

ARKANSAS DEPARTMENT OF TRANSPORTATION



SUBSURFACE INVESTIGATION

STATE JOB NO. 061741

FEDERAL AID PROJECT NO. NHPP-0030(33)

I-30 STR. & APPRS. (HWY. 283) (S)

STATE HIGHWAY 283 SECTION 3

IN HOT SPRING 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.



December 12, 2023

TO: Mr. Rick Ellis, Bridge Engineer
SUBJECT: Job No. 061741
I-30 Str. & Apprs. (Hwy. 283) (S)
Hot Spring County
Route 283, Section 3

INTRODUCTION

Submitted herein are results of the subsurface investigation and geotechnical recommendations developed for the proposed replacement bridge planned on Hwy. 283 over Interstate 30 in Hot Spring County.

The project consists of constructing a new bridge to replace the existing bridge spanning Interstate 30. The proposed structure will be 242 feet in total length and consist of a 240-foot Continuous Composite Plate Girder Unit. The proposed structure will have an out-to-out width of 36.5 feet. The proposed alignment will be located northeast of the existing bridge.

Based on the geotechnical investigation request from Bridge Division, foundation loads are expected to be supported on spread footings or drilled shafts at the intermediate bents and drilled shafts at the end bents. 2-Horizontal to 1-Vertical (2H:1V) end slopes and 3H:1V side slopes are planned at the proposed abutment. Abutment slopes will be constructed utilizing cut and up to 3 feet of fill with a maximum embankment height of 6 to 8 feet.

FIELD INVESTIGATION

A subsurface investigation was requested on April 25, 2023 by Bridge Division to develop recommendations for bridge foundations and abutment slopes. Eight (8) borings were requested and six (6) borings were drilled.

The approximate locations of the borings are presented in the Plan of Borings included in Attachment A. The borings were advanced with a truck-mounted CME 75 rotary drill rig using a combination of hollow-stem auger and rock coring drilling methods. The boring logs showing the subsurface conditions and the results of field and laboratory tests are also included in Attachment A immediately following the Plan of Borings. A legend is attached following the boring logs to describe 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. The correction factor for the hammer is indicated on the boring logs. Liners were not used inside the standard split-barrel samplers.

The number of blows required to drive the standard split-barrel sampler for each 6-inch increment of the total 18-inch drive were measured and recorded on the boring logs. SPT N-values are defined as the total number of blows required to advance the split barrel sampler the final 12 inches of the total 18-inch drive depth. The SPT N-values indicated on the logs are raw (uncorrected) blow counts measured in the field. Groundwater was also observed during the drilling process. Groundwater observations are noted on the logs.

Core samples of bedrock were retrieved 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, Total Core Recovery (TCR) and Rock Quality Designation (RQD) was determined in the field and further evaluated by licensed Professional Geologists (PG). TCR, expressed as a percent, is defined as the sum of all intact core pieces divided by the total length of the core run. RQD, also expressed as a percent, is defined as the sum of all intact core pieces that are longer than 4 in. divided by the total length of the core run. TCR and RQD values of each core run are indicated on each corresponding boring log. Core pictures are also included in Attachment A, following the boring logs and legend.

LAB INVESTIGATION

All samples were brought to the Materials Division laboratory for further evaluation and testing. These samples were tested to evaluate index 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 a licensed Professional Geologist in accordance with both USCS and AASHTO soil classification systems.

Rock cores were first examined by a licensed PG to verify TCR and RQD measured in the field and to obtain parameters for determination of Geological Strength Index (GSI) and RMR. Compressive strength of rock cores was then determined by laboratory uniaxial compressive tests on intact rock cores in accordance with ASTM D7012, Method C. Results of uniaxial compressive tests and Rock Mass Ratings (RMR) are included in Attachment B.

These test results are plotted or indicated on the logs using appropriate denotation (symbols in accordance with scale, number, text, etc.). Table 1 lists the laboratory tests; their corresponding ASTM and AASHTO test methods, and respective denotation on logs.

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 Distribution	D6913	T 88	Whole Number in the "Percent Passing No. 200 Sieve" Column (e.g., 12)
Atterberg Limits	D4318	T 89	Plus Symbol (+) on the Right for Liquid Limit
		T 90	Plus Symbol (+) on the Left for Plastic Limit
Uniaxial Compression of Rock Cores	D7012, Method C		

SITE CONDITIONS

The existing bridge (No. 03896) is 231 feet long, 31.5 feet wide and consists of steel I-beam spans supported by concrete pile bents. The existing bridge is located approximately 130 feet southwest of the proposed bridge. Site pictures for Highway 283 over Interstate 30 are included in Attachment C.



SITE GEOLOGY AND GENERAL SUBSURFACE CONDITIONS

The proposed job site is located in the Ouachita Mountain Region just north of the City of Friendship. The proposed overpass is to be located over Interstate 30 and will parallel the existing overpass on the northeast side.

This area is mapped as terrace deposits overlying the Jackfork Formation. The terrace deposits consist of very stiff to hard sandy clay to loose to very dense clayey sand. Some samples in this zone contained rock fragments. Depth to bedrock in borings varies from ground surface to 11.6 feet below ground level (bgl).

According to the Arkansas Office of the State Geologist stratigraphic summary of the Arkansas River Valley and Ouachita Mountains, the Jackfork Sandstone is thin to massive-bedded, fine to coarse-grained, brown, tan, or bluish-gray quartzitic sandstones with subordinate brown, silty sandstones and gray-black shales. Toward the north of its outcrop area the shale units of the lower and middle Jackfork Sandstone take up more of the section and the sandstones are more lenticular, often occurring as chaotic masses in the shale. Minor conglomerates composed of quartz, chert, and metaquartzite occur notably in the southern exposures of the formation. The Jackfork Sandstone rests conformably on the Stanley Shale and varies between 3,500 to 6,000 feet in thickness.

Bedrock and bedrock depth varies greatly across the proposed job site. Bedrock at this site has been deformed by the Ouachita Mountain building process causing the bedrock to steeply dip towards the south. Bedrock at this site is primarily sandstones with lesser amounts of shale. In general, the shales are poor quality rock from soft to medium hard with slickensides. In contrast, the sandstones, in general, are good quality and are cemented to well cemented (not capable of being scratched with a knife). Much of the well cemented sandstone can be considered quartzite, a very hard quartz-cemented rock. There are also thin layers encountered in the borings that are very poorly cemented and are friable.

At some locations, the sandstones in the Jackfork Formation have been cemented to quartzite forming some of the hardest rock in the state. Only thin quartz veins were encountered in borings, but the Jackfork is known for having very thick quartz veins. **Variable subsurface conditions should be anticipated ranging from quartzite and quartz veins to soft shale to poorly cemented sand.** A generalized Subsurface Profile is included in Attachment D to aid in visualizing subsurface conditions and stratigraphy. Considering natural variations in stratigraphy and subsurface conditions, deviation from these illustrated on the profile must be anticipated. Estimated elevations of competent rock are listed in Table 2.

Table 2: Estimated Elevation of Competent Rock

Boring No.	Boring Location	Ground Surf. Elev.@ Boring Location, ft.	Estimated Elev. of Competent Rock, ft.
1	Sta. 110+40, 16' RT	381.4	357.0
2	Sta. 110+42, 16' LT	382.8	363.5
3	Sta. 111+87, 13' RT	357.0	348.5
4	Sta. 111+87, 13' LT	357.7	350.0
5	Sta. 113+07, 16' RT	375.0	371.0
6	Sta. 113+13, 10' LT	376.8	354.0

SEISMIC CONDITIONS

Seismic Site Class and Seismic Performance Zone – In light of the average subsurface conditions as revealed by the borings, a **Seismic Site Class C (Very Dense Soil and Soft Rock Profile)** was calculated for the proposed bridge over Interstate 30. Utilizing the Seismic Site Class C and the approximate GPS coordinates of the project site, 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}), were determined. These seismic coefficients are summarized in Table 3. For the design long-period spectral acceleration coefficient (S_{D1}) of 0.112g, a **Seismic Performance Zone 1** is considered applicable.

Table 3: Design Ground Motion Acceleration Response Coefficients

Acceleration Coefficient	Value (g)
A_s (Site PGA)	0.099
S_{DS} (0.2 sec)	0.226
S_{D1} (1 sec)	0.112

Design Response Spectrum is presented in Attachment E.

APPROACH EMBANKMENTS

Embankment Configuration – As noted, 2H:1V end slopes and 3H:1V side slopes are planned for the proposed embankments. Abutment slopes will be constructed utilizing cut and up to 3 feet of fill with a maximum embankment height of 6 to 8 feet.

Settlement Potential – The underlying soils mainly comprise of Clayey Sand or Sandy Clay with varying amounts of Rock Fragments. It is anticipated that most of the settlement that occurs will be elastic settlement and will take place shortly after loading is applied. Long-Term consolidation settlement is expected to be minimal.

Approach Stability – Slope stability analyses were performed utilizing a commercial computer program Slide2 (Version 2021) developed by RocScience. Spencer analysis method was utilized to analyze both bridge abutments. Three 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 0.0495 (0.5

A_s/g) was utilized for analysis of the Seismic/Pseudo-Static Condition. A surcharge of 250 psf was used to model the live load in the Long-Term Condition.

Slope stability analyses were performed on the 2H:1V end slopes at the northwest abutment (Bent 1) and the southeast abutment (Bent 3), to evaluate suitability of the plan configuration. Table 4 includes the results of the slope stability analyses with the plan embankment layout. Slope stability analyses results are included in Attachment F.

Table 4: Results of Slope Stability Analyses Utilizing Plan Configuration

Design Condition	Factor of Safety		Recommended Factor of Safety
	Northwest Embankment	Southeast Embankment	
End of Construction (Short Term)	2.57	5.47	1.3
Long Term	1.54	1.64	1.5
Pseudo-Static (Seismic)	2.24	4.75	1.1

Based on results from the slope stability analyses, plan configuration of the embankments are suitable.

FOUNDATION RECOMMENDATIONS

Based on discussions with Bridge Division, spread footings or drilled shafts will be utilized to support the foundation loads at the intermediate bent (Bent 2), and Drilled Shafts are planned at the end bents (Bents 1 and 3).

Spread Footings (Bent 2) – It is understood that spread footings are preferred to support foundation loads at the intermediate bent where rock is less than 15 feet bgl. It is recommended that spread footings be embedded a minimum of 2 feet into competent, slightly weathered to unweathered rock. Based on the results of the borings and our field observations, spread footings founded a minimum of 2 feet into competent, slightly weathered to unweathered rock is a suitable foundation for the intermediate bents. Recommended shallowest footing bottom elevations are summarized below in Table 5. Other foundation types can be evaluated upon request.

