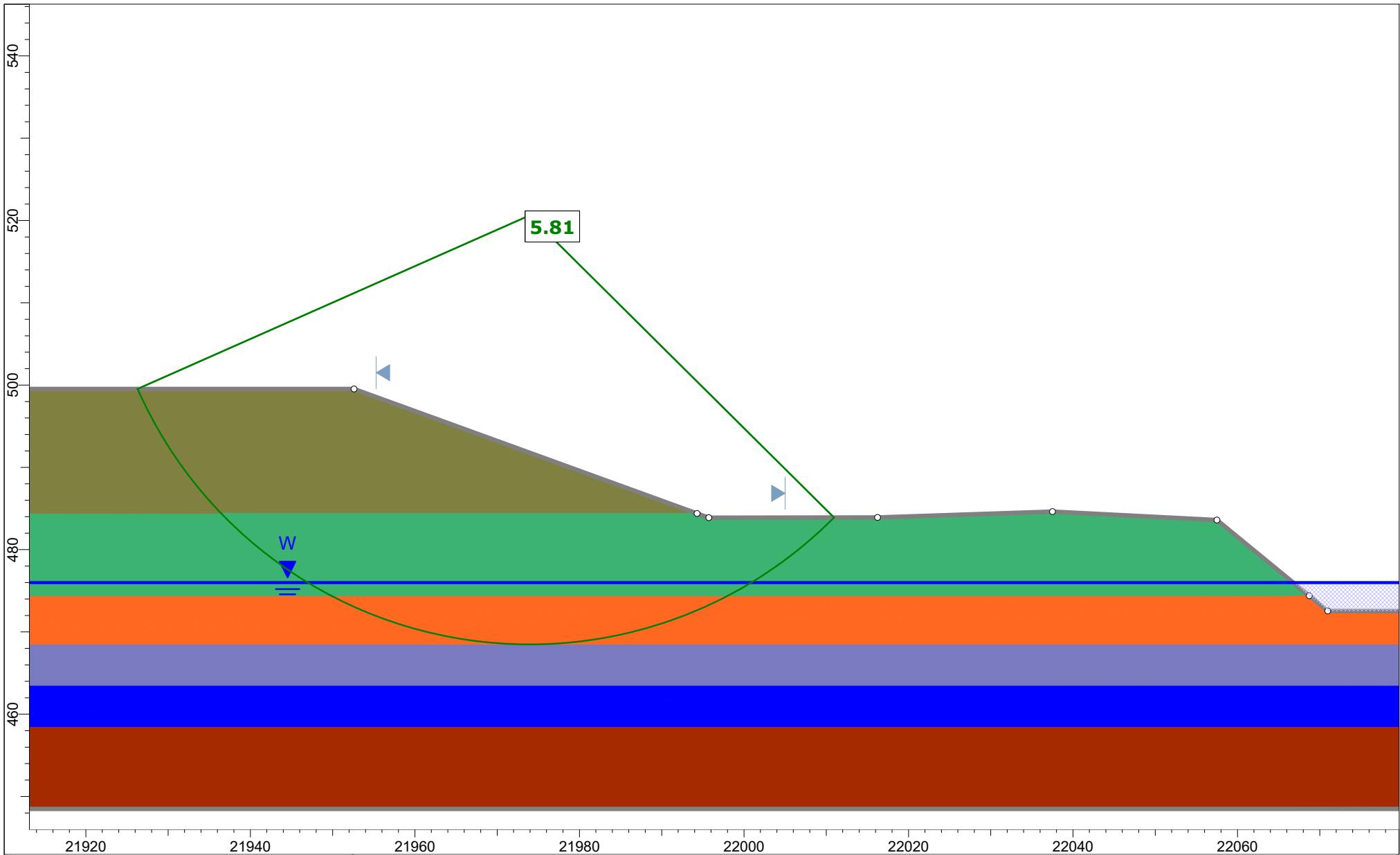
Rock Fill  
Geotextile Fabric (Type 9)


**Pay Unit**

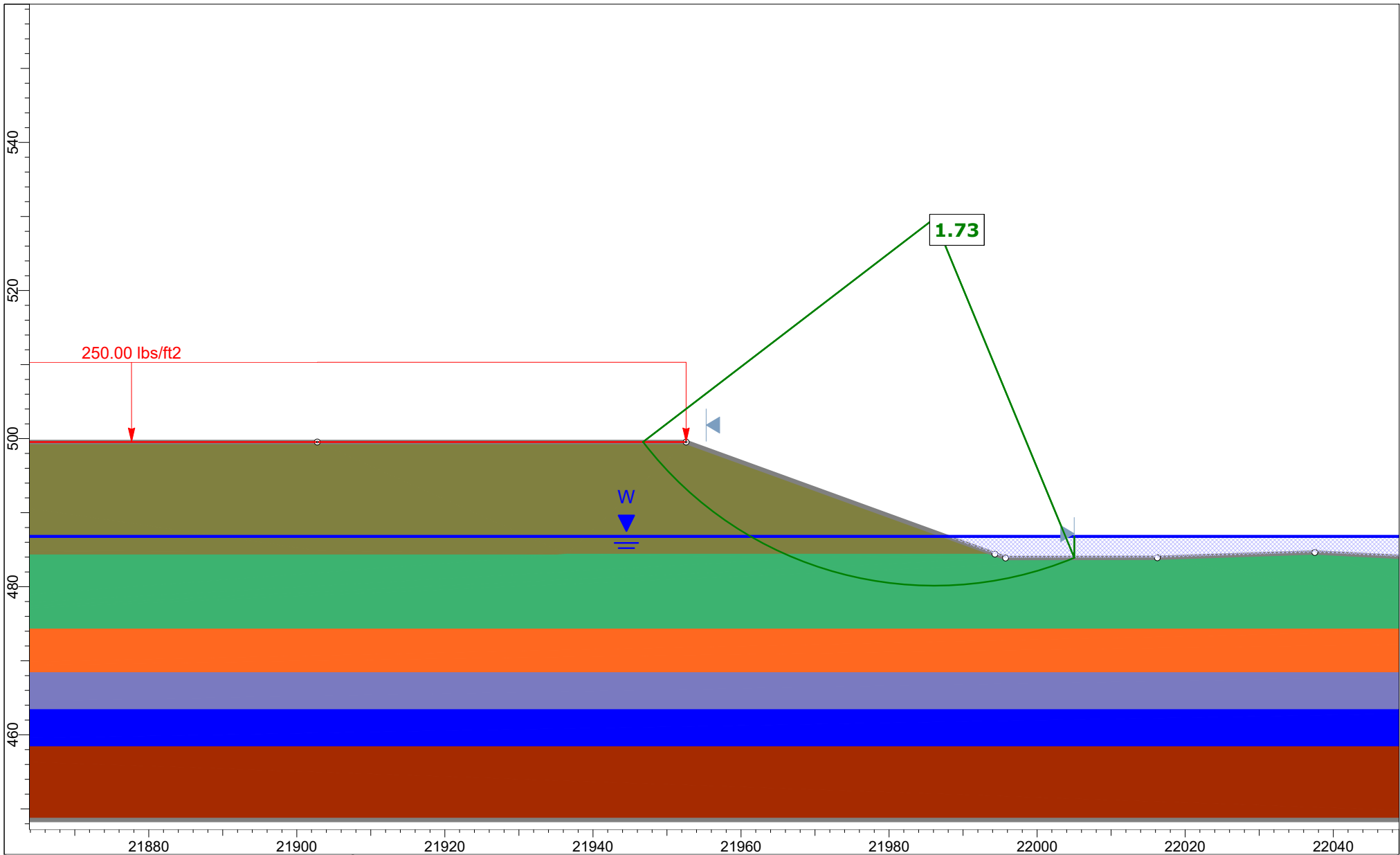
Ton  
Square Yard



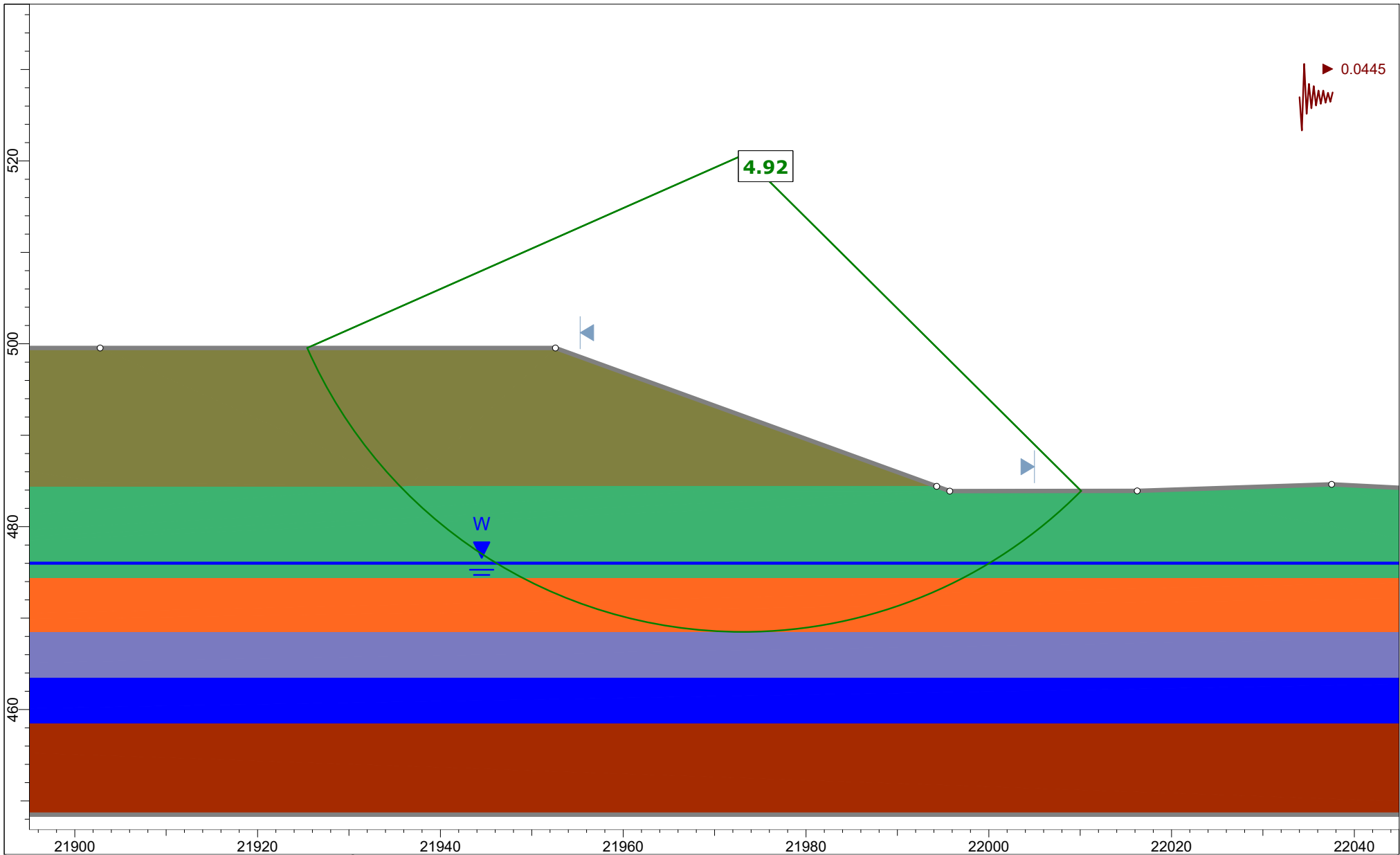
## Attachment G2



	Project 040861 Hwy. 10-Hwy. 96 (Greenwood Bypass)		
	Site	Site 2	Analysis Type Short Term
	Analyzed By	MBB	Configuration West Bridge End, 1V : 2H End Slope
	Date	7/27/2023	

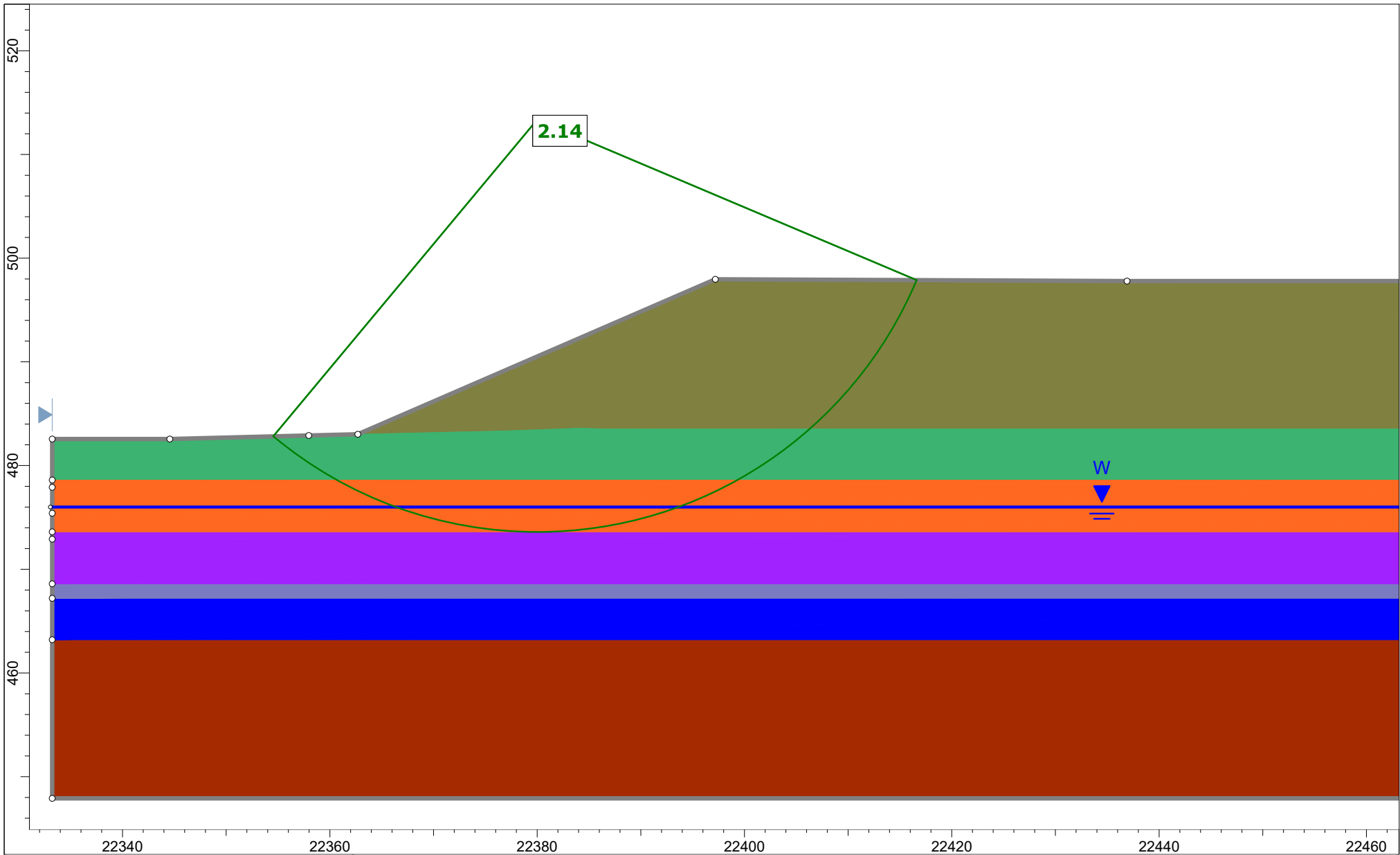


Project	040861 Hwy. 10-Hwy. 96 (Greenwood Bypass)		
Site	Site 2	Analysis Type	Long Term
Analyzed By	MBB	Configuration	West Bridge End, 1V : 2H End Slope
Date	7/27/2023		

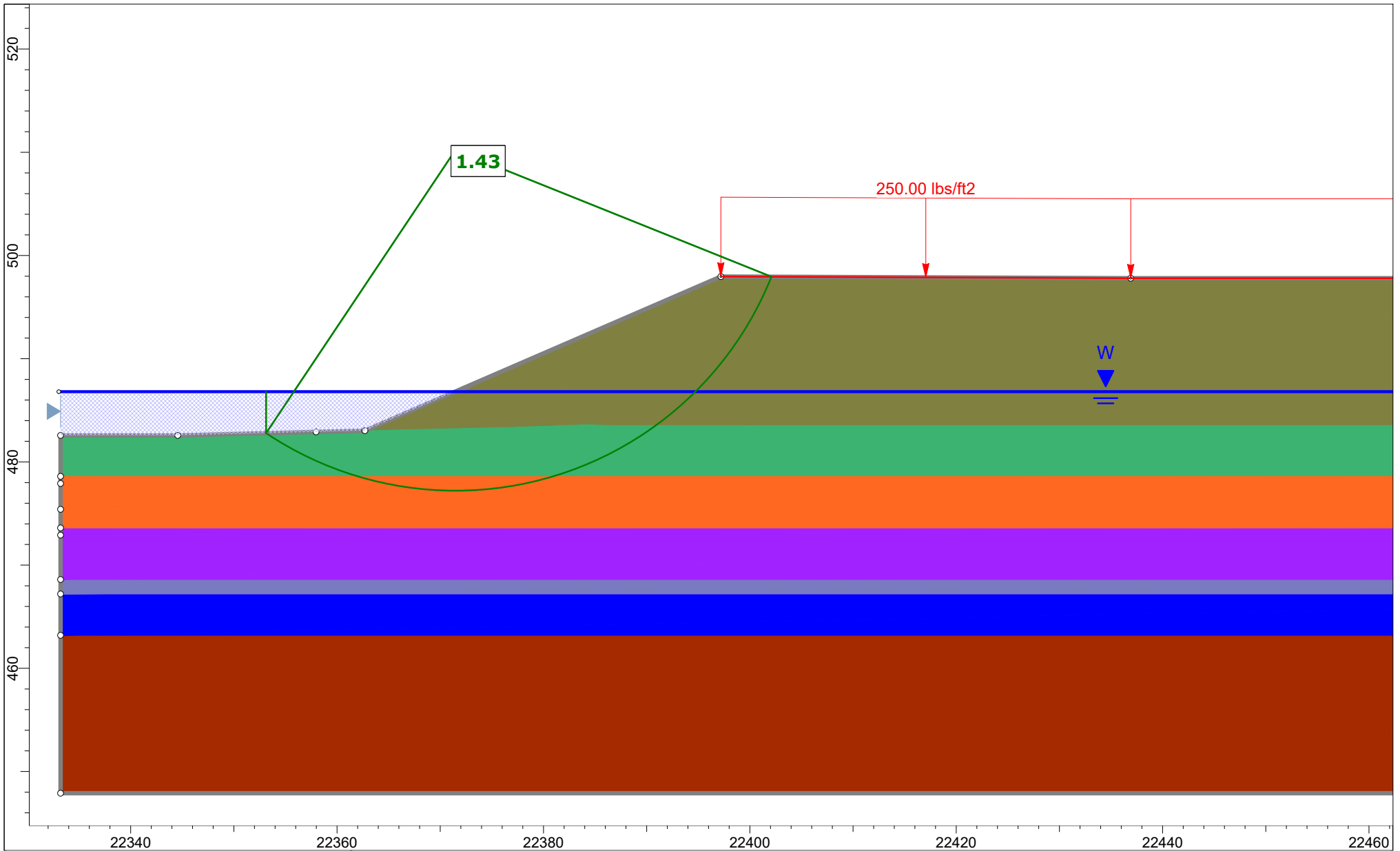


Project	040861 Hwy. 10-Hwy. 96 (Greenwood Bypass)		
Site	Site 2	Analysis Type	Seismic Condition
Analyzed By	MBB	Configuration	West Bridge End, 1V : 2H End Slope
Date	7/27/2023		

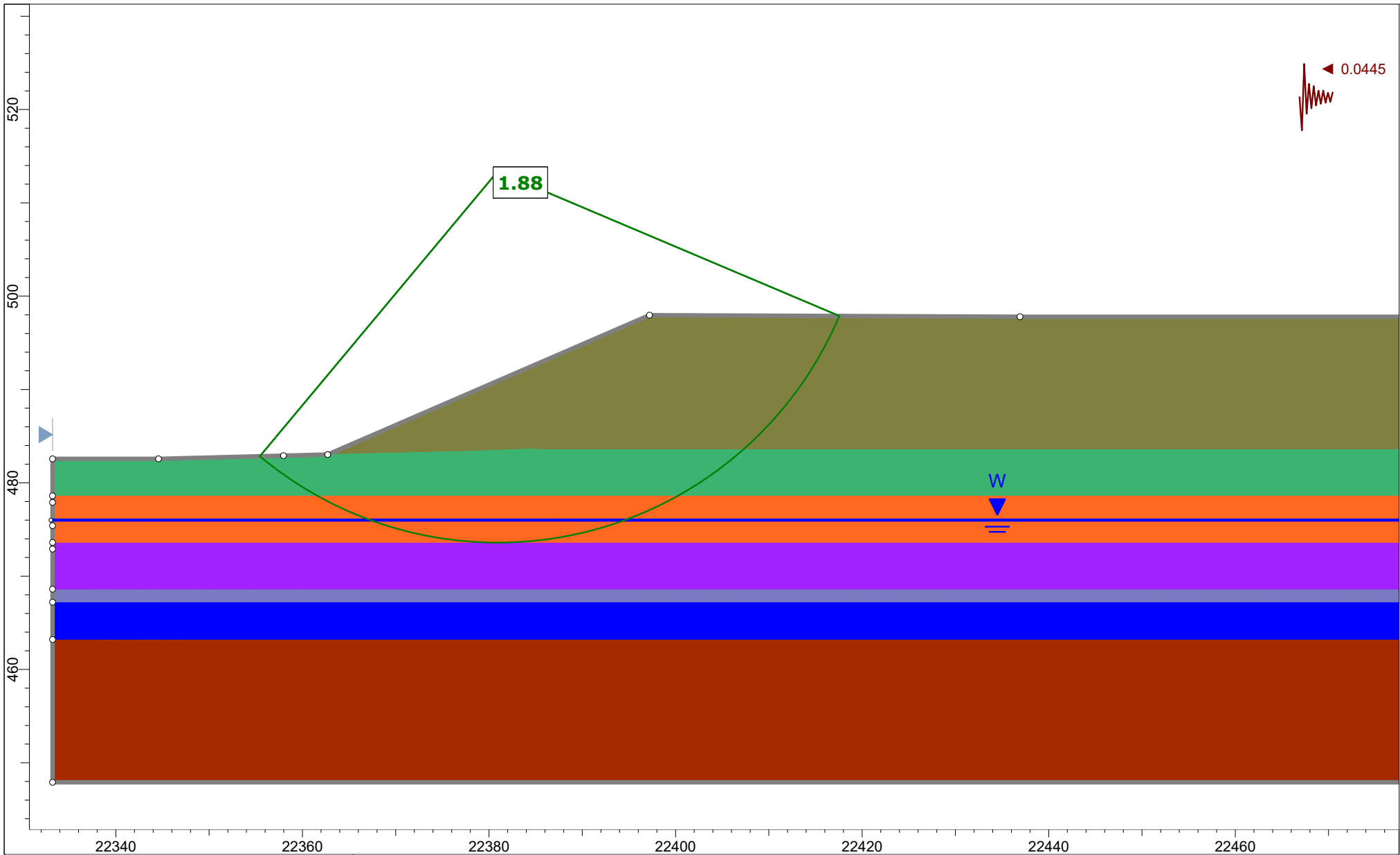




Project	040861 Hwy. 10-Hwy. 96 (Greenwood Bypass)		
Site	Site 2	Analysis Type	Short Term
Analyzed By	MBB	Configuration	East Bridge End, 1V : 2H End Slope
Date	7/27/2023		