Table 5: Bearing Capacity of Competent Rock

Boring No.	Estimated Elev. of Competent Rock, ft	Recommended Shallowest Footing Bottom Elevation
3	348.5	346.5
4	350.0	348.0

It is recommended a maximum nominal bearing capacity of 60 ksf be utilized for spread footings embedded at least 2 feet into competent slightly weathered to unweathered foundation rock. A resistance factor (ϕ_b) of 0.45 is considered suitable for evaluation of factored bearing resistance of spread footings on rock. Consequently, a maximum factored bearing capacity of 27



ksf is suitable. Post-construction settlement of spread footings founded in competent rock is expected to be negligible.

Uplift resistance can be provided by footing self-weight and structure dead loads. Footings may be sized to negate the factored uplift loads. It is understood footings are designed to provide adequate uplift resistance and rock anchors are not needed. If additional uplift resistance is needed, rock anchors can be utilized. Recommendations of rock anchors can be provided upon request.

Lateral resistance of spread footings can be evaluated utilizing a maximum nominal coefficient of friction ($\tan\delta$) of 0.70 for concrete footings on competent rock and a resistance factor for sliding (ϕ_r) of 0.85. Additional lateral resistance may be provided by passive resistance of the foundation rock that is in hard contact with the spread footings. Passive resistance from any overburden soils, highly weathered rock, and the upper 2 feet of foundation rock should be neglected from passive resistance evaluation. Factored passive resistance can be provided upon request.

Any underground utilities in the plan footing excavation areas should be completely removed or relocated and properly backfilled to prevent seepage into excavation bottom. At a minimum, sump pumps should be utilized to remove any water seepage into the excavation bottom. Rock excavation techniques, other than ripping, can be expected to reach plan footing bottom elevation. Any footing over-excavation should be properly backfilled with Class S concrete.

Drilled Shafts (Bents 1, 2 & 3) – Drilled shafts are planned to support foundation loads at the end bents (Bent 1 and 3). It is also understood that drilled shafts are considered as an alternative foundation type at the intermediate bent (Bent 2) in lieu of spread footings.

Drilled shafts should be founded a minimum of two shaft diameters into the competent weathered to slightly weathered sandstone. 6.5-foot diameter and 3-foot diameter shafts are planned at the intermediate and end bents, socketed 13 and 6 feet into competent rock, respectively. A summary of factored Axial Resistance is included in Table 7. A resistance factor (ϕ) of 0.50 was utilized from AASHTO LRFD (2014) Table 10.5.5.2.4-1 to determine the Factored Axial Resistance and the Factored Side Resistance.

It is recommended the drilled shafts be designed utilizing the estimated elevation of competent rock summarized in Table 2 and a rock socket of minimum two shaft diameters into the competent rock. Actual competent rockline elevation at the drilled shaft locations can vary and must be field verified. Depending on specific rock quality, deepening or shortening of shaft length can be warranted. Settlement of properly constructed drilled shafts founded into the competent rock should be negligible.

Table 6. Recommended Shallowest Tip Elevation of Drilled Shafts

Bent	Boring Location	Plan Shaft Diameter, ft	Estimated Elev. Of Competent Rock, ft	Recommended Shallowest Tip Elev., ft
1	110+40, 16' RT	3.0	357.0	351.0
1	110+42, 16' LT	3.0	363.5	357.5
2	111+87, 13' RT	6.5	348.5	335.5
2	111+87, 13' LT	6.5	350.0	337.0
3	113+07, 16' RT	3.0	371.0	365.0
3	113+20, 10' LT	3.0	354.0	348.0

A maximum nominal bearing capacity (q_p) of 120 ksf is recommended for drilled shafts founded as described in Table 6. A resistance factor (ϕ_{stat}) of 0.50 is considered suitable for drilled shaft tip resistance. Due to the roughness of the shaft side wall after drilling and the rate of deterioration of the shale mass once exposed to the atmosphere, it is recommended that shaft side resistance be neglected. Applying the resistance factor to the nominal tip resistance results in a maximum factored tip resistance (q_R) of 60 ksf.

If there are any questions concerning these recommendations, please contact the Materials Division.



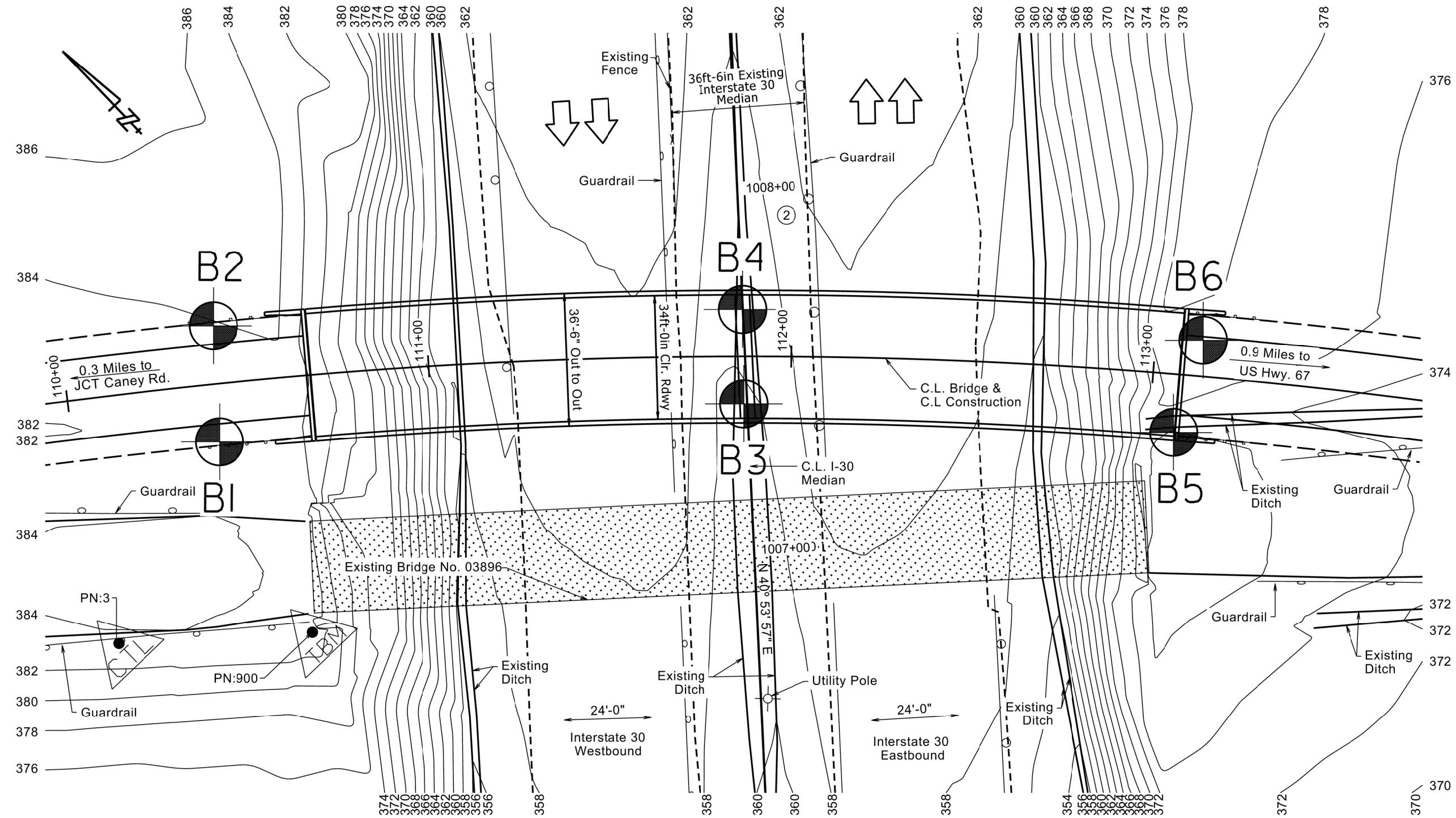
Paul Tinsley
Materials Engineer

PT:yz:pjt:cjs

cc: State Construction Engineer
District 6 Engineer
G. C. File

Attachment A

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	AR			
JOB NO.		061741		
PLAN OF BORINGS				



Plan

PLAN OF BORINGS	
I-30 STR. & APPRS. (HWY. 283)(S) ROUTE 283, SECTION 3 HOT SPRING COUNTY FED. AID PROJECT	
JOB NO. 061741	SHEET 1/1
NOT TO SCALE	

**ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SECTION**

BORING NO. 1

PAGE 1 OF 2

JOB NO. 061741 Hot Spring County
JOB NAME: I-30 Str. & Apprs. (Hwy. 283) (S)
Route 283, Section 3
STATION: 110+40
LOCATION: 16' Right of Construction Centerline
LOGGED BY: Stanley Bates

DATE: September 13 and , 2023
TYPE OF DRILLING:
Hollow Stem Auger - Diamond Core
EQUIPMENT: CME 75

HAMMER CORRECTION FACTOR: 1.41

COMPLETION DEPTH: 63.2

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: 381.4		10 20 30 40 50 60 70				
			Moist, Loose, Reddish Brown Clayey Sand with Rock Fragments	-					
				SC	● ————		3		
5			Moist, Medium Dense, Reddish Brown Clayey Sand with Rock Fragments	-	● ————	41	4		
				SC	● ————		11-10		
			Moist, Very Dense, Clayey Sand with Trace Rock Fragments		●		60 (6")		
10			SANDSTONE - Highly Weathered, Poorly Cemented with Cemented Layers, Brown*				60 (4")	43	0
			SHALE - Highly Weathered, Soft, Gray						
15			SANDSTONE WITH OCCASIONAL SHALE LAYERS - Highly Weathered, Poorly Cemented, Gray					76	7
			SHALE - Highly Weathered, Soft, Gray						
20			SANDSTONE - Weathered, Cemented, Frequent Fractures, Gray					76	8
			SHALE - Highly Weathered, Soft, Gray						
25			SANDSTONE - Slightly Weathered, Cemented with Occasion Poorly Cemented Layers, Frequent Fractures, Gray					96	42
30			SANDSTONE - Slightly Weathered, Cemented to Well Cemented, Frequent Open Fractures, Frequent Voids					68	35
35			SHALE - Highly Weathered, Soft	-					

REMARKS: *Auger refusal at 9.8' below ground level.

ARKANSAS DEPARTMENT OF TRANSPORTATION MATERIALS DIVISION - GEOTECHNICAL SECTION					BORING NO. 1 PAGE 2 OF 2									
JOB NO. 061741 Hot Spring County JOB NAME: I-30 Str. & Apprs. (Hwy. 283) (S) Route 283, Section 3 STATION: 110+40 LOCATION: 16' Right of Construction Centerline LOGGED BY: Stanley Bates					DATE: September 13 and , 2023 TYPE OF DRILLING: Hollow Stem Auger - Diamond Core EQUIPMENT: CME 75 HAMMER CORRECTION FACTOR: 1.41									
COMPLETION DEPTH: 63.2														
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: 381.4											
			Gray										76 0	
			SANDSTONE - Weathered, Cemented, Gray											
40			SANDSTONE - Slightly Weathered, Well Cemented, Frequent Open Fractures, Occasional Quartz Veins, Gray											100 30
45			SANDSTONE - Slightly Weathered, Well Cemented with Occasional Poorly Cemented Layers, Occasional Kaolin Layers, Frequent Fractures, Gray											100 56
50			SANDSTONE - Slightly Weathered, Well Cemented, Frequent Fractures, Gray											100 74
55			SANDSTONE - Slightly Weathered, Well Cemented, Frequent Open Fractures, Occasional Quartz Veins, Gray											100 42
60			SANDSTONE WITH OCCASIONAL SHALE LAYERS - Slightly Weathered, Well Cemented, Frequent Fractures, Shale exhibits slickensides, Gray										94 52	
65			Boring Terminated											
70														
REMARKS: *Auger refusal at 9.8' below ground level.														

**ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SECTION**

BORING NO. 2

PAGE 1 OF 2

JOB NO. 061741 Hot Spring County
JOB NAME: I-30 Str. & Apprs. (Hwy. 283) (S)
Route 283, Section 3
STATION: 110+42
LOCATION: 16' Left of Construction Centerline
LOGGED BY: Stanley Bates

DATE: September 6 and 11-13, 2023
TYPE OF DRILLING:
Hollow Stem Auger-Diamond Core
EQUIPMENT: CME 75
HAMMER CORRECTION FACTOR: 1.41

COMPLETION DEPTH: 67.9

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: 382.8		10 20 30 40 50 60 70				
5			Dry, Medium Dense, Brown Clayey Sand	-	•	45	7 11-13		
			Moist, Dense, Reddish Brown Clayey Sand with Rock Fragments	SC	•	30	6 12-28		
10			SANDSTONE WITH CLAY LAYERS - Highly Weathered, Light Reddish Brown		•		18 60 (2")		
			SANDSTONE - Highly Weathered		•		7 60 (5")		
15			SHALE - Highly Weathered, Medium Hard, Gray				9 20-60		
20			SANDSTONE - Highly Weathered SANDSTONE WITH OCCASIONAL SHALE LAYERS - Slightly Weathered with Occasional Highly Weathered Layers, Cemented with Poorly Cemented Layers, Frequent Fractures, Light Gray				60 (2")	74	11
25			SANDSTONE - Slightly Weathered, Cemented, Frequent Fractures, Light Gray					92	25
30			SHALE WITH OCCASIONAL SANDSTONE LAYERS - Highly Weathered, Soft, Gray SANDSTONE - Slightly Weathered, Cemented, Light Gray SHALE WITH OCCASIONAL SANDSTONE LAYERS - Highly Weathered, Soft, Gray					90	24
35									

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION MATERIALS DIVISION - GEOTECHNICAL SECTION						BORING NO. 2										
						PAGE 2 OF 2										
JOB NO. 061741 Hot Spring County JOB NAME: I-30 Str. & Apprs. (Hwy. 283) (S) Route 283, Section 3 STATION: 110+42 LOCATION: 16' Left of Construction Centerline LOGGED BY: Stanley Bates						DATE: September 6 and 11-13, 2023 TYPE OF DRILLING: Hollow Stem Auger-Diamond Core EQUIPMENT: CME 75 HAMMER CORRECTION FACTOR: 1.41										
COMPLETION DEPTH: 67.9																
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				
			SURFACE ELEVATION: 382.8													
40			SANDSTONE - Slightly Weathered, Well Cemented, Frequent Fractures, Light Gray	-											18	0
															100	30
45			SANDSTONE - Slightly Weathered, Well Cemented, Occasional Fractures, Light Gray												100	82
50			SANDSTONE - Slightly Weathered, Cemented, Frequent Fractures, Light Gray												100	18
			SANDSTONE - Slightly Weathered, Poorly Cemented, Frequent Fractures, Light Gray													
55			SANDSTONE - Slightly Weathered, Well Cemented, Frequent Fractures, Light Gray												100	36
60			SANDSTONE WITH OCCASIONAL SHALE LAYERS - Slightly Weathered (Shale-Highly Weathered), Well Cemented, Occasional Fractures, Light Gray												100	44
			SHALE - Highly Weathered, Soft, Dark Gray													
65			SANDSTONE - Slightly Weathered, Well Cemented, Frequent Fractures, Light Gray												100	52
70				Boring Terminated												
REMARKS:																

**ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SECTION**

BORING NO. 3

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JOB NO. 061741 Hot Spring County

JOB NAME: I-30 Str. & Apprs. (Hwy. 283) (S)

Route 283, Section 3

STATION: 111+87

LOCATION: 13' Right of Construction Centerline

LOGGED BY: Stanley Bates

DATE: October 2 and 3, 2023

TYPE OF DRILLING:

Hollow Stem Auger - Diamond Core

EQUIPMENT: CME 75

HAMMER CORRECTION FACTOR: 1.41

COMPLETION DEPTH: 72.6

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
			SURFACE ELEVATION: 357.0		PL													
					10	20	30	40	50	60	70	LL						
			SANDSTONE - Highly Weathered, Poorly Cemented, Brown													19		
																53-60		
																(11")		
5			SHALE - Highly Weathered, Medium Hard, Dark Gray													12		
																59-60		
																(7")		
			(No Recovery)													28		
			SANDSTONE - Weathered, Cemented, Brown and Gray													60	0	0
																(1")		
10			SANDSTONE WITH OCCASIONAL SHALE LAYERS - Slightly Weathered, Occasional Fractures, Cemented to Well Cemented														76	52
			SANDSTONE - Weathered, Poorly Cemented, Brown															
15			SANDSTONE WITH OCCASIONAL SHALE LAYERS - Slightly Weathered, Cemented to Well Cemented, Occasional Fractures, Gray														50	26
20			SHALE WITH OCCASIONAL SANDSTONE LAYERS - Weathered to Highly Weathered, Medium Hard, Dark Gray														80	14
25			SANDSTONE OCCASIONAL CLAY SEAMS - Slightly Weathered, Well Cemented, Occasional Fractures, Gray														100	98
30																	78	47
			SHALE - Weathered to Slightly Weathered, Medium Hard, Dark Gray															
			SANDSTONE WITH FREQUENT SHALE LAYERS - Slightly															
35																		

REMARKS:

**ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SECTION**

BORING NO. 3

PAGE 2 OF 3

JOB NO. 061741 Hot Spring County
JOB NAME: I-30 Str. & Apprs. (Hwy. 283) (S)
Route 283, Section 3
STATION: 111+87
LOCATION: 13' Right of Construction Centerline
LOGGED BY: Stanley Bates

DATE: October 2 and 3, 2023
TYPE OF DRILLING:
Hollow Stem Auger - Diamond Core
EQUIPMENT: CME 75
HAMMER CORRECTION FACTOR: 1.41

COMPLETION DEPTH: 72.6

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: 357.0												
			Weathered, Cemented, Gray											100	60
40			SANDSTONE - Slightly Weathered, Cemented to Well Cemented, Frequent Fractures Gray											92	54
45			SHALE - Weathered to Slightly Weathered, Medium Hard, Dark Gray											54	24
50			SANDSTONE WITH OCCASIONAL SHALE LAYERS - Unweathered, Cemented, Occasional Fractures, Frequent Quartz Veins, Gray											100	64
55			SANDSTONE - Unweathered, Poorly Cemented, Gray											100	66
60			SANDSTONE WITH FREQUENT SHALE LAYERS - Slightly Weathered, Cemented, Frequent Quartz Veins, Gray											96	52
65			SANDSTONE WITH OCCASIONAL SHALE LAYERS - Unweathered, Cemented with Poorly Cemented Layers, SANDSTONE - Weathered with Highly Weathered Layers, Cemented with Poorly Cemented Layers, Brown SANDSTONE - Slightly Weathered and Highly Weathered along fractures, Well Cemented, Frequent Fractures, Brown and Gray											100	44
70															

REMARKS:

ARKANSAS DEPARTMENT OF TRANSPORTATION MATERIALS DIVISION - GEOTECHNICAL SECTION						BORING NO. 3 PAGE 3 OF 3							
JOB NO. 061741 Hot Spring County JOB NAME: I-30 Str. & Apprs. (Hwy. 283) (S) Route 283, Section 3 STATION: 111+87 LOCATION: 13' Right of Construction Centerline LOGGED BY: Stanley Bates						DATE: October 2 and 3, 2023 TYPE OF DRILLING: Hollow Stem Auger - Diamond Core EQUIPMENT: CME 75 HAMMER CORRECTION FACTOR: 1.41							
COMPLETION DEPTH: 72.6													
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 (%) 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: 357.0										
			SANDSTONE WITH OCCASIONAL SHALE SEAMS AND LAYERS - Unweathered, Cemented, Gray									100 60	
			Boring Terminated										
75													
80													
85													
90													
95													
100													
105													
REMARKS:													

**ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SECTION**

BORING NO. 4

PAGE 1 OF 1

JOB NO. 061741 Hot Spring County
JOB NAME: I-30 Str. & Apprs. (Hwy. 283) (S)
Route 283, Section 3
STATION: 111+87
LOCATION: 13' Left of Construction Centerline
LOGGED BY: Stanley Bates

DATE: October 3 and 9, 2023
TYPE OF DRILLING:
Hollow Stem Auger - Diamond Core
EQUIPMENT: CME 75
HAMMER CORRECTION FACTOR: 1.41

COMPLETION DEPTH: 21.5

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
			SURFACE ELEVATION: 357.7		PL										
					10	20	30	40	50	60	70				
5		X	SHALE - Highly Weathered, Soft, Gray										9 16-17		
		X											11 23-33		
		X	SANDSTONE - Highly Weathered, Brown										29 60 (4")		
10			SANDSTONE WITH OCCASIONAL CLAY SEAMS - Slightly Weathered, Well Cemented, Occasional Fractures, Gray*											95	37
15			SANDSTONE - Slightly Weathered, Well Cemented, Occasional Fractures, Gray*											80	64
20			SHALE WITH OCCASIONAL SANDSTONE LAYERS - Weathered, Soft (Shale) and Poorly Cemented to Cemented (Sandstone), Dark Gray											80	26
			SANDSTONE WITH OCCASIONAL SHALE SEAMS - Slightly Weathered, Cemented, Gray												
			Boring Terminated												
25															
30															
35															

REMARKS: *Auger refusal at 7.6' below ground level.

**ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SECTION**

BORING NO. 5

PAGE 1 OF 2

JOB NO. 061741 Hot Spring County
JOB NAME: I-30 Str. & Apprs. (Hwy. 283) (S)
Route 283, Section 3
STATION: 113+07
LOCATION: 16' Right of Construction Centerline
LOGGED BY: Stanley Bates

DATE: September 19 and 20, 2023
TYPE OF DRILLING:
Hollow Stem Auger - Diamond Core
EQUIPMENT: CME 75
HAMMER CORRECTION FACTOR: 1.41

COMPLETION DEPTH: 57.5

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
			SURFACE ELEVATION: 375.0		PL										
					10	20	30	40	50	60	70				
			SANDSTONE - Highly Weathered, Poorly Cemented, Light Brown												
5			SANDSTONE - Slightly Weathered with Highly Weathered Layers, Well Cemented with Poorly Cemented Layers, Frequent Fractures, Gray										60 (5") 60 (2")	84	65
10			SANDSTONE WITH OCCASIONAL CLAY SEAMS - Slightly Weathered, Well Cemented with Cemented Layers, Frequent Fractures, Gray											96	48
15			SHALE - Highly Weathred, Soft, Gray											62	20
20			SANDSTONE WITH OCCASIONAL CLAY SEAMS - Slightly Weathered with Highly Weathered Layers, Well Cemented with Cemented Layers, Frequent Fractures, Gray											50	30
25			SANDSTONE - Slightly Weathered, Well Cemented, Frequent Fractures, Gray											58	0
			SHALE - Highly Weathered, Soft, Gray												
30			SANDSTONE - Slightly Weathered, Well Cemented, Frequent Fractures, Gray											100	68
35															

REMARKS:

**ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SECTION**

BORING NO. 5

PAGE 2 OF 2

JOB NO. 061741 Hot Spring County
JOB NAME: I-30 Str. & Apprs. (Hwy. 283) (S)
Route 283, Section 3
STATION: 113+07
LOCATION: 16' Right of Construction Centerline
LOGGED BY: Stanley Bates

DATE: September 19 and 20, 2023
TYPE OF DRILLING:
Hollow Stem Auger - Diamond Core
EQUIPMENT: CME 75

HAMMER CORRECTION FACTOR: 1.41

COMPLETION DEPTH: 57.5

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
			SURFACE ELEVATION: 375.0		PL										
					10	20	30	40	50	60	70			98	56
40			SANDSTONE WITH FREQUENT SHALE LAYERS - Highly Weathered to Weathered, Poorly Cemented to Cemented, Frequent Fractures, Reddish Brown and Dark Gray											70	8
45			SHALE WITH FREQUENT SANDSTONE LAYERS - Highly Weathered, Soft, Dark Gray											82	12
			SANDSTONE - Slightly Weathered, Well Cemented, Frequent Fractures, Gray												
			SHALE - Highly Weathered, Soft, Dark Gray												
50			SANDSTONE - Slightly Weathered, Well Cemented, Gray											90	44
			SHALE WITH OCCASIONAL SANDSTONE LAYERS - Highly Weathered to Weathered, Soft to Medium Hard, Dark Gray												
55			SANDSTONE WITH FREQUENT SHALE LAYERS - Slightly Weathered, Cemented, Gray											100	26
			SHALE - Highly Weathered, Soft, Dark Gray												
60			SANDSTONE INTERBEDDED WITH SHALE - Unweathered (Sandstone) to Highly Weathered (Shale), Well Cemented (Sandstone) to Soft (Shale), Gray to Dark Gray												
			Boring Terminated												
65															
70															

REMARKS:

**ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SECTION**

BORING NO. 6

PAGE 1 OF 2

JOB NO. 061741 Hot Spring County
JOB NAME: I-30 Str. & Apprs. (Hwy. 283) (S)
Route 283, Section 3
STATION: 113+13
LOCATION: 10' Lt of Construcion Centerline
LOGGED BY: Jesse Burdine

DATE: September 26, 2023
TYPE OF DRILLING:
Hollow Stem Auger - Diamond Core
EQUIPMENT: CME 75
HAMMER CORRECTION FACTOR: 1.41

COMPLETION DEPTH: 53.4

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: 376.8		10 20 30 40 50 60 70				
5			Dry, Very Stiff, Reddish Brown Sandy Lean Clay	- CL	• -----	61	9 13-16		
			Dry, Hard, Reddish Brown Sandy Lean Clay	- CL	• -----	62	10 17-18		
10			Dry, Very Stiff, Reddish Brown Sandy Lean Clay	- CL	• -----	68	7 8-11		
			Dry, Very Hard, Reddish Brown Sandy Clay		•	57	60 (6")		
15			SHALE - Highly Weathered, Medium Hard, Steeply Dipping, Light Gray to Gray		•		11 50 (4")	30	0
			SANDSTONE - Weathered, Cemented, Steeply Dipping, Gray					84	0
20			SHALE WITH OCCASIONAL SANDSTONE LAYERS - Highly Weathered, Soft to Medium Hard, Frequent Fractures, Steeply Dipping, Gray						
			SANDSTONE WITH OCCASIONAL SHALE LAYERS - Highly Weathered, Poorly Cemented, Steeply Dipping, Gray					64	0
25			SHALE WITH FREQUENT SANDSTONE LAYERS - Highly Weathered, Dark Gray to Gray						
			SANDSTONE - Slightly Weathered, Well Cemented, Gray					100	54
30			SHALE - Slightly Weathered, Medium Hard, Dark Gray						
			SANDSTONE - Slightly Weathered, Cemented, Gray						
35			SHALE - Weathered, Medium Hard, Dark Gray						
			SANDSTONE - Slightly Weathered, Cemented to Well Cemented, Occasional Fractures, Occasional Clay Seams, Gray	-				100	64
			SHALE - Weathered, Soft to						

REMARKS:

**ARKANSAS DEPARTMENT OF TRANSPORTATION
MATERIALS DIVISION - GEOTECHNICAL SECTION**

BORING NO. 6

PAGE 2 OF 2

JOB NO. 061741 Hot Spring County
JOB NAME: I-30 Str. & Apprs. (Hwy. 283) (S)
Route 283, Section 3
STATION: 113+13
LOCATION: 10' Lt of Construcion Centerline
LOGGED BY: Jesse Burdine

DATE: September 26, 2023
TYPE OF DRILLING:
Hollow Stem Auger - Diamond Core
EQUIPMENT: CME 75
HAMMER CORRECTION FACTOR: 1.41

COMPLETION DEPTH: 53.4

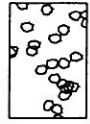
DEPTH FT.	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	SOIL GROUP	MOISTURE CONTENT (%) PL ————— LL							PERCENT PASSING NO. 200 SIEVE	NO. OF BLOWS PER 6-IN.	% T C R	% R Q D
			SURFACE ELEVATION: 376.8		10	20	30	40	50	60	70				
			Medium Hard, Gray											66	24
			SANDSTONE - Slightly Weathered, Cemented, Occasional Fractures, Gray												
40			SHALE - Weathered, Medium Hard, Dark Gray												
			SANDSTONE - Slightly Weathered, Cemented, Gray											88	60
			SHALE - Weathered, Medium Hard, Dark Gray												
45			SHALE WITH FREQUENT SANDSTONE LAYERS - Slightly Weathered, Medium Hard, Dark Gray												
			SANDSTONE WITH OCCASIONAL SHALE LAYERS - Slightly Weathered, Cemented to Well Cemented, Frequent Fractures, Gray											100	62
50															
			SHALE WITH OCCASIONAL SANDSTONE LAYERS - Slightly Weathered, Medium Hard, Dark Gray											100	46
55			Boring Terminated												
60															
65															
70															

REMARKS:

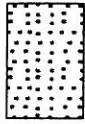
LEGEND

SOIL TYPES

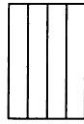
(SHOWN IN SYMBOL COLUMN)
(PREDOMINANT TYPE SHOWN HEAVY)



GRAVEL



SAND



SILT



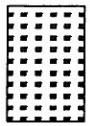
CLAY



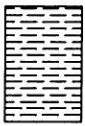
ORGANIC
MATTER

ROCK TYPES

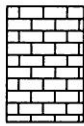
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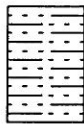
SANDSTONE



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.



ROCK CORE PHOTO

Job No.: 061741 Hot Spring County
Job Name: I-30 Str. & Apprs. (Hwy. 283) (S)



B1: Sta. 110+40, 16' Rt. of Const. CL
Depth: 9.8 – 23.2 ft.



ROCK CORE PHOTO

Job No.: 061741

Hot Spring County

Job Name: I-30 Str. & Apprs. (Hwy. 283) (S)



B1: Sta. 110+40, 16' Rt. of Const. CL
Depth: 23.2 – 33.2 ft.



ROCK CORE PHOTO

Job No.: 061741 Hot Spring County
Job Name: I-30 Str. & Apprs. (Hwy. 283) (S)



B1: Sta. 110+40, 16' Rt. of Const. CL
Depth: 33.2 – 43.2 ft.



ROCK CORE PHOTO

Job No.: 061741 Hot Spring County
Job Name: I-30 Str. & Apprs. (Hwy. 283) (S)



B1: Sta. 110+40, 16' Rt. of Const. CL
Depth: 43.2 – 53.2 ft.



ROCK CORE PHOTO

Job No.: 061741

Hot Spring County

Job Name: I-30 Str. & Apprs. (Hwy. 283) (S)



B1: Sta. 110+40, 16' Rt. of Const. CL
Depth: 53.2 – 63.2 ft.



ROCK CORE PHOTO

Job No.: 061741 Hot Spring County
Job Name: I-30 Str. & Apprs. (Hwy. 283) (S)



B2: Sta. 110+42, 16' Lt. of Const. CL
Depth: 19.1 – 27.9 ft.



ROCK CORE PHOTO

Job No.: 061741 Hot Spring County
Job Name: I-30 Str. & Apprs. (Hwy. 283) (S)



B2: Sta. 110+42, 16' Lt. of Const. CL
Depth: 27.9 – 37.9 ft.



ROCK CORE PHOTO

Job No.: 061741 Hot Spring County
Job Name: I-30 Str. & Apprs. (Hwy. 283) (S)



B2: Sta. 110+42, 16' Lt. of Const. CL
Depth: 37.9 – 47.9 ft.



ROCK CORE PHOTO

Job No.: 061741 Hot Spring County
Job Name: I-30 Str. & Apprs. (Hwy. 283) (S)



B2: Sta. 110+42, 16' Lt. of Const. CL
Depth: 47.9 – 57.9 ft.



ROCK CORE PHOTO

Job No.: 061741 Hot Spring County
Job Name: I-30 Str. & Apprs. (Hwy. 283) (S)



B2: Sta. 110+42, 16' Lt. of Const. CL
Depth: 57.9 – 67.9 ft.



ROCK CORE PHOTO

Job No.: 061741

Hot Spring County

Job Name: I-30 Str. & Apprs. (Hwy. 283) (S)



B3: Sta. 111+87, 13' Rt. of Const. CL
Depth: 6.7 – 17.6 ft.



ROCK CORE PHOTO

Job No.: 061741

Hot Spring County

Job Name: I-30 Str. & Apprs. (Hwy. 283) (S)



B3: Sta. 111+87, 13' Rt. of Const. CL
Depth: 17.6 – 27.6 ft.



ROCK CORE PHOTO

Job No.: 061741 Hot Spring County
Job Name: I-30 Str. & Apprs. (Hwy. 283) (S)



B3: Sta. 111+87, 13' Rt. of Const. CL
Depth: 27.6 – 37.6 ft.



ROCK CORE PHOTO

Job No.: 061741

Hot Spring County

Job Name: I-30 Str. & Apprs. (Hwy. 283) (S)



B3: Sta. 111+87, 13' Rt. of Const. CL
Depth: 37.6 – 47.6 ft.