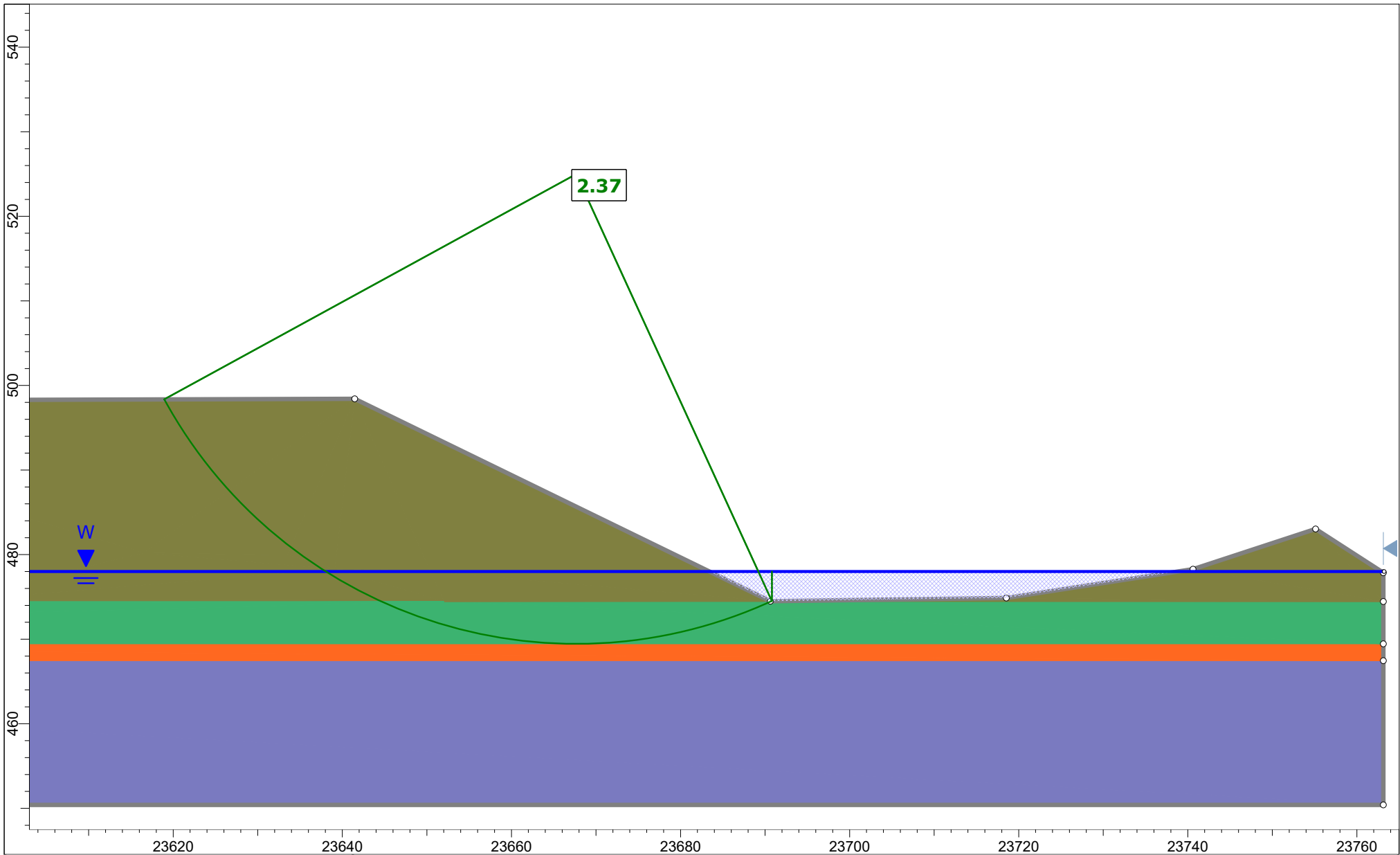
Project	040861 Hwy. 10-Hwy. 96 (Greenwood Bypass)		
Site	Site 2	Analysis Type	Long Term
Analyzed By	MBB	Configuration	East Bridge End, 1V : 2H End Slope
Date	7/27/2023		




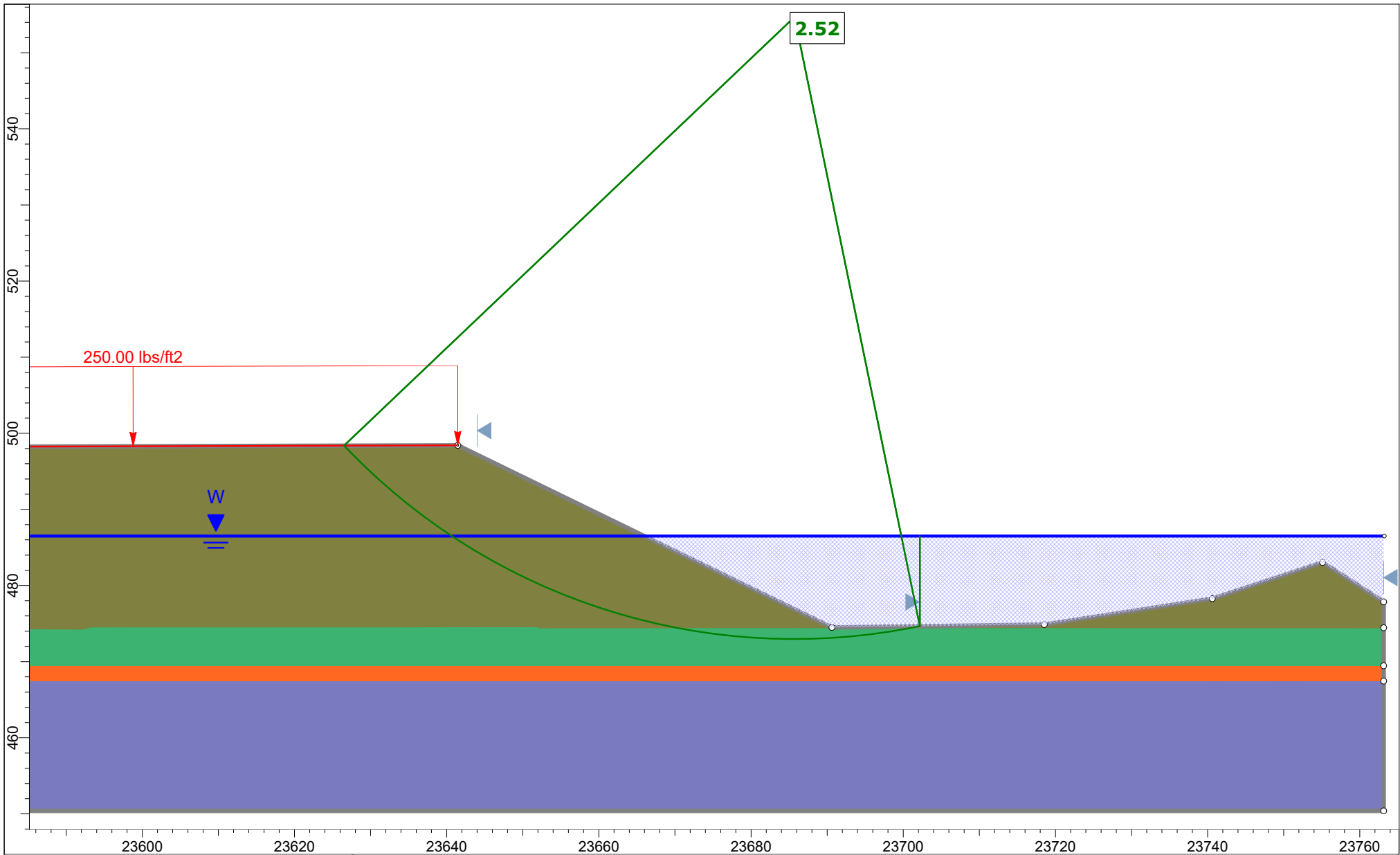
Project	040861 Hwy. 10-Hwy. 96 (Greenwood Bypass)		
Site	Site 2	Analysis Type	Seismic Condition
Analyzed By	MBB	Configuration	East Bridge End, 1V : 2H End Slope
Date	7/27/2023		

## Attachment G3

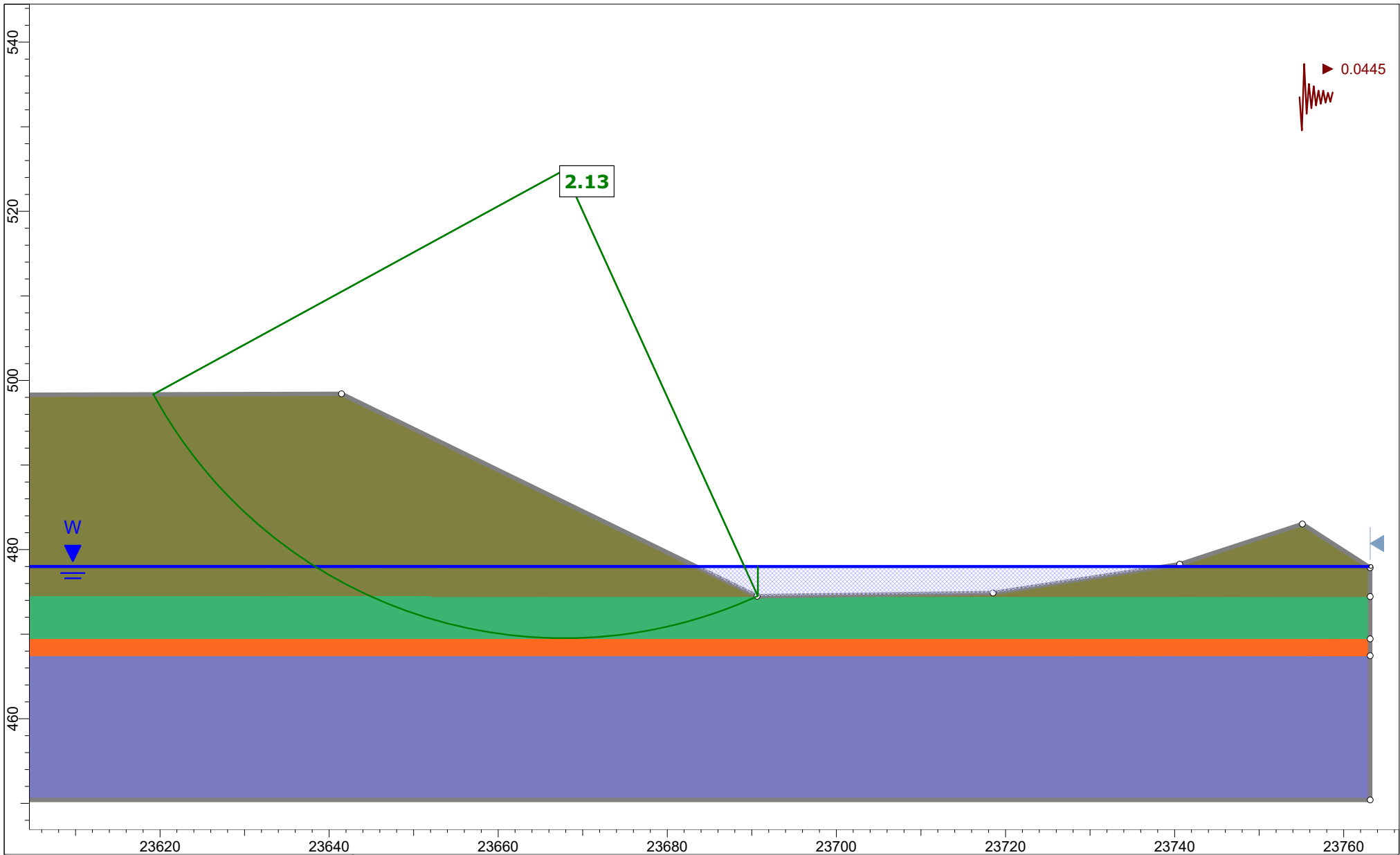




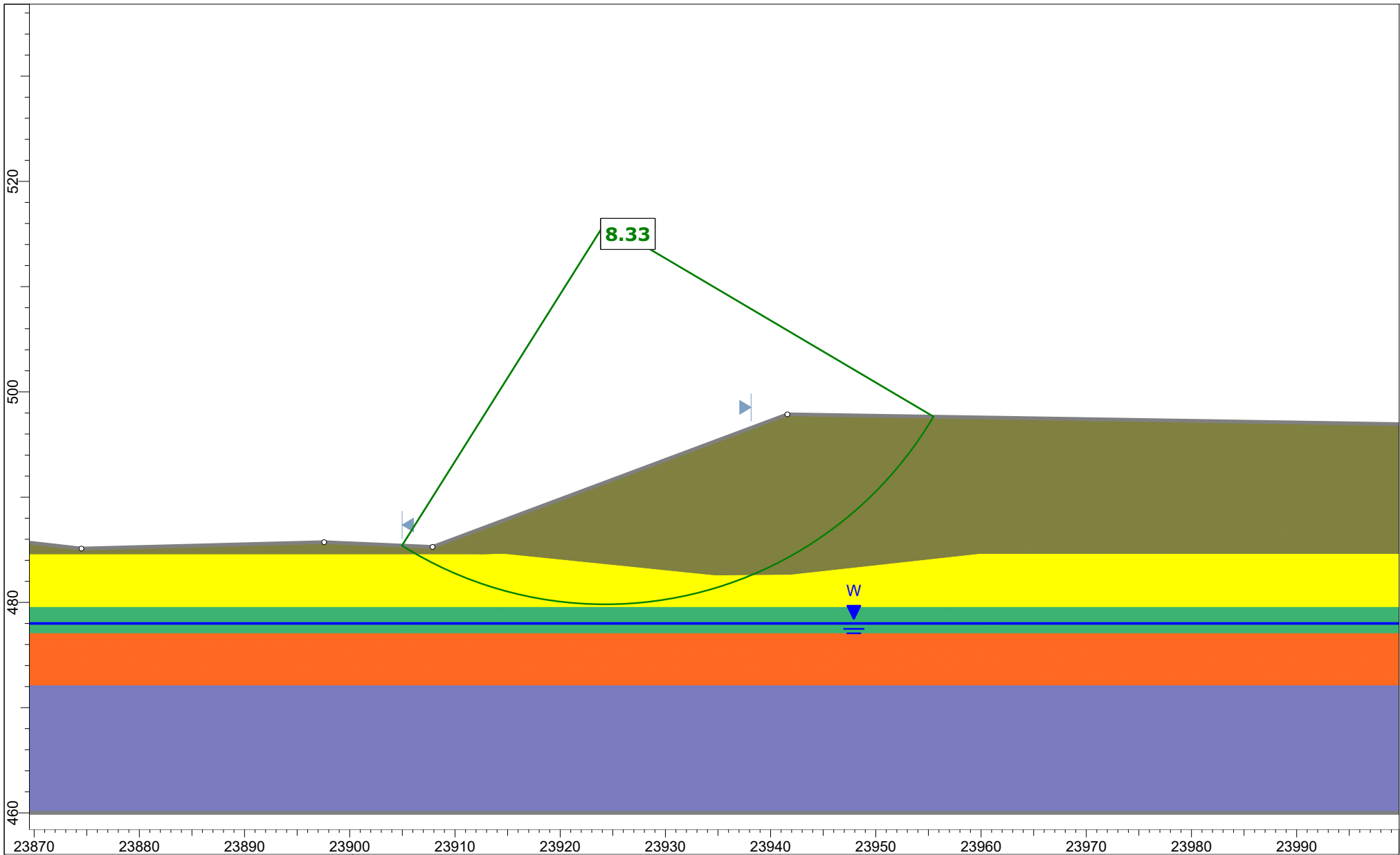
	Project 040861 Hwy. 10-Hwy. 96 (Greenwood Bypass)		
	Site	Site 3	Analysis Type Short Term
	Analyzed By	MBB	Configuration West Bridge End, 1V : 2H End Slope
	Date	7/27/2023	



Project	040861 Hwy. 10-Hwy. 96 (Greenwood Bypass)		
Site	Site 3	Analysis Type	Long Term
Analyzed By	MBB	Configuration	West Bridge End, 1V : 2H End Slope
Date	7/27/2023		

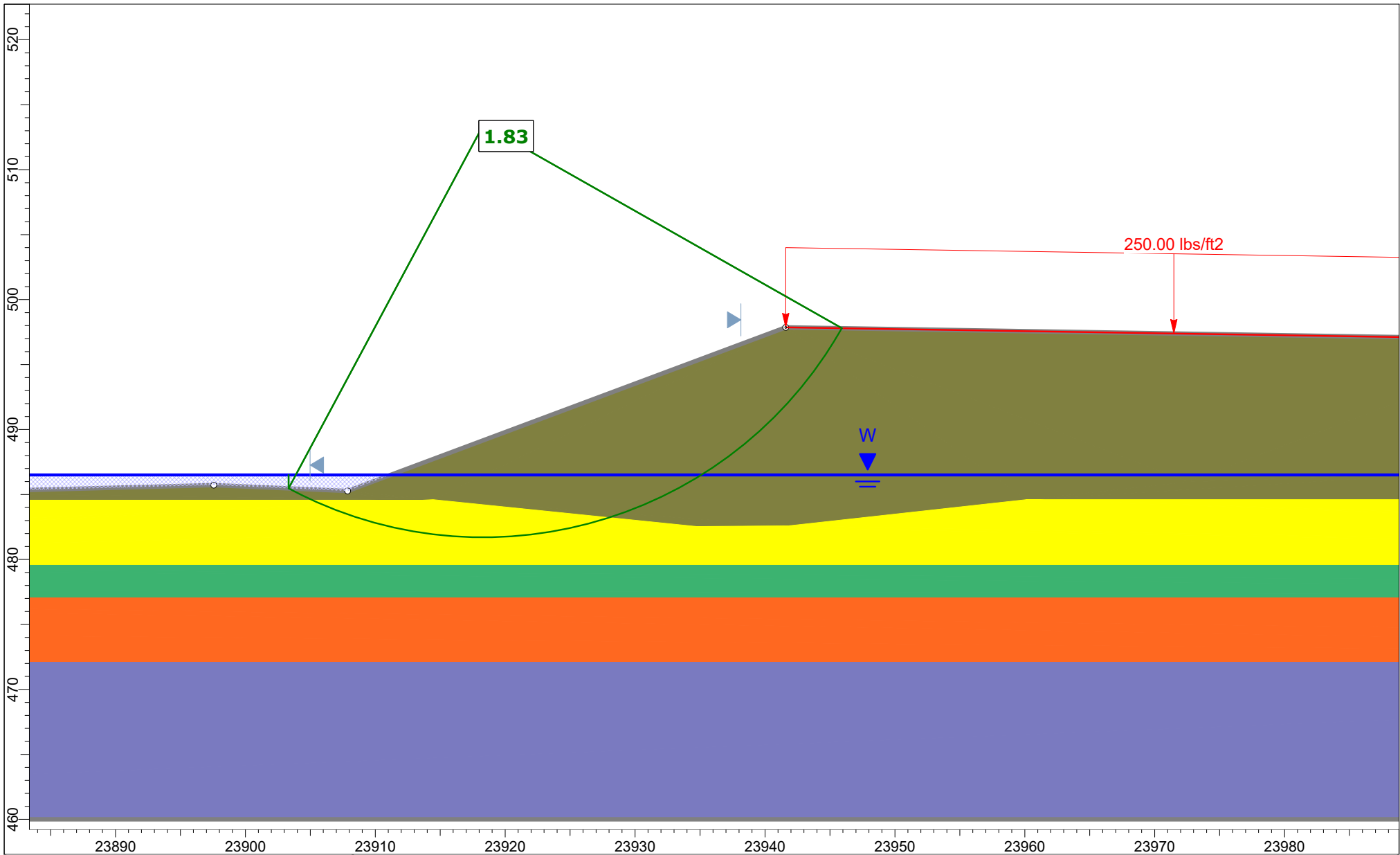


Project	040861 Hwy. 10-Hwy. 96 (Greenwood Bypass)		
Site	Site 3	Analysis Type	Seismic Condition
Analyzed By	MBB	Configuration	West Bridge End, 1V : 2H End Slope
Date	7/27/2023		

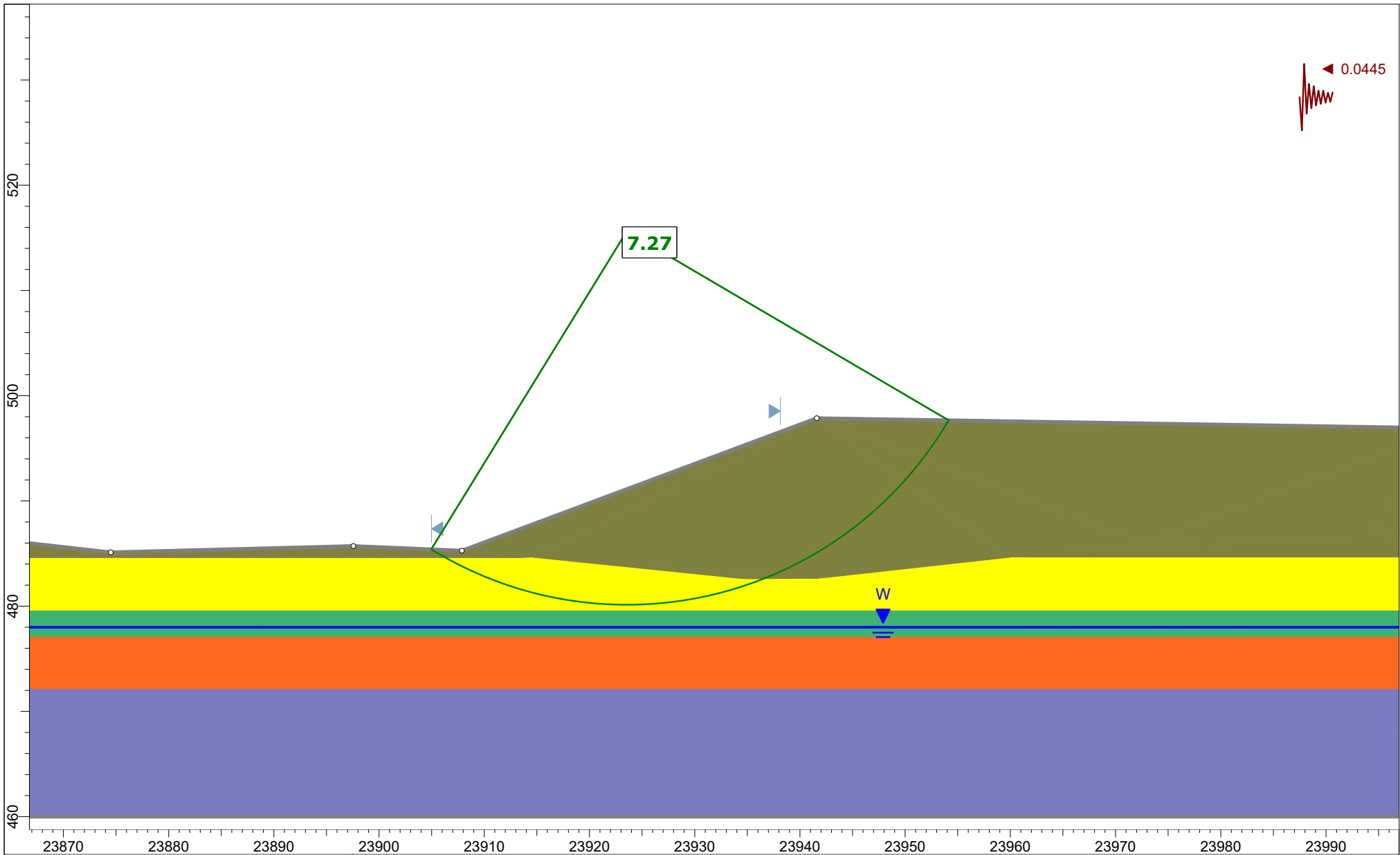



Project	040861 Hwy. 10-Hwy. 96 (Greenwood Bypass)		
Site	Site 3	Analysis Type	Short Term
Analyzed By	MBB	Configuration	East Bridge End, 1V : 2H End Slope
Date	7/27/2023		