ROCK CORE PHOTO

Job No.: 061741 Hot Spring County
Job Name: I-30 Str. & Apprs. (Hwy. 283) (S)



B3: Sta. 111+87, 13' Rt. of Const. CL
Depth: 47.6 – 57.6 ft.



ROCK CORE PHOTO

Job No.: 061741 Hot Spring County
Job Name: I-30 Str. & Apprs. (Hwy. 283) (S)



B3: Sta. 111+87, 13' Rt. of Const. CL
Depth: 57.6 – 67.6 ft.



ROCK CORE PHOTO

Job No.: 061741 Hot Spring County
Job Name: I-30 Str. & Apprs. (Hwy. 283) (S)



B3: Sta. 111+87, 13' Rt. of Const. CL
Depth: 67.6 – 72.6 ft.



ROCK CORE PHOTO

Job No.: 061741 Hot Spring County
Job Name: I-30 Str. & Apprs. (Hwy. 283) (S)



B4: Sta. 111+87, 13' Lt. of Const. CL
Depth: 7.6 – 16.5 ft.



ROCK CORE PHOTO

Job No.: 061741 Hot Spring County
Job Name: I-30 Str. & Apprs. (Hwy. 283) (S)



B4: Sta. 111+87, 13' Lt. of Const. CL
Depth: 16.5 – 21.5 ft.



ROCK CORE PHOTO

Job No.: 061741 Hot Spring County
Job Name: I-30 Str. & Apprs. (Hwy. 283) (S)



B5: Sta. 113+07, 16' Rt. of Const. CL
Depth: 3.8 – 12.5 ft.



ROCK CORE PHOTO

Job No.: 061741

Hot Spring County

Job Name: I-30 Str. & Apprs. (Hwy. 283) (S)



B5: Sta. 113+07, 16' Rt. of Const. CL
Depth: 12.5 – 22.5 ft.



ROCK CORE PHOTO

Job No.: 061741

Hot Spring County

Job Name: I-30 Str. & Apprs. (Hwy. 283) (S)



B5: Sta. 113+07, 16' Rt. of Const. CL
Depth: 22.5 – 32.5 ft.



ROCK CORE PHOTO

Job No.: 061741 Hot Spring County
Job Name: I-30 Str. & Apprs. (Hwy. 283) (S)



B5: Sta. 113+07, 16' Rt. of Const. CL
Depth: 32.5 – 42.5 ft.



ROCK CORE PHOTO

Job No.: 061741 Hot Spring County
Job Name: I-30 Str. & Apprs. (Hwy. 283) (S)



B5: Sta. 113+07, 16' Rt. of Const. CL
Depth: 42.5 – 52.5 ft.



ROCK CORE PHOTO

Job No.: 061741

Hot Spring County

Job Name: I-30 Str. & Apprs. (Hwy. 283) (S)



B5: Sta. 113+07, 16' Rt. of Const. CL
Depth: 52.5 – 57.5 ft.



ROCK CORE PHOTO

Job No.: 061741 Hot Spring County
Job Name: I-30 Str. & Apprs. (Hwy. 283) (S)



B6: Sta. 113+13, 10' Lt. of Const. CL
Depth: 12.4 – 23.4 ft.



ROCK CORE PHOTO

Job No.: 061741 Hot Spring County
Job Name: I-30 Str. & Apprs. (Hwy. 283) (S)



B6: Sta. 113+13, 10' Lt. of Const. CL
Depth: 23.4 – 33.4 ft.

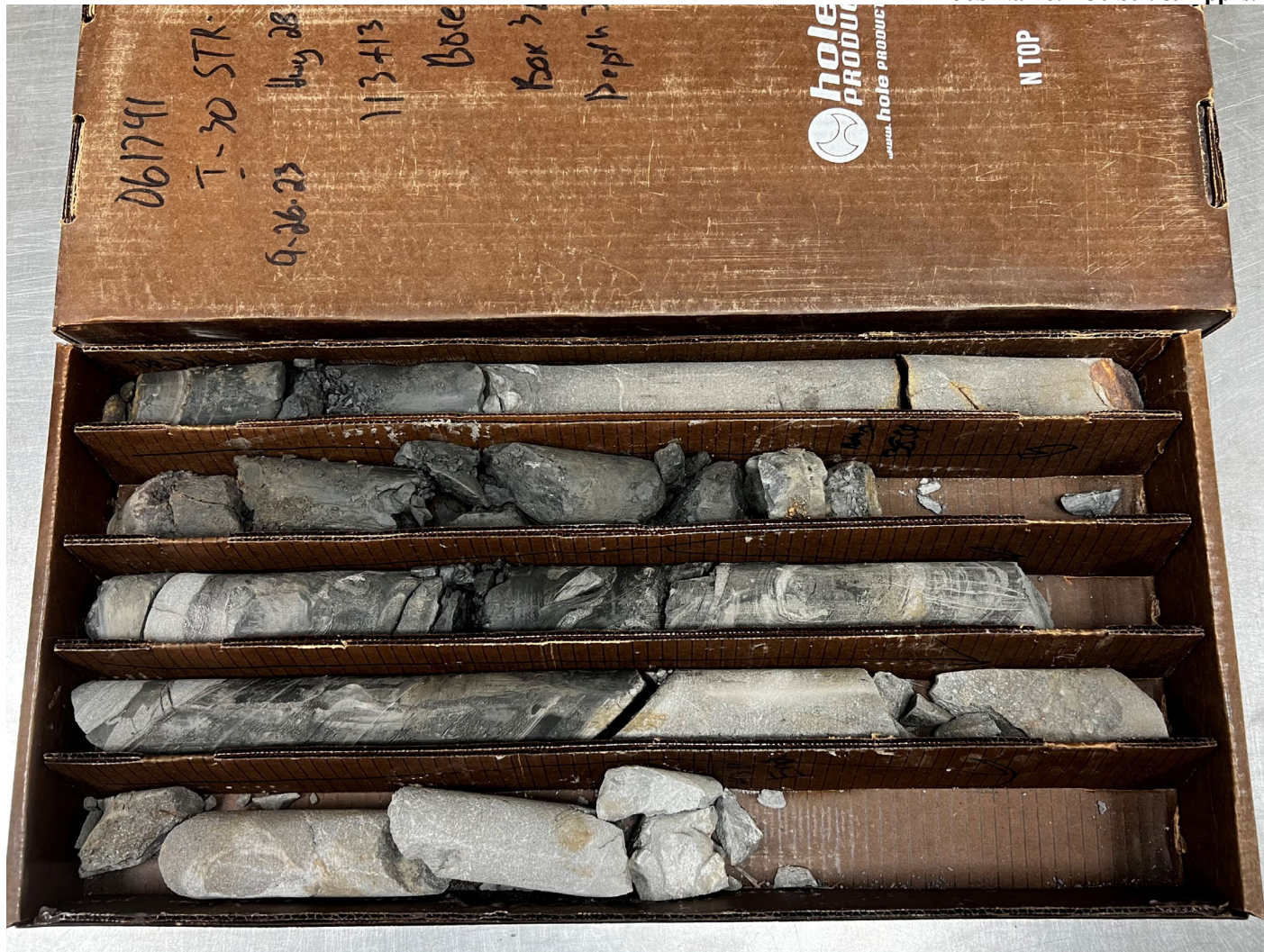


ROCK CORE PHOTO

Job No.: 061741

Hot Spring County

Job Name: I-30 Str. & Apprs. (Hwy. 283) (S)



B6: Sta. 113+13, 10' Lt. of Const. CL
Depth: 33.4 – 43.4 ft.



ROCK CORE PHOTO

Job No.: 061741 Hot Spring County
Job Name: I-30 Str. & Apprs. (Hwy. 283) (S)



B6: Sta. 113+13, 10' Lt. of Const. CL
Depth: 43.4 – 53.4 ft.

Attachment B

Summary of Rock Core Uniaxial Compression Test Results, Geological Strength Index (GSI) and Rock Mass Rating (RMR)

Project Number: 061741
Project Name: Hwy. 283 over I-30
Date Tested:

Input By: PT
Checked By: CS

GSI:	70
------	----

[illegible]

Attachment C



SITE PICTURES

Job No.: 061741

Job Name: Hwy 283 Over Interstate 30
I-30 Str. & Apprs. (Hwy. 283) (S)



Proposed West Abutment Location (April 2023)



SITE PICTURES

Job No.: 061741

Job Name: Hwy 283 Over Interstate 30

I-30 Str. & Apprs. (Hwy. 283) (S)



Proposed West Abutment Location (April 2023)
Note exposed rock of the Jackfork Sandstone Formation