Project	040861 Hwy. 10-Hwy. 96 (Greenwood Bypass)		
Site	Site 3	Analysis Type	Long Term
Analyzed By	MBB	Configuration	East Bridge End, 1V : 2H End Slope
Date	7/27/2023		



	Project040861 Hwy. 10-Hwy. 96 (Greenwood Bypass)		
	Site	Site 3	Analysis TypeSeismic Condition
	Analyzed By	MBB	ConfigurationEast Bridge End, 1V : 2H End Slope
	Date	7/27/2023	

## Attachment H2



Job No.:	040861
Site No.:	2

Input by:	YZ	7/21/2023
Checked by:	MB	7/27/2023
Back-checked by:	YZ	7/27/2023

Bent 1

Elevation, ft		Material	Model	Effective Unit Weight, $\gamma'$ ,pcf	Undrained Shear Strength of Soil ( $C_u$ ) (psf)	Strain Factor ( $\epsilon_{50}$ for Soil) / $k_m$ for Rock)	Friction Angle, $\phi$ , °	Soil Modulus, k, pci	Uniaxial Compressive Strength, $q_u$ , psi	Rock Mass Modulus, $E_{rm}$ , $10^6$ psi	RQD, %
Top	Bottom										
Above Ground Surface		Fill	Soft Clay (Matlock)	120	750	0.010	NA	NA	NA	NA	NA
Ground	468.5	Overburden Soil	Stiff Clay with Free Water (Reese)	55	1500	0.007	NA	500	NA	NA	NA
468.5	459	Highly Weathered to Weathered Shale	Stiff Clay with Free Water (Reese)	85	10000	0.001	NA	2000	NA	NA	NA
below 459		Competent Slightly Weathered to Unweathered Shale	Weak Rock	100	NA	0.001	NA	NA	4000	3.0	70

Bent 2

Elevation, ft		Material	Model	Effective Unit Weight, $\gamma'$ ,pcf	Undrained Shear Strength of Soil ( $C_u$ ) (psf)	Strain Factor ( $\epsilon_{50}$ for Soil) / $k_m$ for Rock)	Friction Angle, $\phi$ , °	Soil Modulus, k, pci	Uniaxial Compressive Strength, $q_u$ , psi	Rock Mass Modulus, $E_{rm}$ , $10^6$ psi	RQD, %
Top	Bottom										
Ground	468.5	Overburden Soil	Stiff Clay with Free Water (Reese)	60	2000	0.0050	NA	1000	NA	NA	NA
468.5	465.5	Highly Weathered to Weathered Shale	Stiff Clay with Free Water (Reese)	85	10000	0.0010	NA	2000	NA	NA	NA
below 465.5		Competent Slightly Weathered to Unweathered Shale	Weak Rock	100	NA	0.0005	NA	NA	4000	3.0	70

Bent 3

Elevation, ft		Material	Model	Effective Unit Weight, $\gamma'$ ,pcf	Undrained Shear Strength of Soil ( $C_u$ ) (psf)	Strain Factor ( $\epsilon_{50}$ for Soil) / $k_m$ for Rock)	Friction Angle, $\phi$ , °	Soil Modulus, k, pci	Uniaxial Compressive Strength, $q_u$ , psi	Rock Mass Modulus, $E_{rm}$ , $10^6$ psi	RQD, %
Top	Bottom										
Ground	467	Overburden Soil	Stiff Clay with Free Water (Reese)	55	1500	0.0070	NA	500	NA	NA	NA
467	466	Highly Weathered to Weathered Shale	Stiff Clay with Free Water (Reese)	85	10000	0.0010	NA	2000	NA	NA	NA
below 466		Competent Slightly Weathered to Unweathered Shale	Weak Rock	100	NA	0.0005	NA	NA	4000	3.0	70

Bent 4

Elevation, ft		Material	Model	Effective Unit Weight, $\gamma'$ ,pcf	Undrained Shear Strength of Soil ( $C_u$ ) (psf)	Strain Factor ( $\epsilon_{50}$ for Soil) / $k_m$ for Rock)	Friction Angle, $\phi$ , °	Soil Modulus, k, pci	Uniaxial Compressive Strength, $q_u$ , psi	Rock Mass Modulus, $E_{rm}$ , $10^6$ psi	RQD, %
Top	Bottom										
Ground	468	Overburden Soil - Weaker	Soft Clay (Matlock)	45	200	0.0500	NA	NA	NA	NA	NA
468	466.5	Overburden Soil - Stiffer	Stiff Clay with Free Water (Reese)	70	3000	0.0050	NA	1000	NA	NA	NA
466.5	462.5	Highly Weathered to Weathered Shale	Stiff Clay with Free Water (Reese)	85	10000	0.0010	NA	2000	NA	NA	NA
below 462.5		Competent Slightly Weathered to Unweathered Shale	Weak Rock	100	NA	0.0005	NA	NA	4000	3.0	70

Bent 5

Elevation, ft		Material	Model	Effective Unit Weight, $\gamma'$ ,pcf	Undrained Shear Strength of Soil ( $C_u$ ) (psf)	Strain Factor ( $\epsilon_{50}$ for Soil) / $k_m$ for Rock)	Friction Angle, $\phi$ , °	Soil Modulus, k, pci	Uniaxial Compressive Strength, $q_u$ , psi	Rock Mass Modulus, $E_{rm}$ , $10^6$ psi	RQD, %
Top	Bottom										
Ground	475	Overburden Soil - Weaker	Soft Clay (Matlock)	45	200	0.05	NA	NA	NA	NA	NA
475	466.5	Overburden Soil - Stiffer	Stiff Clay with Free Water (Reese)	55	1500	0.007	NA	500	NA	NA	NA
466.5	462	Highly Weathered to Weathered Shale	Stiff Clay with Free Water (Reese)	85	10000	0.001	NA	2000	NA	NA	NA
below 462		Competent Slightly Weathered to Unweathered Shale	Weak Rock	100	NA	0.0005	NA	NA	4000	3.0	70

Bent 6

Elevation, ft		Material	Model	Effective Unit Weight, $\gamma'$ ,pcf	Undrained Shear Strength of Soil ( $C_u$ ) (psf)	Strain Factor ( $\epsilon_{50}$ for Soil) / $k_m$ for Rock)	Friction Angle, $\phi$ , °	Soil Modulus, k, pci	Uniaxial Compressive Strength, $q_u$ , psi	Rock Mass Modulus, $E_{rm}$ , $10^6$ psi	RQD, %
Top	Bottom										
Above Ground Surface		Fill	Soft Clay (Matlock)	120	750	0.010	NA	NA	NA	NA	NA
Ground	473.5	Overburden Soil - Weaker	Soft Clay (Matlock)	45	200	0.0500	NA	NA	NA	NA	NA
473.5	467.0	Overburden Soil - Stiffer	Stiff Clay with Free Water (Reese)	55	1500	0.007	NA	500	NA	NA	NA
467	459.5	Highly Weathered to Weathered Shale	Stiff Clay with Free Water (Reese)	85	10000	0.001	NA	2000	NA	NA	NA
below 459.5		Competent Slightly Weathered to Unweathered Shale	Weak Rock	100	NA	0.0005	NA	NA	4000	3.0	70



## Attachment H3



Job No.:	040861
Site No.:	3

Input by:	YZ	7/26/2023
Checked by:	pt	7/27/2023
Back-checked by:	YZ	7/27/2023

Bent 1 - Boring 1

Elevation, ft		Material	Model	Effective Unit Weight, $\gamma'$ ,pcf	Undrained Shear Strength of Soil ( $C_u$ ) (psf)	Strain Factor ( $\epsilon_{50}$ for Soil) / $k_m$ for Rock)	Friction Angle, $\phi$ , °	Soil Modulus, k, pci	Uniaxial Compressive Strength, $q_u$ , psi	Rock Mass Modulus, $E_{rm}$ , $10^6$ psi	RQD, %
Top	Bottom										
Above Ground Surface		Fill	Soft Clay (Matlock)	120	750	0.010	NA	NA	NA	NA	NA
Ground	474.5	Overburden Soil - Weaker	Sand (Reese)	55	NA	NA	26.0	20	NA	NA	NA
474.5	469.5	Overburden Soil - Stiffer	Soft Clay (Matlock)	45	500	0.0100	NA	NA	NA	NA	NA
469.5	467.5	Highly Weathered to Weathered Shale	Stiff Clay with Free Water (Reese)	85	10000	0.001	NA	2000	NA	NA	NA
below 467.5		Competent Slightly Weathered to Unweathered Shale	Weak Rock	100	NA	0.0005	NA	NA	5500	5.0	65

Bent 2 - Boring 2

Elevation, ft		Material	Model	Effective Unit Weight, $\gamma'$ ,pcf	Undrained Shear Strength of Soil ( $C_u$ ) (psf)	Strain Factor ( $\epsilon_{50}$ for Soil) / $k_m$ for Rock)	Friction Angle, $\phi$ , °	Soil Modulus, k, pci	Uniaxial Compressive Strength, $q_u$ , psi	Rock Mass Modulus, $E_{rm}$ , $10^6$ psi	RQD, %
Top	Bottom										
Ground	470	Overburden Soil - Weaker	Sand (Reese)	55	NA	NA	27.0	20	NA	NA	NA
470	465	Overburden Soil - Stiffer	Stiff Clay with Free Water (Reese)	55	1900	0.0070	NA	500	NA	NA	NA
465	464.5	Highly Weathered to Weathered Shale	Stiff Clay with Free Water (Reese)	85	10000	0.0010	NA	2000	NA	NA	NA
below 464.5		Competent Slightly Weathered to Unweathered Shale	Weak Rock	100	NA	0.0005	NA	NA	5500	5.0	70

Bent 3 - Borings 3 and 4

Elevation, ft		Material	Model	Effective Unit Weight, $\gamma'$ ,pcf	Undrained Shear Strength of Soil ( $C_u$ ) (psf)	Strain Factor ( $\epsilon_{50}$ for Soil) / $k_m$ for Rock)	Friction Angle, $\phi$ , °	Soil Modulus, k, pci	Uniaxial Compressive Strength, $q_u$ , psi	Rock Mass Modulus, $E_{rm}$ , $10^6$ psi	RQD, %
Top	Bottom										
Ground	481.5	Overburden Soil - Clay	Stiff Clay with Free Water (Reese)	50	1300	0.0070	NA	500	NA	NA	NA
481.5	478.5	Overburden Soil - Sand	Sand (Reese)	65	NA	NA	36.0	92	NA	NA	NA
478.5	474	Highly Weathered to Weathered Shale	Stiff Clay with Free Water (Reese)	85	10000	0.0010	NA	2000	NA	NA	NA
below 474		Competent Slightly Weathered to Unweathered Shale	Weak Rock	100	NA	0.0005	NA	NA	5500	5.0	85

Bent 4 - Borings 5 and 6

Elevation, ft		Material	Model	Effective Unit Weight, $\gamma'$ ,pcf	Undrained Shear Strength of Soil ( $C_u$ ) (psf)	Strain Factor ( $\epsilon_{50}$ for Soil) / $k_m$ for Rock)	Friction Angle, $\phi$ , °	Soil Modulus, k, pci	Uniaxial Compressive Strength, $q_u$ , psi	Rock Mass Modulus, $E_{rm}$ , $10^6$ psi	RQD, %
Top	Bottom										
Above Ground Surface		Fill	Soft Clay (Matlock)	120	750	0.010	NA	NA	NA	NA	NA
Ground	477.0	Overburden Soil - Stiffer	Stiff Clay with Free Water (Reese)	65	2750	0.005	NA	1000	NA	NA	NA
477	472	Highly Weathered to Weathered Shale	Stiff Clay with Free Water (Reese)	85	10000	0.001	NA	2000	NA	NA	NA
below 472		Competent Slightly Weathered to Unweathered Shale	Weak Rock	100	NA	0.0005	NA	NA	5500	5.0	75



ARKANSAS DEPARTMENT OF TRANSPORTATION

ArDOT.gov | IDriveArkansas.com | Lorie H. Tudor, P.E., Director

MATERIALS DIVISION

11301 West Baseline Road | P.O. Box 2261 | Little Rock, AR 72203-2261 | Phone: 501.569.2185 | Fax: 501.569.2368

August 12, 2022

**TO:** Mr. Trinity Smith, Engineer of Roadway Design

**SUBJECT:** Job No. 040861  
Hwy. 10 - Hwy. 96 (Greenwood Bypass) (S)  
Route 10 Section 0  
Sebastian County

Attached is the requested soil survey, and strength data test results. The project consists of constructing a new section for Highway 10 in Greenwood and improving Coker, Main and Center Streets. Samples we obtained along the new alignment, the existing travel lanes, and ditch line.

The subgrade soils consist primarily of low plasticity silty sands and may require stabilization to provide a stable working platform. The locations, type and amount of additive will be discussed later in the report.

Highway 10 Alignment

From Stations 185+00 - 196+00 the grade line closely matches the existing roadway. The embankments will be constructed in the existing ditches. All soft unstable organic material should be undercut to a maximum depth of 3 feet prior to construction. The embankments may be constructed with locally available unspecified material utilizing a 3:1 slope configuration.

The new location for Highway 10 traverses wooded areas and pasture land that floods in the fall and spring. Between stations 205+50 to 207+20 is a pond at the centerline of construction, and should be drained prior to construction. The maximum embankment height is approximately 24 feet for this alignment. Prior to construction the soft organic material should be undercut to a maximum depth of 3 feet. The embankment may be constructed with locally available unspecified material utilizing a 3:1 slope configuration, shown in the attached figure.

Center Street

The grade line of the existing road is being raised between stations 500+25 to 504+00 and 508+00 to 521+00. The embankment is being placed in the existing ditch line and has a maximum height of 19 feet. The soft unstable organic material should be undercut to a maximum depth of 3 feet. The embankment may be constructed with locally available material utilizing a 3:1 slope configuration.

The embankment between stations 524+00 to 526+00 is on new location in an area that is seasonably wet. Prior to construction, the soils should be stabilized with 4% Portland cement (by dry wt.) mixed to a depth of 16 inches to provide a stable working platform. The embankment may be constructed with locally available unspecified material utilizing a 3:1 slope configuration.

The construction grade line between stations 526+00 to 532+00 closely matches the existing grade line. Prior to fill being placed in the ditch line, all soft unstable organic material should be undercut to a maximum depth of 3 feet. The embankment may be constructed with locally available unspecified material using a 3:1 slope configuration.



# ARKANSAS DEPARTMENT OF TRANSPORTATION

ArDOT.gov | IDriveArkansas.com | Lorie H. Tudor, P.E., Director

## MATERIALS DIVISION

11301 West Baseline Road | P.O. Box 2261 | Little Rock, AR 72203-2261 | Phone: 501.569.2185 | Fax: 501.569.2368

### Coker Street

The construction grade line closely matches that of the existing roadway. Embankment is being placed in the ditch line with a maximum height of 5 feet. The soft unstable organic material should be undercut to a maximum depth of 3 feet. The embankments may be constructed with locally available unspecified material utilizing a 3:1 slope configuration.

### Main Street

Between stations 601+00 to 606+00 the maximum embankment height is approximately 14 feet. The alignment traverses a wooded area that is seasonably wet. After clearing and prior to embankment construction the subgrade soils should be stabilized with 4% Portland cement (by dry wt.) mixed to a depth of 16 inches to provide a stable working platform. The embankment may be constructed with locally available unspecified material utilizing a 3:1 slope configuration.

Below is a table to summarize the locations of undercut and soil stabilization.

**Stabilization/Undercut Locations**

Station	Action	Amount	Description
185+00 – 196+00	Undercut	3 feet	Existing ditches
201+00 – 240+00	Undercut	3 feet	Full width, new location
500+24 – 504+00	Undercut	3 feet	Existing ditches
508+00 – 521+00	Undercut	3 feet	Existing ditches
524+00 – 526+00	Stabilize	4% Portland Cement	Full width, new location
526+00 – 532+00	Undercut	3 feet	Existing ditches
601+00 – 606+00	Stabilize	4% Portland Cement	Full width, new location

Listed below is the additional information requested for use in developing the plans:

1. The Qualified Products List (QPL) indicates that Aggregate Base Course (Class CL-7) is available from commercial producers located in the vicinity of Jenny Lind.

2. Asphalt Concrete Hot Mix for **PG 64-22**

Type	Asphalt Cement %	Mineral Aggregate %
Surface Course	5.8	94.2
Binder Course	4.6	95.4
Base Course	4.3	95.7

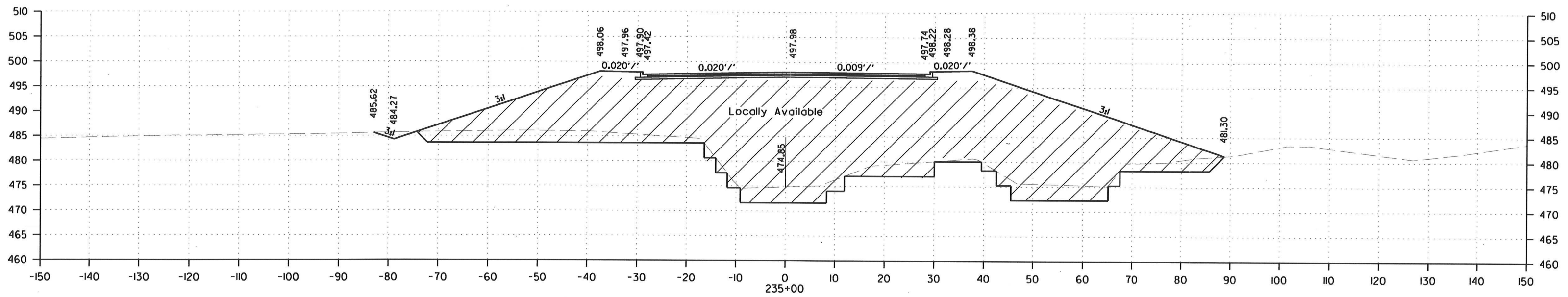
  
Paul Tinsley  
Materials Engineer

RPT:yz:bjj

Attachment

cc: State Constr. Eng. – Master File Copy  
District 4 Engineer  
System Information and Research  
G. C. File





JOB: 040861

## Arkansas State Highway Transporation Department

JOB NAME: HWY.10-HWY.96(GREENWOOD BYPASS)(S)

Materials Division

COUNTY NO. 65 DATE TESTED

Michael Benson, Materials Engineer

STA.#	LOC.	DEPTH	COLOR	#4	#10	#40	#80	#200	L.L.	P.I.	SOIL CLASS	LAB #:	%MOISTURE
				S	I	E	V	E					
245+00	25 RT	0-5	GRAY										
207+00	100 lt	0-5	GRAY										
207+00	100'LT	0-5	GRAY	68	55	47	45	39	25	8	A-4(1)	RV80	
245+00	25'RT	0-5	GAY	93	87	82	79	56	24	7	A-4(1)	RV81	
191+00	05 RT	0-5	BROWN	99	98	97	86	63	20	6	A-4(1)	S59	17.6
191+00	24 RT	0-5	GRAY	99	97	95	83	58	18	3	A-4(0)	S60	21
199+00	CL	0-5	BROWN	99	97	94	89	81	24	10	A-4(6)	S61	28.4
206+00	CL	0-5	GRAY	84	79	68	64	55	25	8	A-4(2)	S62	14
214+00	CL	0-5	BROWN	98	96	95	94	86	22	3	A-4(1)	S63	26.8
222+00	CL	0-5	BROWN		100	99	95	89	24	17	A-6(12)	S64	27.9
230+00	CL	0-5	BROWN				100	94	26	7	A-4(6)	S65	29
237+00	CL	0-5	BROWN				100	92	24	6	A-4(4)	S66	23.3
245+00	06 RT	0-5	BROWN	99	97	95	91	73	22	8	A-4(3)	S67	15.9
245+00	16 RT	0-5	BROWN	99	96	94	89	68	22	7	A-4(2)	S68	17.6
245+00	25 RT	0-5	BROWN	96	94	91	86	67	20	6	A-4(1)	S69	19.3
402+00	21 LT	0-5	BROWN	99	97	92	80	58	18	3	A-4(1)	S70	26.5
408+00	05 RT	0-5	BR/GR		100	96	85	62	24	10	A-4(3)	S71	18.1
408+00	15 RT	0-5	BR/GR	96	92	89	80	55	ND	NP	A-4(1)	S72	17.3
503+00	06 RT	0-5	BR/GR	98	95	91	86	74	32	12	A-6(7)	S73	20.7
511+00	05 LT	0-5	GRAY	97	92	88	86	77	21	5	A-4(1)	S74	19.5
511+00	18 LT	0-5	GRAY	99	98	97	96	88	22	6	A-4(3)	S75	19.1
511+00	30 LT	0-5	GRAY	86	74	72	68	59	28	11	A-6(4)	S76	16.4
519+00	06 RT	0-5	GRAY				100	90	22	5	A-4(3)	S77	32.1
519+00	16 RT	0-5	BR/GR	97	95	94	92	81	23	5	A-4(2)	S78	17.8
519+00	25 RT	0-5	BR/GR	94	87	81	77	68	30	8	A-4(4)	S79	20.9

comments: X:STRIPPED W=MULTIPLE LAYERS

Tuesday, August 02, 2022

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS  
MATERIALS DIVISION  
PAUL TINSLEY, MATERIALS ENGINEER  
\*\*\* SOIL SURVEY STRENGTH TEST REPORT \*\*\*

DATE - 07/13/2022  
JOB NUMBER - 040861

SEQUENCE NO. - 1  
MATERIAL CODE - SSRV  
SPEC. YEAR - 2014  
SUPPLIER ID. - 1  
COUNTY/STATE - 65  
DISTRICT NO. - 04

JOB NAME - HWY.10-HWY.96 (GREENWOOD BYPASS) (S)

\*\*\*\*\*  
\* STATION LIMITS R-VALUE AT 240 psi \*  
\*\*\*\*\*

BEGINJOB-END JOB

32

-----  
REMARKS -  
-

AASHTO TESTS : T190

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS  
MATERIALS DIVISION

PAUL TINSLEY, MATERIALS ENGINEER

\*\*\* SOIL SURVEY / PAVEMENT SOUNDING TEST REPORT \*\*\*

DATE	- 07/12/22	SEQUENCE NO.	- 2
JOB NUMBER	- 040861	MATERIAL CODE	- SSRVPS
FEDERAL AID NO.	- TO BE ASSIGNED	SPEC. YEAR	- 2014
PURPOSE	- SOIL SURVEY SAMPLE	SUPPLIER ID.	- 1
SPEC. REMARKS	- NO SPECIFICATION CHECK	COUNTY/STATE	- 65
SUPPLIER NAME	- STATE	DISTRICT NO.	- 04
NAME OF PROJECT	- HWY.10-HWY.96 (GREENWOOD BYPASS) (S)		
PROJECT ENGINEER	- NOT APPLICABLE		
PIT/QUARRY	- ARKANSAS		
LOCATION	- SEBASTIAN, COUNTY	DATE SAMPLED	- 04/07/22
SAMPLED BY	- d.thornton	DATE RECEIVED	- 04/07/22
SAMPLE FROM	- TEST HOLE	DATE TESTED	- 05/10/22
MATERIAL DESC.	- SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS		