SITE PICTURES

Job No.: 061741

**Job Name: Hwy 283 Over Interstate 30
I-30 Str. & Apprs. (Hwy. 283) (S)**



**Proposed West Abutment Location (April 2023)
Looking from top of slope to bottom toward the northeast**



SITE PICTURES

Job No.: 061741

**Job Name: Hwy 283 Over Interstate 30
I-30 Str. & Apprs. (Hwy. 283) (S)**



**Proposed East Abutment Location (April 2023)
Note exposed rock of the Jackfork Sandstone Formation**



SITE PICTURES

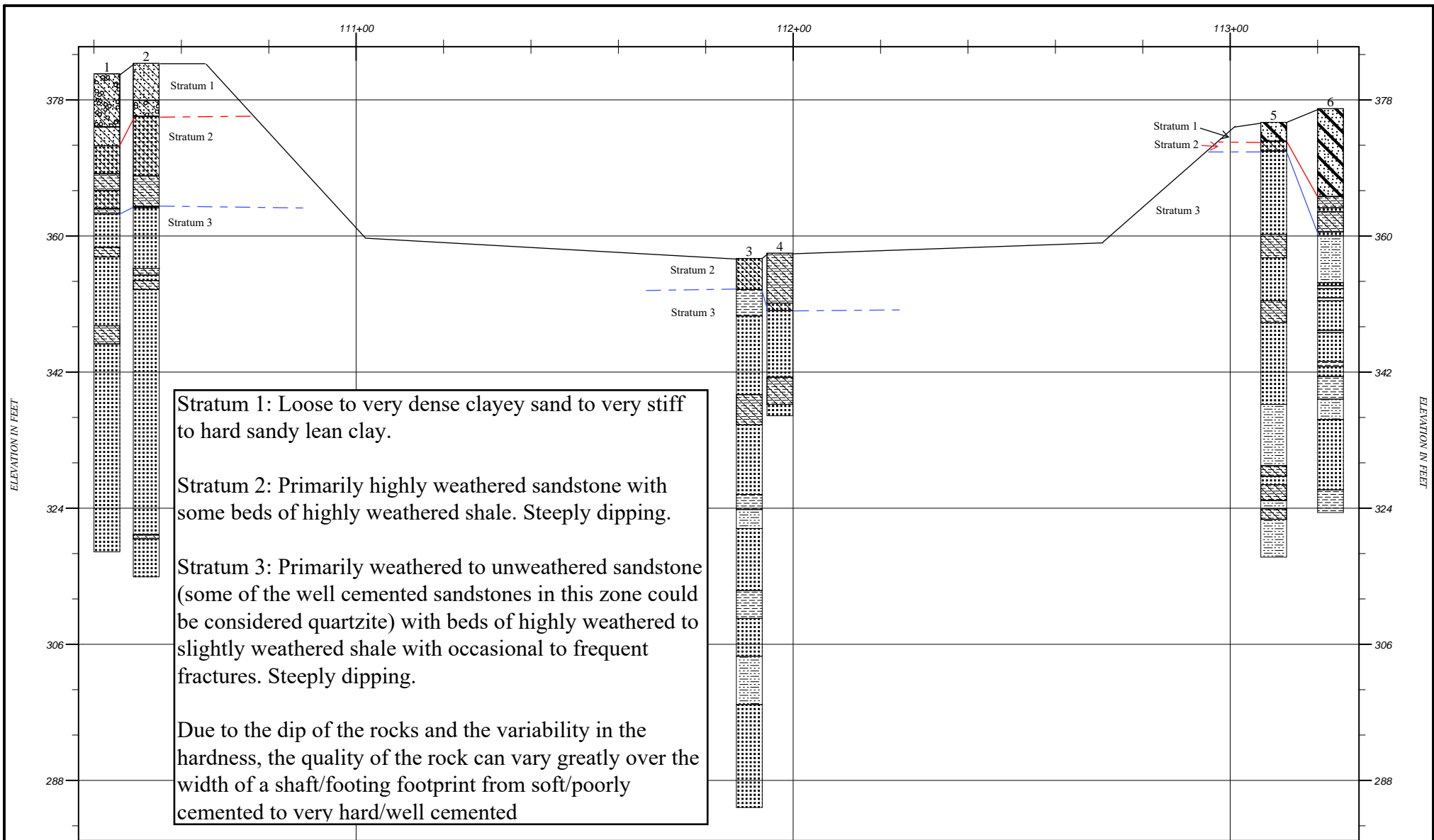
Job No.: 061741

Job Name: Hwy 283 Over Interstate 30
I-30 Str. & Apprs. (Hwy. 283) (S)

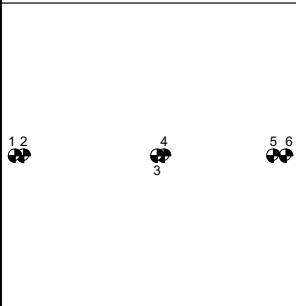


Proposed East Abutment Location (April 2023)
Looking northeast from existing Hwy. 283 Overpass east abutment

Attachment D



Plan View



Strata symbols

	clayey sand and gravel		cemented sand/sandstone
	clayey sand		shale/siltstone
	sandstone with clay seams/ highly weathered sandstone		sandstone interbedded with shale
	shale with clay seams/highly weathered shale		sandy clay

Arkansas Department of Transportation

Generalized Subsurface Profile

HORIZONTAL SCALE: Not to scale	DRAWN BY/APPROVED BY	DATE DRAWN
VERTICAL SCALE: Not to scale		10/13/2023

I-30 Str. & Apprs. (Hwy. 283) (S)

Route 283, Section 3

PROJECT NO. 061741
Hot Spring County

FIGURE NUMBER

Attachment E

Title: 061741

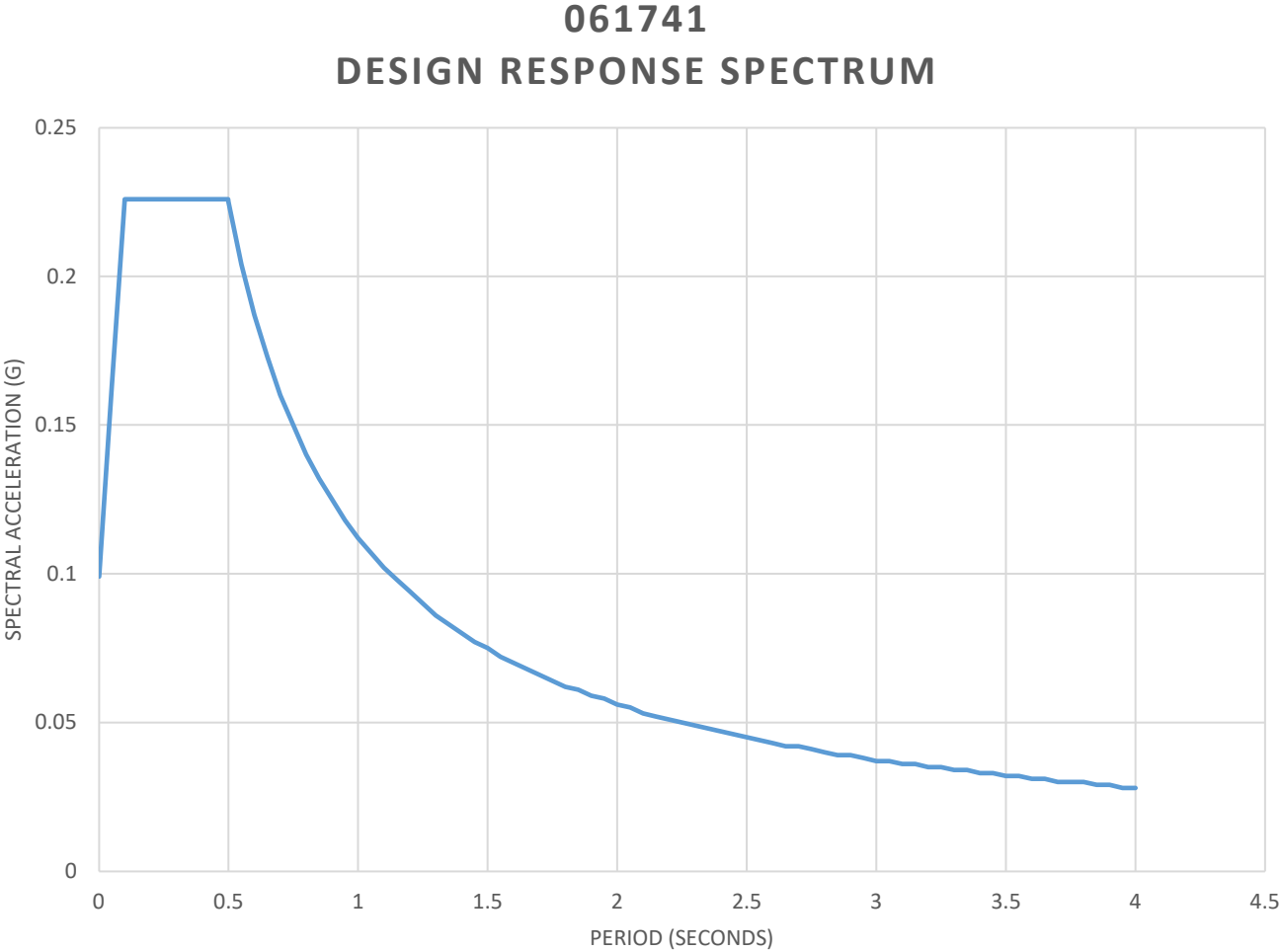
Latitude: 34.235023

Longitude: -93.007798

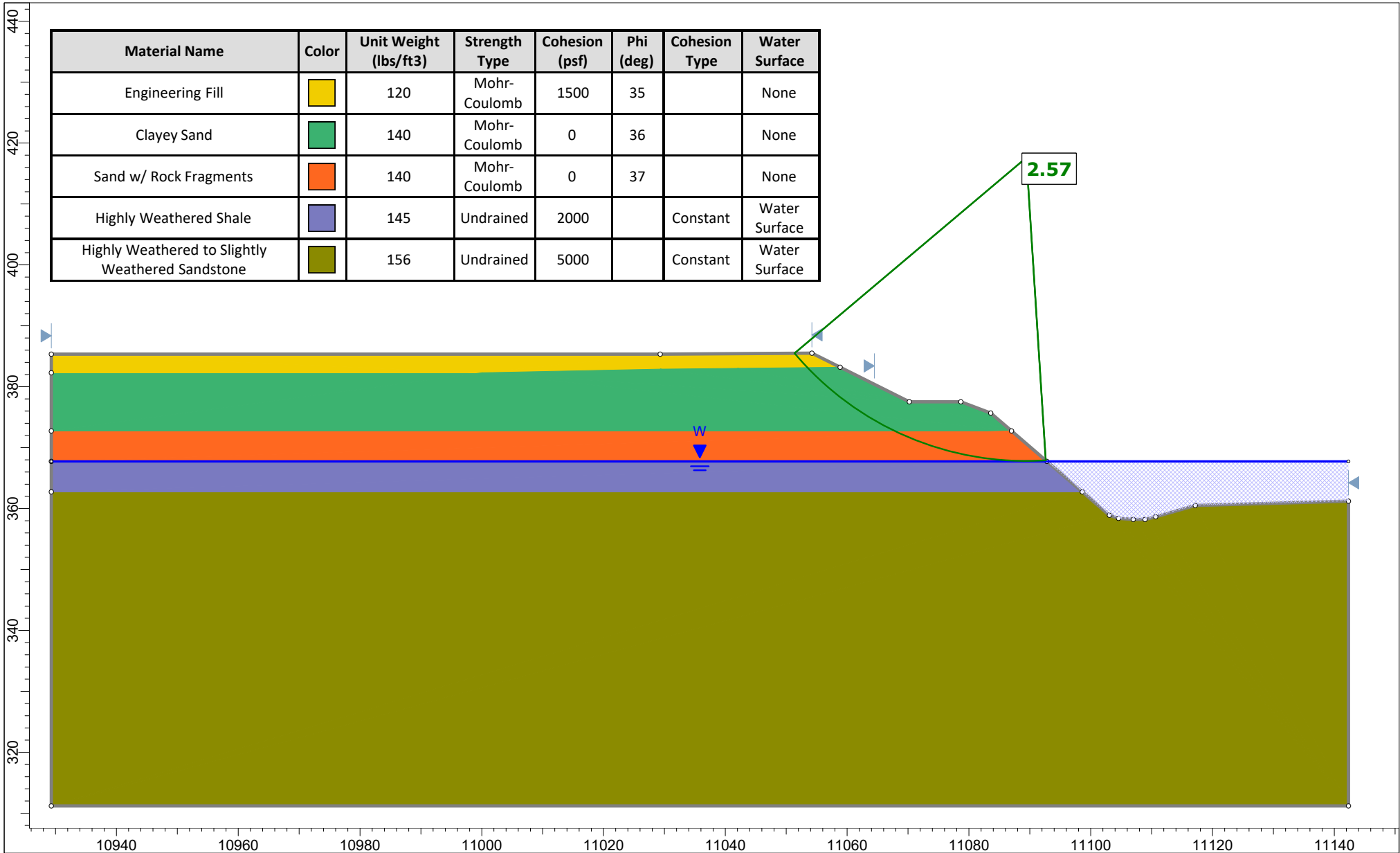
Site Class: C


Get USGS Data






PGA:	0.082
F _{PGA} :	1.2
A _S :	0.099
S _S :	0.188
F _A :	1.2
S _{DS} :	0.226
S ₁ :	0.066
F _V :	1.7
S _{D1} :	0.112
S _{DC} :	A
T _S :	0.498
T ₀ :	0.1

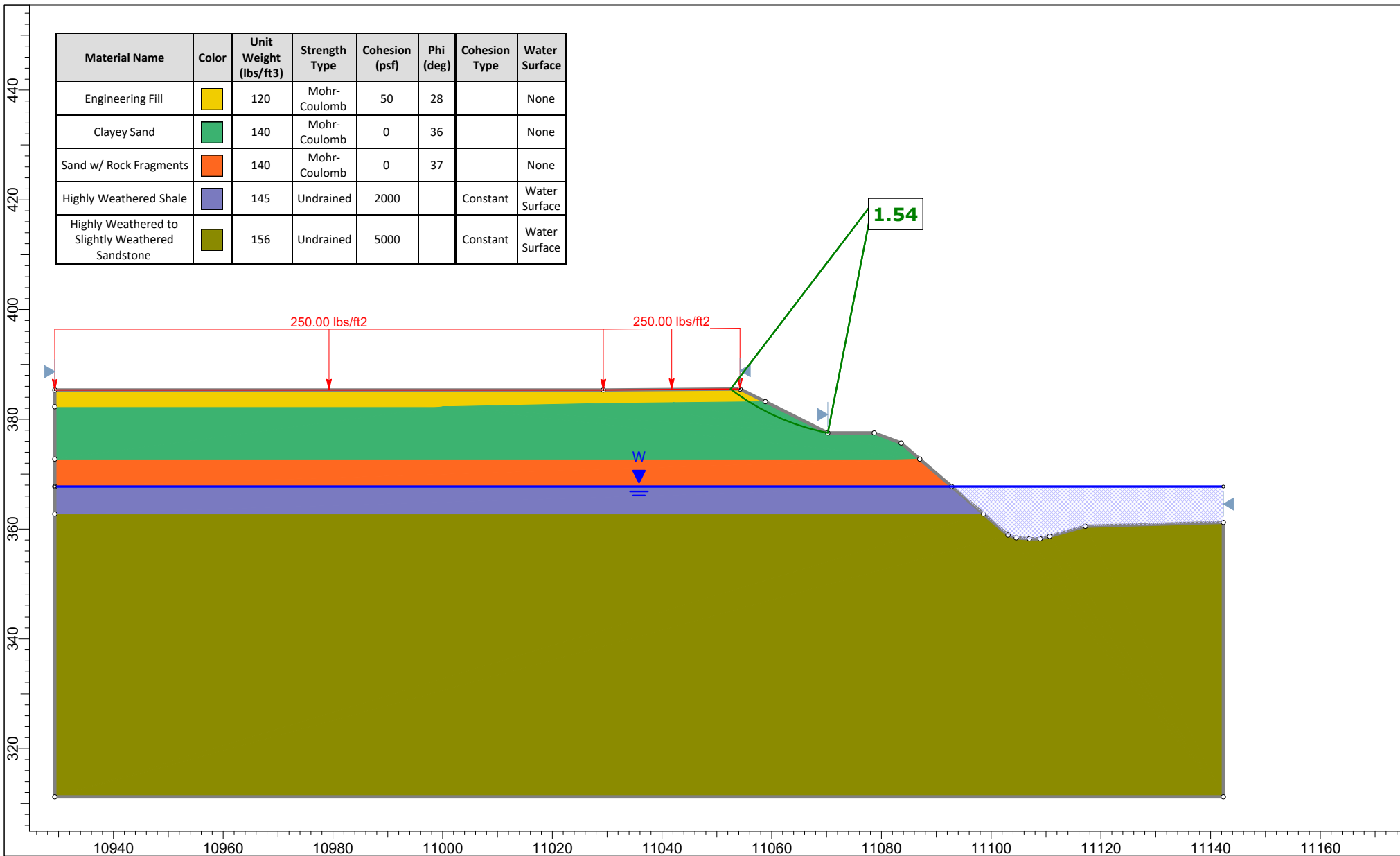


Attachment F









	Project 061741 - I-30 Str. & Apprs. (Hwy. 283)(S)		
	Site	Hwy. 283 over Interstate 30	Analysis Type Short Term/End of Construction
	Analyzed By	PT	Configuration Northwest Embankment
	Date	12/4/2023	

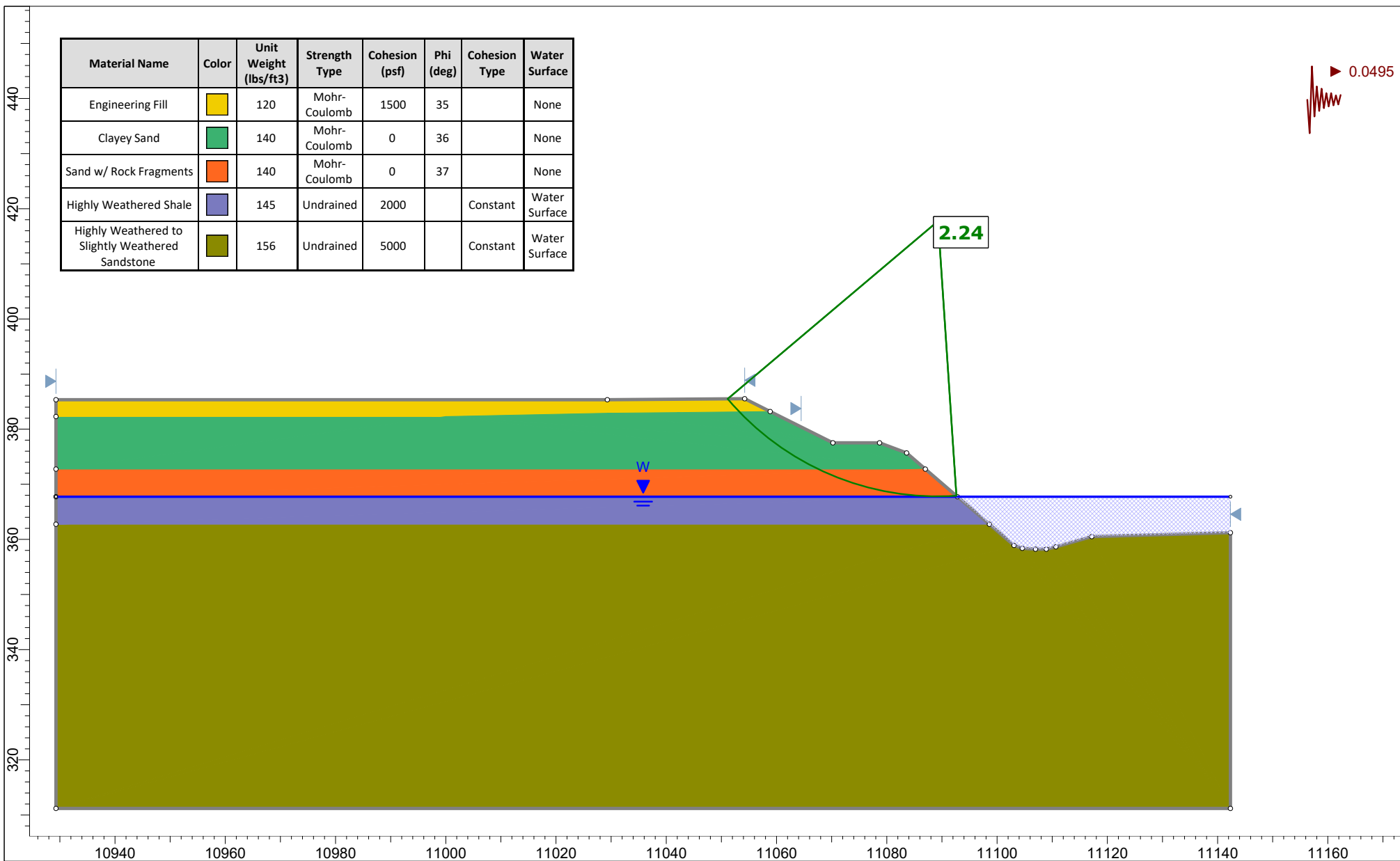
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Cohesion Type	Water Surface
Engineering Fill		120	Mohr-Coulomb	50	28		None
Clayey Sand		140	Mohr-Coulomb	0	36		None
Sand w/ Rock Fragments		140	Mohr-Coulomb	0	37		None
Highly Weathered Shale		145	Undrained	2000		Constant	Water Surface
Highly Weathered to Slightly Weathered Sandstone		156	Undrained	5000		Constant	Water Surface



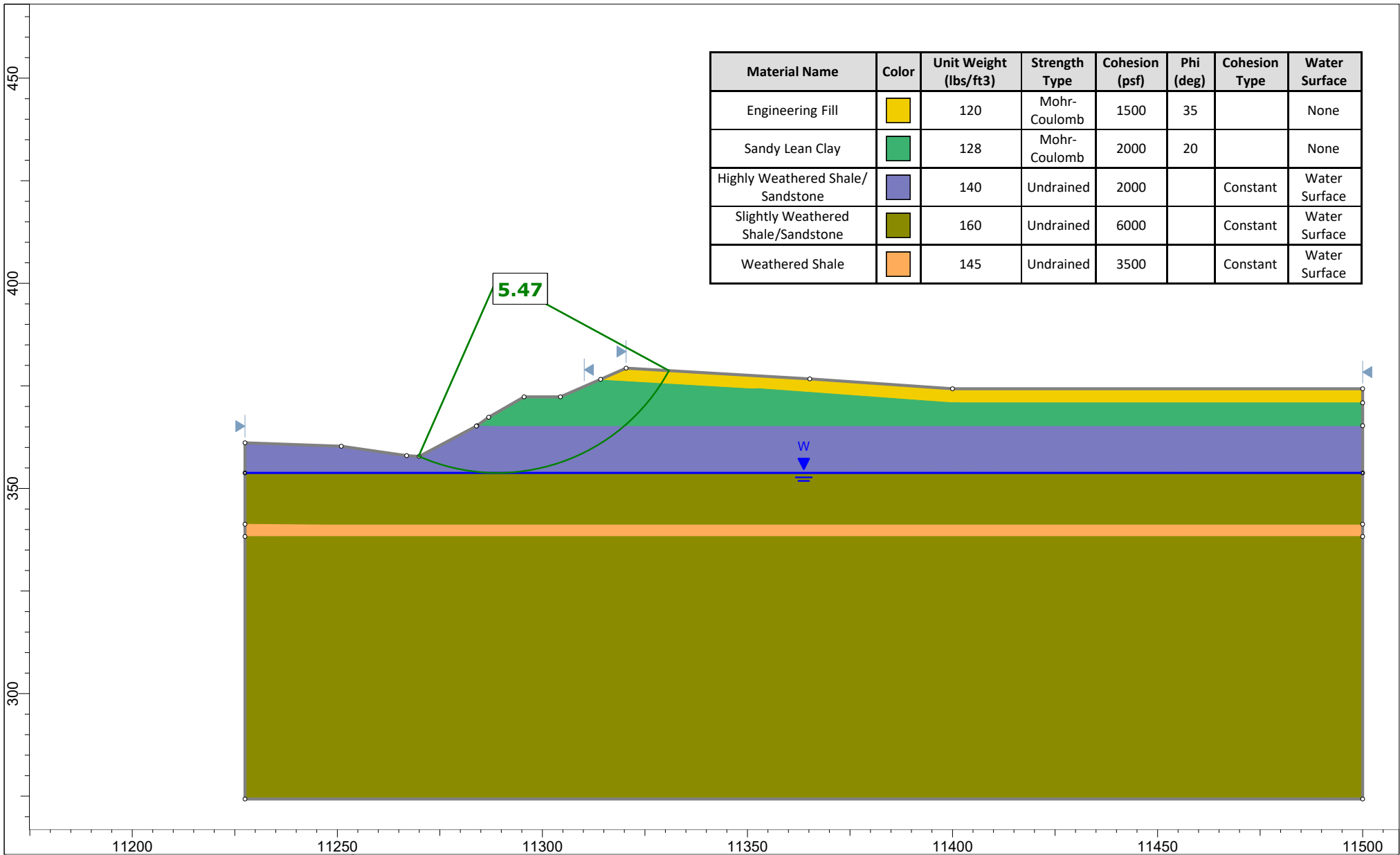
Project	061741 - I-30 Str. & Apprs. (Hwy. 283)(S)		
Site	Hwy. 283 over Interstate 30	Analysis Type	Long Term
Analyzed By	PT	Configuration	Northwest Embankment
Date	12/4/2023		


Material Name	Color	Unit Weight (lbs/ft ³)	Strength Type	Cohesion (psf)	Phi (deg)	Cohesion Type	Water Surface
Engineering Fill		120	Mohr-Coulomb	1500	35		None
Clayey Sand		140	Mohr-Coulomb	0	36		None
Sand w/ Rock Fragments		140	Mohr-Coulomb	0	37		None
Highly Weathered Shale		145	Undrained	2000		Constant	Water Surface
Highly Weathered to Slightly Weathered Sandstone		156	Undrained	5000		Constant	Water Surface

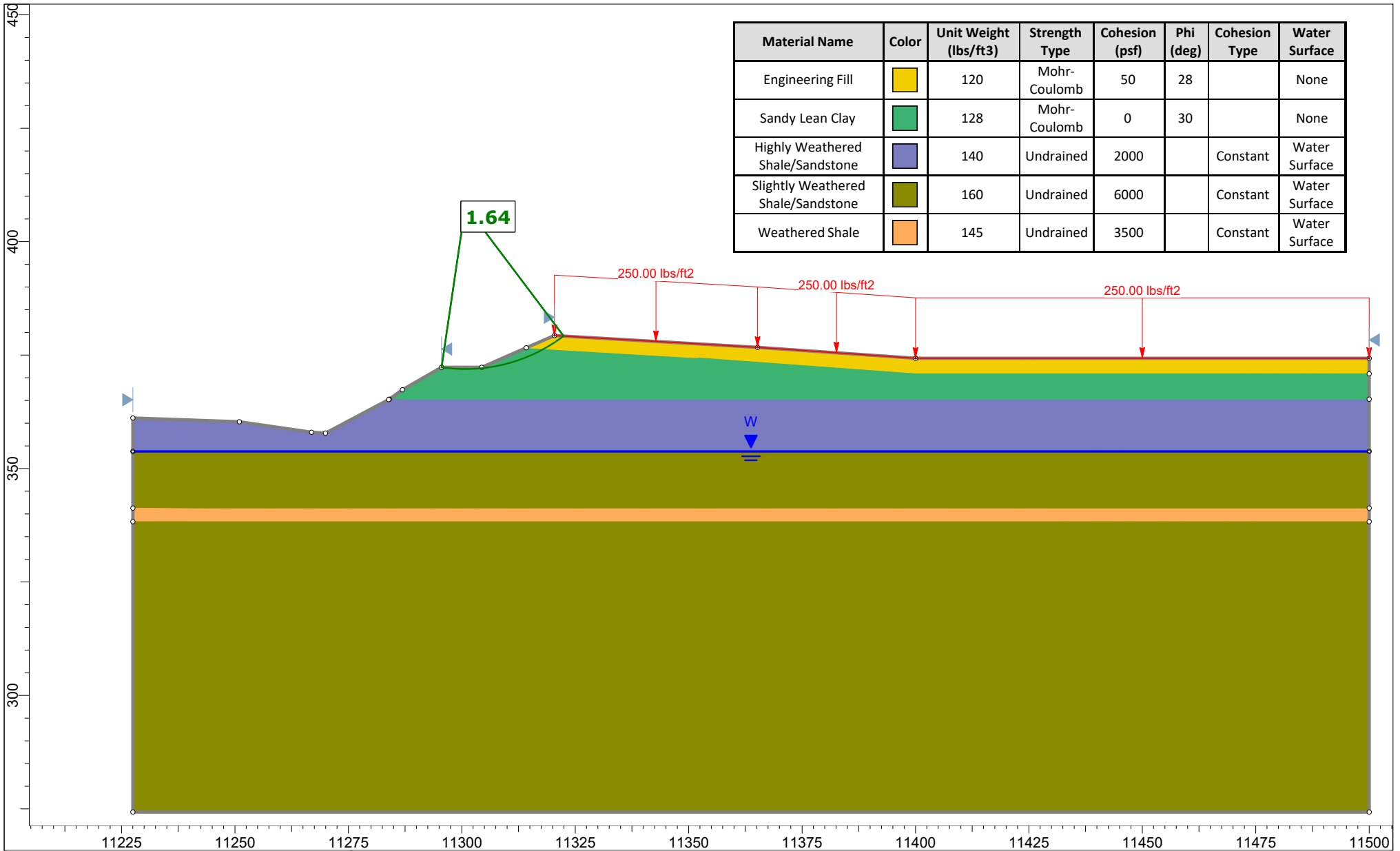
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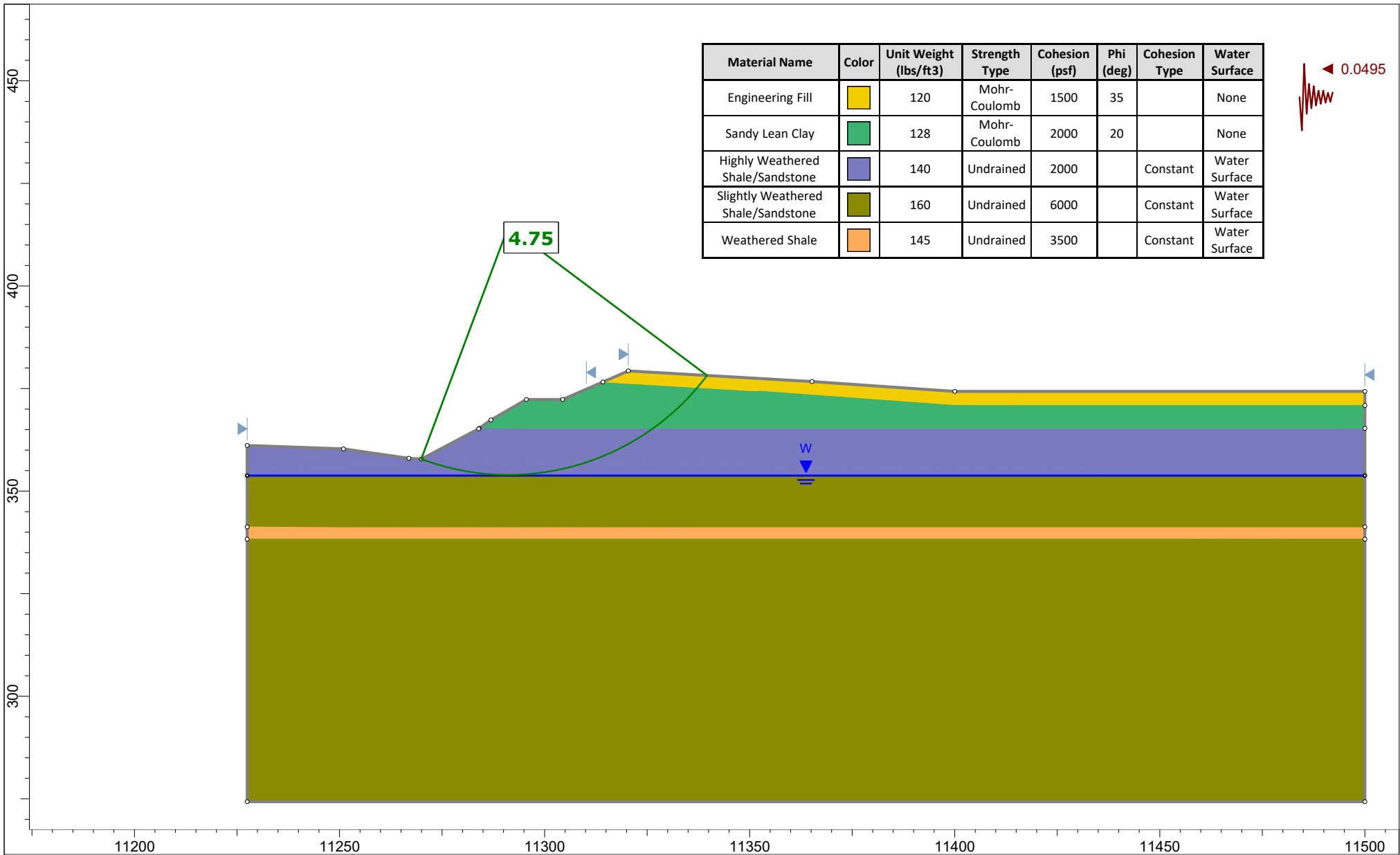
Project	061741 - I-30 Str. & Apprs. (Hwy. 283)(S)		
Site	Hwy. 283 over Interstate 30	Analysis Type	Seismic
Analyzed By	PT	Configuration	Northwest Embankment
Date	12/4/2023		




	Project 061741 - I-30 Str. & Apprs. (Hwy. 283)(S)		
	Site Hwy. 283 over Interstate 30	Analysis Type Short Term/End of Construction	
	Analyzed By PT	Configuration Southeast Embankment	
	Date 12/4/2023		



Project	061741 - I-30 Str. & Apprs. (Hwy. 283)(S)		
Site	Hwy. 283 over Interstate 30	Analysis Type	Long Term
Analyzed By	PT	Configuration	Southeast Embankment
Date	12/4/2023		



	Project 061741 - I-30 Str. & Apprs. (Hwy. 283)(S)		
	Site	Hwy. 283 over Interstate 30	Analysis Type Seismic
	Analyzed By	PT	Configuration Southeast Embankment
	Date	12/4/2023	