LAB NUMBER	- 20220535	- 20220536	- 20220537
SAMPLE ID	- S62	- S63	- S64
TEST STATUS	- INFORMATION ONLY	- INFORMATION ONLY	- INFORMATION ONLY
STATION	- 206+00	- 214+00	- 222+00
LOCATION	- CL	- CL	- CL
DEPTH IN FEET	- 0-5	- 0-5	- 0-5
MAT'L COLOR	- GRAY	- BROWN	- BROWN
MAT'L TYPE	-	-	-
LATITUDE DEG-MIN-SEC	- 35 12 30.60	- 35 12 36.10	- 35 12 39.00
LONGITUDE DEG-MIN-SEC	- 94 15 24.50	- 94 15 17.50	- 94 15 8.70
% PASSING	2 IN. -	-	-
	1 1/2 IN. -	-	-
	3/4 IN. - 100	- 100	-
	3/8 IN. - 95	- 100	-
	NO. 4 - 84	- 98	-
	NO. 10 - 79	- 96	- 100
	NO. 40 - 68	- 95	- 99
	NO. 80 - 64	- 94	- 95
	NO. 200 - 55	- 86	- 89
LIQUID LIMIT	- 25	- 22	- 24
PLASTICITY INDEX	- 8	- 3	- 17
AASHTO SOIL	- A-4 (2)	- A-4 (1)	- A-6 (12)
UNIFIED SOIL	-	-	-
% MOISTURE CONTENT	- 14.0	- 26.8	- 27.9
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-

REMARKS - X:STRIPPED W=MULTIPLE LAYERS

-  
-  
-  
-

AASHTO TESTS : T24 T88 T89 T90 T265

:



ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS  
MATERIALS DIVISION

PAUL TINSLEY, MATERIALS ENGINEER

\*\*\* SOIL SURVEY / PAVEMENT SOUNDING TEST REPORT \*\*\*

DATE	- 07/12/22	SEQUENCE NO.	- 1
JOB NUMBER	- 040861	MATERIAL CODE	- SSRVPS
FEDERAL AID NO.	- TO BE ASSIGNED	SPEC. YEAR	- 2014
PURPOSE	- SOIL SURVEY SAMPLE	SUPPLIER ID.	- 1
SPEC. REMARKS	- NO SPECIFICATION CHECK	COUNTY/STATE	- 65
SUPPLIER NAME	- STATE	DISTRICT NO.	- 04
NAME OF PROJECT	- HWY.10-HWY.96 (GREENWOOD BYPASS) (S)		
PROJECT ENGINEER	- NOT APPLICABLE		
PIT/QUARRY	- ARKANSAS		
LOCATION	- SEBASTIAN, COUNTY	DATE SAMPLED	- 04/07/22
SAMPLED BY	- d.thornton	DATE RECEIVED	- 04/07/22
SAMPLE FROM	- TEST HOLE	DATE TESTED	- 05/10/22
MATERIAL DESC.	- SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS		

LAB NUMBER	- 20220532	- 20220533	- 20220534
SAMPLE ID	- S59	- S60	- S61
TEST STATUS	- INFORMATION ONLY	- INFORMATION ONLY	- INFORMATION ONLY
STATION	- 191+00	- 191+00	- 199+00
LOCATION	- 05 RT	- 24 RT	- CL
DEPTH IN FEET	- 0-5	- 0-5	- 0-5
MAT'L COLOR	- BROWN	- GRAY	- BROWN
MAT'L TYPE	-	-	-
LATITUDE DEG-MIN-SEC	- 35 12 24.80	- 35 12 24.70	- 35 12 26.50
LONGITUDE DEG-MIN-SEC	- 94 15 40.70	- 94 15 40.70	- 94 15 31.20

% PASSING	2 IN.	-	-
	1 1/2 IN.	-	-
	3/4 IN.	-	-
	3/8 IN.	-	-
	100	-	100
NO. 4	- 99	-	99
NO. 10	- 98	-	97
NO. 40	- 97	-	95
NO. 80	- 86	-	83
NO. 200	- 63	-	58

LIQUID LIMIT	- 20	- 18	- 24
PLASTICITY INDEX	- 6	- 3	- 10
AASHTO SOIL	- A-4 (1)	- A-4 (0)	- A-4 (6)
UNIFIED SOIL	-	-	-
% MOISTURE CONTENT	- 17.6	- 21.0	- 28.4

BST	(IN)	- .5	- --
ACHMSC	(IN)	- 3.75W	- --
AGG BASE CRS CL5	(IN)	- 12.0	- --
		-	-
		-	-
		-	-
		-	-
		-	-
		-	-
		-	-

REMARKS - X:STRIPPED W=MULTIPLE LAYERS

AASHTO TESTS : T24 T88 T89 T90 T265

:

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS  
MATERIALS DIVISION

PAUL TINSLEY, MATERIALS ENGINEER

\*\*\* SOIL SURVEY / PAVEMENT SOUNDING TEST REPORT \*\*\*

DATE	- 07/12/22	SEQUENCE NO.	- 3
JOB NUMBER	- 040861	MATERIAL CODE	- SSRVPS
FEDERAL AID NO.	- TO BE ASSIGNED	SPEC. YEAR	- 2014
PURPOSE	- SOIL SURVEY SAMPLE	SUPPLIER ID.	- 1
SPEC. REMARKS	- NO SPECIFICATION CHECK	COUNTY/STATE	- 65
SUPPLIER NAME	- STATE	DISTRICT NO.	- 04
NAME OF PROJECT - HWY.10-HWY.96 (GREENWOOD BYPASS) (S)			
PROJECT ENGINEER - NOT APPLICABLE			
PIT/QUARRY	- ARKANSAS		
LOCATION	- SEBASTIAN, COUNTY	DATE SAMPLED	- 04/07/22
SAMPLED BY	- d.thornton	DATE RECEIVED	- 04/07/22
SAMPLE FROM	- TEST HOLE	DATE TESTED	- 05/10/22
MATERIAL DESC. - SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS			

LAB NUMBER	- 20220538	- 20220539	- 20220540
SAMPLE ID	- S65	- S66	- S67
TEST STATUS	- INFORMATION ONLY	- INFORMATION ONLY	- INFORMATION ONLY
STATION	- 230+00	- 237+00	- 245+00
LOCATION	- CL	- CL	- 06 RT
DEPTH IN FEET	- 0-5	- 0-5	- 0-5
MAT'L COLOR	- BROWN	- BROWN	- BROWN
MAT'L TYPE	-	-	-
LATITUDE DEG-MIN-SEC	- 35 12 37.70	- 35 12 35.10	- 35 12 35.90
LONGITUDE DEG-MIN-SEC	- 94 14 59.30	- 94 14 51.60	- 94 14 42.50
% PASSING	2 IN. -	-	-
	1 1/2 IN. -	-	-
	3/4 IN. -	-	-
	3/8 IN. -	-	-
	NO. 4 -	-	100
	NO. 10 -	-	99
	NO. 40 -	-	97
	NO. 80 -	100	95
	NO. 200 -	94	91
		92	73
LIQUID LIMIT	- 26	- 24	- 22
PLASTICITY INDEX	- 7	- 6	- 8
AASHTO SOIL	- A-4 (6)	- A-4 (4)	- A-4 (3)
UNIFIED SOIL	-	-	-
% MOISTURE CONTENT	- 29.0	- 23.3	- 15.9
ACHM SC (IN)	- --	- --	- 5.5W
SOIL CEMENT (IN)	- --	- --	- 1.5
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-

REMARKS - X:STRIPPED W=MULTIPLE LAYERS

-  
-  
-  
-

AASHTO TESTS : T24 T88 T89 T90 T265

:

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS  
MATERIALS DIVISION

PAUL TINSLEY, MATERIALS ENGINEER

\*\*\* SOIL SURVEY / PAVEMENT SOUNDING TEST REPORT \*\*\*

DATE	-	07/12/22	SEQUENCE NO.	-	4
JOB NUMBER	-	040861	MATERIAL CODE	-	SSRVPS
FEDERAL AID NO.	-	TO BE ASSIGNED	SPEC. YEAR	-	2014
PURPOSE	-	SOIL SURVEY SAMPLE	SUPPLIER ID.	-	1
SPEC. REMARKS	-	NO SPECIFICATION CHECK	COUNTY/STATE	-	65
SUPPLIER NAME	-	STATE	DISTRICT NO.	-	04
NAME OF PROJECT	-	HWY.10-HWY.96 (GREENWOOD BYPASS) (S)			
PROJECT ENGINEER	-	NOT APPLICABLE			
PIT/QUARRY	-	ARKANSAS			
LOCATION	-	SEBASTIAN, COUNTY			
SAMPLED BY	-	d.thornton	DATE SAMPLED	-	04/07/22
SAMPLE FROM	-	TEST HOLE	DATE RECEIVED	-	04/07/22
			DATE TESTED	-	05/10/22
MATERIAL DESC.	-	SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS			

LAB NUMBER	-	20220541	-	20220542	-	20220543
SAMPLE ID	-	S68	-	S69	-	S70
TEST STATUS	-	INFORMATION ONLY	-	INFORMATION ONLY	-	INFORMATION ONLY
STATION	-	245+00	-	245+00	-	402+00
LOCATION	-	16 RT	-	25 RT	-	21 LT
DEPTH IN FEET	-	0-5	-	0-5	-	0-5
MAT'L COLOR	-	BROWN	-	BROWN	-	BROWN
MAT'L TYPE	-		-		-	
LATITUDE DEG-MIN-SEC	-	35 12 35.80	-	35 12 35.80	-	35 12 22.20
LONGITUDE DEG-MIN-SEC	-	94 14 42.40	-	94 14 42.40	-	94 15 35.10

% PASSING	2	IN.	-		-		
	1 1/2	IN.	-		-		
	3/4	IN.	-	100	-		
	3/8	IN.	-	98	-	100	
	NO. 4	-	99	-	96	-	99
	NO. 10	-	96	-	94	-	97
	NO. 40	-	94	-	91	-	92
	NO. 80	-	89	-	86	-	80
	NO. 200	-	68	-	67	-	58

LIQUID LIMIT	-	22	-	20	-	18
PLASTICITY INDEX	-	7	-	6	-	3
AASHTO SOIL	-	A-4 (2)	-	A-4 (1)	-	A-4 (1)
UNIFIED SOIL	-		-		-	
% MOISTURE CONTENT	-	17.6	-	19.3	-	26.5

ACHMSC	(IN)	-	2.0	-	--	-	--
ACHMSC	(IN)	-	.25X	-	--	-	--
ACHMSC	(IN)	-	1.0	-	--	-	--
AGG BASE CRS CL5	(IN)	-	6.0	-	--	-	--
		-		-		-	
		-		-		-	
		-		-		-	
		-		-		-	
		-		-		-	

REMARKS - X:STRIPPED W=MULTIPLE LAYERS

AASHTO TESTS : T24 T88 T89 T90 T265  
:

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS  
MATERIALS DIVISION

PAUL TINSLEY, MATERIALS ENGINEER

\*\*\* SOIL SURVEY / PAVEMENT SOUNDING TEST REPORT \*\*\*

DATE	- 07/12/22	SEQUENCE NO.	- 5
JOB NUMBER	- 040861	MATERIAL CODE	- SSRVPS
FEDERAL AID NO.	- TO BE ASSIGNED	SPEC. YEAR	- 2014
PURPOSE	- SOIL SURVEY SAMPLE	SUPPLIER ID.	- 1
SPEC. REMARKS	- NO SPECIFICATION CHECK	COUNTY/STATE	- 65
SUPPLIER NAME	- STATE	DISTRICT NO.	- 04
NAME OF PROJECT	- HWY.10-HWY.96 (GREENWOOD BYPASS) (S)		
PROJECT ENGINEER	- NOT APPLICABLE		
PIT/QUARRY	- ARKANSAS		
LOCATION	- SEBASTIAN, COUNTY	DATE SAMPLED	- 04/07/22
SAMPLED BY	- d.thornton	DATE RECEIVED	- 04/07/22
SAMPLE FROM	- TEST HOLE	DATE TESTED	- 05/10/22
MATERIAL DESC.	- SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS		

LAB NUMBER	- 20220544	- 20220545	- 20220546
SAMPLE ID	- S71	- S72	- S73
TEST STATUS	- INFORMATION ONLY	- INFORMATION ONLY	- INFORMATION ONLY
STATION	- 408+00	- 408+00	- 503+00
LOCATION	- 05 RT	- 15 RT	- 06 RT
DEPTH IN FEET	- 0-5	- 0-5	- 0-5
MAT'L COLOR	- BR/GR	- BR/GR	- BR/GR
MAT'L TYPE	-	-	-
LATITUDE DEG-MIN-SEC	- 35 12 28.50	- 35 12 28.50	- 35 12 44.50
LONGITUDE DEG-MIN-SEC	- 94 15 34.60	- 94 15 34.50	- 94 15 11.70
% PASSING	2 IN. -	-	-
	1 1/2 IN. -	-	-
	3/4 IN. -	- 100	- 100
	3/8 IN. -	- 99	- 99
	NO. 4 -	- 96	- 98
	NO. 10 - 100	- 92	- 95
	NO. 40 - 96	- 89	- 91
	NO. 80 - 85	- 80	- 86
	NO. 200 - 62	- 55	- 74
LIQUID LIMIT	- 24	- ND	- 32
PLASTICITY INDEX	- 10	- NP	- 12
AASHTO SOIL	- A-4 (3)	- A-4 (1)	- A-6 (7)
UNIFIED SOIL	-	-	-
% MOISTURE CONTENT	- 18.1	- 17.3	- 20.7
ACHMSC (IN)	- 4.75W	- 2.0	- 12.0W
ACHMBC (IN)	- --	- 2.0	- --
PCCP (IN)	- 6.0	- --	- 8.0
AGG BASE CRS CL5 (IN)	- --	- 8.0	- --
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-

REMARKS - X:STRIPPED W=MULTIPLE LAYERS

AASHTO TESTS : T24 T88 T89 T90 T265

:



ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS  
MATERIALS DIVISION

PAUL TINSLEY, MATERIALS ENGINEER

\*\*\* SOIL SURVEY / PAVEMENT SOUNDING TEST REPORT \*\*\*

DATE	- 06/23/22	SEQUENCE NO.	- 6
JOB NUMBER	- 040861	MATERIAL CODE	- SSRVPS
FEDERAL AID NO.	- TO BE ASSIGNED	SPEC. YEAR	- 2014
PURPOSE	- SOIL SURVEY SAMPLE	SUPPLIER ID.	- 1
SPEC. REMARKS	- NO SPECIFICATION CHECK	COUNTY/STATE	- 65
SUPPLIER NAME	- STATE	DISTRICT NO.	- 04
NAME OF PROJECT	- HWY.10-HWY.96 (GREENWOOD BYPASS) (S)		
PROJECT ENGINEER	- NOT APPLICABLE		
PIT/QUARRY	- ARKANSAS		
LOCATION	- SEBASTIAN, COUNTY	DATE SAMPLED	- 04/07/22
SAMPLED BY	- d.thornton	DATE RECEIVED	- 04/07/22
SAMPLE FROM	- TEST HOLE	DATE TESTED	- 05/10/22
MATERIAL DESC.	- SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS		
LAB NUMBER	- 20220547	- 20220548	- 20220549
SAMPLE ID	- S74	- S75	- S76
TEST STATUS	- INFORMATION ONLY	- INFORMATION ONLY	- INFORMATION ONLY
STATION	- 511+00	- 511+00	- 511+00
LOCATION	- 05 LT	- 18 LT	- 30 LT
DEPTH IN FEET	- 0-5	- 0-5	- 0-5
MAT'L COLOR	- GRAY	- GRAY	- GRAY
MAT'L TYPE	-	-	-
LATITUDE DEG-MIN-SEC	- 35 12 43.60	- 35 12 43.70	- 35 12 43.80
LONGITUDE DEG-MIN-SEC	- 94 15 3.10	- 94 15 3.10	- 94 15 3.10
% PASSING	2 IN. -	-	-
	1 1/2 IN. -	-	-
	3/4 IN. - 100	-	- 100
	3/8 IN. - 99	- 100	- 90
	NO. 4 - 97	- 99	- 86
	NO. 10 - 92	- 98	- 74
	NO. 40 - 88	- 97	- 72
	NO. 80 - 86	- 96	- 68
	NO. 200 - 77	- 88	- 59
LIQUID LIMIT	- 21	- 22	- 28
PLASTICITY INDEX	- 5	- 6	- 11
AASHTO SOIL	- A-4 (1)	- A-4 (3)	- A-6 (4)
UNIFIED SOIL	-	-	-
% MOISTURE CONTENT	- 19.5	- 19.1	- 16.4
ACHM SC (IN)	- 1.25	- 3.0W	- --
AGG BASE CRS CL7 (IN)	- 2.0	- --	- --
AGG BASE CRS CL5 (IN)	- --	- 6.0	- --
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-

REMARKS - X:STRIPPED W=MULTIPLE LAYERS

-  
-  
-  
-

AASHTO TESTS : T24 T88 T89 T90 T265

:

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS  
MATERIALS DIVISION

PAUL TINSLEY, MATERIALS ENGINEER

\*\*\* SOIL SURVEY / PAVEMENT SOUNDING TEST REPORT \*\*\*

DATE	-	07/12/22	SEQUENCE NO.	-	7
JOB NUMBER	-	040861	MATERIAL CODE	-	SSRVPS
FEDERAL AID NO.	-	TO BE ASSIGNED	SPEC. YEAR	-	2014
PURPOSE	-	SOIL SURVEY SAMPLE	SUPPLIER ID.	-	1
SPEC. REMARKS	-	NO SPECIFICATION CHECK	COUNTY/STATE	-	65
SUPPLIER NAME	-	STATE	DISTRICT NO.	-	04
NAME OF PROJECT	-	HWY.10-HWY.96 (GREENWOOD BYPASS) (S)			
PROJECT ENGINEER	-	NOT APPLICABLE			
PIT/QUARRY	-	ARKANSAS			
LOCATION	-	SEBASTIAN, COUNTY	DATE SAMPLED	-	04/07/22
SAMPLED BY	-	d.thornton	DATE RECEIVED	-	04/07/22
SAMPLE FROM	-	TEST HOLE	DATE TESTED	-	05/10/22
MATERIAL DESC.	-	SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS			

LAB NUMBER	-	20220550	-	20220551	-	20220552
SAMPLE ID	-	S77	-	S78	-	S79
TEST STATUS	-	INFORMATION ONLY	-	INFORMATION ONLY	-	INFORMATION ONLY
STATION	-	519+00	-	519+00	-	519+00
LOCATION	-	06 RT	-	16 RT	-	25 RT
DEPTH IN FEET	-	0-5	-	0-5	-	0-5
MAT'L COLOR	-	GRAY	-	BR/GR	-	BR/GR
MAT'L TYPE	-		-		-	
LATITUDE DEG-MIN-SEC	-	35 12 40.40	-	35 12 40.40	-	35 12 40.40
LONGITUDE DEG-MIN-SEC	-	94 14 54.10	-	94 14 54.10	-	94 14 54.20

% PASSING	2	IN.	-		-	
	1 1/2	IN.	-		-	
	3/4	IN.	-	100	-	100
	3/8	IN.	-	99	-	99
	NO. 4		-	97	-	94
	NO. 10		-	95	-	87
	NO. 40		-	94	-	81
	NO. 80	100	-	92	-	77
	NO. 200	90	-	81	-	68

LIQUID LIMIT	-	22	-	23	-	30
PLASTICITY INDEX	-	5	-	5	-	8
AASHTO SOIL	-	A-4 (3)	-	A-4 (2)	-	A-4 (4)
UNIFIED SOIL	-		-		-	
% MOISTURE CONTENT	-	32.1	-	17.8	-	20.9

ACHM SC	(IN)	-	9.5W	-	4.0W	-	--
ACHM BC	(IN)	-	1.5	-	--	-	--
ACHM BC	(IN)	-	4.0	-	--	-	--
AGG BASE CRS CL5	(IN)	-	6.0	-	6.0	-	--
		-		-		-	
		-		-		-	
		-		-		-	
		-		-		-	
		-		-		-	
		-		-		-	

REMARKS - X:STRIPPED W=MULTIPLE LAYERS

AASHTO TESTS : T24 T88 T89 T90 T265  
:

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS  
MATERIALS DIVISION

PAUL TINSLEY, MATERIALS ENGINEER

\*\*\* SOIL SURVEY / PAVEMENT SOUNDING TEST REPORT \*\*\*

DATE	- 06/23/22	SEQUENCE NO.	- 8
JOB NUMBER	- 040861	MATERIAL CODE	- SSRVPS
FEDERAL AID NO.	- TO BE ASSIGNED	SPEC. YEAR	- 2014
PURPOSE	- SOIL SURVEY SAMPLE	SUPPLIER ID.	- 1
SPEC. REMARKS	- NO SPECIFICATION CHECK	COUNTY/STATE	- 65
SUPPLIER NAME	- STATE	DISTRICT NO.	- 04
NAME OF PROJECT - HWY.10-HWY.96 (GREENWOOD BYPASS) (S)			
PROJECT ENGINEER - NOT APPLICABLE			
PIT/QUARRY	- ARKANSAS		
LOCATION	- SEBASTIAN, COUNTY	DATE SAMPLED	- 04/07/22
SAMPLED BY	- d.thornton	DATE RECEIVED	- 04/07/22
SAMPLE FROM	- TEST HOLE	DATE TESTED	- 05/10/22
MATERIAL DESC. - SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS			

LAB NUMBER	- 20220553	- 20220554	-
SAMPLE ID	- RV80	- RV81	-
TEST STATUS	- INFORMATION ONLY	- INFORMATION ONLY	-
STATION	- 207+00	- 245+00	-
LOCATION	- 100'LT	- 25'RT	-
DEPTH IN FEET	- 0-5	- 0-5	-
MAT'L COLOR	- GRAY	- GAY	-
MAT'L TYPE	-	-	-
LATITUDE DEG-MIN-SEC	- 35 12 31.30	- 35 12 35.80	-
LONGITUDE DEG-MIN-SEC	- 94 15 25.50	- 94 14 42.40	-
% PASSING	2 IN. -	-	-
	1 1/2 IN. - 100	-	-
	3/4 IN. - 92	-	-
	3/8 IN. - 85	- 100	-
	NO. 4 - 68	- 93	-
	NO. 10 - 55	- 87	-
	NO. 40 - 47	- 82	-
	NO. 80 - 45	- 79	-
	NO. 200 - 39	- 56	-
LIQUID LIMIT	- 25	- 24	-
PLASTICITY INDEX	- 8	- 7	-
AASHTO SOIL	- A-4 (1)	- A-4 (1)	-
UNIFIED SOIL	-	-	-
% MOISTURE CONTENT	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-

REMARKS -  
-  
-  
-  
-

AASHTO TESTS : T24 T88 T89 T90 T265  
: