FINAL GEOTECHNICAL INVESTIGATION
STEM FOCUSED START-UP UNIVERSITY
BENTONVILLE, ARKANSAS

Prepared for:

STEM LANDS, LLC
BENTONVILLE, ARKANSAS

Prepared by:

UES PROFESSIONAL SOLUTIONS 25, LLC
SPRINGDALE, ARKANSAS

Date:

JULY 28, 2026

UES Project No.:

A25186.00132

SAFETY
TEAMWORK
RESPONSIVENESS
INTEGRITY
VALUE
EXCELLENCE

UES™

Environmental
Geotechnical Engineering
Materials Testing
Field Inspections & Code Compliance
Geophysical Technology

July 28, 2026

Scott McMurtrey, Vice President of Construction
STEM Lands, LLC
850 Museum Way
Bentonville, Arkansas 72712

Re: Final Geotechnical Investigation
STEM Focused Start-Up University
Bentonville, Arkansas
UES Project No. A25186.00132

Dear Mr. McMurtrey:

Presented in this report are the results of the final geotechnical investigation performed by UES Professional Solutions 25, LLC (UES) for the above-referenced project in Bentonville, Arkansas. The report includes our understanding of the project, observed site conditions, conclusions and recommendations, and support data as listed in the Table of Contents.

We appreciate the opportunity to provide these services. If you have any questions regarding this report, or if we can be of any additional service to you, please do not hesitate to contact us.

Respectfully submitted,

UES PROFESSIONAL SOLUTIONS 25, LLC

Subrahmanya Bhat T.

Yancy Schrader, P.E.
Geotechnical Engineer

Subra T. Bhat, Ph.D., P.E.
Principal Geotechnical Engineer

YS/STB:ys

Copies submitted: client (email)

TABLE OF CONTENTS

LIST OF TABLES

FINAL GEOTECHNICAL INVESTIGATION
STEM FOCUSED START-UP UNIVERSITY
BENTONVILLE, ARKANSAS
July 28, 2026 | Project No. A25186.00132

1.0 INTRODUCTION

UES has prepared this final geotechnical investigation for the proposed STEM University Campus project to be located at the former Walmart Corporate Campus near the intersection of South Walton Boulevard and Southwest 8th Street in Bentonville, Arkansas. Services for STEM University were authorized by Scott McMurtrey and Scott Eccleston of STEM Lands, LLC on May 6, 2026. UES previously issued a preliminary geotechnical investigation report (see UES Project No. A25186.00070) dated February 26, 2026, and two supplemental letters (see UES Project No. A25186.00132) dated April 1, 2026 and June 12, 2026 regarding this project. Our scope of services is concluded with this issuance of this final geotechnical investigation report.

The purposes of the geotechnical investigation were to develop a general subsurface profile at the site and prepare recommendations for the geotechnical aspects of the design and construction of the project as defined in our proposal. Our scope of services included site reconnaissance, geotechnical borings, laboratory testing, engineering analyses, and preparation of this report. Unless noted otherwise, all dimensions, measurements, depths, and locations in this report should be considered approximate.

2.0 PROJECT INFORMATION

The project consists of construction of a new STEM-Focused Start-Up University at the former Walmart Corporate Campus located in Bentonville, Arkansas. The STEM University will consist of a multi-story, post-tension concrete student dormitory building (Building Type A1.b), an academic building that will be constructed using structural steel elements as well as post-tension concrete (Building Type A2), and a maker-space building that will utilize a composite structural system (Building Type A3). Finished floor elevation for Building A1.b is planned at EL 1294.50, for Building A2 at EL 1292.00, and for Building A3 at EL 1290.75.

Foundation loads are expected to be heavy. Structural and floor loading information provided by LERA Consulting Structural Engineers (LERA) are summarized in Table 1 below.

Table 1. Structural Loads – STEM University.

Load Type	Building Type		
	A1b	A2	A3
Max Column Reaction (kips)	1,550	850	1,100
Min Column Reaction (kips)	250	400	125
Average Wall Load (k/ft)	3.9	2.75	2.75

Table 2. Provided Floor Slab on Grade Loads.

Load Type	Typical SOG Loading (psf)	Heavier Localized Loading at Equipment Pads (psf)
	A1.b - Dormitory	
Sustained Load (CLD + SDL)	105	225
Total Load (CDL+SDL+LL)	205	285
	A2 - Academic	
Sustained Load (CLD + SDL)	105	225
Total Load (CDL+SDL+LL)	205	285
	A3 - Crucible	
Sustained Load (CLD + SDL)	105	275
Total Load (CDL+SDL+LL)	205	315

Based on the provided grading plans[1], between 2 ft and 4 ft of fill is expected at the northwest and southeast corners of Building A1.b, respectively. Between 2.5 ft and 5.5 ft of fill is expected at the northwest and southeast corners of the Building A2 footprint, respectively. Between 2 ft and 3.5 ft of fill is expected in the Building A3 footprint. A full-height basement with a wall height of about 11.5 ft below the ground floor elevations is planned for a portion of Building A3.

Large box culverts are planned at the intersection of SW D and SW 6th Streets and the intersection of SW D and SW 8th Streets as part of the development. The bottom of the box culverts will be founded at approximate EL 1279. Below-grade walls and wing walls are also planned.

3.0 GEOTECHNICAL EXPLORATION

The geotechnical exploration consisted of 35 boring locations, designated as Borings B-1 through B-12 that were performed as part of a preliminary geotechnical study for the STEM University and Mixed-Use Development site as well as FB-1 through FB-18 that were performed as part of the final geotechnical study for the STEM University project. Borings MP-1 through MP-5 were performed for the future master plan site. Boring locations were located in the field by a UES representative. Approximate locations of borings are shown in Figures 2 through 4 of Appendix A. Elevations on the boring logs were estimated from topographic information[2] provided by Walter P. Moore and Development Consultants, Inc. If more precise locations or elevations are required, the client should retain a registered surveyor to establish boring locations and elevations.

The borings were drilled in December 2025 (Borings B-1 through B-12, MP-1 through MP-5), May 2026 (Borings FB-13 through FB-18), and June and July 2026 (Borings FB-1 through FB-12), using track-mounted rotary drill rigs (CME 55 and CME 550X). Solid-stem auger drilling methods

---

[1] STEM University, Retail Village – Mass Grading Package, 508 SW 8th St, Bentonville, Arkansas, dated February 13, 2026, and prepared by Walter P. Moore and Associates, Inc.

[2] Sheets 1 through 11, ALTA Survey, STEM University, Bentonville, Arkansas, dated January 19, 2026, and prepared by Development Consultants, Inc.

were used as indicated on the boring logs presented in Appendix B. Sampling of the soils was accomplished ahead of the augers at the depths indicated on the boring logs, using 2-inch-outside-diameter (O.D.) split-spoon samplers in general accordance with the procedures outlined by ASTM D1586. Standard Penetration Tests (SPTs) were performed using an automatic hammer to obtain the standard penetration resistance, or N-value[3], of the sampled material.

Representative samples of the underlying bedrock were obtained using a 5-ft-long NQ-size double-tube core barrel with a diamond bit. For each core run, the percent recovery was determined as the ratio of recovery to total length of core run. Rock Quality Designation (RQD) was also determined for the core run as the sum of intact, sound rock core greater than 4-inch length divided by the total length of the run and expressed in percent. Both these values are presented on the boring logs. Photographs of the recovered rock cores are provided in Appendix C.

The drill crew recorded the subsurface profile noting the soil types and stratifications, groundwater, SPT results, and other pertinent data. Observations for groundwater were made in the borings during drilling, at the completion of drilling, and 24 hours after drilling when feasible. Groundwater readings were taken prior to the injection of water where rock coring was performed. All samples were removed from sampling tools in the field, then placed in appropriate containers to prevent moisture loss and/or change in condition during transfer to our laboratory in Springdale for further examination and testing.

To obtain long-term groundwater data, an open standpipe piezometer (P-1) was installed in the proposed basement area near Boring FB-14. The piezometer location is shown in Appendix A. The piezometer consisted of a 2-inch-diameter, Schedule 40 PVC, flush-thread well pipe placed in a 6-inch-diameter borehole. The piezometer included a 10-ft-long, 0.010-inch slotted screen section, a 30/50 filter sand pack, and a bentonite seal. The slotted screen with sand pack was installed in the bottom 1 ft of the pipe, and the remainder of the hole was backfilled with bentonite. A summary of piezometer readings is provided in Section 5.5.1.

4.0 LABORATORY REVIEW AND TESTING

To evaluate pertinent physical properties and engineering characteristics of the foundation and subgrade soils, laboratory tests consisting of natural water content determinations and soil classification tests were performed on selected representative samples. Testing included 175 natural water content determinations (ASTM D2216) performed to complete a water content profile for each boring.

---

[3] The standard penetration resistance, or N-value, is defined as the number of blows required to drive the split-spoon sampler 12 inches with a 140-pound hammer falling 30 inches. Since the split-spoon sampler is driven 18 inches or until refusal, the blows for the first 6 inches are for seating the sampler, and the number of blows for the final 12 inches is the N-value. Additionally, “refusal” of the split-spoon sampler occurs when the sampler is driven less than 6 inches with 50 blows of the hammer.

To verify field classification and to evaluate soil plasticity, 24 liquid and plastic limit determinations (Atterberg limits – ASTM D4318) and 21 sieve analyses (ASTM D6913) were performed on selected representative samples. A total of 23 unconfined compressive strength tests (ASTM D7012) were performed on selected, intact rock core specimens. Point Load Strength Index tests (ASTM D5731) were performed on selected shale core specimens from Borings B-1 and B-4 as testable shale cores were not available for unconfined compressive strength. The laboratory test results are presented in Appendix D as well as on the boring logs in Appendix B.

The boring logs were prepared by a geotechnical engineer from the field logs, visual classifications of the soil samples in the laboratory, and laboratory test results. Terms and symbols used on the boring logs are presented in the Boring Log: Terms and Symbols in Appendix B. Stratification lines on the boring logs indicate approximate changes in strata. The actual transition between strata could be abrupt or gradual.

5.0 SITE AND SUBSURFACE CONDITIONS

5.1 Site Description

The project site is located at the old Walmart Corporate Campus on the west side of Bentonville, Arkansas. The new development will be bounded by SW 6th Street to the north, SW 8th Street to the south, S Walton Boulevard to the west, and SW C Street to the east. The project site consists of approximately 66 acres, and is currently occupied by office and warehouse buildings, residences, parking lots, trees, and green space. Several buildings of the old Walmart Corporate Campus have been recently demolished.

Based on the provided topographic information as well as the Benton County, Arkansas GIS system, elevations across the site range from about EL 1310 to EL 1286. The site appears to slope down from the northwest to the southeast. Drainage at the site is considered fair to good.

5.2 Site Geology

As described and mapped by the United States Geological Survey and shown on the Geologic Map of Arkansas[4], the project site is underlain by the geologic unit mapped as the Pitkin Limestone, Fayetteville Shale, and Batesville Sandstone. The Pitkin Limestone is usually represented by a fine- to coarse-grained, oolitic, bioclastic limestone. The average thickness is about 50 ft in the west and about 200 ft in the east. The Fayetteville Shale is a black, fissile, concretionary, clay shale. Dark gray, fine-grained limestones commonly interbed with the shales in north central Arkansas. The Fayetteville Shale ranges in thickness from 10 to 400 ft. The Batesville Sandstone is an often flaggy, fine- to coarse-grained, cream-colored to brown sandstone with thin shales. The thickness of the Batesville Sandstone is quite variable, ranging from a feather edge to over 200 ft.

---

[4] Geologic Map of Arkansas, Arkansas Geologic Commission and United States Geological Survey, 1993.

5.3 Site Surface

The surface at boring locations B-1 through B-12 and MP-1 through MP-5 generally consisted of 6 to 8 inches of concrete, 4 to 6 inches of asphalt, or 6 inches of topsoil. The pavements are generally underlain by 4 to 6 inches of crushed stone base. The surface at Borings FB-1 through FB-18 generally consisted of between 3 and 24 inches of crushed gravel or bare ground. Specific types and thicknesses of surface materials encountered at the boring locations are shown on the boring logs in Appendix B. It should be noted that Borings FB-1 through FB-18 were drilled following demolition of the existing structures at the project site.

5.4 Site Stratigraphy

Based on the results of the borings, the subsurface conditions in the project area beneath the surface materials may be generalized into six primary strata as stated below.

Stratum I: Existing fill materials were encountered throughout the site to depths ranging generally from 1.5 to 6 ft below existing grade. Deeper existing fill, up to 11 ft below existing grade, was encountered in Boring FB-16. Existing fill materials were not encountered in Borings B-3, B-4, B-7, B-9, FB-13, and FB-14. The fill materials generally consisted of soft to very stiff, red, tan, and brown, sandy clay, lean clay, and fat clay, as well as medium dense, dark brown clayey sand. Concrete rubble, and occasional to numerous limestone and chert fragments, were also encountered. The on-site fill is expected to be highly variable across the site. This stratum exhibited low to moderate shear strength during drilling and sampling.

Stratum II: A stratum of natural, soft to stiff, olive gray, gray, and tan, lean clay was encountered in Borings B-1 through B-4 (western portion of the site), to depths ranging from 5.5 to 13.5 ft. This stratum was also locally encountered in the eastern portion of the site to a depth of 3 ft at Boring B-7 (where it overlies Stratum III fat clay) and in Boring FB-14 to a depth of 9.75 ft (where it extends to auger refusal depth). The Stratum II lean clays exhibited low to moderate shear strength and moderate to high compressibility during drilling and sampling. These soils exhibited moderate plasticity and were predominant in the western portion of the site (generally between SW F Street and SW E Street).

Stratum III: A discontinuous stratum of natural, soft to stiff, olive gray, gray, and tan fat clay was encountered in B-2, B-3, B-5, B-8, FB-3, FB-5, FB-7, FB-9, FB-10, FB-13, FB-15, FB-17, and FB-18 to depths ranging from 7 to 17 ft. The Stratum III fat clay soils exhibited low to moderate shear strength and moderate to high compressibility. These soils exhibited high plasticity and have significant potential for shrink/swell with changes in moisture content.

Stratum IV: A discontinuous stratum of cemented, medium dense to dense, tan and gray fine sandy silt and silty sand (completely weathered sandstone) was encountered at Borings B-2, B-3, FB-3 through FB-6, FB-8, and FB-10 through FB-12 generally on top of the underlying bedrock. The thickness of this stratum ranges from 1 to 7 ft. This stratum was generally absent from the footprint of Building A3. The Stratum IV soils generally exhibited moderate shear strength and moderate compressibility during drilling and sampling.

Stratum V: The basal stratum at the site consisted of moderately hard to very hard, light gray limestone bedrock. Localized clay-filled voids were encountered within the upper portion of the limestone bedrock. Vertical fractures were also encountered. Rock coring was performed at Borings B-1, B-4, B-8, B-9, and B-12 to a maximum depth of exploration of 21 ft, and at Borings FB-1, FB-4, FB-6, FB-7, FB-9, FB-11, FB-13, FB-16, and FB-18 to a maximum depth of exploration of 40 ft. Occasional shale seams are present within this stratum. The Stratum V limestone, where free of clay-filled voids or other major discontinuities, is considered a competent rock for the purposes of this report.

Uniaxial compressive strength tests on limestone rock core samples generally ranged from 4,150 to 25,070 psi (pounds per square inch). RQD values measured from the rock cores ranged from 7 to 100 percent, indicative of very poor to excellent quality rock. Recovery of the samples ranged from 83 to 100 percent. Photographs of rock cores are presented in Appendix C.

Stratum Va: Friable to moderately soft, weathered to fresh shale was generally encountered within the upper portion of the limestone bedrock. The thickness of this stratum ranged from about 2 to 3 ft. A single uniaxial compressive strength test on an intact shale rock core yielded a value of 1,880 psi. Additionally, point load strength indices ranging from 23 to 162 were measured in the Stratum Va shale. These index values correlate to uniaxial compressive strength values of 550 to 3,890 psi. The Stratum Va weak shale is not considered a competent rock.

5.4.1 Future Phase and Master Plan Borings

Borings B-2, B-5, B-6, and B-9 through B-12 were drilled in the footprints of the planned A1, A4.a, and A4.b buildings, as well as the future commercial building space east of SW D Street. The surface of these borings consisted of concrete, asphalt, grass, and bare ground. The master plan borings (Borings MP-1 through MP-5) were drilled at the western edge of the project site. The surface of these borings consisted of 6 inches of asphalt overlying 6 inches of crushed base. Fill materials were encountered in Borings B-6, B-10 through B-12, and MP-3 through MP-5. Overburden soils consisted of silty sand, lean clay, fine sandy silt (completely weathered sandstone), silty clay, and fat clay overlying the underlying limestone with interbedded shale bedrock.

No detailed information has been provided to us regarding development in the vicinity of the master plan borings and the A1, A4.a, and A4.b buildings. The recommendations in this report pertain only to the STEM University project (Buildings A1.b, A2, and A3).

5.5 Groundwater

Groundwater was encountered during drilling, upon completion of drilling, and approximately 24 hours after the completion of drilling at the depths and locations summarized in Table 3. Groundwater levels will vary over time because of seasonal variation in precipitation or other factors not evident at the time of exploration.

Table 3. Groundwater Summary.

Boring	Groundwater Readings		
	During Drilling (ft) / Elevation (ft)	Upon Completion of Drilling (ft) / Elevation (ft)	24 Hours (ft) / Elevation (ft)*
B-1	5 / 1287	N/A	N/A
B-2	12 / 1279	Dry	7.42 / 1283.58
B-3	5 / 1283	11.25 / 1276.75	3.5 / 1284.5
B-4	8 / 1278	N/A	N/A
B-5	9 / 1279	9 / 1279	6.67 / 1281.33
B-6	9 / 1278	9 / 1278	5.33 / 1281.67
B-7	3 / 1283	3 / 1283	2.17 / 1283.83
B-8	Dry	N/A	N/A
B-9	8.5 / 1279.5	N/A	N/A
B-10	Dry	Dry	6.5 / 1279.5
B-11	7 / 1280	7 / 1280	3.42 / 1283.58
B-12	Dry	Dry	N/A
MP-1	Dry	Dry	Dry
MP-2	Dry	11	7.5
MP-3	9	9	5.33
MP-4	8	8	2.5
MP-5	Dry	Dry	6.17
FB-1	2 / 1291	2 / 1291	2 / 1291
FB-2	2 / 1290	2 / 1290	3 / 1289
FB-3	2 / 1291	3 / 1290	3 / 1290
FB-4	2 / 1290	2 / 1290	3 / 1289
FB-5	6.5 / 1285.5	N/A	3 / 1289
FB-6	12 / 1278	3 / 1287	3 / 1287
FB-7	13.5 / 1275.5	N/A	N/A
FB-8	Dry	Dry	4 / 1285
FB-9	5 / 1281	5 / 1281	3 / 1283
FB-10	13.5 / 1275.5	Dry	3 / 1286
FB-11	14 / 1273	N/A	5 / 1282
FB-12	3 / 1283	3 / 1283	3 / 1283
FB-13	Dry	N/A	N/A
FB-14	5.5 / 1281	Dry	N/A
FB-15	10 / 1278	Dry	N/A

Boring	Groundwater Readings		
	During Drilling (ft) / Elevation (ft)	Upon Completion of Drilling (ft) / Elevation (ft)	24 Hours (ft) / Elevation (ft)*
FB-16	3 / 1283.5	N/A	N/A
FB-17	Dry	Dry	N/A
FB-18	5.5 / 1281.5	Dry	N/A

*Readings were also taken at 16 and 18 hours, see boring logs for detailed information.

5.5.1 Piezometer Summary

A piezometer (P-1) was installed to a depth of approximately 11 ft in the vicinity of Boring FB-14. The piezometer was tipped onto bedrock. Groundwater levels were allowed to stabilize within the piezometer, the water was removed, and then the recharge into the piezometer was measured on June 4, 2026. Additional measurements were taken up to 6 days following initial bailing of the piezometer. Results are summarized in Table 4.

Table 4. Piezometer Reading Summary.

Date	Elapsed Time (minutes)	Water Level (ft from existing grade)	Approx. Water Elevation (ft)*	Notes
6/4/26	0	9.42	1277.0	After bailing**
6/4/26	10	8.80	1277.7	
6/4/26	20	8.17	1278.3	
6/4/26	30	7.64	1278.9	
6/4/26	40	7.19	1279.3	
6/4/26	50	6.81	1279.7	
6/4/26	60	6.44	1280.0	
6/4/26	4 hours	5.99	1280.5	
6/5/26	24 hours	5.50	1281.0	
6/8/26	4 days	4.48	1282.0	
6/10/26	6 days	4.01	1282.5	

* Ground surface elevation estimated from the available topographic information at EL 1286.5.

** Piezometer was bailed prior to first reading (at 0 minutes).

5.6 Seismic Site Classification

It is our understanding the proposed construction site will be designed in accordance with Chapter 20 of ASCE 7-16 and the 2021 International Building Code (IBC). The 2021 IBC/ASCE 7-16 stipulates structures designed based on an earthquake event with a probability of exceedance of 2% in 50 years. Based on the subsurface conditions encountered in the borings, our historical database of soil information in the site vicinity, and our experience with the local geology, a Seismic Site Class C is considered applicable as per the criteria of the ASCE 7-16. Based on the results of the field and laboratory testing, our understanding of the vicinity, and our interpretations of the 2021 IBC/ASCE 7-16, it is our opinion the seismic parameters in Table 5 are applicable for this project.

Table 5. Seismic Parameters – Site Class C.

Parameter[a]	Designation/ Value	Reference
S_S	0.152	Latitude 36.36496°N/Longitude 94.21508°W
S_1	0.089	
F_a	1.3	2021 IBC Table 1613.2.3(1)
F_v	1.5	2021 IBC Table 1613.2.3(2)
PGA	0.072	ASCE 7-16 Figure 22-7
PGA_M	0.094	ASCE 7-16 Equation 11.8-1

[a] S_S and S_1 were computed using the web-based U.S. Seismic Design Maps (https://www.seismicmaps.org) using the indicated latitude and longitude coordinates of the project site.

The Benton County, Arkansas site is located in Seismic Zone 1, defined by the Arkansas Building Authority (2005) as the zone of least seismic potential. The liquefaction potential of the soils encountered within the exploration depth of the borings is considered negligible.

5.7 Significant Conditions

Site and subsurface conditions considered significant to design and construction of the project are as follows:

1. Previous development, including buildings, pavements, and slabs at the site;

2. The variability of the existing fill materials (Stratum I) encountered to depths up to 11 ft below existing grade at the site;

3. The low to moderate shear strength and moderate to high compressibility exhibited by the Stratum II and III natural lean clay and fat clay overburden soils to depths ranging from 13.5 to 17 ft below existing grade at the site;

4. The high plasticity exhibited by the discontinuous Stratum III fat clay soils from depths ranging from 7 to 17 ft below existing grade;

5. The moderate shear strength and moderate compressibility exhibited by the discontinuous Stratum IV medium dense to dense sandy silt and silty sand (completely weathered sandstone) ranging in thickness from 1 to 7 ft;

6. The presence of Stratum V hard to very hard limestone with chert intervals and inclusions beginning at depths ranging from 10 to 17 ft below existing grade and extending to 40 ft termination depth of the borings;

7. The localized presence of clay-filled voids generally encountered in the upper portion of the limestone bedrock;

8. The presence of low hardness shale intervals (Stratum Va) within the Stratum V moderately hard to very hard limestone; and

9. The presence of shallow groundwater in December 2025, and May, June and July 2026, the potential for significant water seepage into excavations at the site, and the potential for developing shallow perched groundwater in the near surface soils during wet periods of the year.

The relationship of these factors to the construction of the proposed development is considered in subsequent sections of this report.

6.0 GEOTECHNICAL ANALYSIS AND RECOMMENDATIONS

UES has prepared the following recommendations based on our understanding of the proposed project, the layout of the structures, site grading, foundation loads provided to us, the field and laboratory data presented in this report, engineering analyses, and our experience and judgment.

6.1 Foundations – General Considerations

Foundations for the heavily loaded structures must satisfy two (2) basic and independent design criteria. First, the maximum bearing pressure transmitted to the supporting strata must not exceed the allowable bearing pressure based on an allowable factor of safety with respect to bearing stratum shear strength. Second, foundation movements resulting from consolidation, shrinkage, or swelling of the supporting strata should be within tolerable limits for the structure. Construction factors, such as installation of foundations, excavation procedures and surface and groundwater conditions, must also be considered.

Foundation loads are expected to be heavy, with maximum column loads on the order of 700 to 1,500 kips. Considering the heavy foundation loads and the results of the borings, shallow footings founded on the overburden soils (Stratum I through IV) are not suitable to support the planned structures. Foundation loads must be transferred to the underlying Stratum V limestone bedrock. We understand that straight-shaft drilled piers will be utilized as the foundation system for the structures. Foundation recommendations for drilled piers are presented below.

6.2 Foundations – Drilled Piers

The STEM University buildings could be supported on straight-shaft drilled piers founded (socketed) a minimum of 1-pier diameter into competent very hard gray limestone (Stratum V). Piers so founded may be designed with a maximum net allowable end-bearing pressure of 110 ksf (kips per square foot). A minimum pier length of 10 ft and a minimum pier diameter of 30 inches are recommended. Estimated drilled pier tip elevations at each applicable boring location are presented in Table 6. Karst features consisting of clay-filled voids were encountered in some of the borings. In addition, a 2-to-3-ft-thick strata of friable to moderately soft shale (Stratum Va) was generally encountered within the upper portion of the limestone bedrock. The piers must extend through the clay-filled voids and the weak shale stratum and be socketed into the underlying competent limestone. Estimated depths and elevations to top of bedrock and competent rock bearing stratum, as well as estimated tip elevations for a 4 ft diameter pier are provided in Table 6 for each applicable boring location. It should be noted that the estimated depth/elevation of the top of the competent limestone bedrock where pier sockets will begin should be considered approximate, and it must be field verified as further described.

Uplift loads may be resisted by the weight of concrete and friction between the pier and the overburden soils (Stratum I through IV) and the underlying limestone (Stratum V). The upper 4 feet of pier penetration into the overburden soils should be ignored from skin friction considerations. Below 4 feet, an allowable skin friction value of 200 psf may be used in the overburden soils. An allowable skin friction value of 15 ksf may be used for penetration into the very hard limestone (Stratum V). The allowable bearing and skin friction values may be increased by 33 percent under seismic loading conditions. The allowable values include a minimum factor of safety of 2.5 based on the competence of the Stratum V limestone and the shear strength of the overburden soils.

Table 6. Estimated Drilled Pier Depths and Elevations.

Structure	Boring No.	Approx. Ground Elevation (ft)	Approx. Depth to Bedrock (ft)	Estimated Depth to Competent Limestone Bearing Stratum (ft)	Estimated Elevation of Bearing Stratum (ft)	Estimated Pier Tip Elevation (4 ft diameter pier)	Estimated Pier Depth Below FFE (4 ft diameter pier)
A1.b (FFE = 1294.5)	B-1	1292	11.5	19	1273	1269	25.5
	FB-1	1293	16.5	16.5	1276.5	1272.5	22
	FB-2	1292	12	18	1274	1270	24.5
	FB-3	1293	14.5	20	1273	1269	25.5
	FB-4	1292	14.5	22	1270	1266	28.5
	FB-5	1292	17.5	22	1270	1266	28.5
	FB-6	1290	14.5	20	1270	1266	28.5
A2 (FFE = 1292)	FB-7	1289	14	19	1270	1266	26
	FB-8	1289	15	21	1268	1264	28
	FB-9	1286	15.5	20	1266	1262	30
	FB-10	1289	15	21	1268	1264	28
	FB-11	1287	15	19.5	1267.5	1263.5	28.5
	FB-12	1286	14.5	19	1267	1263	29
	B-3	1288	14	22	1266	1262	30
	B-4	1286	10.5	16	1270	1266	26
A3 (FFE = 1290.75)	FB-13	1287	11	16.5	1270.5	1266.5	24.5
	FB-14	1286.5	10	16.5	1270	1266	25
	FB-15	1288	10.5	18	1270	1266	25
	FB-16	1286.5	11	16	1270.5	1266.5	24.5
	FB-17	1286.5	10.5	16.5	1270	1266	25
	FB-18	1287	10.5	11.5	1275.5	1270.5	19.5
	B-7	1286	10.5	16	1270	1266	25
	B-8	1287	9.75	12.5	1274.5	1270.5	20.5

Pier tip elevations ranging from EL 1262 to EL 1272 are generally expected, assuming 4 feet of embedment into the competent limestone. It should be noted that the actual pier depths may vary significantly from the estimated depths depending on the results of probing as discussed below.

Considering the presence of the friable to moderately soft shale (Stratum Va) at the site, clay-filled voids encountered within the Stratum V limestone, and the potential for encountering karst features such as cavities and void spaces in the limestone bedrock at the site, we recommend that pier bottoms be probed to verify limestone competence, suitable bearing, and the absence of karst features and/or friable shale layers. Probes should extend to a minimum depth of 2-shaft-diameters below the bottom of pier elevation. If cavities or void spaces, or low hardness shale (Stratum Va) are encountered within the 2-shaft-diameter probe depth, the pier must be deepened and socketed into competent rock below the discontinuities.

Probe holes should have a minimum diameter of 3 inches. Probe holes may be drilled using a drill rig fitted with a down-the-hole air hammer in the presence of the Geotechnical Engineer. Alternatively, intact rock cores of the bearing strata may be obtained. Pier excavations and probing must be observed by the Geotechnical Engineer to verify suitable bearing. Where discontinuities or weak zones are indicated by probing, the pier depth should be extended to competent limestone and again probed. It is the responsibility of the Contractor to drill probe holes and facilitate inspection of probing by the Geotechnical Engineer.

The soft to stiff clay and silt overburden soils (Stratum I through IV) have the potential to cave-in during pier drilling and pier installation, particularly if they become wet. Use of temporary and/or permanent casing may be warranted at the project site. Settlement of properly installed piers should be minor. Drilled pier installation and probing should be observed by the Geotechnical Engineer to verify suitable bearing.

Shallow groundwater was encountered during drilling at the depths indicated in Table 3. Significant groundwater should be expected in the pier excavations. The Contractor should be prepared to dewater the pier holes. Temporary casing of pier holes may be warranted to control groundwater inflow and/or prevent caving during pier installation. Underwater concrete placement techniques may be warranted.

Heavy-duty drilling equipment and rock drilling tools will be required to advance the pier excavations through the overburden soils into the limestone bearing stratum (Stratum V). The limestone encountered in the borings is considered hard to very hard with compressive strength ranging from about 4,000 to 25,000 psi. Stronger intervals may be present in the limestone rock mass. Considering these factors, very slow and challenging drilling/coring conditions should be expected.

6.3 Foundations – Lateral Loading Analysis

Lateral capacity analyses of straight-shaft drilled piers socketed into the Stratum V limestone were requested by LERA and performed by UES using the program LPILE. The following assumptions were provided by LERA for use in the analysis.

- Head displacement for fixed conditions and free conditions should be limited to 0.5 inches and 1 inch, respectively.

- Drilled pier reinforcement should be assumed to be 1% and 1.5% of the gross shaft area for fixed and free conditions, respectively.

- Drilled shaft diameters ranging from 24 inches to 60 inches were considered.

- Concrete compressive strength was modeled at 4,000 to 4,500 psi (normal weight).

Results of the L-Pile analysis are included in Appendix E. Lateral load capacities for both fixed head and free head conditions for different diameter piers were calculated for limiting the pier head deflection to the criteria provided above. A typical subsurface profile was used in the analysis and is included in Appendix E. Overburden soils were neglected from lateral resistance considerations. Lateral loading analysis was performed assuming top of the pier at approximately 4 feet below the finish floor elevation.

6.4 Floor Slabs

A 6-inch-thick concrete slab-on-grade (SOG) is planned for the floor slabs for Buildings A1.b, A2, and A3. Equipment pad thickness may range from 6 to 14 inches. Slab on-grade type construction is considered suitable in conjunction with localized undercut as further described in the Site Grading section of the report. Based on the provided slab loading information, the planned finished floor elevations of the buildings, and the results of the borings, we have estimated the post-construction settlement of slabs-on-grade. The results of the analysis are summarized in Table 7 below.

Table 7. SOG Settlement Analysis Results.

Building	Finished Floor Elevation (ft)	Approximate Anticipated Cut (-) / Fill (+) Depths (ft)	Estimated Post-Construction Settlement (inches)	
			Total	Differential
A1.b	1294.50	+2 to +4	1	0.5
A2	1292.00	+2.5 to +5.5	1	0.5
A3	1290.75	+2 to +3.5	1	0.5

We recommend that the at-grade floor slab be supported on a 4- to 6-inch-thick, clean crushed stone or gravel layer placed on a properly prepared subgrade. The granular layer should be densified with vibrating equipment prior to floor slab construction. Impervious sheeting should be placed between the slab and granular course to act as a vapor barrier.

Considering the site grading requirements, subgrade soils are expected to consist of new engineered fill. Assuming locally available “hillside” borrow material, with a minimum California Bearing Ratio (CBR) of 8.0, a modulus of subgrade reaction (k) value of 175 pci may be used for slab-on-grade design. A modulus of subgrade reaction (k) value of 125 pci may be used for Building A3.

6.5 Basement Foundations and Slabs

A full-height basement will be constructed as part of the building footprint of Building A3. The basement will have approximate dimensions of 55 ft by 100 ft and will be situated on the west side of the building footprint. Wall heights of about 11.5 ft below the ground floor elevation are expected. A finish floor elevation of EL 1,279.75 is planned for the basement level. Bedrock was encountered at EL 1276.50 in the vicinity of the planned basement. The bearing stratum for footings is expected to consist of Stratum V moderately hard to hard light gray limestone. Shallow foundations founded with a minimum embedment (socket) of 2 ft into the competent Stratum V limestone free of voids and karst features may be designed for an allowable bearing capacity of 40 ksf. Rock undercut on the order of 3 to 4 ft should be generally expected to reach the top of the competent limestone. The footings should extend a minimum of 2 ft into the competent limestone as mentioned above.

Probing is recommended to verify the rock competency beneath shallow foundations. Probes should extend a minimum of 5 ft below footings and should be spaced 10 ft apart for continuous footings. We recommend that a minimum of two probes be performed in each column footing. If voids or other discontinuities are encountered during probing, the foundations should be deepened to bear on competent rock beneath the discontinuities. Rock undercuts should be backfilled with concrete to bottom of foundation elevations.

Alternatively, continuous footings for the basement walls founded on the Stratum V limestone can be designed for an allowable bearing capacity of 5,000 psf without probing. Continuous footings should have a minimum width of 18 inches and should be founded a minimum of 2 ft below final adjacent grade. Total and differential settlement of footings founded on the Stratum V limestone is considered negligible. Resistance to sliding may be evaluated using an ultimate friction value of 0.60 for concrete on intact limestone. An appropriate factor of safety must be included in analysis of sliding. An allowable passive pressure of 3,000 psf may be used for the top 2 ft of Stratum V limestone. Below 2 ft, an allowable passive pressure of 10,000 psf may be used in design for competent limestone.

For basement slabs, we recommend that the slabs be supported on the Stratum V limestone bedrock with a subfloor drainage system. If the Stratum V limestone bedrock is not encountered at planned subgrade elevation, overburden soils should be undercut down to bedrock and backfilled with clean stone or B-stone.

The drainage layer of the subfloor drainage system should consist of a minimum of 6 inches of No. 57 stone. In addition, regularly spaced French drains should be provided to collect water from the drainage layer. The French drains should extend a minimum of 6 inches into the bedrock below the drainage layer, and have a spacing of about 50 to 75 ft and a slope of about 0.5%. A modulus of subgrade reaction (k) value of 250 pci may be used for basement slabs.

The static groundwater level was measured at approximately EL 1282.50 in the piezometer installed in the basement footprint. Dewatering of the basement excavation should be expected during construction. This can be accomplished through the use of sump pits/pumps, blanket drains, or French drains. Specific dewatering recommendations can be provided at the time of excavation.

6.6 Lateral Earth Pressures

Active earth pressures will be mobilized for walls that are cantilevered and free to rotate about the base. Where walls are restricted from rotation by inside corners, baffle walls, and/or top slabs, at-rest lateral earth pressures will be mobilized.

Lateral earth pressure parameters for both at-rest and active conditions have been developed. It is expected that the below-grade walls will be backfilled with either clean crushed stone or imported low-plasticity engineered fill. To maintain backfill drainage in case of engineered fill backfill, the zone extending at least 2 ft behind walls should be backfilled with clean, free-draining crushed stone or gravel. For clean crushed stone, a gradation complying with ASTM D448 No. 57 stone is recommended. In order to utilize the equivalent fluid pressure values provided for free-draining crushed stone backfill, as a minimum, clean crushed stone wall backfill should be placed in a zone extending from the back of the wall to daylight on a 1-horizontal to 1-vertical (1H:1V) configuration. If stable limestone (Stratum V) is encountered behind the planned below-grade walls, the 1H:1V configuration for crushed stone wall backfill is not required. A minimum of 2 ft of crushed stone wall backfill should be placed behind the wall to function as a chimney drain in this case. To allow drainage of groundwater from the wall backfill, a perimeter drain consisting of a continuous, perforated PVC pipe wrapped in geotextile fabric should be provided within the granular course behind below-grade walls. Water should be discharged from backfill via a drain pipe. A summary of recommended equivalent fluid pressures is shown in Table 8 for walls backfilled with either clean, crushed stone or low-plasticity fill.

Table 8. Lateral Earth Pressures for Wall Backfill.

Earth Pressure Condition	Equivalent Fluid Pressure, lbs per sq ft per ft depth	
	Free-draining crushed stone backfill	Low-plasticity select fill
Active, drained	35	50
Active, undrained	80	90
At-rest (restrained), drained	50	80
At rest (restrained), undrained	85	100

Undrained conditions assume that the walls will be subject to full hydrostatic pressure. For the undrained condition, groundwater level may be assumed at EL 1,282.5. Drained conditions assume positive and continuous drainage of infiltrated water from the backfill. Lateral surcharge loads on walls backfilled with clean stone may be evaluated using an earth pressure coefficient 0.43 for the at-rest condition. For evaluation of lateral surcharge loads on walls backfilled with select fill, an earth pressure coefficient of 0.66 for the at-rest condition should be utilized.

Clean granular backfill should be placed in nominal 10- to 12-inch-thick lifts and densified by vibrating equipment, rodding or other suitable means. Granular backfill must be separated from the on-site soils by a suitable filter fabric. A geotextile such as Mirafi 140N or approved equal is recommended.

For walls backfilled with low-plasticity select fill, wall backfill should be compacted to a minimum of 98 percent of the maximum dry density as determined by Standard Proctor (ASTM D698) procedures within 3% of the optimum. The top 12 to 18 inches of wall backfill, where exposed, should consist of low-permeability clayey soils compacted to the Standard Proctor value recommended above. This top layer should limit infiltration of surface water into backfill. Maximum particle size in wall backfill should be limited to about 1.5 inches. Compaction within 5 ft of walls should be performed with hand compaction equipment. Care should be taken when compacting as overcompaction may cause damage to walls.

6.7 Box Culverts

Box culverts will be constructed to facilitate drainage around the project site and at the intersections of SW D and SW 6th Streets, and SW D and SW 8th Streets. The bedrock at the SW D and SW 6th intersection is expected at approximate elevations ranging from EL 1277 to EL 1278. Similarly, at the intersections of SW D/E and SW 8th, the bedrock is expected at approximate elevation ranging from EL 1275 to EL 1277. Bottom of box culverts is planned at EL 1279. Weak fat clay overburden soil is expected to be encountered at the bottom of the excavation. These soils are not considered suitable to support the box culverts or below-grade walls. We recommend that the fat clay be undercut down to bedrock and backfilled with B-stone. The top of the B-stone should be choked with a minimum of 6 inches of compacted Class 7 base.

The box culvert and below-grade walls may be supported on the Class 7 base. Below-grade walls may be designed using an allowable bearing capacity of 3500 psf. Resistance to sliding may be evaluated using an ultimate friction angle (δ) of 30° for Class 7 base. The lateral earth pressure information provided in Table 8 may be used for the design of box culverts. The groundwater level may be assumed at EL 1270. Undrained conditions may be assumed below this elevation. Lateral earth pressures must also include the influence of surcharge loads. We recommend a lateral earth pressure coefficient of 0.4 be used to evaluate surcharge loads in the active case. For the at-rest (restrained) case, a lateral earth pressure coefficient of 0.75 should be applied to surcharge loads.

6.8 Pavements

Specific information regarding the location of pavements and anticipated traffic was not available. However, it is expected that pavements will generally surround the planned structures and traffic in the pavement areas is expected to include frequent automobiles and light utility vehicles, some passenger vans, occasional single-unit delivery trucks, and dumpster service vehicles.

Site grading information is not available at this time. Considering the weak nature of the overburden soils and the presence of fat clays across the site, we recommend that the pavement section should be underlain by a minimum of 2 ft of volumetrically stable engineered fill. Additional undercuts beyond the recommended minimum may be warranted. As an alternative to undercut, lime stabilization of the subgrade may be considered. In this case, a minimum of 1 ft of the subgrade should be appropriately lime treated.

In light of the above discussion, pavement subgrade is expected to consist of a minimum of 2 ft of select engineered fill or 1 ft of lime treated soils. These soils will provide good subgrade support for the pavements in conjunction with good drainage conditions. The following properties have been assumed for development of pavement section alternatives. Recommended alternatives for pavement sections are summarized in Table 9. Should traffic volumes or loads exceed the conditions outlined previously, or if subgrade conditions vary from those assumed, pavement sections should be re-evaluated.

Subgrade: Min. 2 ft of volumetrically stable engineered fill or 1 ft of lime treated subgrade
California Bearing Ratio (CBR): 8 or greater
Resilient Modulus (M_R): 6000 lbs per sq inch
Modulus of Subgrade Reaction (k): 125 lbs per sq in. per inch

Table 9. Recommended Pavement Section Alternatives.

Pavement Type	Pavement Component	ARDOT* Specification Section	Thickness (inches)
Flexible (Light Duty)	Asphalt Concrete Hot Mix Surface Course, ½ inch, N_{max}=115	407	3
	ARDOT Class 7 Aggregate Base Course	303	6
Flexible (Heavy Duty)	Asphalt Concrete Hot Mix Surface Course, ½ inch, N_{max}=115	407	3
	ARDOT Class 7 Aggregate Base Course	303	10
Rigid (Light Duty)	Portland Cement Concrete f'_c=4,000 psi @ 28 days minimum	501	5
	ARDOT Class 7 Aggregate Base Course	303	4
Rigid (Heavy Duty)	Portland Cement Concrete f'_c=4,000 psi @ 28 days minimum	501	6
	ARDOT Class 7 Aggregate Base Course	303	4

*Arkansas Highway and Transportation Department, Standard Specifications for Highway Construction, 2014.

We also recommend that pavements in service/trash dumpster areas be a minimum 6 inches of Portland cement concrete underlain by at least 6 inches of compacted crushed stone aggregate base (ARDOT Standard Specifications for Highway Construction, 2014 Edition, Section 303, Class 7). The concrete area should be large enough to incorporate both the dumpster and the wheels of a service truck. The route to the trash dumpster area and service areas should utilize the recommended drive pavement section.

Subgrade conditions should be evaluated by the Geotechnical Engineer prior to pavement construction. Subgrade preparation should include a thorough proofrolling following any cut and prior to placing fill. Unstable soils or otherwise unsuitable materials should be undercut and replaced with select fill or stabilized as directed by the Engineer. Additional undercuts beyond the recommended minimum of 2 ft may be required. All aggregate base should be compacted to a minimum of 95 percent of the Modified Proctor (ASTM D1557) maximum dry density and with a workable moisture content. Pavement subgrade should be prepared as described in the Site Preparation and Grading section of this report.

The importance of positive surface drainage for acceptable pavement performance cannot be overemphasized. Grades should direct water off paved areas and ditches or storm drains should be used to develop positive flow away from pavements. Periodic maintenance of pavements should include sealing of all joints and cracks to restrict surface water infiltration.

6.9 Site Preparation and Grading

We recommend that a pre-site grading meeting be held to review site and subgrade conditions at the time of construction. This meeting should include the Engineer, Geotechnical Engineer, General Contractor, Site Grading Contractor and Owner. At that time, specific site grading procedures, such as temporary drainage, type of equipment to be used and potential for undercut should be reviewed.

Subgrade preparation in the construction areas should begin with removal of all structures, foundations, slabs, and pavements. Stripping of all soft and/or organic-containing soils should also take place. Specific subgrade preparation recommendations for each building footprint are provided in the following sections.

6.9.1 Building A1.b

Between 2 and 4 ft of new fill will be placed in the footprint of Building A1.b. Following stripping of surface materials, and cutting as dictated by site grading requirements, but prior to any fill placement, the subgrade should be proofrolled with a loaded tandem-wheel dump truck or similar equipment in the presence of the Geotechnical Engineer. No minimum undercut is recommended if the exposed subgrade soils pass the proofroll.

All soft or loose soils encountered in the construction area should be excavated, reprocessed and recompacted or replaced with engineered fill, whichever is appropriate. Additional undercut may be warranted depending on the site conditions at the time of construction.

6.9.2 Building A2

Between 2.5 and 5.5 ft of new fill will be placed in the footprint of Building A2. Following stripping of surface materials, and cutting as dictated by site grading requirements, but prior to any fill placement, the subgrade should be proofrolled with a loaded tandem-wheel dump truck or similar equipment in the presence of the Geotechnical Engineer. No minimum undercut is recommended if the exposed subgrade soils pass the proofroll, however, the near-surface soils are generally soft, with significant undercut expected. Anticipated undercut depths in the footprint of Building A2 are shown in Table 10.

Table 10. Anticipated Undercuts (Building A2).

Boring	Estimated Undercut (ft below existing grade)	Estimated Elevation of Stable Soils (ft)
FB-7	3	1286
FB-8	4	1285
FB-9	Minor	--
FB-10	4	1285
FB-11	Minor	--
FB-12	4	1282
B-3	4	1284

Groundwater was encountered at a shallow depth in the Building A2 footprint. If seepage into the undercut cannot be controlled by sump and pump method, seepage should be diverted by French drains or blanket drains.

6.9.3 Building A3

Site grading for the A3 building pad is expected to include about 2 to 3.5 ft of fill. Mass undercut of on-site soils is not warranted in the existing building pad area. However, it was observed that the existing foundation elements are being excavated and backfilled with on-site spoils during demolition. These excavations are typically 4 to 5 ft deep based on our observations. It is important that these areas are locally undercut and replaced with engineered fill before placing additional fill for site grading.

The near-surface soils encountered on the south side of the planned building pad were found to be very soft. We recommend that these soils be undercut a minimum of 4 ft below existing grades and replaced with engineered fill. The approximate limits of anticipated undercut are shown on Figure 4 in Appendix A. Localized undercut of about 6 ft is expected (see Boring FB-16). Additionally, the potential exists for encountering seepage in the undercut areas due to the presence of perched water in the near-surface soils and shallow groundwater conditions. Use of a French drain or a blanket drain may be warranted to facilitate site grading.

6.9.4 Suitable Fill and Compaction

On-site soils undercut from the site are not considered suitable for use as engineered fill; however, these soils may be used in greenspace areas. Fill material, if required, should consist of imported material meeting the following requirements. Imported borrow for use as engineered fill or backfill should consist of “hillside” sandy clay, silty/clayey gravel that classifies as CL, SC, GC or GM by the Unified Soil Classification System having a liquid limit (LL) less than 45. Fill proposed for use at the site that does not meet the plasticity requirements should be evaluated by the Geotechnical Engineer on a case-by-case basis.

Fill and backfill should be placed in level lifts, up to 8 inches in loose thickness. For soils that exhibit a well-defined moisture density relationship, each lift should be compacted to a minimum of 98% of Standard Proctor (ASTM D698) maximum dry density in the structure areas and a minimum of 95% of Standard Proctor (ASTM D698) maximum dry density in the pavement areas at a moisture content range of +/- 3% of optimum value. Crushed stone base should be compacted to a minimum of 95% of Modified Proctor (ASTM D1557) maximum dry density at a moisture content close to optimum.

6.10 Temporary Excavations

All excavations must comply with Local, State and Federal requirements for worker safety. Based on the results of the borings, the on-site existing fill and natural soils (Stratum I, II, and III) typically classify as Type C by OSHA criteria. The on-site Stratum IV fine sandy silt and silty sand typically classifies as Type B by OSHA criteria. Intact limestone bedrock and shale (Stratum V and Va) will typically classify as Stable Rock by OSHA criteria. Based on the above information and the results of the borings, temporary open-cut excavations in overburden soils can probably be made on a 1-horizontal to 1-vertical (1H:1V) to 1.5-horizontal to 1-vertical (1.5H:1V) configurations. Excavations into exposed rock can be made with near-vertical sidewalls; however, rock fall protection should be provided. Flattening slopes or incorporating horizontal benches will be required where seepage or zones of loose on-site backfill are encountered. Stability of short-term excavations should be evaluated in the field based on specific site observations. Temporary slopes should be monitored on a continuing basis and flattened as warranted by site conditions.

As an alternative to sloping temporary cuts, excavations may be cut with near-vertical sidewalls. Temporary support for vertical cut excavations may utilize cantilevered steel sheeting, interior (cross-lot) braced sheeting, deadman tieback systems, soil nails, or other suitable systems. Depending on the system and design criteria selected, support systems are subject to lateral movements and potential loss of ground at the top of excavations. Soil movement and settlement related to the selected support system must be evaluated based on the proximity of adjacent foundations and structures.

Temporary bracing or excavation support for below-grade structures should be designed by a Professional Engineer and monitored by the Architect or a designated representative. All excavations must comply with Local, State and Federal requirements for worker safety. Bracing or retention systems should be monitored on a continuous basis for movement or loss of ground.

6.11 Construction Considerations

Positive surface drainage should be established and maintained throughout construction operations. Water should not be allowed to pond in the structure and pavement areas. If ponding occurs and the foundation or subgrade soils become soft or otherwise disturbed, unsuitable soils should be excavated and wasted. Density and water content of all earthwork should be maintained until foundations and floor slabs are completed. All foundation excavations must be observed by the Geotechnical Engineer to verify suitable bearing and adequate cleanup.

Heavy-duty drilling equipment will be warranted to advance pier excavations through the overburden soils into the bedrock. Coring will be required to advance pier excavations into the Stratum V limestone bedrock.

We recommend that Contract Documents include an allowance for drilling through intervals of rock that cannot be drilled with conventional augers fitted with rock teeth. This should include intervals where the pier excavation cannot be advanced without extraordinary effort and notably slow progress with conventional heavy-duty equipment of size, power, torque, and downthrust typically used in the project area. We recommend that the allowance for rock drilling be limited to zones where auger refusal is experienced and coring methods are required.

All pier excavations should be practically dry and clean prior to concrete placement. Groundwater should be expected in the pier excavations. The Contractor should be prepared to dewater. Temporary casing may also be required to control groundwater seepage and caving of overburden soils. Where more than about 3 inches of water is present, pier shafts should be dewatered or underwater concrete placement methods used. Pier excavation, steel placement and concreting should be completed expeditiously to reduce the possibility of changes in foundation conditions.

Utility trenches backfilled with clean gravel are a common source of water infiltration under buildings, pavements, and other structures. To reduce the potential for surface water conveyance and infiltration, we recommend the top 18 inches of utility trench backfill be capped with a cohesive engineered fill beyond the building.

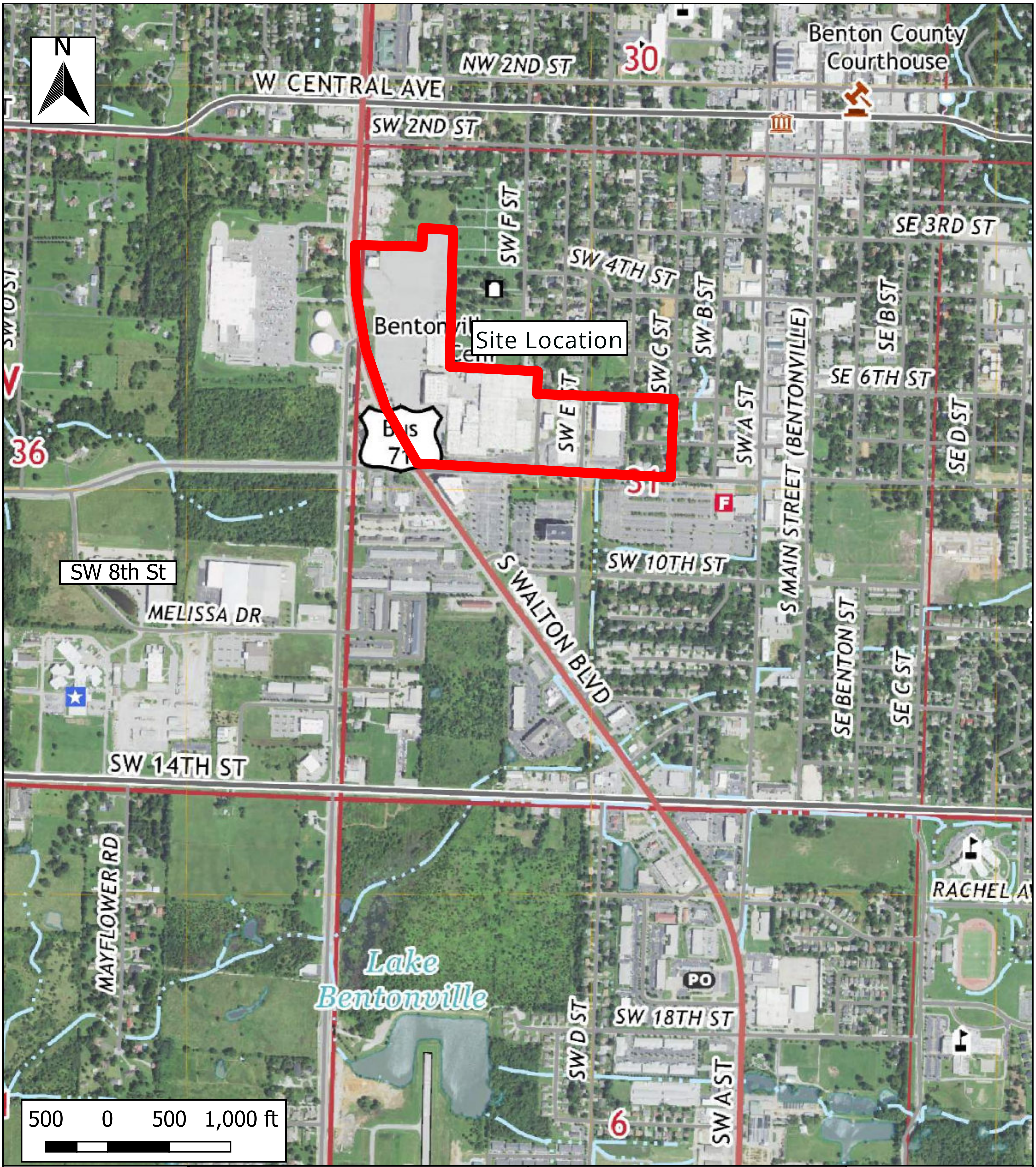
6.12 Rock Excavation

It is our opinion that mass cuts and excavations in the overburden soils (Stratum I through IV) can be performed with conventional medium- to heavy-duty excavation equipment. However, deeper excavations extending into the limestone bedrock will require rock excavation methods. This may include techniques such as hoeram, blasting, or jackhammering. Depths/elevations below which bedrock is expected to be encountered at each boring location are summarized in Table 6. We recommend that the contract documents include a unit price for removal and disposal of materials and obstructions that cannot be excavated with conventional heavy-duty excavating equipment. We recommend that conventional heavy-duty excavating equipment be defined as a Caterpillar D-8 bulldozer with single tooth ripper, a Caterpillar 322B track excavator equipped with rock teeth, or equipment of similar power and capability. Rock excavation volumes should be determined based on in-place measurements via cross sectioning.

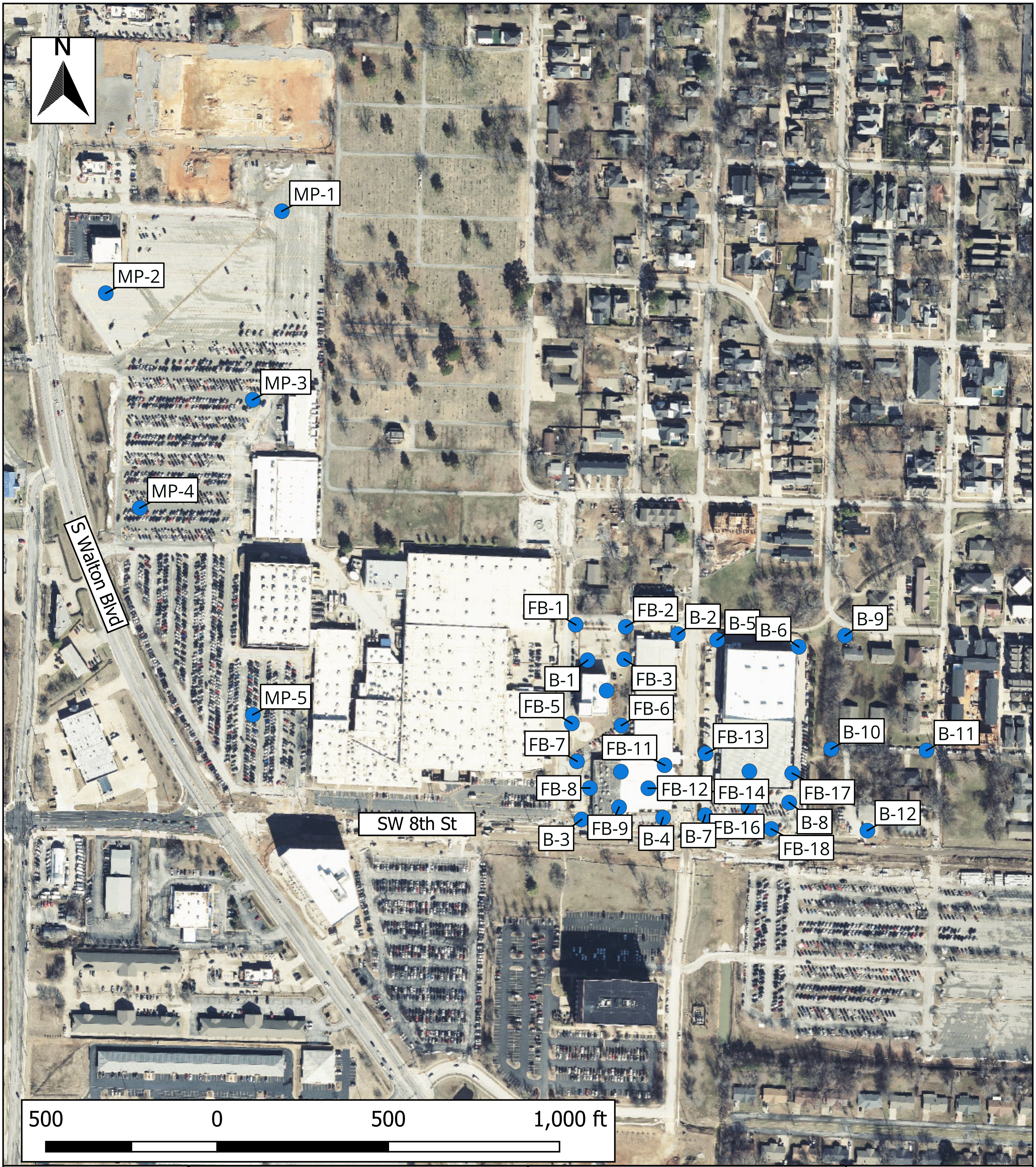
7.0 CLOSURE

Site preparation, grading work, undercuts, and pavement construction should be monitored by the Architect or a designated representative thereof. Subsurface conditions significantly at variance with those encountered in the borings should be brought to the attention of the Geotechnical Engineer. The conclusions and recommendations of this report should then be reviewed in light of the new information. Additionally, UES Professional Solutions 25, LLC, should be retained to provide testing and observation during excavation, grading and construction phases of the project based on our familiarity with the project, the subsurface conditions, and the intent of the recommendations in this report.

APPENDIX A – FIGURES



UES	Site Vicinity STEM University Academics Bentonville, Arkansas	Notes:	Date: 7-21-2026
			Job No: A25186.00132
		Drawn By: MSE Date: 7-21-2026	Figure 1
		Ck'd By: YS Date: 7-21-26	
		App'vd By: SB Date: 7-21-26	



UES™

All Boring Locations

STEM Focused Start-Up University
Bentonville, Arkansas

Notes:

Drawn By: MSE	Ck'd By: YS	App'vd By: SB
Date: 7-21-2026	Date: 7-21-26	Date: 7-21-26

Date:
7-21-2026

Job No:
A25186.00132

Figure 2

STEM Campus Boring Locations

STEM University Academics
Bentonville, Arkansas

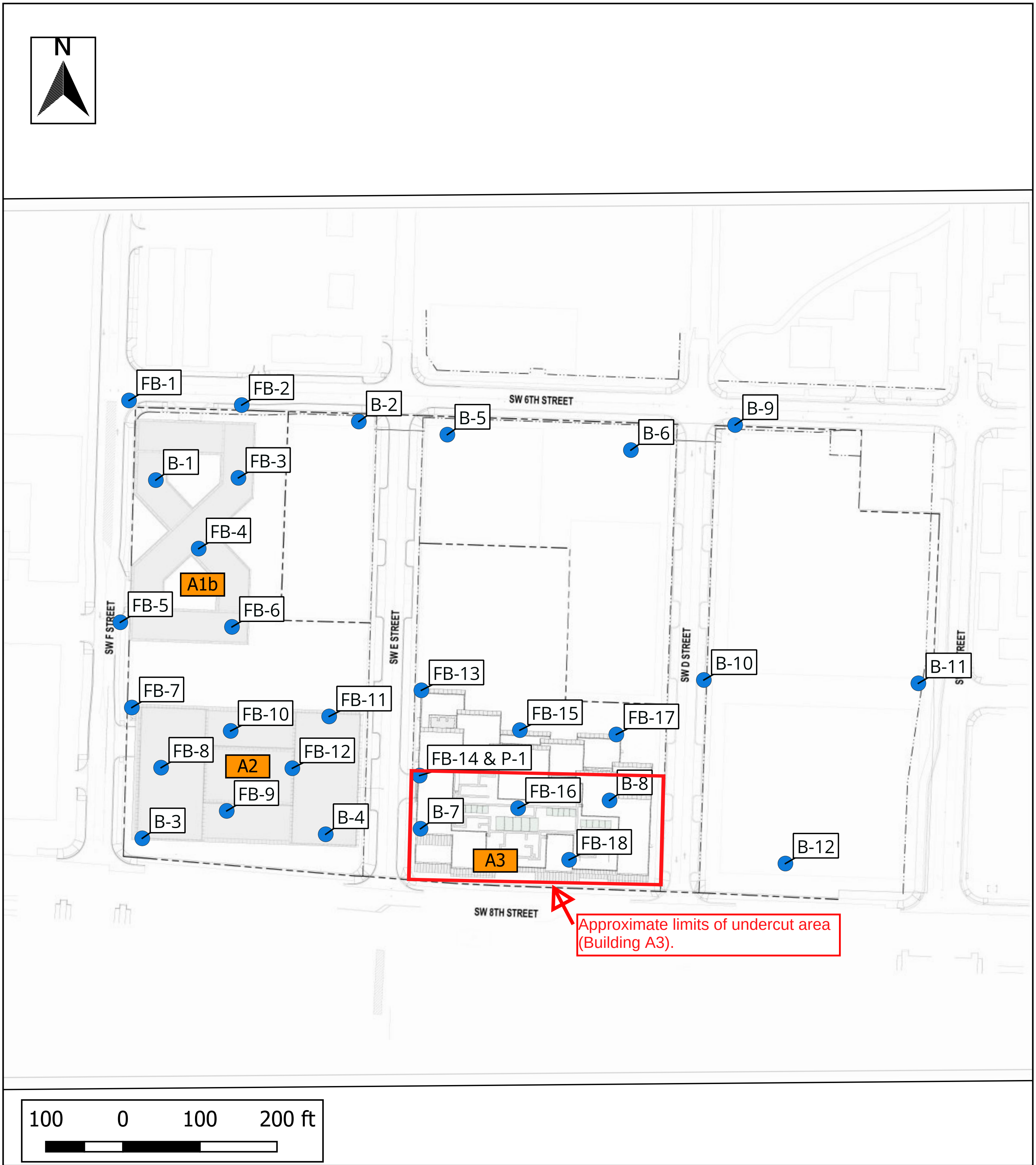
Notes:

Drawn By: MSE	Ck'd By: YS	App'vd By: SB
Date: 7-21-2026	Date: 7-21-26	Date: 7-21-26

Date:
7-21-2026

Job No:
A25186.00132

Figure 3



Approximate limits of undercut area (Building A3).

Stem Campus Boring Locations
& Site Plan

STEM Focused Start-Up University
Bentonville, Arkansas

Notes:

Drawn By: MSE	Ck'd By: YS	App'vd By: SB
Date: 7-21-2026	Date: 7-21-26	Date: 7-21-26

Date:
7-21-2026

Job No:
A25186.00132

Figure 4

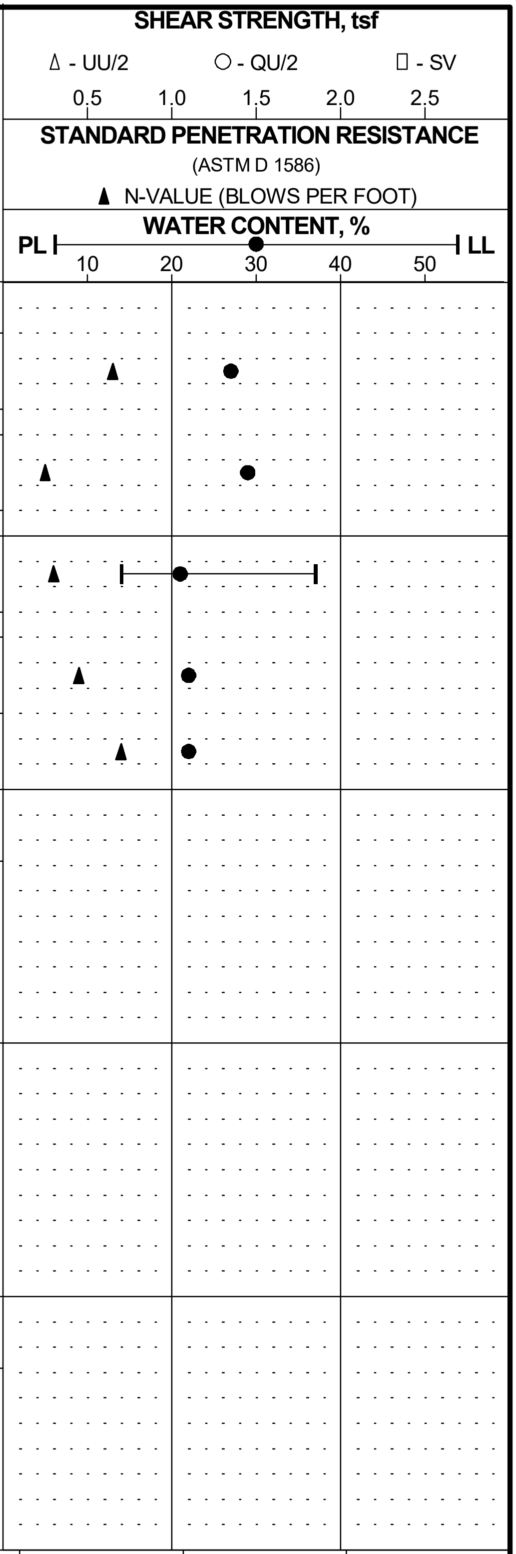
APPENDIX B – BORING INFORMATION

Surface Elevation: 1292

Datum ______

Completion Date: 12/23/25

DEPTH IN FEET	ELEVATION IN FEET	DESCRIPTION OF MATERIAL	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
		Concrete: 6 inches		
		Crushed Gravel Base: 6 inches		
		Very stiff, light gray and tan, SANDY CLAY - CL, with numerous chert gravel (FILL)	14-9-4	SS1
		Medium stiff to stiff, olive gray and tan, LEAN CLAY - (CL)	3-2-3	SS2
5	1287	80% passing No. 200 sieve ∇	1-3-3	SS3
		- tan and gray below 8 feet	1-4-5	SS4
			6-6-8	SS5
10	1282			
		Auger refusal at 11 feet 5 inches.		
		Hard to very hard, light gray LIMESTONE **- clay filled void from 12 feet 4 inches to 15 feet 4 inches** Uniaxial compressive strength = 21,980 psi - slightly weathered, with a vertical fracture from 14 feet 3 inches to 15 feet 4 inches	100% 87%	NQ Run 1
15	1277			
		Friable to moderately soft, dark gray SHALE - moderately weathered from 16½ to 17½ feet	84% 35%	NQ Run 2
		Hard to very hard, light gray LIMESTONE		
20	1272	Uniaxial compressive strength = 12,350 psi	94% 71%	NQ Run 3
		Boring terminated at 21 feet 5 inches.		



NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

GROUNDWATER DATA

ENCOUNTERED AT 5 FEET ∇

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM

WASHBORING FROM __ FEET

SP DRILLER MV LOGGER

CME 55 DRILL RIG

HAMMER TYPE Auto

REMARKS:

Drawn by: YS	Checked by: YS	App'vd. by: STB
Date: 1/6/25	Date: 2/12/26	Date: 2/12/26

UES™

STEM Focused Start-Up University
Bentonville, Arkansas

LOG OF BORING: B- 1

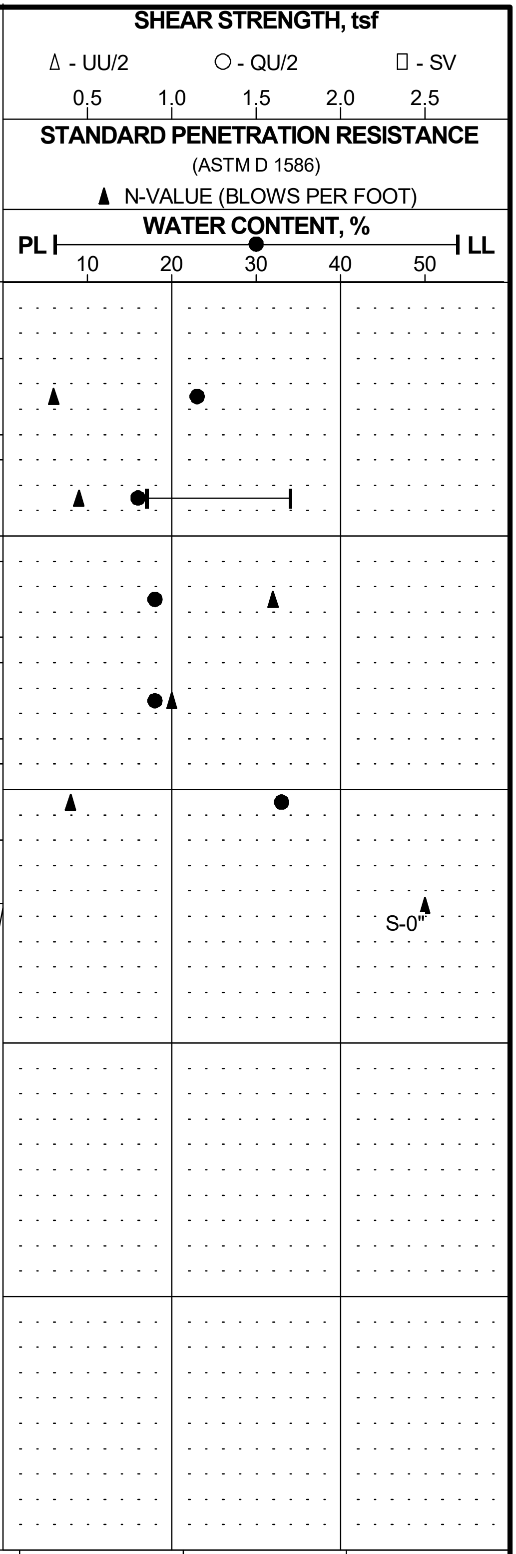
Project No. A25186.00132

Surface Elevation: 1291

Datum ______

Completion Date: 12/30/25

DEPTH IN FEET	ELEVATION IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
		Concrete: 7 inches			
		Crushed Gravel Base: 11 inches			
		Medium stiff, olive gray and tan, LEAN CLAY - (CL), with fat clay seams and layers		2-3-3	SS1
		Stiff, tan and gray, LEAN CLAY - CL 83% passing No. 200 sieve		4-4-5	SS2
5	1286				
		Dense, tan and gray, fine SANDY SILT - ML, cemented, with some lean clay seams and layers (completely weathered sandstone)		7-14-18	SS3
				9-10-10	SS4
10	1281	Stiff, tan and gray, FAT CLAY - CH		2-4-4	SS5
		▽			
		Auger refusal at 12 feet 4 inches on limestone.		50/0"	SS6
15	1276				
20	1271				



NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

GROUNDWATER DATA

ENCOUNTERED AT 12 FEET ⊻

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM
WASHBORING FROM __ FEET
SP DRILLER MV LOGGER
CME 55 DRILL RIG
HAMMER TYPE Auto

REMARKS: Dry at completion. Groundwater at 7' 5" at 24 hours.

Drawn by: YS	Checked by: YS	App'vd. by: STB
Date: 1/6/25	Date: 2/12/26	Date: 2/12/26

UES™

STEM Focused Start-Up University
Bentonville, Arkansas

LOG OF BORING: B- 2

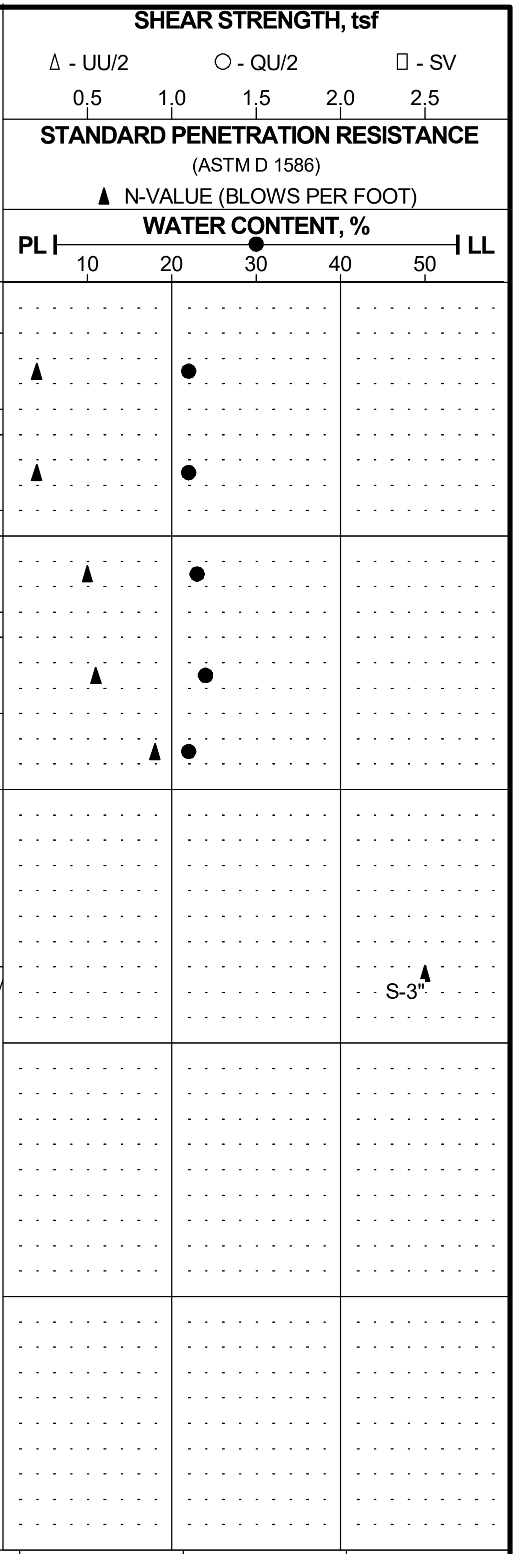
Project No. A25186.00132

Surface Elevation: 1288

Datum ______

Completion Date: 12/23/25

DEPTH IN FEET	ELEVATION IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
		Asphalt: 4 inches			
		Crushed Gravel Base: 4 inches			
		Soft, olive gray and tan, LEAN CLAY - CL		3-3-1	SS1
		Medium stiff to stiff, tan and gray, LEAN CLAY - CL		2-2-2	SS2
5	1283	- stiff, red, tan and gray, with some fat clay and sand pockets below 5 feet	∇	3-4-6	SS3
		Stiff, tan and gray, FAT CLAY - CH, with numerous ferrous stains and nodules, and some sand seams		4-5-6	SS4
				5-9-9	SS5
10	1278	Medium dense, tan and gray, fine SANDY SILT - ML, cemented, (completely weathered sandstone)			
		- with limestone fragments below 13½ feet		50/3"	SS6
		Auger refusal at 13 feet 9 inches.			
15	1273				
20	1268				



NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

GROUNDWATER DATA

ENCOUNTERED AT 5 FEET ∇

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM
WASHBORING FROM __ FEET
SP DRILLER MV LOGGER
CME 55 DRILL RIG
HAMMER TYPE Auto

REMARKS: Groundwater at 11' 3" upon completion, 3' 6" at 24 hours.

Drawn by: YS	Checked by: YS	App'vd. by: STB
Date: 1/6/25	Date: 2/12/26	Date: 2/12/26

UES™

STEM Focused Start-Up University
Bentonville, Arkansas

LOG OF BORING: B- 3

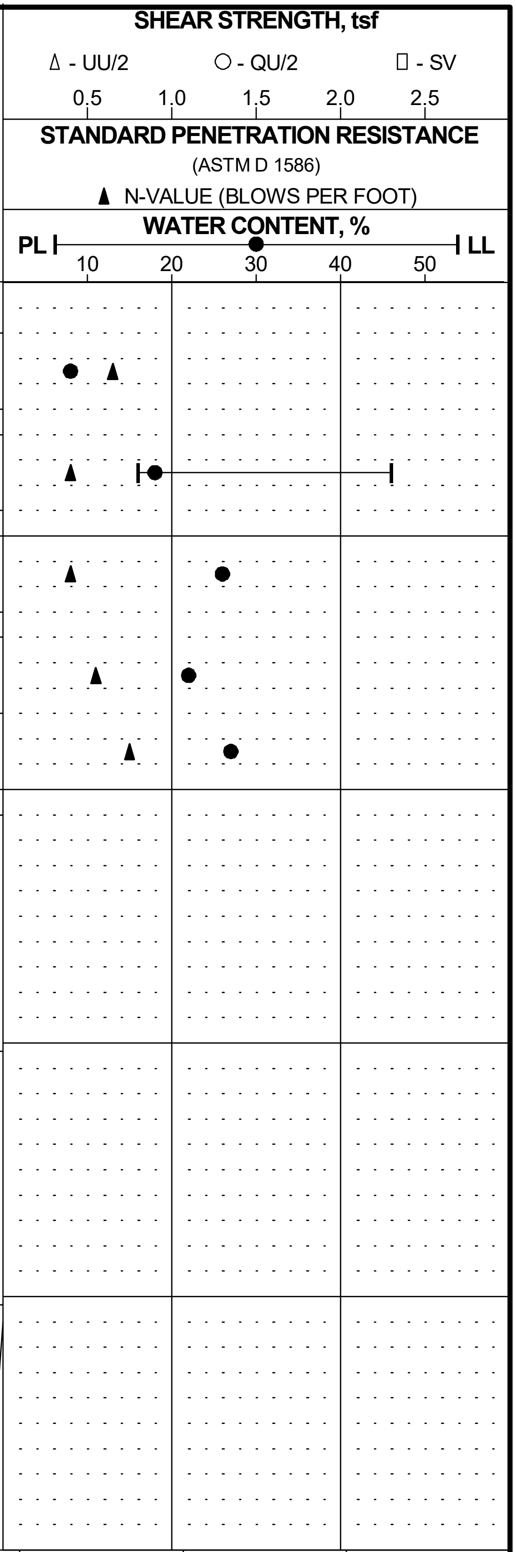
Project No. A25186.00132

Surface Elevation: 1286

Datum ______

Completion Date: 12/24/25

DEPTH IN FEET	ELEVATION IN FEET	DESCRIPTION OF MATERIAL	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
		Asphalt: 4 inches		
		Crushed Gravel Base: 20 inches	22-9-4	SS1
		Stiff, gray and tan, LEAN CLAY - (CL), with fat clay seams and layers 77% passing No. 200 sieve	2-4-4	SS2
5	1281	- tan and reddish tan below 5 feet	3-4-4	SS3
		- with ferrous staining below 7 feet ∇	3-5-6	SS4
			3-7-8	SS5
10	1276	Auger refusal at 10 feet 6 inches.		
		Very hard, light gray, LIMESTONE Uniaxial compressive strength = 22,920 psi	100% 73%	NQ Run 1
		Friable to moderately soft, dark gray, SHALE Uniaxial compressive strength = 1,880 psi		
15	1271	- highly weathered below 15½ feet		
		Very hard, light gray LIMESTONE, with occasional shale partings Uniaxial compressive strength = 16,540 psi	100% 73%	NQ Run 2
20	1266		100%/0%	NQ Run 3
		Boring terminated at 20 feet 6 inches.		



NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

LOG OF BORING 2020 JDM - ELEVATIONS A25186.00070 STEM CAMPUS.GPJ GTINC 063001.GPJ 7/10/26

GROUNDWATER DATA

ENCOUNTERED AT 8 FEET ∇

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM
WASHBORING FROM __ FEET
SP DRILLER MV LOGGER
CME 55 DRILL RIG
HAMMER TYPE Auto

REMARKS:

Drawn by: YS	Checked by: YS	App'vd. by: STB
Date: 1/6/25	Date: 2/12/26	Date: 2/12/26

UES™

STEM Focused Start-Up University
Bentonville, Arkansas

LOG OF BORING: B- 4

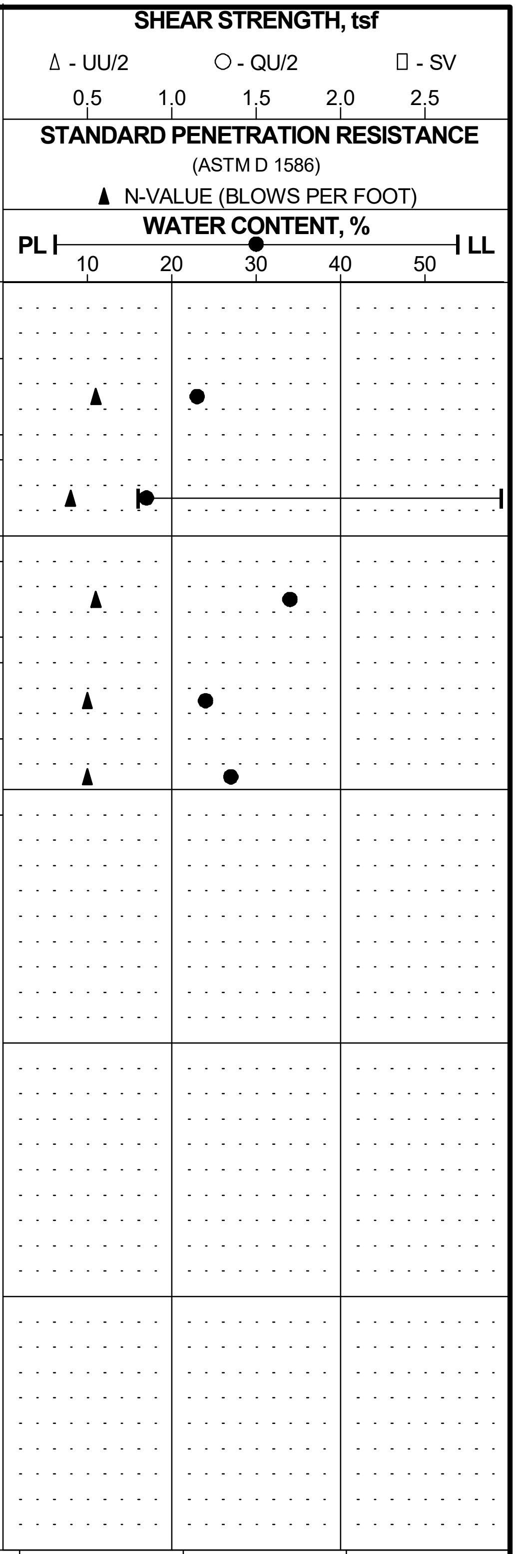
Project No. A25186.00132

Surface Elevation: 1288

Datum ______

Completion Date: 12/29/25

DEPTH IN FEET	ELEVATION IN FEET	DESCRIPTION OF MATERIAL	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
		Concrete: 8 inches		
		Crushed Gravel Base: 8 inches		
		Stiff, tan and brown, FAT CLAY - (CH)	4-5-6	SS1
		- tan and reddish tan, with fat clay seams and layers below 3½ feet 82% passing No. 200 sieve	3-3-5	SS2
5	1283	- with fine sand pockets below 5 feet	3-5-6	SS3
		- with more fat clay seams and layers below 7½ feet	3-4-6	SS4
		- with numerous fine sandy silt seams and layers below 9 feet ▽	3-6-4	SS5
10	1278			
		Auger refusal at 11 feet 1 inch on limestone.		
15	1273			
20	1268			



NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

LOG OF BORING 2020 JDM - ELEVATIONS A25186.00070 STEM CAMPUS.GPJ GTINC 0638901.GPJ 1/16/26

GROUNDWATER DATA

ENCOUNTERED AT 9 FEET ▽

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM

WASHBORING FROM __ FEET

SP DRILLER MV LOGGER

CME 55 DRILL RIG

HAMMER TYPE Auto

REMARKS: Groundwater at 9' upon completion, 6' 8" at 24 hours.

Drawn by: YS	Checked by: YS	App'vd. by: STB
Date: 1/6/25	Date: 2/12/26	Date: 2/12/26

UES™

STEM Focused Start-Up University
Bentonville, Arkansas

LOG OF BORING: B- 5

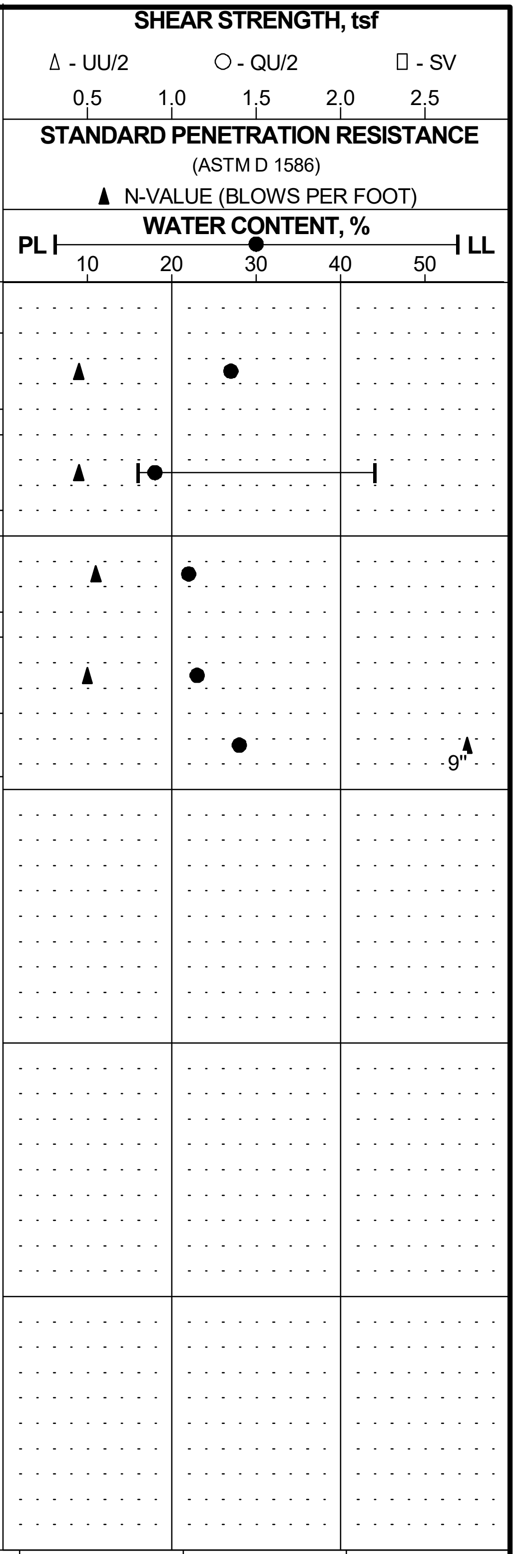
Project No. A25186.00132

Surface Elevation: 1287

Datum ______

Completion Date: 12/29/25

DEPTH IN FEET	ELEVATION IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
		Concrete: 6 inches			
		Stiff, red and reddish brown SANDY CLAY, with numerous chert gravel (FILL)			
		Stiff, gray and tan, FAT CLAY - CH, with lean clay seams and layers		10-7-2	SS1
		78% passing No. 200 sieve		2-4-5	SS2
5	1282	- red, reddish tan, and gray below 5 feet		3-5-6	SS3
		- with numerous ferrous stains and nodules below 7 feet		2-5-5	SS4
		Medium stiff, gray, tan, and reddish tan, SANDY CLAY - CL, with occasional sandstone fragments and seams ▽		2-5-50/3"	SS5
10	1277	Auger refusal at 9 feet 10 inches on limestone.			
15	1272				
20	1267				



NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

GROUNDWATER DATA

ENCOUNTERED AT 9 FEET ▽

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM
WASHBORING FROM __ FEET
SP DRILLER MV LOGGER
CME 55 DRILL RIG
HAMMER TYPE Auto

REMARKS: Groundwater at 9' upon completion, 5' 4" at 24 hours.

Drawn by: YS	Checked by: YS	App'vd. by: STB
Date: 1/6/25	Date: 2/12/26	Date: 2/12/26

UES™

STEM Focused Start-Up University
Bentonville, Arkansas

LOG OF BORING: B- 6

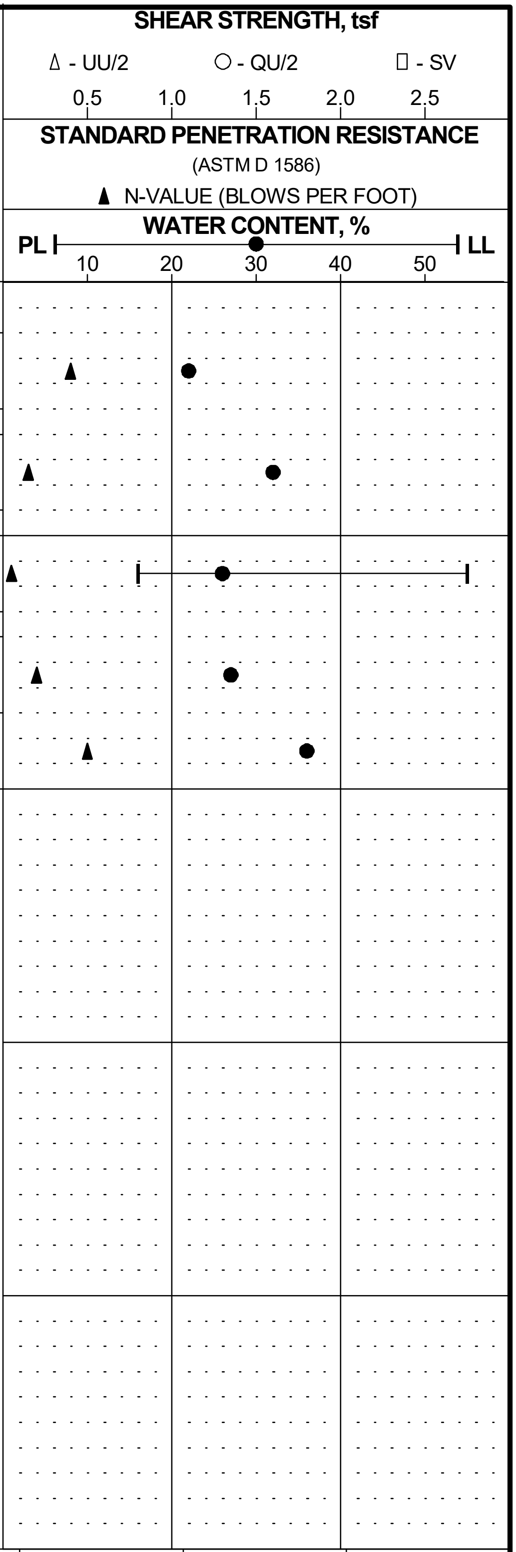
Project No. A25186.00132

Surface Elevation: 1286

Datum ______

Completion Date: 12/23/25

DEPTH IN FEET	ELEVATION IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
		Asphalt: 4 inches			
		Crushed Gravel Base: 4 inches			
		Stiff, dark gray, LEAN CLAY - CL, with occasional chert fragments		16-5-3	SS1
		▽			
		Soft, olive gray, FAT CLAY - CH		1-1-2	SS2
5	1281	- very soft, olive gray and tan, moist, below 5 feet 74% passing No. 200 sieve		0-0-1	SS3
		- soft below 7 feet		2-2-2	SS4
				0-1-9	SS5
10	1276	- with some weathered limestone fragments below 10 feet			
		Auger refusal at 10 feet 5 inches.			
15	1271				
20	1266				



NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

GROUNDWATER DATA

ENCOUNTERED AT 3 FEET ▽

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM

WASHBORING FROM __ FEET

SP DRILLER MV LOGGER

CME 55 DRILL RIG

HAMMER TYPE Auto

REMARKS: Groundwater at 3' upon completion, 2' 2" at 24 hours.

Drawn by: YS	Checked by: YS	App'vd. by: STB
Date: 1/6/25	Date: 2/12/26	Date: 2/12/26

UES™

STEM Focused Start-Up University
Bentonville, Arkansas

LOG OF BORING: B- 7

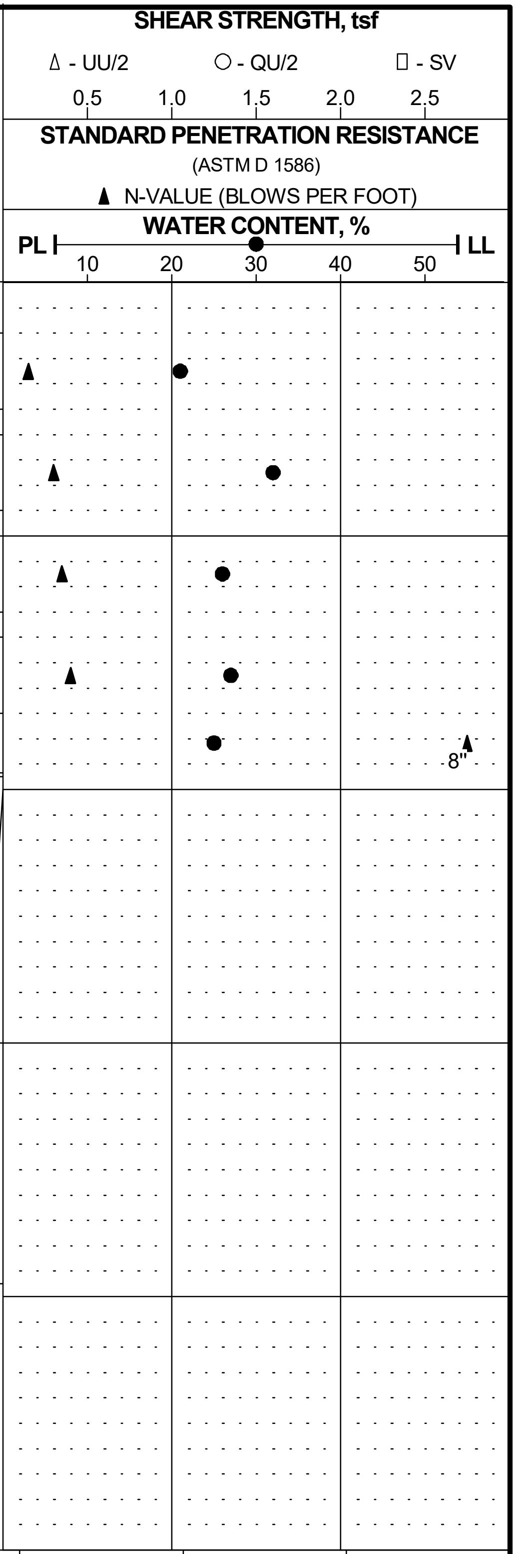
Project No. A25186.00132

Surface Elevation: 1287

Datum ______

Completion Date: 12/23/25

DEPTH IN FEET	ELEVATION IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
		Asphalt: 4 inches			
		Crushed Gravel Base: 4 inches			
		Soft, red, SANDY CLAY - CL, with numerous chert fragments (FILL)		2-1-2	SS1
		Medium stiff, olive gray, FAT CLAY - CH	🟩		
				2-2-4	SS2
5	1282				
				2-3-4	SS3
		- gray and tan below 7 feet			
				2-3-5	SS4
				2-5-50/2"	SS5
10	1277	Auger refusal at 9 feet 9 inches.		100%/0%	NQ Run 1
		Moderately hard, light gray, moderately weathered LIMESTONE, with some shale seams and layers **- clay filled void from 10 feet 4 inches to 10 feet 9 inches**			
		Very hard, unweathered below 12½ feet Uniaxial compressive strength = 19,860 psi		93% 53%	NQ Run 2
		Uniaxial compressive strength = 21,500 psi			
15	1272				
				100% 86%	NQ Run 3
20	1267	Boring terminated at 19 feet 9 inches.			



NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

LOG OF BORING 2020 JDM - ELEVATIONS A25186.00070 STEM CAMPUS.GPJ GTINC 063891.GPJ 1/10/26

GROUNDWATER DATA

X FREE WATER NOT ENCOUNTERED DURING DRILLING

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM

WASHBORING FROM __ FEET

SP DRILLER MV LOGGER

CME 55 DRILL RIG

HAMMER TYPE Auto

REMARKS: Dry during drilling.

Drawn by: YS	Checked by: YS	App'vd. by: STB
Date: 1/6/25	Date: 2/12/26	Date: 2/12/26

UES™

STEM Focused Start-Up University
Bentonville, Arkansas

LOG OF BORING: B- 8

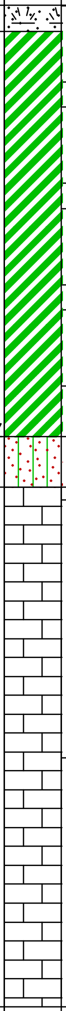
Project No. A25186.00132

Surface Elevation: 1288

Datum ______

Completion Date: 12/29/25

DEPTH IN FEET	ELEVATION IN FEET	DESCRIPTION OF MATERIAL	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
		Topsoil: 6 inches		
		Soft to medium stiff, gray and tan, FAT CLAY - CH	2-2-2	SS1
			1-2-2	SS2
5	1283		0-1-3	SS3
		- gray and tan, with ferrous stains and trace fine sand below 6 feet	3-3-4	SS4
		Medium dense, tan and gray, fine SANDY SILT, (completely weathered sandstone) Auger refusal at 9 feet 9 inches.	4-6-50/0"	SS5
10	1278	Hard to very hard, light gray, LIMESTONE Uniaxial compressive strength = 22,040 psi	100% 87%	NQ Run 1
15	1273	- moderately soft to friable gray shale seam from 15 feet 6 inches to 15 feet 10 inches - some healed fractures below 16 feet Uniaxial compressive strength = 9,750 psi - weathered shale seam at 17 feet 4 inches	100% 58%	NQ Run 2
20	1268	Boring terminated at 19 feet 9 inches.		



SHEAR STRENGTH, tsf

∆ - UU/2 ○ - QU/2 ▯ - SV

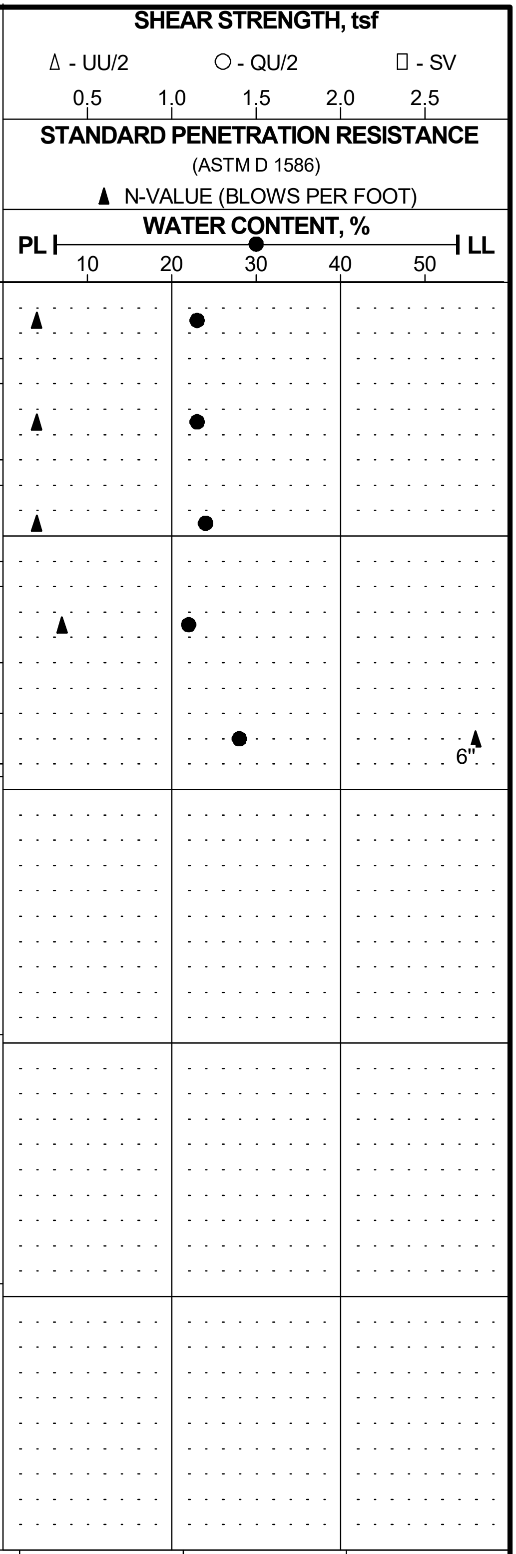
STANDARD PENETRATION RESISTANCE

(ASTM D 1586)

▲ N-VALUE (BLOWS PER FOOT)

WATER CONTENT, %

PL ⊢——●——⊣ **LL**



NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

LOG OF BORING 2020 JDM - ELEVATIONS A25186.00070 STEM CAMPUS.GPJ GTINC 063001.GDT 1/10/26

GROUNDWATER DATA

ENCOUNTERED AT 8.5 FEET ∇

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM
WASHBORING FROM __ FEET
SP DRILLER MV LOGGER
CME 55 DRILL RIG
HAMMER TYPE Auto

REMARKS:

Drawn by: YS	Checked by: YS	App'vd. by: STB
Date: 1/6/25	Date: 2/12/26	Date: 2/12/26

UES™

STEM Focused Start-Up University
Bentonville, Arkansas

LOG OF BORING: B- 9

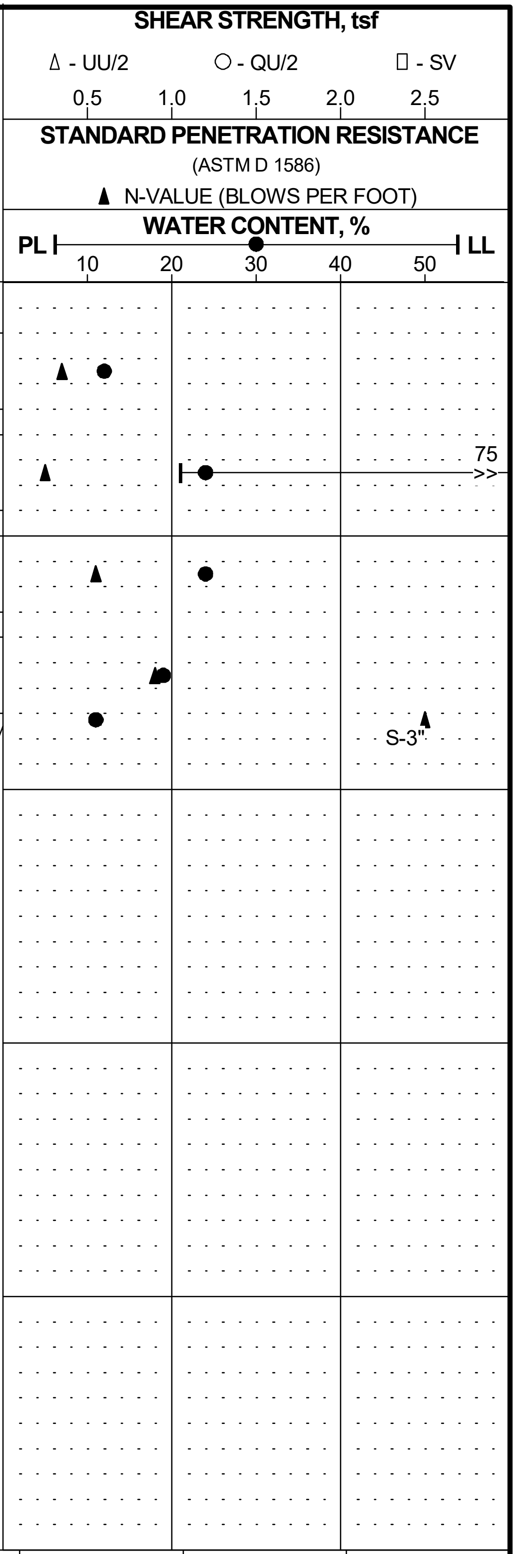
Project No. A25186.00132

Surface Elevation: 1286

Datum ______

Completion Date: 12/29/25

DEPTH IN FEET	ELEVATION IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
		Asphalt: 6 inches			
		Crushed Gravel Base: 4 inches			
		Medium stiff, dark brown, LEAN CLAY - CL, with occasional chert fragments (FILL)		3-3-4	SS1
		Medium stiff, olive gray, FAT CLAY - (CH) 83% passing No. 200 sieve		2-2-3	SS2
5	1281	- stiff, gray and tan, with some fine sand pockets and seams below 5 feet		3-5-6	SS3
				3-4-14	SS4
		Medium dense, gray and tan, fine SANDY SILT - ML, (completely weathered sandstone)		50/3"	SS5
		Auger refusal at 8 feet 11 inches on limestone.			
10	1276				
15	1271				
20	1266				



NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

LOG OF BORING 2020 JDM - ELEVATIONS A25186.00070 STEM CAMPUS.GPJ GTINC 063880 1.GPJ 1/16/26

GROUNDWATER DATA

X FREE WATER NOT ENCOUNTERED DURING DRILLING

DRILLING DATA

___ AUGER 3 3/4" HOLLOW STEM

WASHBORING FROM ___ FEET

SP DRILLER MV LOGGER

CME 55 DRILL RIG

HAMMER TYPE Auto

REMARKS: Dry during drilling and at completion. Groundwater at 6' 6" at 24 hours.

Drawn by: YS	Checked by: YS	App'vd. by: STB
Date: 1/6/25	Date: 2/12/26	Date: 2/12/26

UES™

STEM Focused Start-Up University
Bentonville, Arkansas

LOG OF BORING: B-10

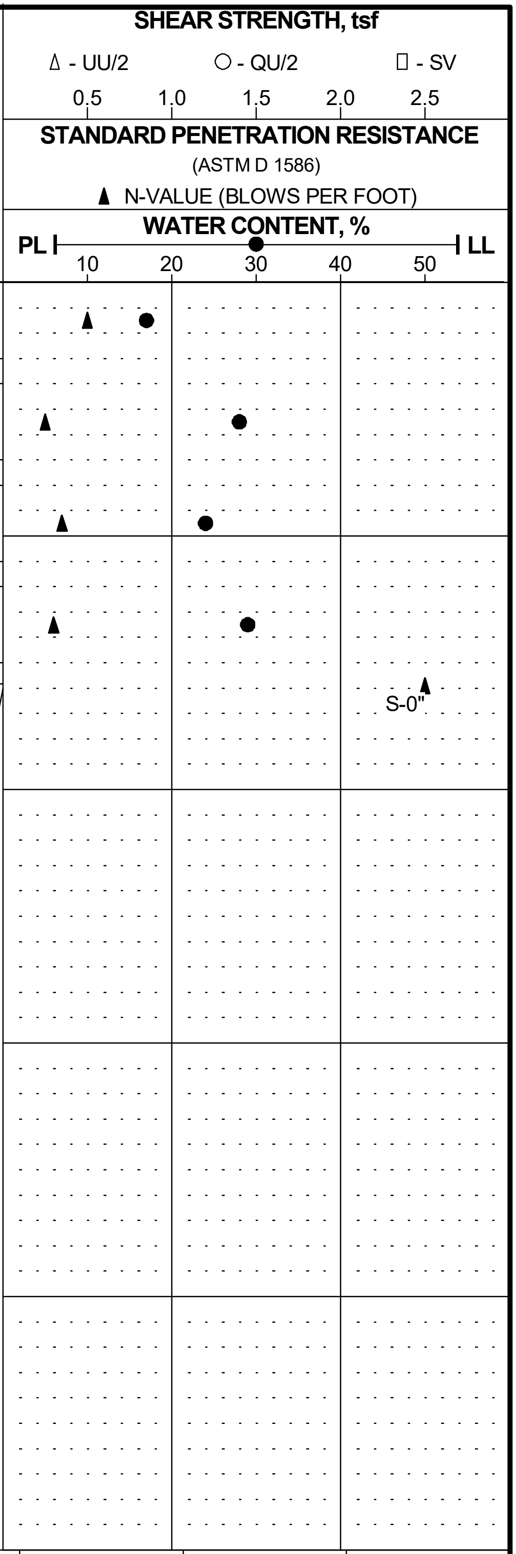
Project No. A25186.00132

Surface Elevation: 1287

Datum ______

Completion Date: 12/29/25

DEPTH IN FEET	ELEVATION IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
		Medium dense, dark brown, CLAYEY SAND - SC, with some chert and limestone fragments, and organics (FILL)	▨	11-6-4	SS1
		Medium stiff, olive gray, tan, and reddish brown, FAT CLAY - CH	🟩	1-2-3	SS2
		- with ferrous nodules below 4 feet		2-3-4	SS3
5	1282				
		- tan and gray below 6 feet		2-3-3	SS4
		∇			
		Auger refusal at 8 feet on limestone.		50/0"	SS5
10	1277				
15	1272				
20	1267				



NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

LOG OF BORING 2020 JDM - ELEVATIONS A25186.00070 STEM CAMPUS.GPJ GTINC 063001.GDT 1/16/26

GROUNDWATER DATA

ENCOUNTERED AT 7 FEET ∇

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM

WASHBORING FROM __ FEET

SP DRILLER MV LOGGER

CME 55 DRILL RIG

HAMMER TYPE Auto

REMARKS: Groundwater at 7' upon completion, 3' 5" at 24 hours.

Drawn by: YS	Checked by: YS	App'vd. by: STB
Date: 1/6/25	Date: 2/12/26	Date: 2/12/26

UES™

STEM Focused Start-Up University
Bentonville, Arkansas

LOG OF BORING: B-11

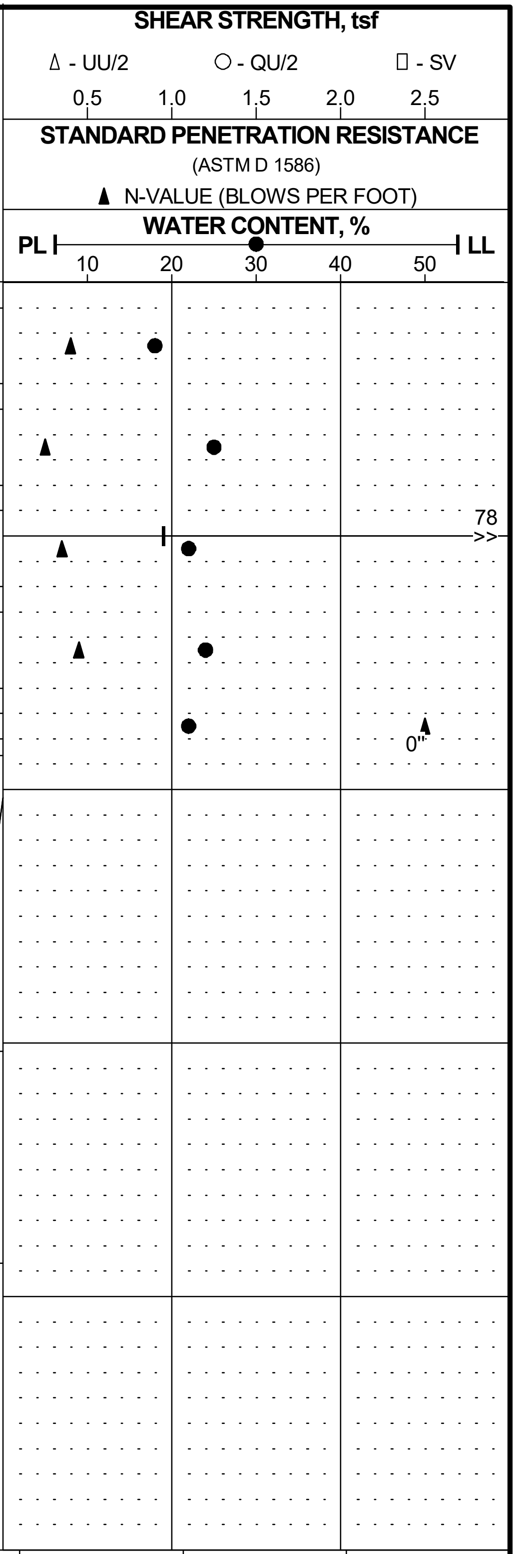
Project No. A25186.00132

Surface Elevation: 1287

Datum ______

Completion Date: 12/24/25

DEPTH IN FEET	ELEVATION IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
		Crushed Gravel Base: 6 inches			
		Stiff, red, LEAN CLAY - CL, with occasional chert fragments (FILL)		4-4-4	SS1
		Medium stiff, gray and tan, FAT CLAY - (CH)		2-2-3	SS2
5	1282	- olive gray below 4½ feet 80% passing No. 200 sieve		2-3-4	SS3
		- gray and tan, with ferrous stains below 6½ feet		2-4-5	SS4
		- with silty sand seams below 8½ feet Auger refusal at 9 feet 4 inches.		8-50/0"	SS5
10	1277	Hard to very hard, light gray LIMESTONE		100% 0%	NQ Run 1
		- with frequent weathered seams and vugs to 11 feet 4 inches **- clay filled void from 11 feet 4 inches to 12 feet 2 inches** - unweathered below 12 feet 2 inches Uniaxial compressive strength = 9,850 psi		83% 50%	NQ Run 2
15	1272	Uniaxial compressive strength = 19,340 psi		92% 82%	NQ Run 3
20	1267	**- clay filled void from 18 feet 9 inches to 19 feet 1 inch** - with a moderately hard gray shale seam below 19 feet Boring terminated at 19 feet 4 inches.			



NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

LOG OF BORING 2020 JDM - ELEVATIONS A25186.00070 STEM CAMPUS.GPJ GTINC 063[illegible]1.GDT [illegible]/26

GROUNDWATER DATA

X FREE WATER NOT ENCOUNTERED DURING DRILLING

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM

WASHBORING FROM __ FEET

SP DRILLER MV LOGGER

CME 55 DRILL RIG

HAMMER TYPE Auto

REMARKS: Dry during drilling and at completion.

Drawn by: YS	Checked by: YS	App'vd. by: STB
Date: 1/6/25	Date: 2/12/26	Date: 2/12/26

UES™

STEM Focused Start-Up University
Bentonville, Arkansas

LOG OF BORING: B-12

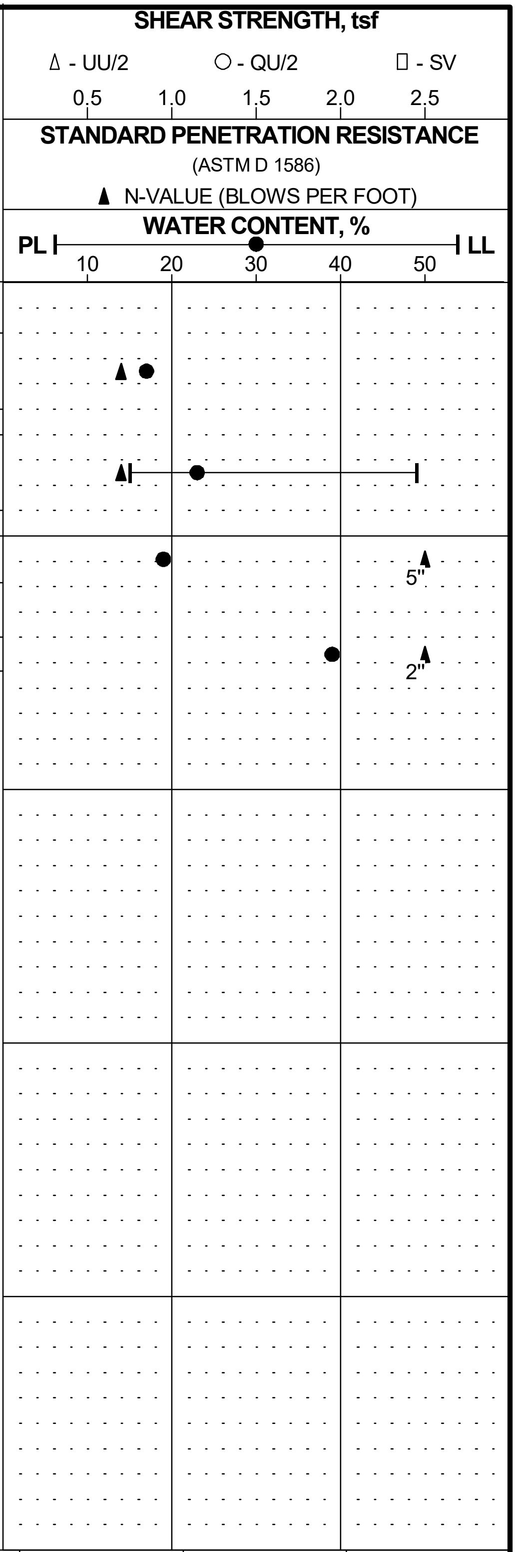
Project No. A25186.00132

Surface Elevation: ______

Datum ______

Completion Date: 12/22/25

DEPTH IN FEET	ELEVATION IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
		Asphalt: 6 inches			
		Crushed Gravel Base: 6 inches			
		Medium dense, brown, SILTY SAND - SM		14-8-6	SS1
		Very stiff, red, reddish tan, and tan, LEAN CLAY - (CL), with occasional sandstone fragments and fat clay seams and layers		3-5-9	SS2
5				5-50/5"	SS3
		- with some chert fragments below 7 feet		4-50/2"	SS4
		Auger refusal at 7 feet 9 inches.			
10					
15					
20					



NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

LOG OF BORING 2020 JDM - ELEVATIONS A25186.00070 STEM CAMPUS.GPJ GTINC 0630001.GPJ 1/10/26

GROUNDWATER DATA

X FREE WATER NOT ENCOUNTERED DURING DRILLING

DRILLING DATA

___ AUGER 3 3/4" HOLLOW STEM

WASHBORING FROM ___ FEET

SP DRILLER MV LOGGER

CME 55 DRILL RIG

HAMMER TYPE Auto

REMARKS: Dry during drilling and at completion, dry at 24 hours.

Drawn by: YS	Checked by: YS	App'vd. by: STB
Date: 1/6/25	Date: 2/12/26	Date: 2/12/26

UES™

STEM Focused Start-Up University
Bentonville, Arkansas

LOG OF BORING: MP-1

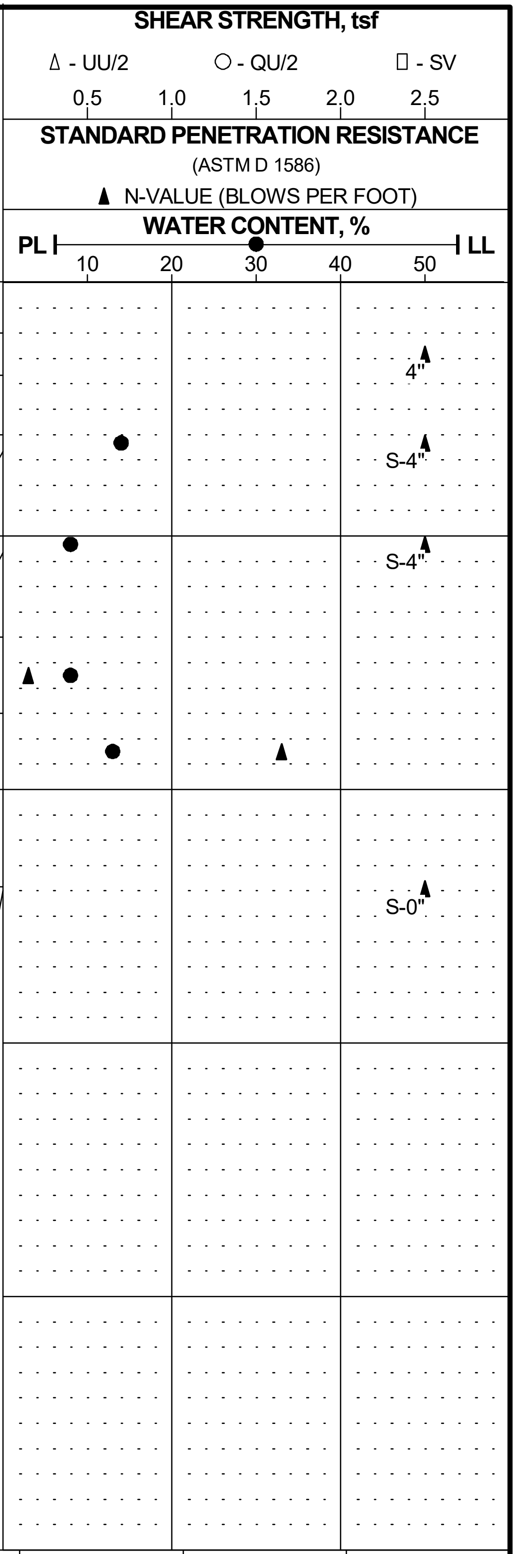
Project No. A25186.00132

Surface Elevation: ______

Datum ______

Completion Date: **12/22/25**

DEPTH IN FEET	ELEVATION IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
		Asphalt: 6 inches			
		Crushed Gravel Base: 6 inches			
		Dense, gray and tan, cemented, FINE SANDY SILT - ML, (completely weathered shale) 64% passing No. 200 sieve		24-50/4"	SS1
				50/4"	SS2
5				50/4"	SS3
				9-2-1	SS4
		- with some shale and limestone fragments below 8 feet		0-9-24	SS5
10					
		Auger refusal at 12 feet.		50/0"	SS6
15					
20					



NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

GROUNDWATER DATA

X FREE WATER NOT ENCOUNTERED DURING DRILLING

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM

WASHBORING FROM __ FEET

SP DRILLER MV LOGGER

CME 55 DRILL RIG

HAMMER TYPE Auto

REMARKS: Dry during drilling, groundwater at 11' upon completion, 7' 6" at 24 hours.

Drawn by: YS	Checked by: YS	App'vd. by: STB
Date: 1/6/25	Date: 2/12/26	Date: 2/12/26

UES™

STEM Focused Start-Up University
Bentonville, Arkansas

LOG OF BORING: MP-2

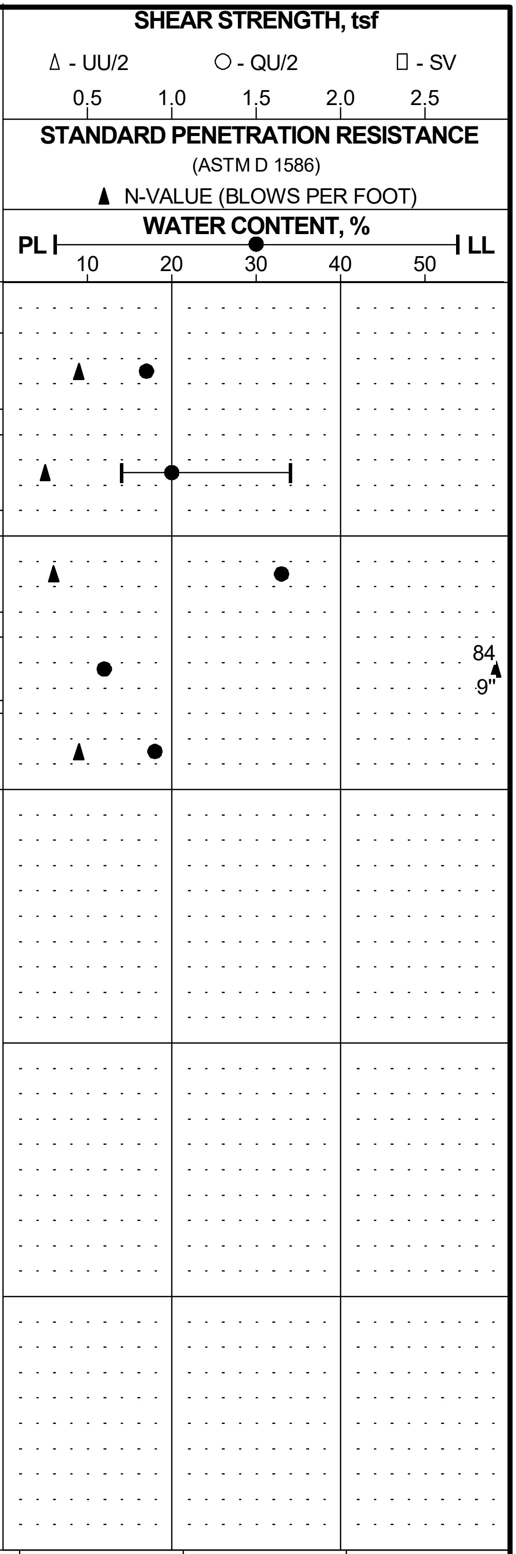
Project No. A25186.00132

Surface Elevation: ______

Datum ______

Completion Date: 12/23/25

DEPTH IN FEET	ELEVATION IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
		Asphalt: 6 inches			
		Crushed Gravel Base: 6 inches			
		Stiff, dark brown, LEAN CLAY - CL, with occasional chert fragments (FILL)		5-5-4	SS1
		Medium stiff, gray and tan, LEAN CLAY - (CL)			
				2-2-3	SS2
5		- olive gray, moist below 5 feet		1-3-3	SS3
		Dense, tan, fine SANDY SILT - ML, cemented, (completely weathered sandstone and shale)		10-34 -50/3"	SS4
			∇	13-3-6	SS5
10		Auger refusal at 10 feet 2 inches.			
15					
20					



NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

LOG OF BORING 2020 JDM - ELEVATIONS A25186.00070 STEM CAMPUS.GPJ GTINC 063001.GPJ 1/16/26

GROUNDWATER DATA

ENCOUNTERED AT 9 FEET ∇

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM
WASHBORING FROM __ FEET
SP DRILLER MV LOGGER
CME 55 DRILL RIG
HAMMER TYPE Auto

REMARKS: Groundwater at 9' upon completion, 5' 4" at 24 hours.

Drawn by: YS	Checked by: YS	App'vd. by: STB
Date: 1/6/25	Date: 2/12/26	Date: 2/12/26

UES™

STEM Focused Start-Up University
Bentonville, Arkansas

LOG OF BORING: MP-3

Project No. A25186.00132

Surface Elevation: ______

Datum ______

Completion Date: 12/23/25

DEPTH IN FEET	ELEVATION IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
		Asphalt: 6 inches			
		Crushed Gravel Base: 6 inches			
		Medium stiff, dark gray, SILTY CLAY - CL-ML, with trace chert fragments (FILL)		2-4-4	SS1
				2-2-2	SS2
		Soft, gray and olive gray, LEAN CLAY - CL, moist			
5		- medium stiff, gray and tan below 5½ feet		1-3-3	SS3
		Dense, tan and gray, fine SANDY SILT, cemented, (completely weathered shale and sandstone) ⊻		10-39 -50/2"	SS4
		- with limestone fragments below 8 feet		50/1"	SS5
		Auger refusal at 8 feet 7 inches.			
10					
15					
20					

SHEAR STRENGTH, tsf

Δ - UU/2 ○ - QU/2 ☐ - SV

0.5 1.0 1.5 2.0 2.5

STANDARD PENETRATION RESISTANCE

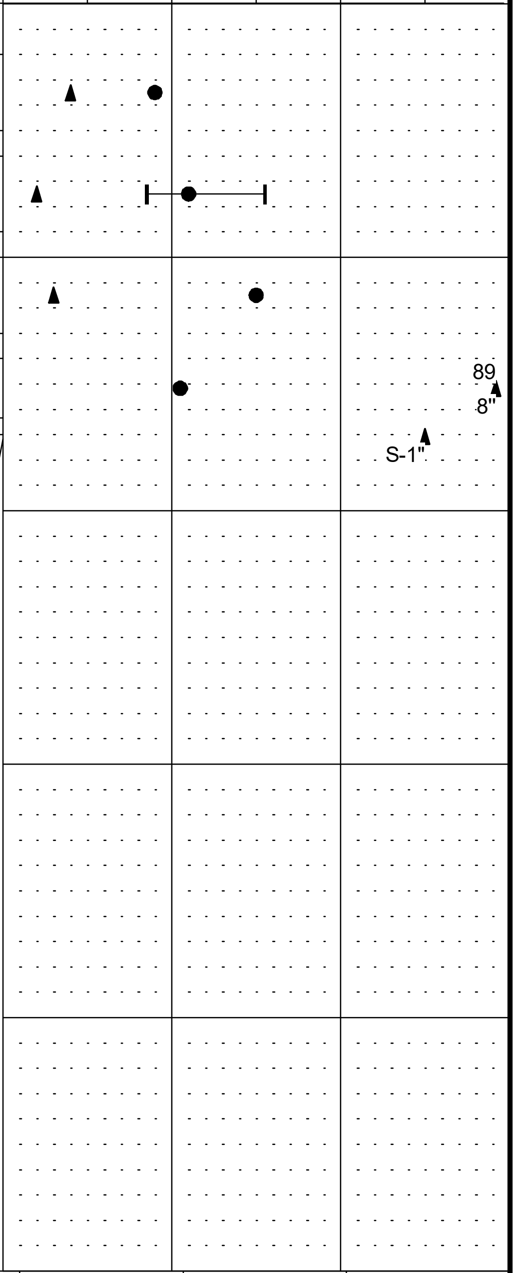
(ASTM D 1586)

▲ N-VALUE (BLOWS PER FOOT)

WATER CONTENT, %

PL ├──●──┤ **LL**

10 20 30 40 50



GROUNDWATER DATA

ENCOUNTERED AT 8 FEET ⊻

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM
WASHBORING FROM __ FEET
SP DRILLER MV LOGGER
CME 55 DRILL RIG
HAMMER TYPE Auto

REMARKS: Groundwater at 8' upon completion, 2' 6" at 24 hours.

Drawn by: YS	Checked by: YS	App'vd. by: STB
Date: 1/6/25	Date: 2/12/26	Date: 2/12/26

UES™

STEM Focused Start-Up University
Bentonville, Arkansas

LOG OF BORING: MP-4

Project No. A25186.00132

NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

Surface Elevation: ______

Datum ______

Completion Date: 12/23/25

DEPTH IN FEET	ELEVATION IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
		Asphalt: 6 inches			
		Crushed Gravel Base: 6 inches			
		Stiff, red and reddish tan, SANDY CLAY - CL, with chert gravel (FILL)		8-6-5	SS1
		Stiff, dark gray, SILTY CLAY - CL-ML			
		Stiff, gray, olive gray, and tan, FAT CLAY - (CH)		2-4-4	SS2
5				2-4-6	SS3
				3-5-20	SS4
		- brown and tan, with some sandstone fragments below 8 feet		50/0"	SS5
		Auger refusal at 8 feet 6 inches on limestone.			
10					
15					
20					

SHEAR STRENGTH, tsf

∆ - UU/2 ○ - QU/2 ☐ - SV

0.5 1.0 1.5 2.0 2.5

STANDARD PENETRATION RESISTANCE

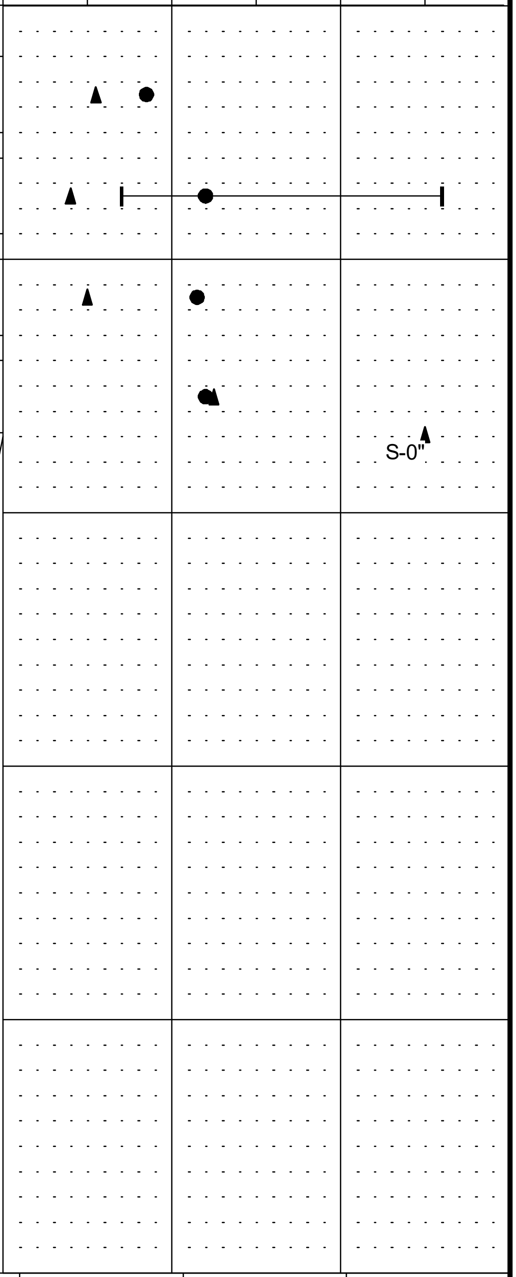
(ASTM D 1586)

▲ N-VALUE (BLOWS PER FOOT)

WATER CONTENT, %

PL ├──●──┤ LL

10 20 30 40 50



NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

GROUNDWATER DATA

X FREE WATER NOT ENCOUNTERED DURING DRILLING

DRILLING DATA

___ AUGER 3 3/4" HOLLOW STEM

WASHBORING FROM ___ FEET

SP DRILLER MV LOGGER

CME 55 DRILL RIG

HAMMER TYPE Auto

REMARKS: Dry during drilling and at completion, groundwater at 6' 2" at 24 hours.

Drawn by: YS	Checked by: YS	App'vd. by: STB
Date: 1/6/25	Date: 2/12/26	Date: 2/12/26

UES™

STEM Focused Start-Up University
Bentonville, Arkansas

LOG OF BORING: MP-5

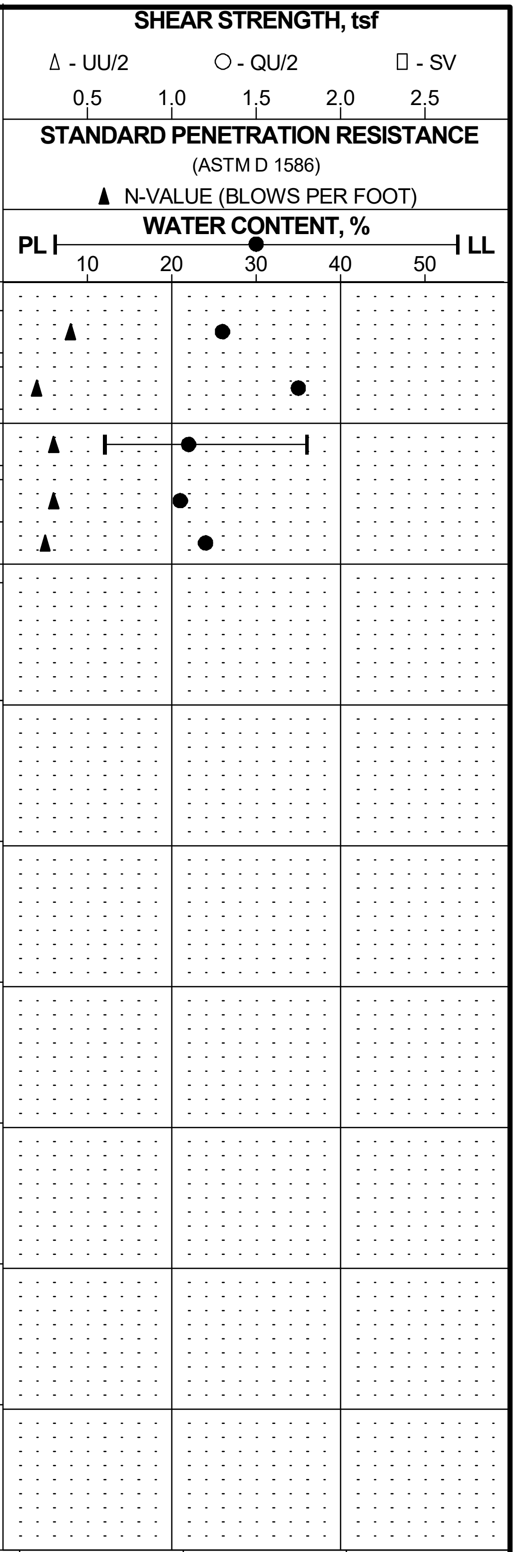
Project No. A25186.00132

Surface Elevation: 1293

Datum ______

Completion Date: 7/1/26

DEPTH IN FEET	ELEVATION IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
		Stiff, tan and reddish brown, SANDY CLAY, with numerous chert fragments, moist - CL (FILL) ⊻		3-5-3	SS1
		Soft to medium stiff, gray, LEAN CLAY - CL		1-2-2	SS2
5	1288	92% passing No. 200 sieve		2-3-3	SS3
		gray and tan below 7 ft		2-3-3	SS4
		with ferrous nodules below 8.5 ft		2-2-3	SS5
10	1283	Auger refusal at 10'-8"			
		Hard, light gray, LIMESTONE		100% 73%	NQ1
		Low hardness, olive gray, SHALE, with occasional limestone seams, sandy			
15	1278				
		Very hard, light gray, LIMESTONE		100% 75%	NQ2
		with some chert inclusions below 19 ft			
20	1273			100% 55%	NQ3
25	1268			100% 87%	NQ4
30	1263			100% 93%	NQ5
35	1258			100% 90%	NQ6
40	1253	Boring terminated at 39'-10"			



NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

GROUNDWATER DATA

ENCOUNTERED AT 2 FEET ⊻

AT 2 FEET AFTER 24 HOURS ⊻

DRILLING DATA

___ AUGER 3 3/4" HOLLOW STEM

WASHBORING FROM ___ FEET

SP DRILLER TK LOGGER

CME 55 DRILL RIG

HAMMER TYPE Auto

REMARKS:

Drawn by: YS	Checked by: YS	App'vd. by: STB
Date: 7/7/26	Date: 7/14/26	Date: 7/24/26

STEM University Academics
Bentonville, Arkansas

LOG OF BORING: FB -1

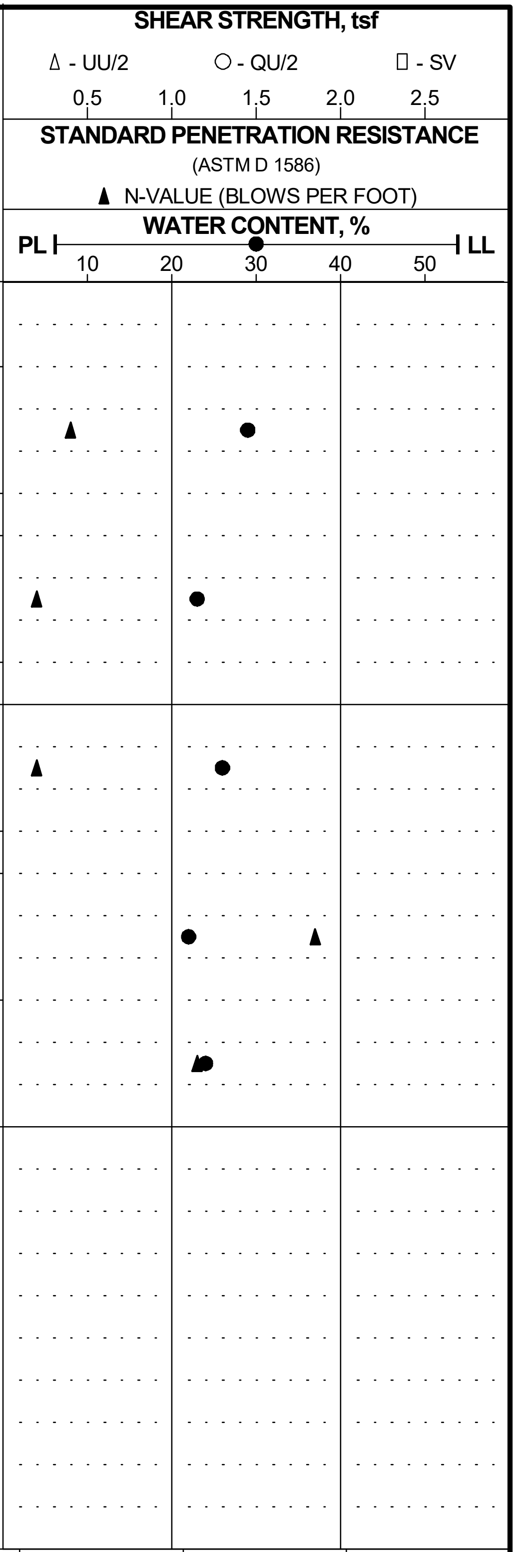
Project No. A25186.00132

Surface Elevation: 1292

Datum ______

Completion Date: 6/29/26

DEPTH IN FEET	ELEVATION IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
		Stiff, tan and reddish tan, SANDY CLAY, with numerous chert fragments, moist - CL (FILL)			
		∇		3-5-3	SS1
		Soft, gray and dark gray, LEAN CLAY - CL			
		▼		1-2-2	SS2
5	1287	gray and tan, with sand seams below 5 ft		1-1-3	SS3
		Dense, gray, tan, and dark gray, SILTY FINE SAND (completely weathered sandstone) - SM		8-13-24	SS4
		with clay seams and layers below 8.5 ft		8-10-13	SS5
10	1282				
		Auger refusal at 12'-2" on limestone.			



NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

GROUNDWATER DATA

ENCOUNTERED AT 2 FEET ∇

AT 3 FEET AFTER 24 HOURS ▼

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM

WASHBORING FROM __ FEET

SP DRILLER TK LOGGER

CME 55 DRILL RIG

HAMMER TYPE Auto

REMARKS:

Drawn by: YS	Checked by: YS	App'vd. by: STB
Date: 7/7/26	Date: 7/14/26	Date: 7/24/26

UES™

STEM University Academics
Bentonville, Arkansas

LOG OF BORING: FB -2

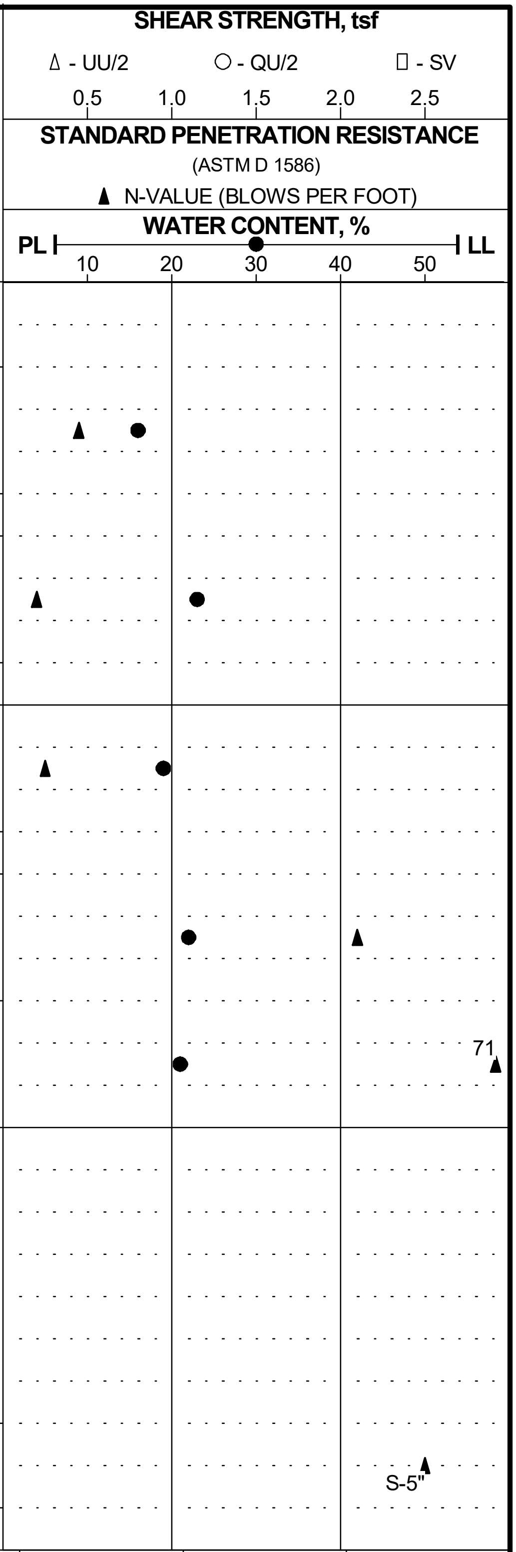
Project No. A25186.00132

Surface Elevation: 1293

Datum ______

Completion Date: 6/30/26

DEPTH IN FEET	ELEVATION IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
		Stiff, brown and tan, SANDY CLAY, with numerous chert fragments - CL (FILL)	∇	5-4-5	SS1
		Soft to medium stiff, gray and tan, FAT CLAY - CH	▼	1-2-2	SS2
5	1288			2-2-3	SS3
		Dense to very dense, tan and gray, SANDY SILT (completely weathered sandstone) - ML		5-21-21	SS4
				16-25-46	SS5
10	1283				
				50/5"	SS6
		Auger refusal at 14.5 ft on limestone.			



GROUNDWATER DATA

ENCOUNTERED AT 2 FEET ∇

AT 3 FEET AFTER 24 HOURS ▼

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM

WASHBORING FROM __ FEET

SP DRILLER TK LOGGER

CME 55 DRILL RIG

HAMMER TYPE Auto

REMARKS:

Drawn by: YS	Checked by: YS	App'vd. by: STB
Date: 7/7/26	Date: 7/14/26	Date: 7/24/26

UES™

STEM University Academics
Bentonville, Arkansas

LOG OF BORING: FB -3

Project No. A25186.00132

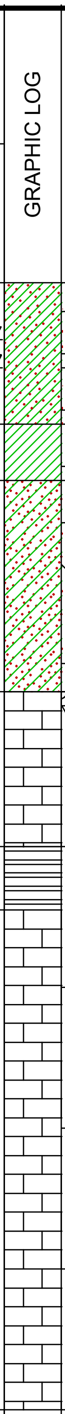
NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

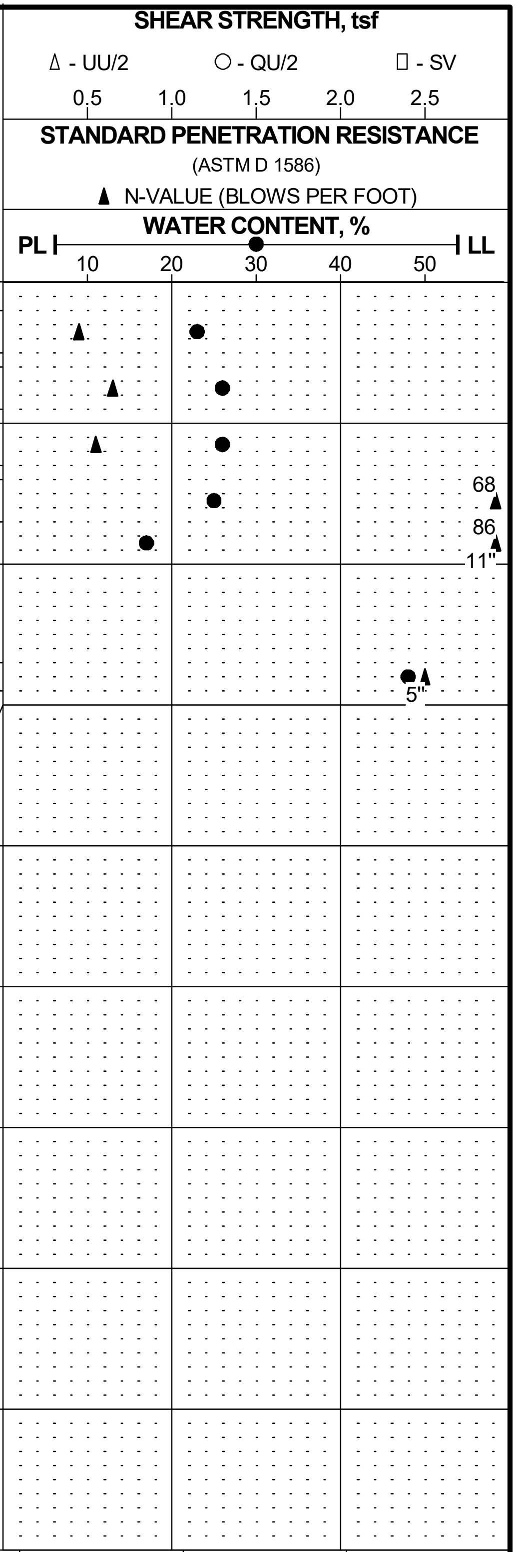
Surface Elevation: 1292

Datum ______

Completion Date: 7/1/26

DEPTH IN FEET	ELEVATION IN FEET	DESCRIPTION OF MATERIAL	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
		Medium stiff to stiff, tan and brown, SANDY CLAY, with numerous chert fragments - CL (FILL) ▽ ▼	1-3-6	SS1
			9-8-5	SS2
5	1287	Stiff, gray and tan, LEAN CLAY - CL	7-6-5	SS3
		Very dense, reddish tan, gray, and red, CLAYEY SAND (completely weathered sandstone) - SC	12-40-28	SS4
			16-36 -50/5"	SS5
10	1282			
		with fat clay seams below 13.5 ft	1-50/5"	SS6
		Auger refusal at 14.5 ft	100%/100%	NQ1
15	1277	Very hard, light gray, LIMESTONE	97% 63%	NQ2
20	1272	Low hardness, olive gray, SHALE		
		Very hard, light gray, LIMESTONE	100% 73%	NQ3
25	1267	with chert inclusions below 26.5 ft	100% 72%	NQ4
30	1262		100% 100%	NQ5
35	1257		100% 97%	NQ6
40	1252	Boring terminated at 40 ft		





NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

LOG OF BORING 2020 JDM - ELEVATIONS A25186.00132.GPJ GTINC 0638301.GPJ 7/28/26

GROUNDWATER DATA

ENCOUNTERED AT 2 FEET ▽

AT 3 FEET AFTER 24 HOURS ▼

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM

WASHBORING FROM __ FEET

SP DRILLER TK LOGGER

CME 55 DRILL RIG

HAMMER TYPE Auto

REMARKS:

Drawn by: YS	Checked by: YS	App'vd. by: STB
Date: 7/7/26	Date: 7/14/26	Date: 7/24/26

UES™

STEM University Academics
Bentonville, Arkansas

LOG OF BORING: FB -4

Project No. A25186.00132

Surface Elevation: 1292

Datum ______

Completion Date: 6/30/26

DEPTH IN FEET	ELEVATION IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
		Gravel: 6 inches			
		Medium stiff, red and reddish brown, SANDY CLAY, with numerous chert fragments - CL (FILL)		4-4-1	SS1
		Soft, gray, tan, and brown, LEAN CLAY, with sand seams and layers		0-1-1	SS2
5	1287	medium stiff, with more sand below 5 ft		3-3-5	SS3
		80% passing No. 200 sieve		3-3-5	SS4
		Dense, gray, orange, and tan, SANDY SILT, with fat clay seams and layers (completely weathered sandstone) - ML		10-15-16	SS5
10	1282				
		Stiff, tan and gray, FAT CLAY, with sand seams and layers - CH		4-4-5	SS6
15	1277				
		Auger refusal at 17'-3" on limestone.			

SHEAR STRENGTH, tsf

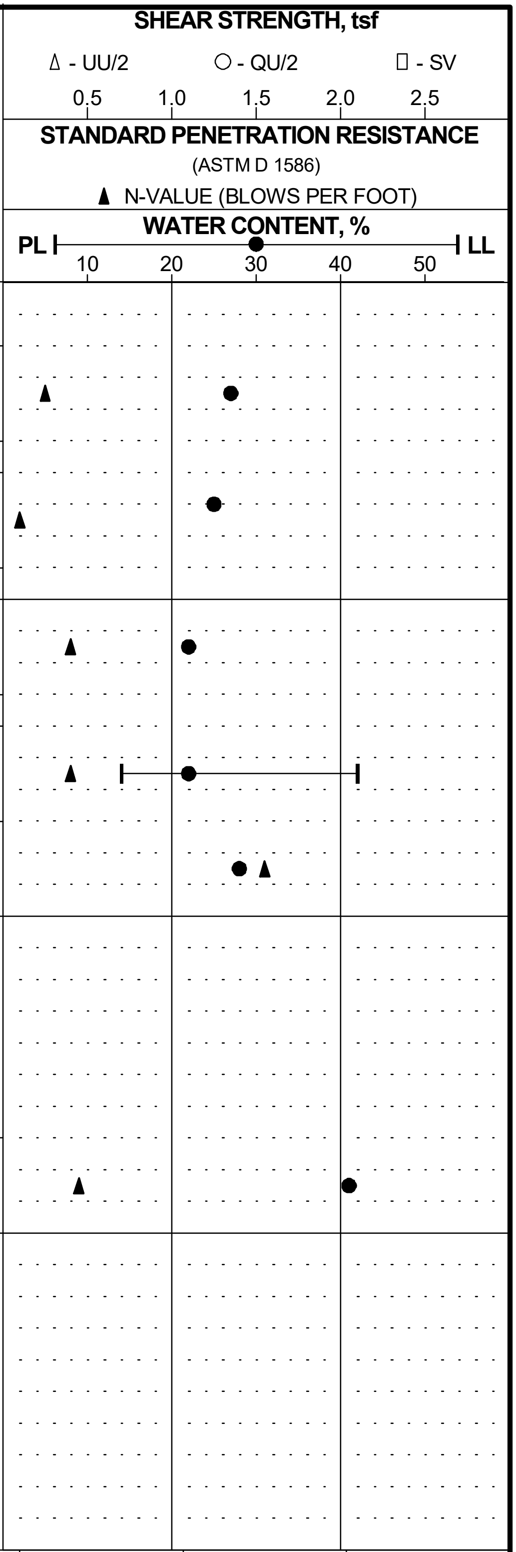
∆ - UU/2 ○ - QU/2 ☐ - SV

STANDARD PENETRATION RESISTANCE

(ASTM D 1586)

▲ N-VALUE (BLOWS PER FOOT)

WATER CONTENT, %



NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

GROUNDWATER DATA

ENCOUNTERED AT 6.5 FEET ∇

AT 3 FEET AFTER 24 HOURS ▼

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM

WASHBORING FROM __ FEET

SP DRILLER TK LOGGER

CME 55 DRILL RIG

HAMMER TYPE Auto

REMARKS:

Drawn by: YS	Checked by: YS	Appʼvd. by: STB
Date: 7/7/26	Date: 7/14/26	Date: 7/24/26

UES™

STEM University Academics
Bentonville, Arkansas

LOG OF BORING: FB -5

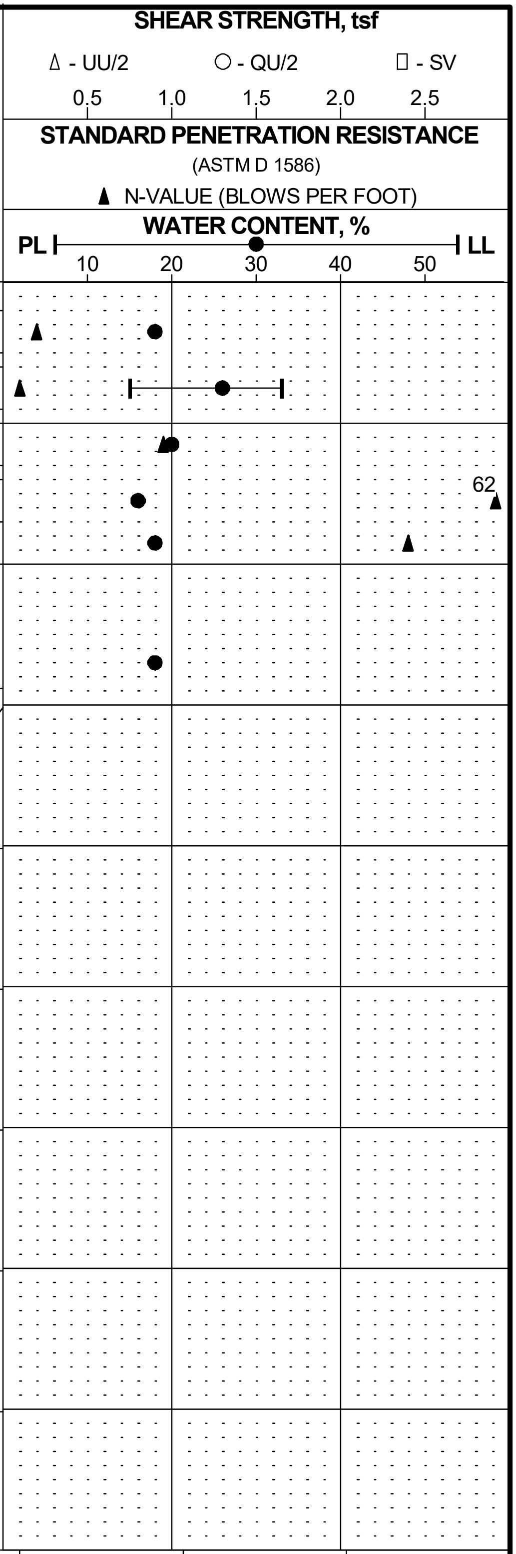
Project No. A25186.00132

Surface Elevation: 1290

Completion Date: 7/1/26

Datum ______

DEPTH IN FEET	ELEVATION IN FEET	DESCRIPTION OF MATERIAL	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
		Gravel: 4 inches		
		Soft, olive gray and dark gray, LEAN CLAY - CL	2-2-2	SS1
		Very soft, gray and tan, LEAN CLAY - CL 82% passing No. 200 sieve	0-1-1	SS2
5	1285	Medium dense, tan, gray, and reddish tan, CLAYEY SAND (completely weathered sandstone) - SC	2-4-15	SS3
		dense to very dense, tan and light gray below 7 ft	18-30-32	SS4
			15-21-27	SS5
10	1280			
		moist below 13.5 ft		
15	1275	Auger refusal at 14'-5"	100%/0%	NQ1
		Very hard, light gray, LIMESTONE	100% 58%	NQ2
		Low hardness, olive gray, SHALE		
20	1270	Very hard, light gray, LIMESTONE	100% 47%	NQ3
25	1265	with chert inclusions below 26.5 ft	100% 67%	NQ4
30	1260		100% 63%	NQ5
35	1255		100% 85%	NQ6
40	1250	Boring terminated at 40'-1"		



NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

GROUNDWATER DATA

ENCOUNTERED AT 12 FEET ▽

AT 3 FEET AFTER 24 HOURS ▼

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM

WASHBORING FROM __ FEET

SP DRILLER TK LOGGER

CME 55 DRILL RIG

HAMMER TYPE Auto

REMARKS:

Drawn by: YS	Checked by: YS	App'vd. by: STB
Date: 7/7/26	Date: 7/14/26	Date: 7/24/26

UES™

STEM University Academics
Bentonville, Arkansas

LOG OF BORING: FB -6

Project No. A25186.00132

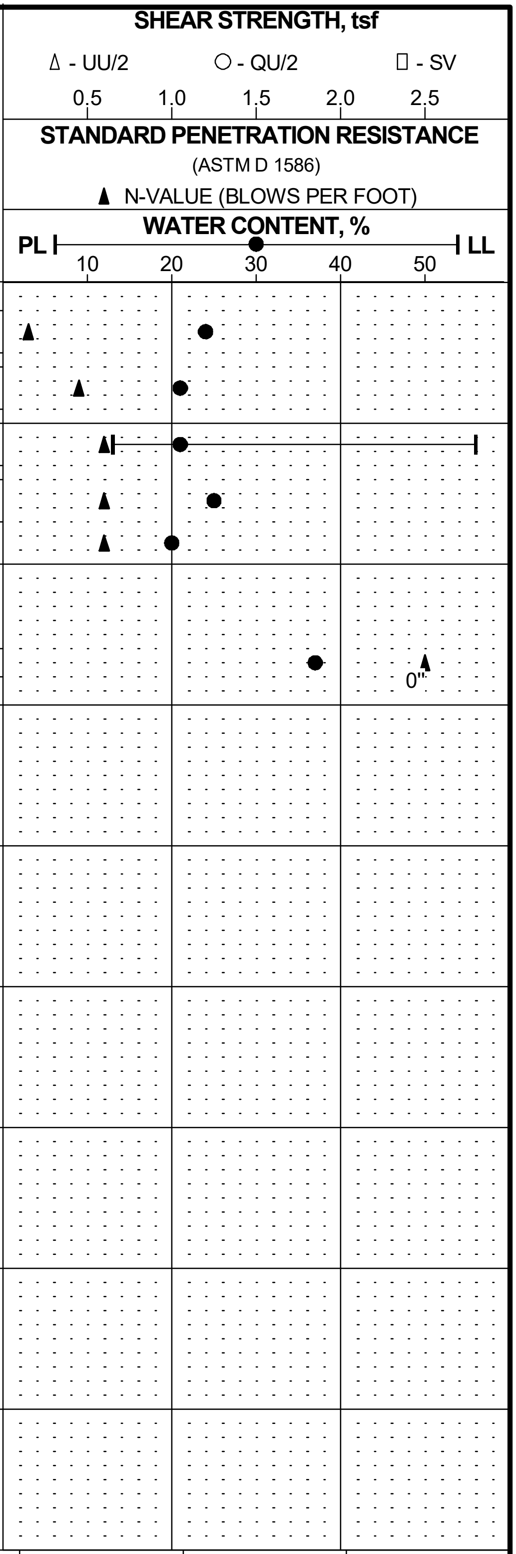
LOG OF BORING 2020 JDM - ELEVATIONS A25186.00132.GPJ GTINC 0638301.GPJ 7/28/26

Surface Elevation: 1289

Datum ______

Completion Date: 7/2/26

DEPTH IN FEET	ELEVATION IN FEET	DESCRIPTION OF MATERIAL	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
		Gravel: 8 inches		
		Soft, dark gray and reddish tan, FAT CLAY, with trace chert fragments - CH (FILL)	1-1-2	SS1
		Stiff, gray and tan, FAT CLAY - CH	2-4-5	SS2
5	1284	slightly sandy below 5 ft 84% passing No. 200 sieve	3-5-7	SS3
		with ferrous nodules below 7 ft	2-5-7	SS4
			4-5-7	SS5
10	1279			
		wet, with sandstone fragments below 13 ft ⊽	2-50/0"	SS6
		Auger refusal at 14 ft	50%/50%	NQ1
15	1274	Very hard, light gray, LIMESTONE clay-filled void from 14.5 to 15 ft		
		Low hardness, olive gray, SHALE	100% 55%	NQ2
20	1269	Very hard, light gray, LIMESTONE	100% 70%	NQ3
		with chert inclusions below 23 ft		
25	1264		100% 80%	NQ4
30	1259		100% 53%	NQ5
35	1254		100% 85%	NQ6
40	1249	Boring terminated at 40 ft		



NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

LOG OF BORING 2020 JDM - ELEVATIONS A25186.00132.GPJ GTINC 0638301.GPJ 7/28/26

GROUNDWATER DATA

ENCOUNTERED AT 13.5 FEET ⊽

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM

WASHBORING FROM __ FEET

SP DRILLER TK LOGGER

CME 55 DRILL RIG

HAMMER TYPE Auto

REMARKS:

Drawn by: YS	Checked by: YS	App'vd. by: STB
Date: 7/7/26	Date: 7/14/26	Date: 7/24/26

UES™

STEM University Academics
Bentonville, Arkansas

LOG OF BORING: FB -7

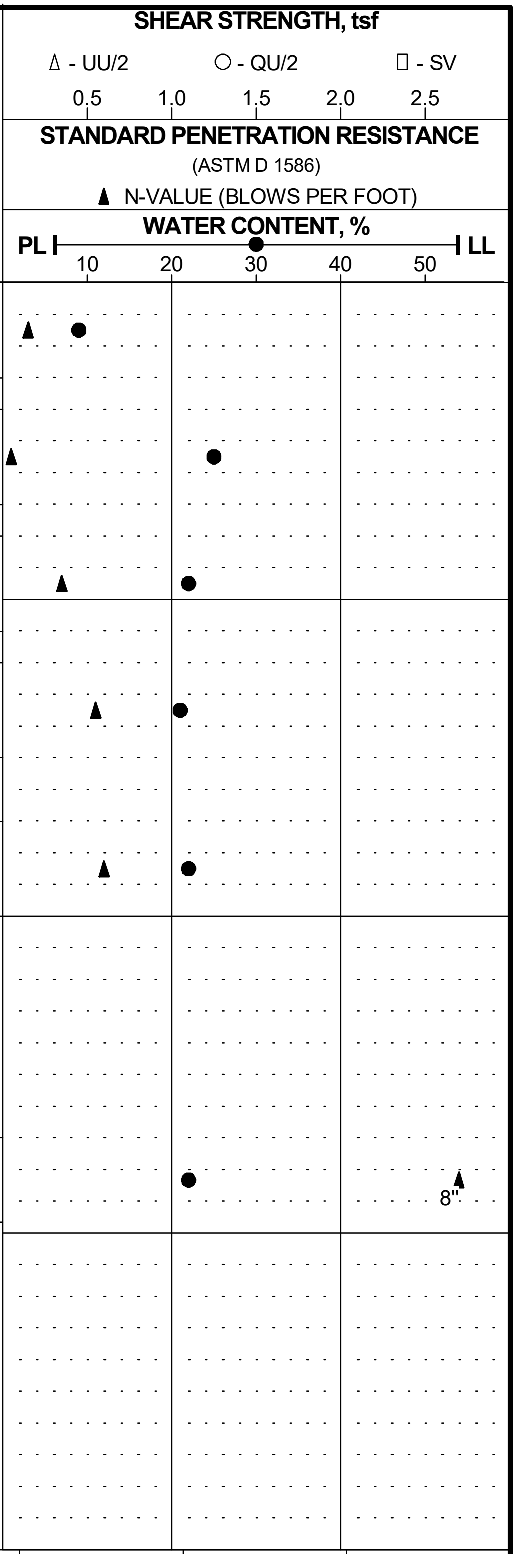
Project No. A25186.00132

Surface Elevation: 1289

Datum ______

Completion Date: 7/1/26

DEPTH IN FEET	ELEVATION IN FEET	DESCRIPTION OF MATERIAL	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
		Soft, brown and reddish tan, SANDY CLAY, with numerous chert fragments - CL (FILL)	1-1-2	SS1
		Very soft, gray and brown, LEAN CLAY - CL	1-0-1	SS2
		Medium stiff, gray and tan, LEAN CLAY, with fat clay seams and layers - CL	2-3-4	SS3
5	1284			
		stiff, with ferrous nodules below 6 ft	4-5-6	SS4
			2-5-7	SS5
10	1279			
		Very dense, olive gray and tan, SILTY SAND (completely weathered sandstone) - SM	2-4-50/2"	SS6
15	1274	Auger refusal at 14'-10" on limestone.		



NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

GROUNDWATER DATA

X FREE WATER NOT ENCOUNTERED DURING DRILLING

AT 4 FEET AFTER 24 HOURS ▽

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM

WASHBORING FROM __ FEET

SP DRILLER TK LOGGER

CME 55 DRILL RIG

HAMMER TYPE Auto

REMARKS:

Drawn by: YS	Checked by: YS	App'vd. by: STB
Date: 7/7/26	Date: 7/14/26	Date: 7/24/26

UES™

STEM University Academics
Bentonville, Arkansas

LOG OF BORING: FB -8

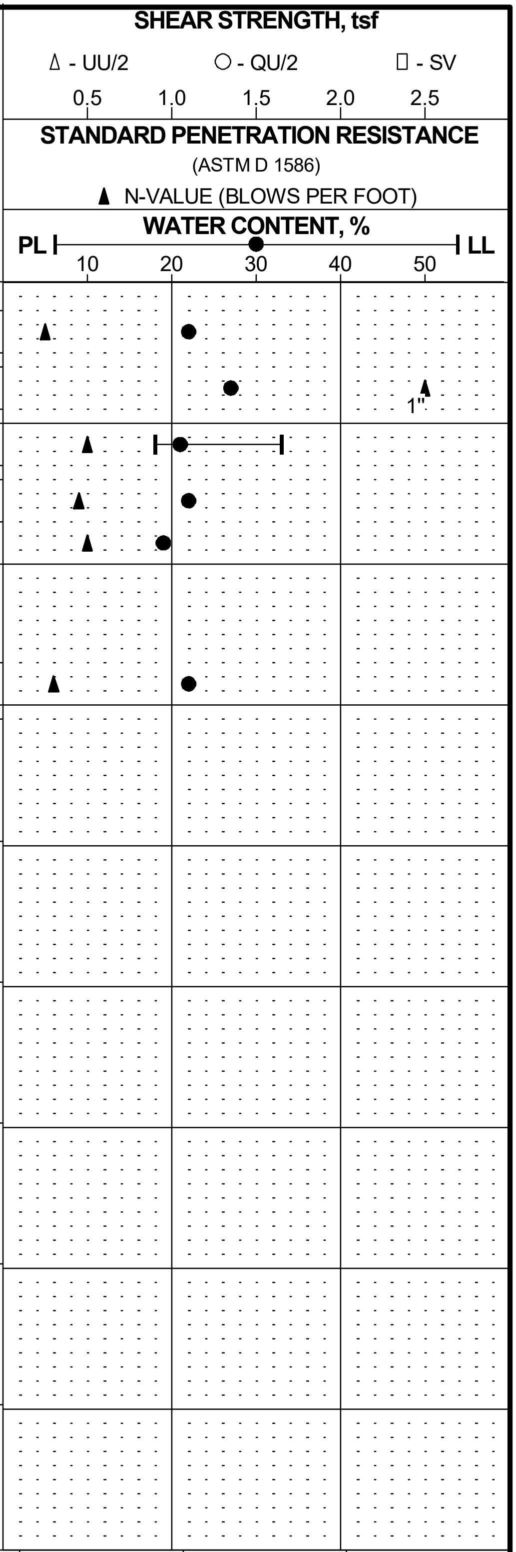
Project No. A25186.00132

Surface Elevation: 1286

Datum ______

Completion Date: 7/2/26

DEPTH IN FEET	ELEVATION IN FEET	DESCRIPTION OF MATERIAL	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
		Gravel: 8 inches		
		Medium stiff, red, SANDY CLAY, with numerous chert fragments - CL (FILL)	2-3-2	SS1
		concrete rubble at 4 ft	2-50/1"	SS2
5	1281	Stiff, tan and gray, LEAN CLAY - CL 84% passing No. 200 sieve with ferrous staining below 6 ft	4-5-5	SS3
			3-4-5	SS4
		Stiff, tan and gray, FAT CLAY, with ferrous nodules - CH	2-4-6	SS5
10	1276			
		moist, with silty sand seams and layers below 13.5 ft	2-2-4	SS6
15	1271	Auger refusal at 15.5 ft		
		Very hard, light gray, LIMESTONE	100% 81%	NQ1
		Low hardness, olive gray, SHALE		
20	1266	Very hard, light gray, LIMESTONE	100% 70%	NQ2
25	1261	with chert inclusions below 25 ft	100% 50%	NQ3
30	1256		100% 90%	NQ4
35	1251		100% 77%	NQ5
40	1246	Boring terminated at 39'-10"		



NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

GROUNDWATER DATA

ENCOUNTERED AT 5 FEET ∇

AT 3 FEET AFTER 18 HOURS ▼

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM

WASHBORING FROM __ FEET

SP DRILLER TK LOGGER

CME 55 DRILL RIG

HAMMER TYPE Auto

REMARKS:

Drawn by: YS	Checked by: YS	App'vd. by: STB
Date: 7/7/26	Date: 7/14/26	Date: 7/24/26

UES™

STEM University Academics
Bentonville, Arkansas

LOG OF BORING: FB -9

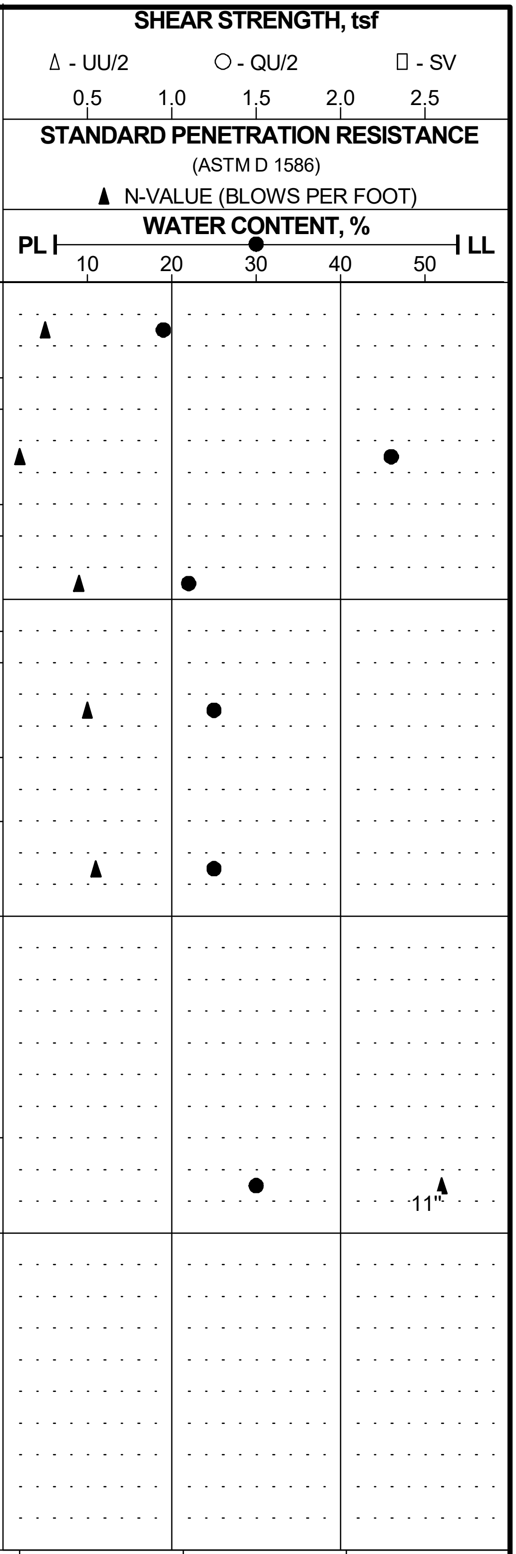
Project No. A25186.00132

Surface Elevation: 1289

Datum ______

Completion Date: 7/1/26

DEPTH IN FEET	ELEVATION IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
		Soft to medium stiff, red and reddish brown, SANDY CLAY, with numerous chert fragments - CL (FILL)		1-2-3	SS1
			▼	1-1-1	SS2
		Stiff, red, reddish tan, and gray, LEAN CLAY, slightly sandy, with ferrous nodules - CL			
5	1284			3-4-5	SS3
		gray and tan below 6 ft		3-5-5	SS4
		Stiff, gray and tan, FAT CLAY - CH		2-4-7	SS5
10	1279				
			∇		
		Medium dense, tan, FINE SANDY SILT (completely weathered sandstone), wet - ML		4-2-50/5"	SS6
15	1274	Auger refusal at 15 ft on limestone.			



NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

GROUNDWATER DATA

ENCOUNTERED AT 13.5 FEET ∇

AT 3 FEET AFTER 24 HOURS ▼

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM

WASHBORING FROM __ FEET

SP DRILLER TK LOGGER

CME 55 DRILL RIG

HAMMER TYPE Auto

REMARKS:

Drawn by: YS	Checked by: YS	App'vd. by: STB
Date: 7/7/26	Date: 7/14/26	Date: 7/24/26

STEM University Academics
Bentonville, Arkansas

LOG OF BORING: FB-10

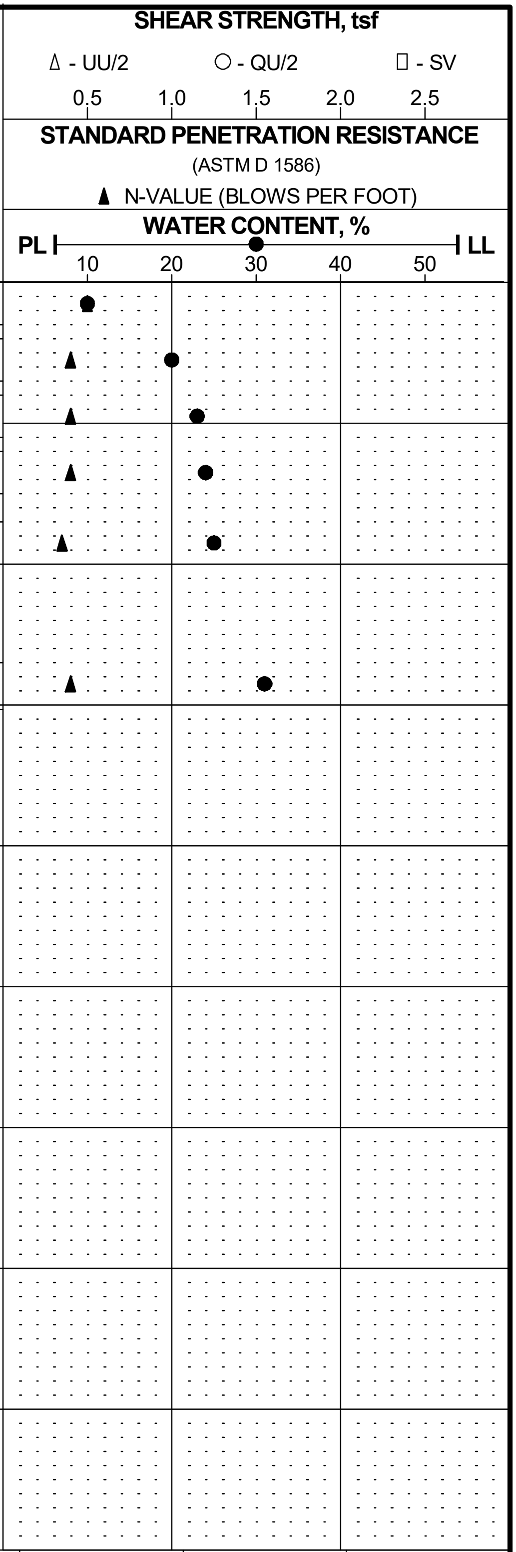
Project No. A25186.00132

Surface Elevation: 1287

Datum ______

Completion Date: 7/2/26

DEPTH IN FEET	ELEVATION IN FEET	DESCRIPTION OF MATERIAL	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
		Stiff, red, gray, and tan, SANDY CLAY, with numerous chert fragments - CL (FILL)	7-5-5	SS1
			3-4-4	SS2
		Stiff, olive gray, gray, and tan, LEAN CLAY - CL		
5	1282	▼	2-3-5	SS3
		with fat clay seams and layers below 6 ft		
			3-3-5	SS4
			2-3-4	SS5
10	1277			
		Loose, gray and tan, FINE SILTY SAND, with occasinoal sandstone gravel, wet - SM ∇	3-5-3	SS6
15	1272	Very hard, light gray, LIMESTONE		
			100% 79%	NQ1
		Low hardness, olive gray, SHALE		
20	1267	Very hard, light gray, LIMESTONE		
		shale seam at 21'-3"	100% 75%	NQ2
25	1262	with chert inclusions below 25 ft		
			100% 87%	NQ3
30	1257			
			100% 83%	NQ4
35	1252			
			100% 82%	NQ5
40	1247	Boring terminated at 40 ft		



NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

GROUNDWATER DATA

ENCOUNTERED AT 14 FEET ∇

AT 5 FEET AFTER 16 HOURS ▼

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM

WASHBORING FROM __ FEET

SP DRILLER TK LOGGER

CME 55 DRILL RIG

HAMMER TYPE Auto

REMARKS:

Drawn by: YS	Checked by: YS	App'vd. by: STB
Date: 7/7/26	Date: 7/14/26	Date: 7/24/26

UES™

STEM University Academics
Bentonville, Arkansas

LOG OF BORING: FB-11

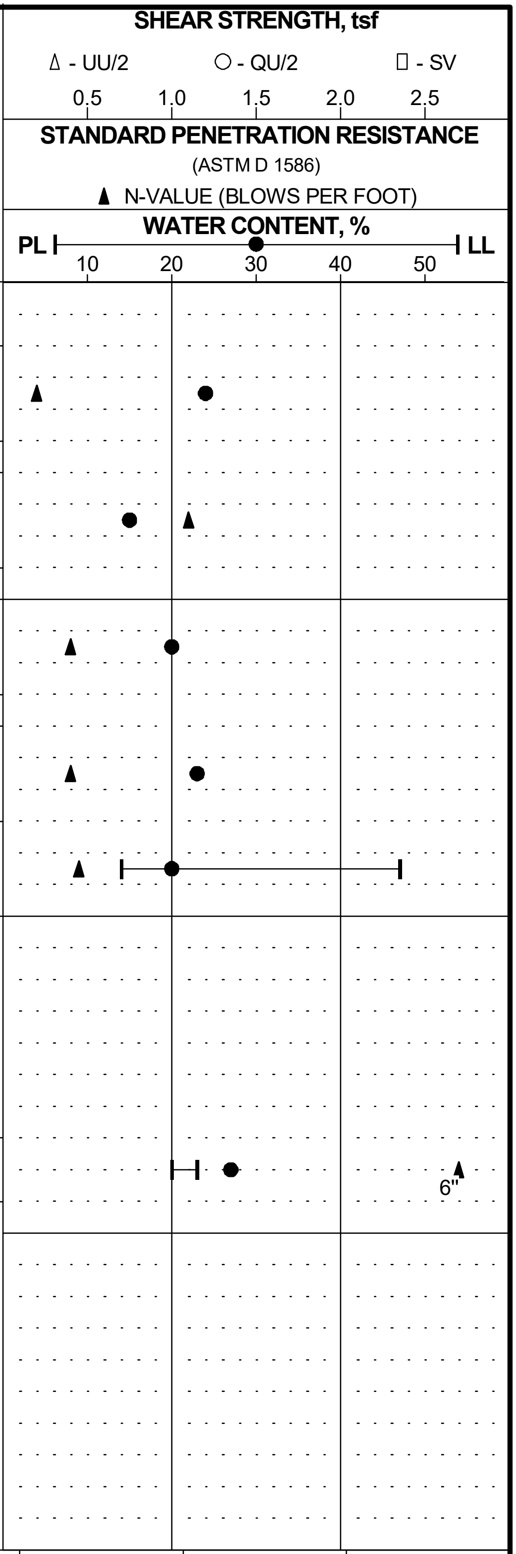
Project No. A25186.00132

Surface Elevation: 1286

Datum ______

Completion Date: 7/1/26

DEPTH IN FEET	ELEVATION IN FEET	DESCRIPTION OF MATERIAL	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
		Gravel: 8 inches		
		Soft, red and tan, SANDY CLAY, with numerous chert fragments - CL (FILL)	1-2-2	SS1
		▼		
			4-7-15	SS2
		with crushed stone base layer at 4 ft		
5	1281	Stiff, gray and tan, LEAN CLAY - CL	2-4-4	SS3
			3-4-4	SS4
		83% passing No. 200 sieve	3-4-5	SS5
10	1276			
		Medium dense, tan and brown, FINE SILTY SAND, wet - SM 48% passing No. 200 sieve	2-4-50/0"	SS6
		Auger refusal at 14.5 ft on limestone.		
15	1271			



NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

GROUNDWATER DATA

ENCOUNTERED AT 3 FEET ∇
AT 3 FEET AFTER 16 HOURS ▼

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM
WASHBORING FROM __ FEET
SP DRILLER TK LOGGER
CME 55 DRILL RIG
HAMMER TYPE Auto

REMARKS:

Drawn by: YS	Checked by: YS	App'vd. by: STB
Date: 7/7/26	Date: 7/14/26	Date: 7/24/26

UES™

STEM University Academics
Bentonville, Arkansas

LOG OF BORING: FB-12

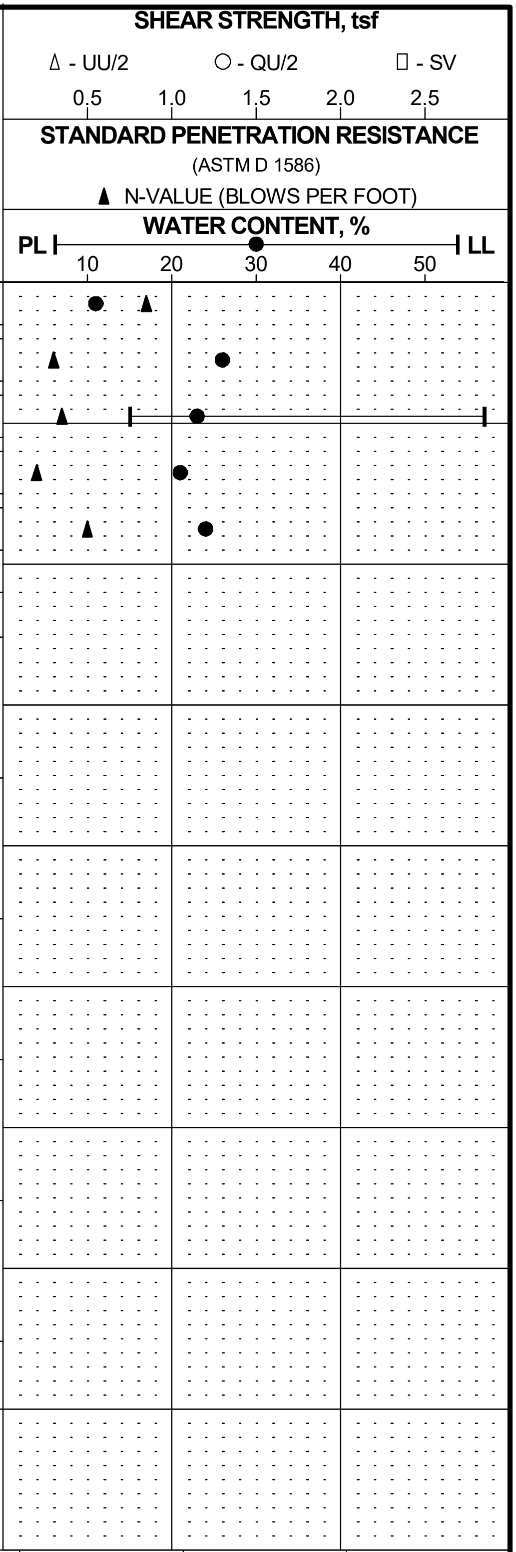
Project No. A25186.00132

Surface Elevation: 1287

Datum ______

Completion Date: 5/21/26

DEPTH IN FEET	ELEVATION IN FEET	DESCRIPTION OF MATERIAL	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
		Gravel: 3 inches Medium stiff, gray, tan, FAT CLAY - CH	4-8-9	SS1
			3-3-3	SS2
5	1282	Stiff, gray, tan, brown below 4 ft 92% passing No. 200 sieve	3-3-4	SS3
		Medium stiff below 6 ft	2-2-2	SS4
		Stiff to very stiff below 8 ft	3-4-6	SS5
10	1277	⊻		
		Very hard, light gray, LIMESTONE	100% 68%	NQ1
15	1272		100% 75%	NQ2
		Low hardness, olive gray, SHALE		
		Very hard, gray, light gray, LIMESTONE		
		With chert seams and layers below 19 ft		
20	1267		100% 85%	NQ3
		Chert seam from 21 to 23 ft		
25	1262		100% 73%	NQ4
30	1257		100% 93%	NQ5
35	1252		100% 7%	NQ6
			100% 100%	NQ7
40	1247	Boring terminated at 40 ft		



NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

GROUNDWATER DATA

X FREE WATER NOT ENCOUNTERED DURING DRILLING

AT 10 FEET AFTER ___ HOURS ⊻

DRILLING DATA

___ AUGER 3 3/4" HOLLOW STEM

WASHBORING FROM ___ FEET

EP DRILLER SB LOGGER

CME 550X DRILL RIG

HAMMER TYPE Auto

REMARKS:

Drawn by: MSE	Checked by: YS	App'vd. by: STB
Date: 5/28/26	Date: 7/14/26	Date: 7/24/26

UES™

STEM University Academics
Bentonville, Arkansas

LOG OF BORING: FB-13

Project No. A25186.00132

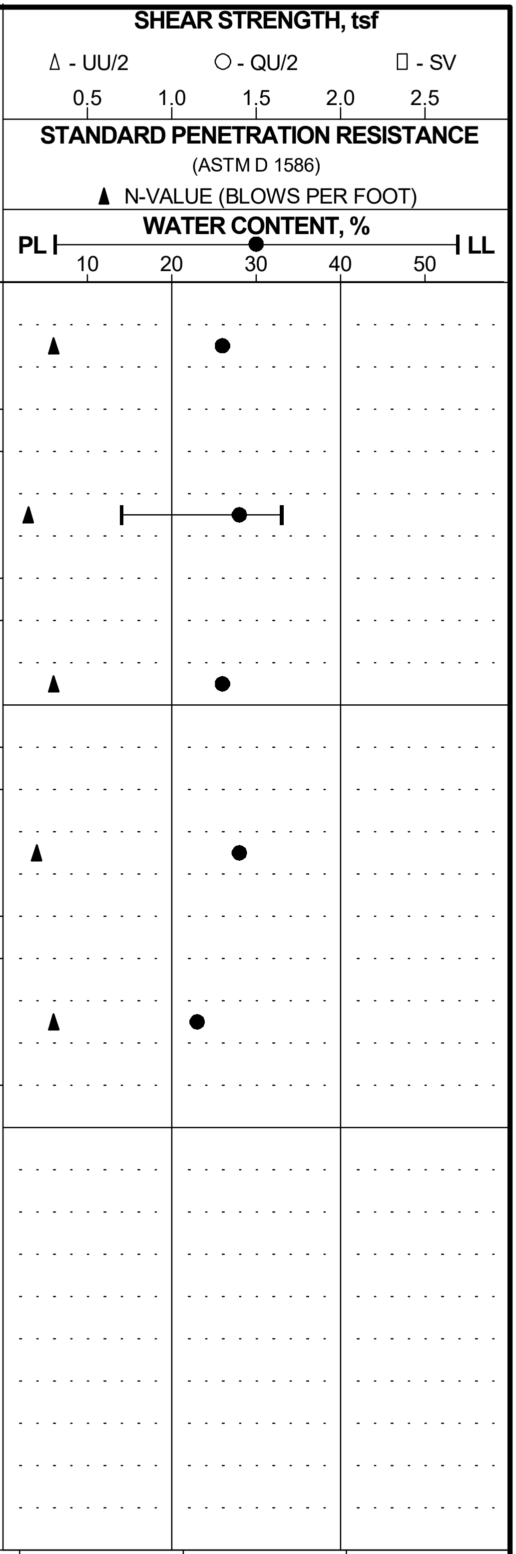
LOG OF BORING 2020 JDM - ELEVATIONS A25186.00132.GPJ GTINC 0638301.GPJ 7/28/26

Surface Elevation: **1286.5**

Datum ______

Completion Date: **5/21/26**

DEPTH IN FEET	ELEVATION IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
		Gravel: 8 inches			
		Soft, olive gray, LEAN CLAY - CL		7-4-2	SS1
		91% passing No. 200 sieve		0-1-2	SS2
		Medium stiff below 4 ft		2-2-4	SS3
5	1282				
		▽			
		Gray and tan below 6 ft		2-2-2	SS4
				2-3-3	SS5
10	1277	Auger refusal at 9.75 ft on limestone.			



GROUNDWATER DATA

ENCOUNTERED AT 5.5 FEET ▽

DRILLING DATA

___ AUGER 3 3/4" HOLLOW STEM

WASHBORING FROM ___ FEET

EP DRILLER SB LOGGER

CME 550X DRILL RIG

HAMMER TYPE Auto

REMARKS: Piezometer installed

Drawn by: MSE	Checked by: YS	App'vd. by: STB
Date: 5/28/26	Date: 7/14/26	Date: 7/24/26

UES™

STEM University Academics
Bentonville, Arkansas

LOG OF BORING: FB-14

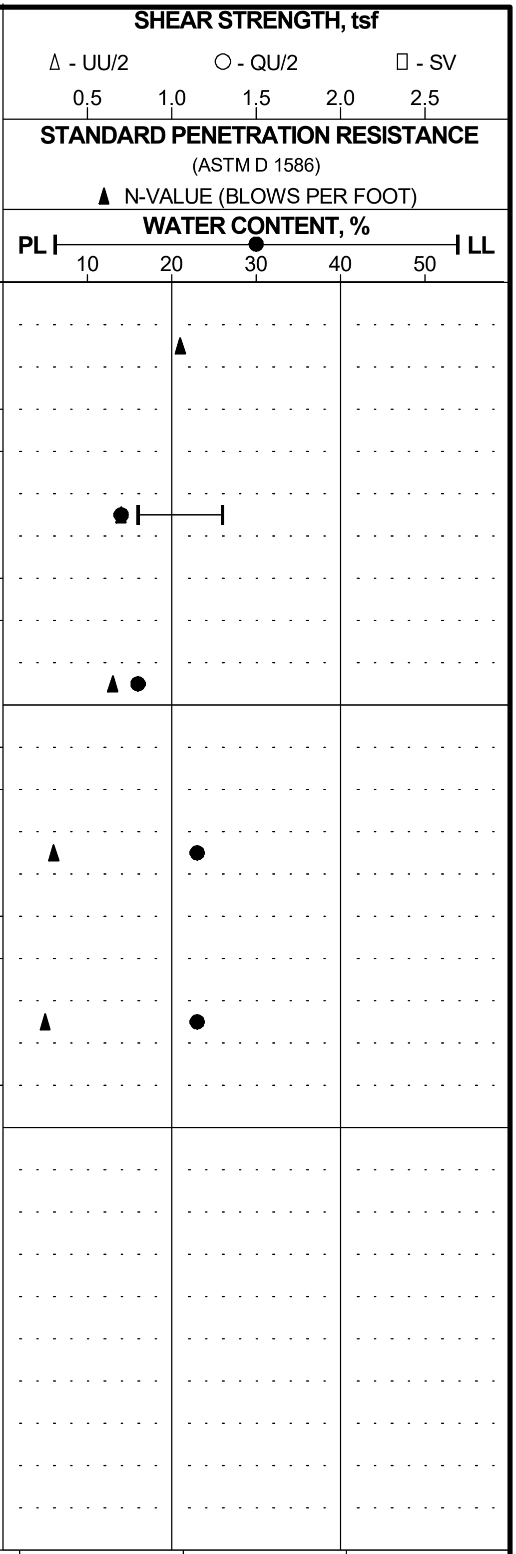
Project No. A25186.00132

Surface Elevation: 1288

Datum ______

Completion Date: 5/21/26

DEPTH IN FEET	ELEVATION IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
		Gravel: 16 inches		16-11-10	SS1
		Stiff, red, SANDY CLAY, with numerous chert fragments - CL (FILL) 67% passing No. 200 sieve			
		Stiff, gray, brown, LEAN CLAY, slightly sandy, with some sandstone fragments - CL (FILL)		5-7-7	SS2
				4-6-7	SS3
5	1283				
		Medium stiff to stiff, gray, tan, FAT CLAY - CH		2-3-3	SS4
				2-2-3	SS5
10	1278				
		Auger refusal at 10.25 ft on limestone.			



NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

GROUNDWATER DATA

X FREE WATER NOT ENCOUNTERED DURING DRILLING

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM
WASHBORING FROM __ FEET
EP DRILLER SB LOGGER
CME 550X DRILL RIG
HAMMER TYPE Auto

REMARKS:

Drawn by: MSE	Checked by: YS	App'vd. by: STB
Date: 5/28/26	Date: 7/14/26	Date: 7/24/26

UES™

STEM University Academics
Bentonville, Arkansas

LOG OF BORING: FB-15

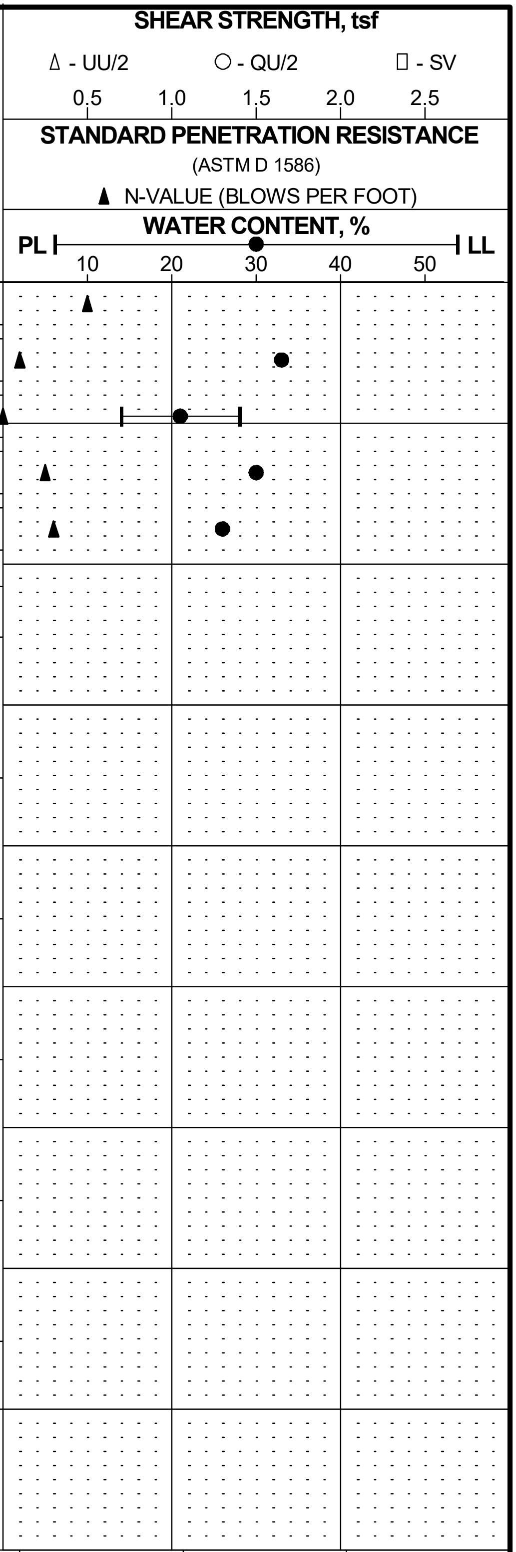
Project No. A25186.00132

Surface Elevation: **1286.5**

Completion Date: **5/22/26**

Datum ______

DEPTH IN FEET	ELEVATION IN FEET	DESCRIPTION OF MATERIAL	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
		Gravel: 24 inches	6-6-4	SS1
		Loose, tan, CLAYEY CHERT GRAVEL - GC (FILL)	0-1-1	SS2
		Very soft, gray, tan, LEAN CLAY, with occasional chert gravel - CL (FILL)		
5	1282	59% passing No. 200 sieve	0-0-0	SS3
		Medium stiff, gray and tan below 6 ft	3-2-3	SS4
			3-2-4	SS5
10	1277			
		Very hard, light gray, LIMESTONE	100% 71%	NQ1
			100% 80%	NQ2
15	1272	Low hardness, olive gray, SHALE		
		Very hard, light gray, LIMESTONE		
		With some chert seams and layers below 19 ft		
20	1267		100% 72%	NQ3
		With more chert below 21 ft		
25	1262		100% 57%	NQ4
30	1257		100% 45%	NQ5
35	1252		100% 100%	NQ6
			100% 100%	NQ7
40	1247	Boring terminated at 40 ft		



NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

GROUNDWATER DATA

X FREE WATER NOT ENCOUNTERED DURING DRILLING

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM

WASHBORING FROM __ FEET

EP DRILLER SB LOGGER

CME 550X DRILL RIG

HAMMER TYPE Auto

REMARKS:

Drawn by: MSE	Checked by: YS	App'vd. by: STB
Date: 5/28/26	Date: 7/14/26	Date: 7/24/26

UES™

STEM University Academics
Bentonville, Arkansas

LOG OF BORING: FB-16

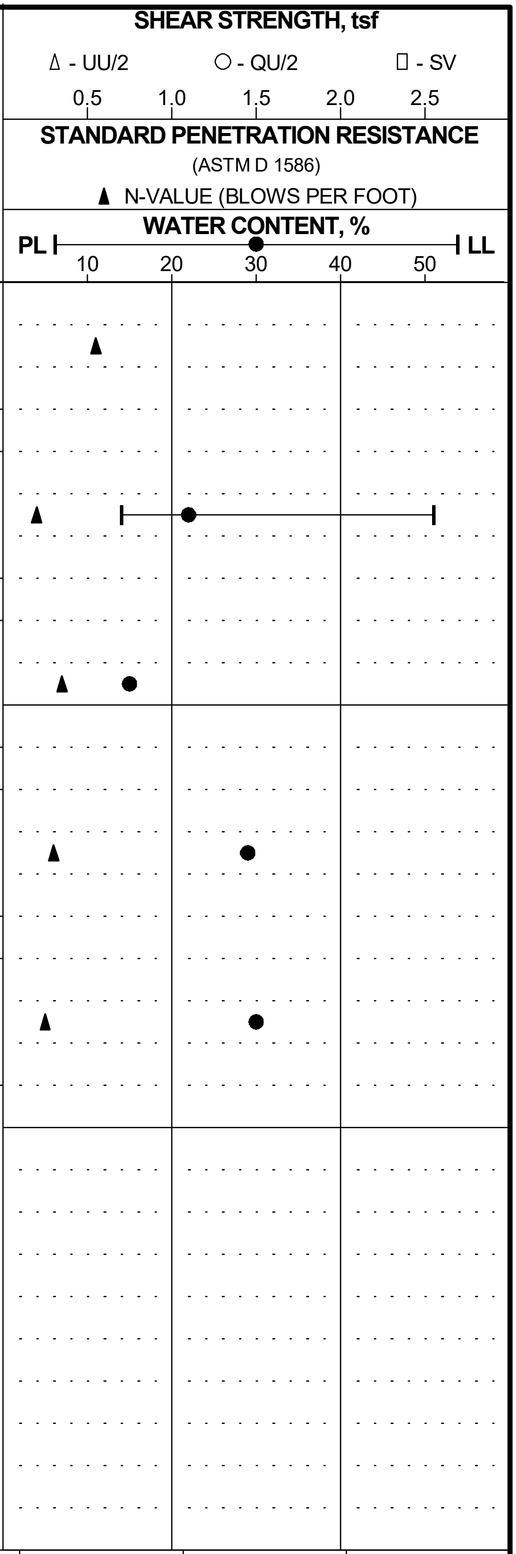
Project No. A25186.00132

Surface Elevation: 1286.5

Datum ______

Completion Date: 5/22/26

DEPTH IN FEET	ELEVATION IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
		Gravel: 12 inches		3-5-6	SS1
		Medium stiff, olive gray, tan, FAT CLAY - CH			
		78% passing No. 200 sieve		2-2-2	SS2
		Stiff below 4 ft		2-3-4	SS3
5	1282				
		Medium stiff below 6 ft		2-2-4	SS4
				3-2-3	SS5
10	1277				
		Auger refusal at 10.5 ft on limestone.			



NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

GROUNDWATER DATA

X FREE WATER NOT ENCOUNTERED DURING DRILLING

DRILLING DATA

__ AUGER 3 3/4" HOLLOW STEM

WASHBORING FROM __ FEET

EP DRILLER SB LOGGER

CME 550X DRILL RIG

HAMMER TYPE Auto

REMARKS:

Drawn by: MSE	Checked by: YS	App'vd. by: STB
Date: 5/28/26	Date: 7/14/26	Date: 7/24/26

UES™

STEM University Academics
Bentonville, Arkansas

LOG OF BORING: FB-17

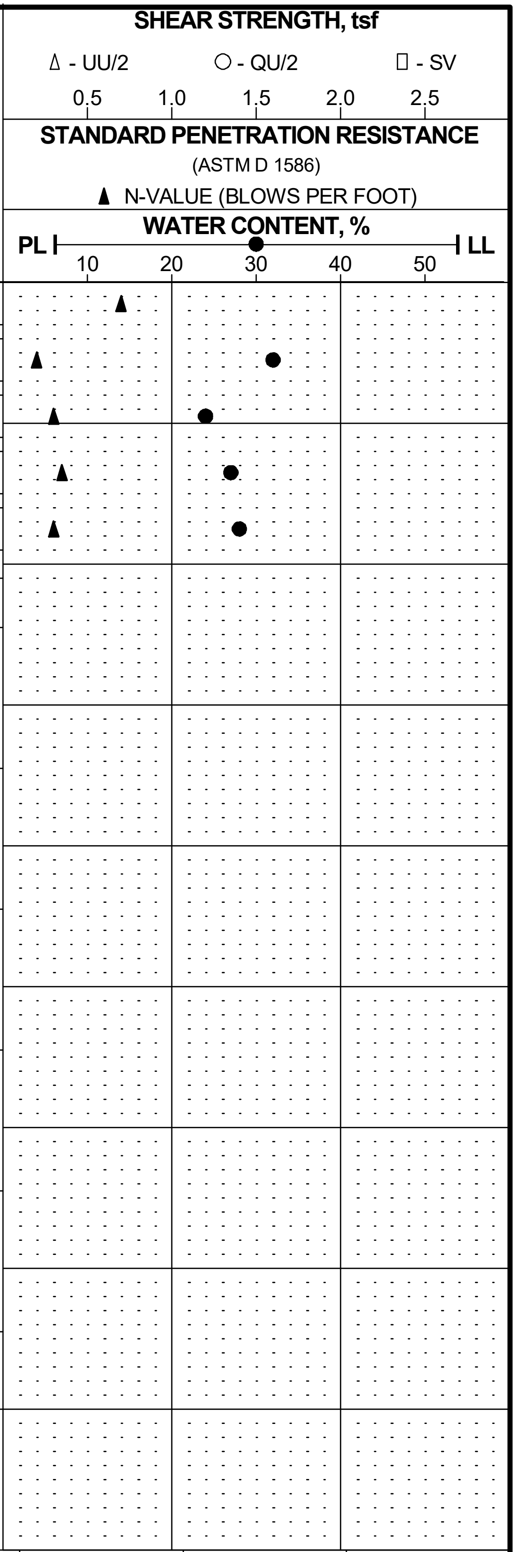
Project No. A25186.00132

Surface Elevation: 1287

Datum ______

Completion Date: 5/26/26

DEPTH IN FEET	ELEVATION IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES
		Gravel: 8 inches		5-8-6	SS1
		Stiff, red, SANDY CLAY, with chert fragments - CL (FILL)			
		Medium stiff, dark brown, LEAN CLAY, with some gravel - CL (FILL)		2-2-2	SS2
5	1282	Medium stiff, olive gray, tan, FAT CLAY - CH ∇		2-2-4	SS3
		Stiff below 6ft		2-3-4	SS4
				2-2-4	SS5
10	1277				
		Moderately hard, gray, slightly weathered, LIMESTONE		86% 38%	NQ1
		Clay filled void from 11 to 11.5 ft			
		Very hard, light gray, LIMESTONE			
15	1272			100% 98%	NQ2
		shale seam at 18.5 ft		100% 60%	NQ3
20	1267				
		Cherty below 22.5 ft			
25	1262			98% 78%	NQ4
30	1257			100% 72%	NQ5
35	1252			100% 85%	NQ6
				100% 84%	NQ7
40	1247	Boring terminated at 40 ft			



NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

GROUNDWATER DATA

ENCOUNTERED AT 5.5 FEET ∇

DRILLING DATA

___ AUGER 3 3/4" HOLLOW STEM
WASHBORING FROM ___ FEET
EP DRILLER SB LOGGER
CME 550X DRILL RIG
HAMMER TYPE Auto

REMARKS:

Drawn by: MSE	Checked by: YS	App'vd. by: STB
Date: 5/28/26	Date: 7/14/26	Date: 7/24/26

UES™

STEM University Academics
Bentonville, Arkansas

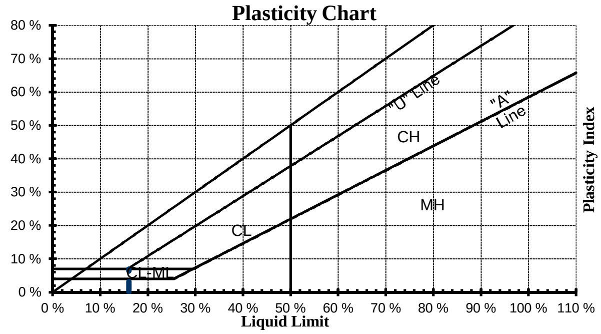
LOG OF BORING: FB-18

Project No. A25186.00132

BORING LOG: TERMS AND SYMBOLS

LEGEND

CS	Continuous Sampler
GB	Grab Sample
NQ	NQ Rock Core
PST	Three-Inch Diameter Piston Tube Sample
SS	Split-Spoon Sample (Standard Penetration Test)
ST	Three-Inch Diameter Shelby Tube Sample
*	Sample Not Recovered
PL	Plastic Limit (ASTM D4318)
LL	Liquid Limit (ASTM D4318)
SV	Shear Strength from Field Vane (ASTM D2573)
UU	Shear Strength from Unconsolidated-Undrained Triaxial Compression Test (ASTM D2850)
QU	Shear Strength from Unconfined Compression Test (ASTM D2166)



SOIL GRAIN SIZE

US STANDARD SIEVE

12" 3" 3/4" 4 10 40 200

BOULDERS	COBBLES	GRAVEL		SAND			SILT	CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE		

300 76.2 19.1 4.76 2.00 0.42 0.074 0.005

SOIL GRAIN SIZE IN MILLIMETERS

UNIFIED SOIL CLASSIFICATION SYSTEM

Major Divisions			***Symbol***	***Description***
Coarse-Grained Soils (More than 50% Larger than No. 200 Sieve Size)	Gravel and Gravelly Soil	Clean Gravels Little or no Fines	GW	Well-Graded Gravel, Gravel- Sand Mixture
			GP	Poorly-Graded Gravel, Gravel-Sand Mixture
		Gravels with Appreciable Fines	GM	Silty Gravel, Gravel-Sand-Silt Mixture
			GC	Clayey-Gravel, Gravel-Sand-Clay Mixture
	Sand and Sandy Soils	Clean Sands Little or no Fines	SW	Well-Graded Sand, Gravelly Sand
			SP	Poorly-Graded Sand, Gravelly Sand
		Sands with Appreciable Fines	SM	Silty Sand, Sand-Silt Mixture
			SC	Clayey-Sand, Sand-Clay Mixture
Fine-Grained Soils (More than 50% Smaller than No. 200 Sieve Size)	Silts and Clays	Liquid Limit Less Than 50	ML	Silt, Sandy Silt, Clayey Silt, Slight Plasticity
			CL	Lean Clay, Sandy Clay, Silty Clay, Low to Medium Plasticity
			OL	Organic Silts or Lean Clays, Low Plasticity
	Silts and Clays	Liquid Limit Greater Than 50	MH	Silt, High Plasticity
			CH	Fat Clay, High Plasticity
			OH	Organic Clay, Medium to High Plasticity
	Highly Organic Soils		PT	Peat, Humus, Swamp Soil

STRENGTH OF COHESIVE SOILS

Consistency	***Undrained Shear Strength (tsf)***	***Unconfined Comp. Strength (tsf)***
Very Soft	less than 0.125	less then 0.25
Soft	0.125 to 0.25	0.25 to 0.5
Medium Stiff	0.25 to 0.5	0.5 to 1.0
Stiff	0.5 to 1.0	1.0 to 2.0
Very Stiff	1.0 to 2.0	2.0 to 3.0
Hard	greater than 2.0	greater than 4.0

DENSITY OF GRANULAR SOILS

Descriptive Term	***Approximate N_{60}-Value Range***
Very Loose	0 to 4
Loose	5 to 10
Medium Dense	11 to 30
Dense	31 to 50
Very Dense	>50

N-Value (Blow Count) is the last two, 6-inch drive increments (i.e. 4/7/9, N = 7 + 9 = 16). Values are shown as a summation on the grid plot and shown in the Unit Dry Weight/SPT column.

RELATIVE COMPOSITION

Trace	0 to 10%
Little	10 to 20%
Some	20 to 35%
And	35 to 50%

OTHER TERMS

Layer - Inclusion greater than 3 inches thick.

Seam - Inclusion 1/8-inch to 3 inches thick

Parting - Inclusion less than 1/8-inch thick

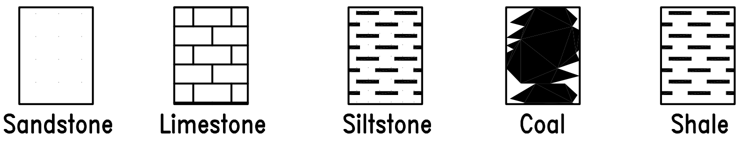
Pocket - Inclusion of material that is smaller than sample diameter

UES™

Relative composition and Unified Soil Classification System (USCS) designations are based on visual descriptions and are approximate only. If laboratory tests were performed to classify the soil, the USCS designation is shown in parenthesis.

BORING LOG TERMS – ROCK

ROCK TYPES
(SHOWN IN SYMBOLS COLUMN)



Joint Characteristics –

Spacing	
Very Close	0.75 to 2.5 in.
Close	2.5 to 8 in.
Moderately Close	8 to 24 in.
Wide	2 to 6 ft
Very Wide	More than 6 ft

Bedding Characteristics –

Very Thin	0.75 to 2.5 in.
Thin	2.5 to 8 in.
Medium	8 to 24 in.
Thick	2 to 6 ft
Massive	More than 6 ft

Lithologic Characteristics –

Clayey
Shaly
Calcareous (limy)
Siliceous
Sandy (Arenaceous)
Silty
Plastic Seams

Parting –	Less than 1/16 inch
Seam –	1/16 to 1/2 inch
Layer –	1/2 to 12 inches
Stratum –	Greater than 12 inches

Hardness–

Soft (S) – Reserved for plastic material alone.

Friable (F) – Easily crumbled by hand, pulverized or reduced to powder and is too soft to be cut with a pocket knife.

Low Hardness (LH) – Can be gouged deeply or carved with a pocket knife.

Moderately Hard (MH) – Can be readily scratched by a knife blade; scratch leaves a heavy trace of dust and scratch is readily visible after the powder has been blown away.

Hard (H) – Can be scratched with difficulty; scratch produces little powder and is often faintly visible; traces of the knife steel may be visible.

Very hard (VH) – Cannot be scratched with a pocket knife. Knife steel marks left on surface.

Texture –

Fine – Barely seen with naked eye
Medium – Barely seen up to 1/8 in.
Coarse – 1/8 in. to 1/4 in.

Structure –

- Bedding
  - Flat – 0° – 5°
  - Gently Dipping – 5° – 35°
  - Moderately Dipping – 35° – 55°
  - Steeply Dipping – 55° – 85°
- Fractures, scattered
  - Open
  - Cemented or Tight
- Fractures, closely spaced
  - Open
  - Cemented or Tight
- Brecciated (Sheared and Fragmented)
  - Open
  - Cemented or Tight
- Joints
  - Faulted
  - Slickensides

Degree of Weathering –

Fresh – No visible signs of decomposition or discoloration. Rings under hammer impact.

Slighty Weathered – Slight discoloration inwards from open fractures, otherwise similar to fresh.

Moderately Weathered – Discoloration throughout. Weaker minerals such as feldspar decomposed. Strength somewhat less than fresh rock, but cores cannot be broken by hand or scraped by knife. Texture preserved.

Highly Weathered – Most minerals somewhat decomposed. Specimens can be broken by hand with effort or shaved with knife. Core stones present in rock mass. Texture becoming indistinct but fabric

Completely Weathered – Minerals decomposed to soil but fabric and structure preserved (Saprolite). Specimens easily crumbled or penetrated.

Residual Soil – Advanced state of decomposition resulting in plastic soils. Rock fabric and structure completely destroyed. Large volume change.

Solution and Void Conditions –

Solid, contains no voids
Vuggy (pitted)
Vesicular (igneous)
Porous
Cavities
Cavernous

Swelling Properties –

Nonswelling
Swelling

Slaking Properties –

Nonslaking
Slakes slowly on exposure
Slakes readily on exposure

Rock Quality Designation (RQD) –

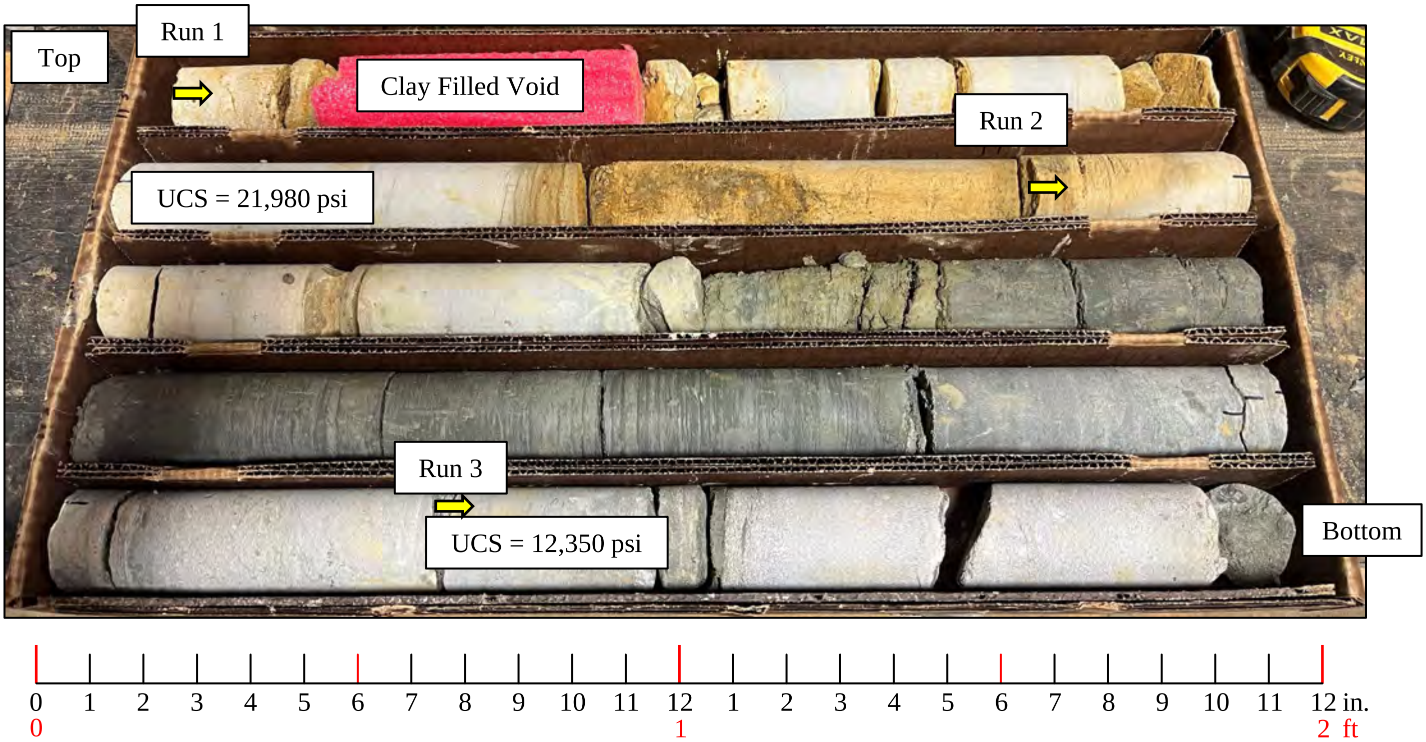
RQD (Percent)	Diagnostic Description
Greater than 90	Excellent
75 – 90	Good
50 – 75	Fair
25 – 50	Poor
Less than 25	Very Poor

KEYROCK FHWA

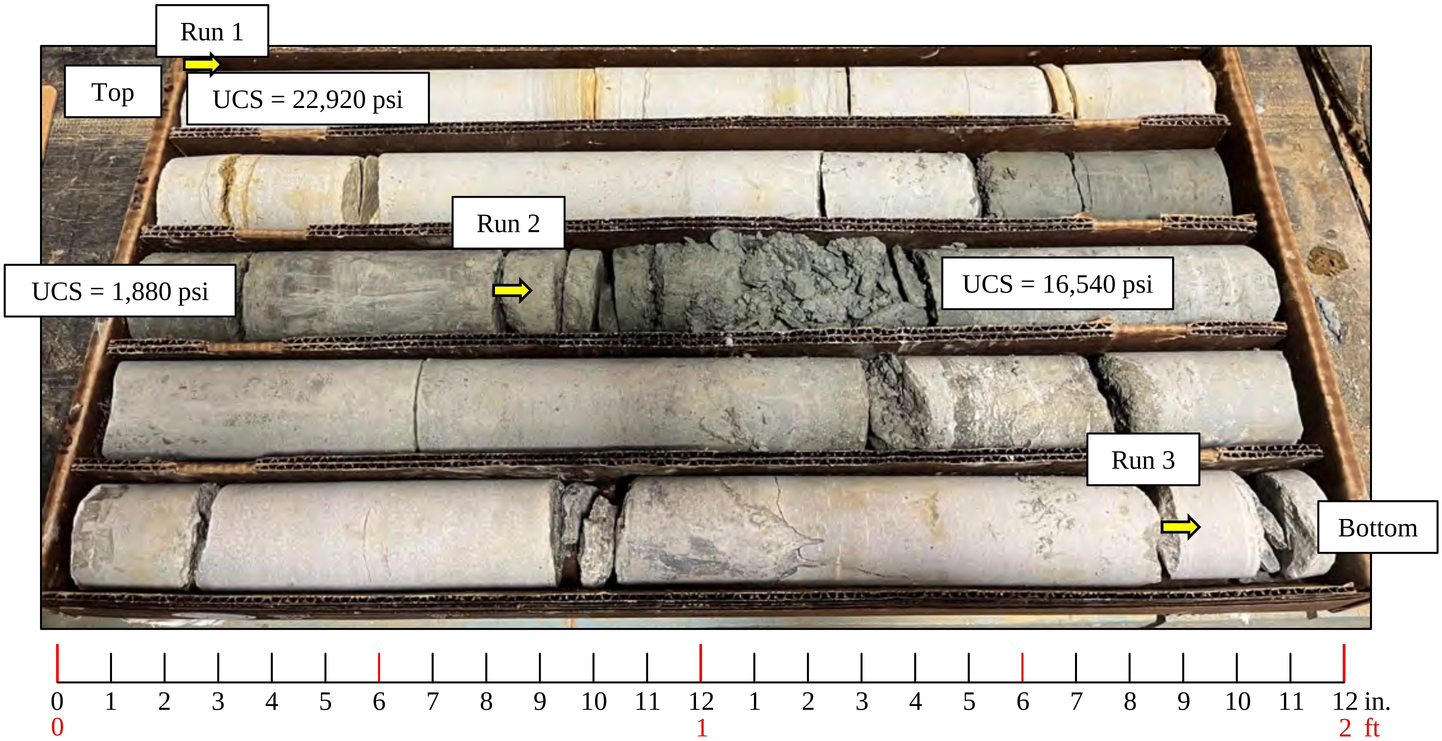
PLATE

APPENDIX C – ROCK CORE PHOTOGRAPHS

Boring B-1: 11’-5” to 21’-5”



Boring B-4: 10’-6” to 20’-6”

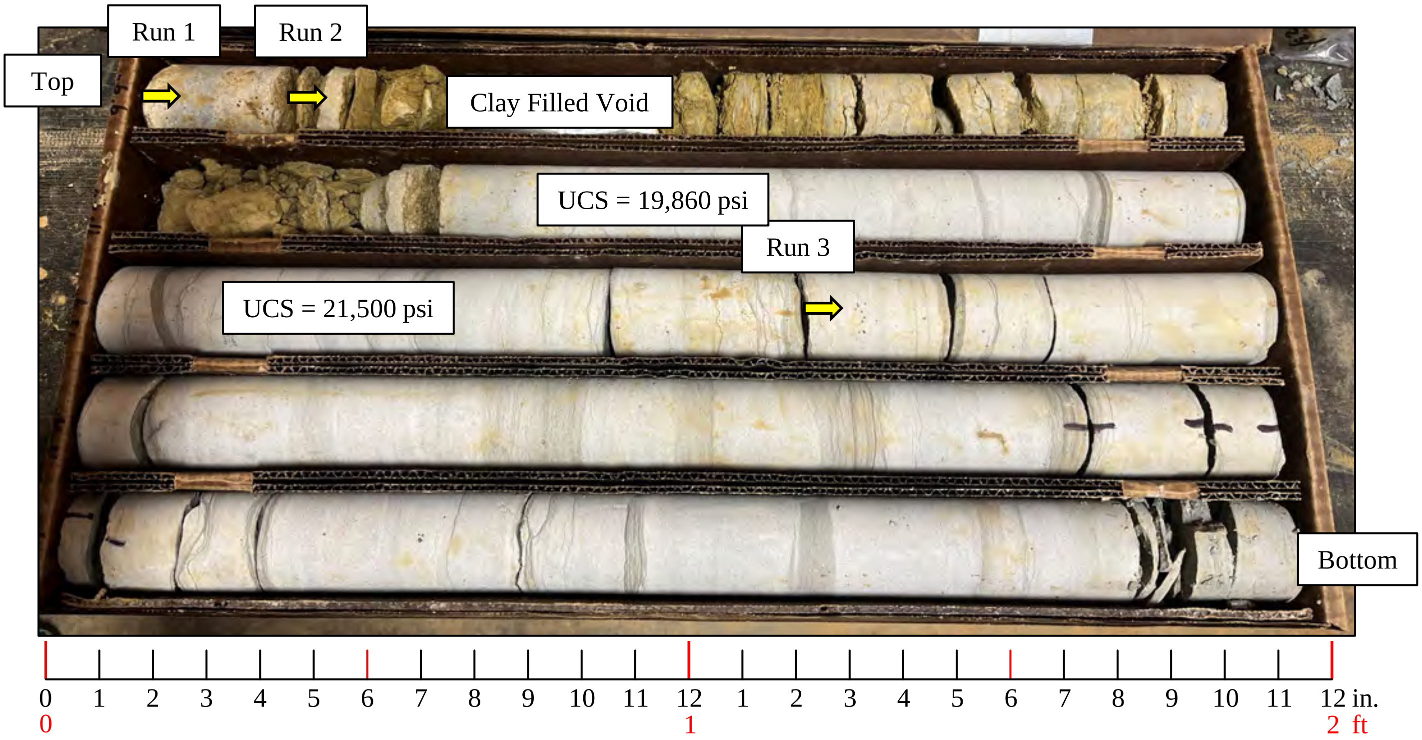


UES

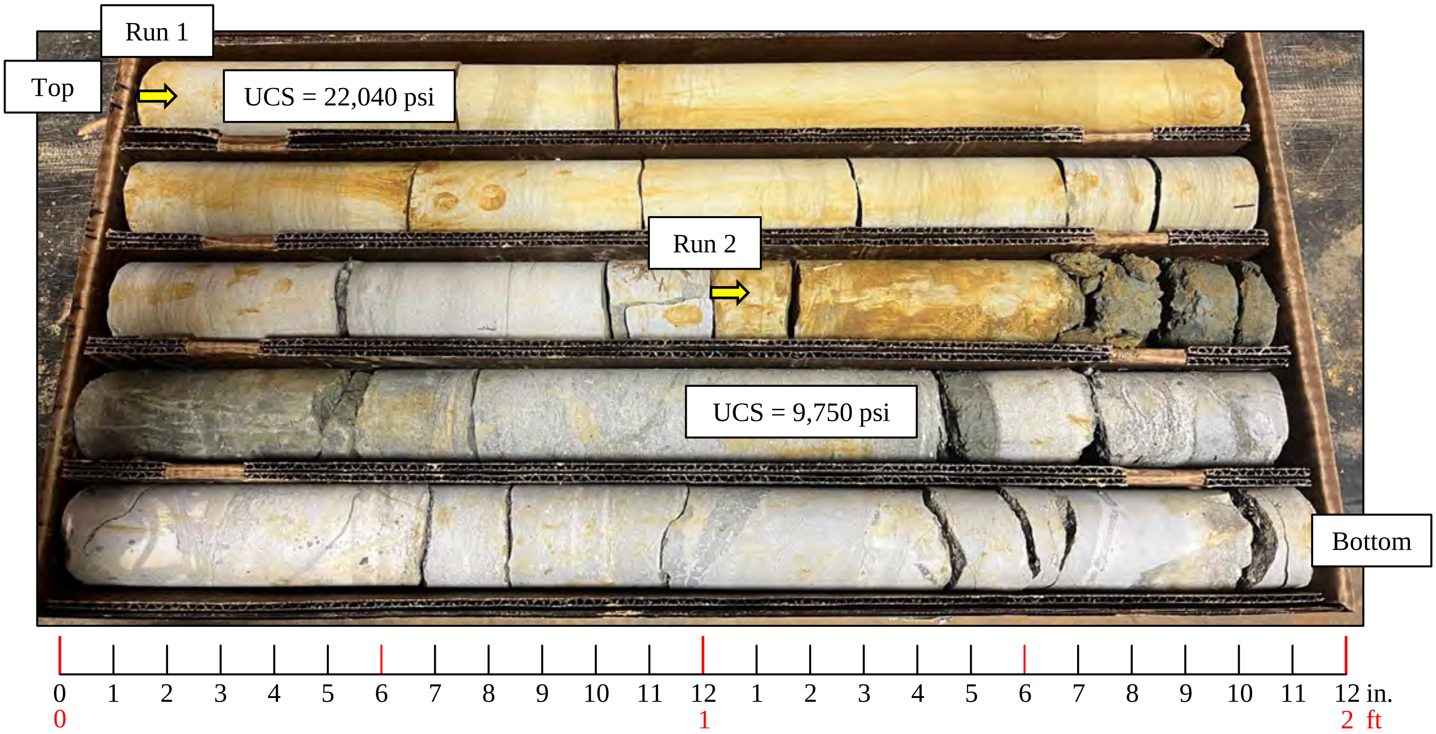
<u>ROCK CORE PHOTOGRAPHS</u>
STEM Focused Start-Up University
Bentonville, Arkansas

Job No. A25186.00132

Boring B-8: 9’-9” to 19’-9”



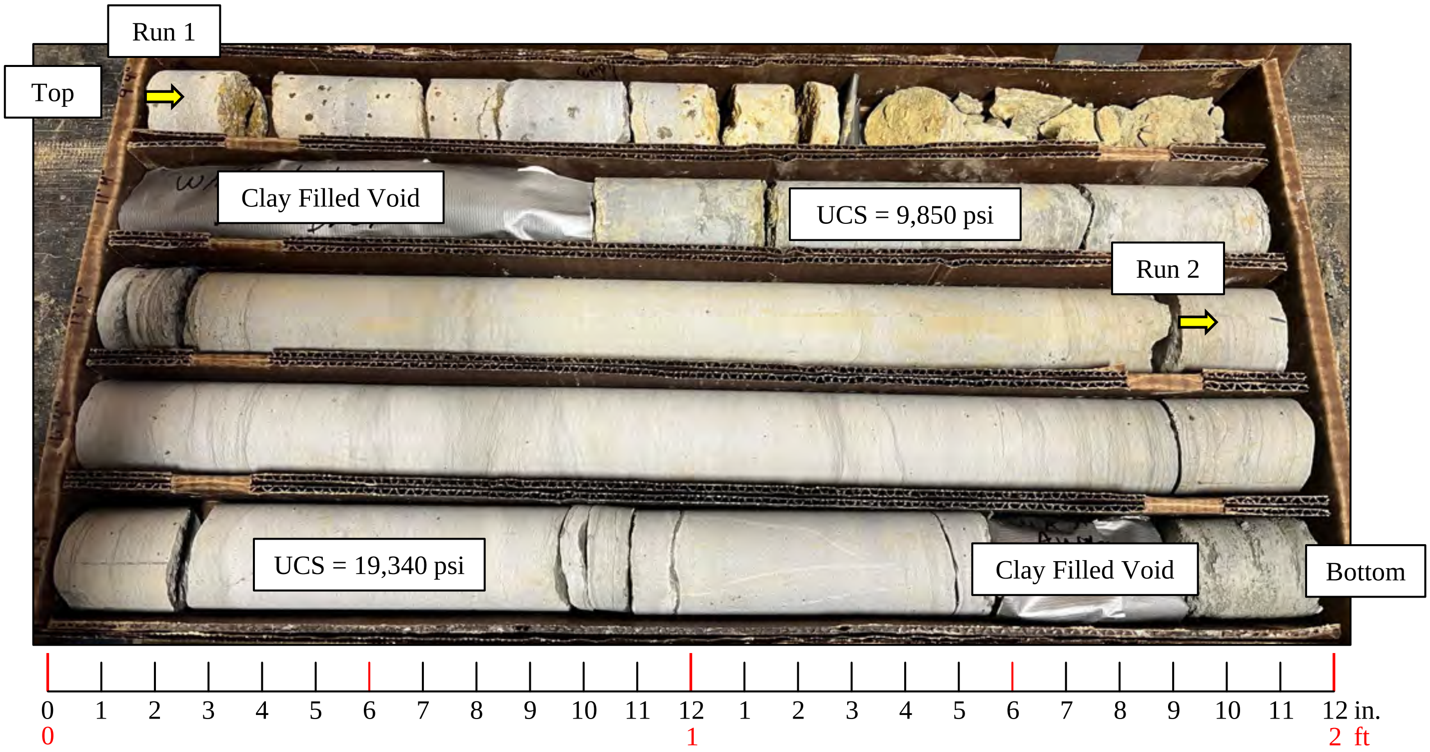
Boring B-9: 9’-9” to 19’-9”



ROCK CORE PHOTOGRAPHS
STEM Focused Start-Up University
Bentonville, Arkansas

Job No. A25186.00132

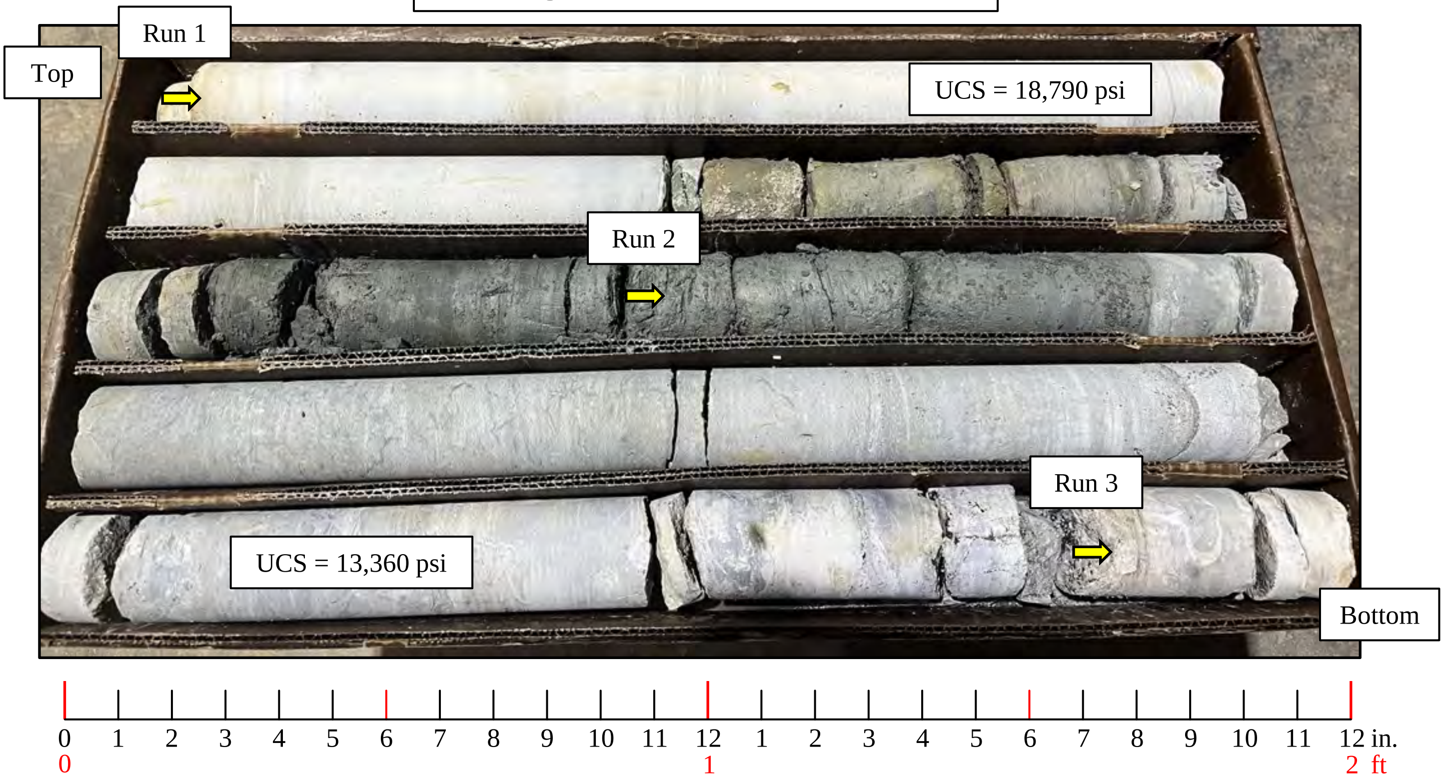
Boring B-12: 9’-4” to 19’-4”



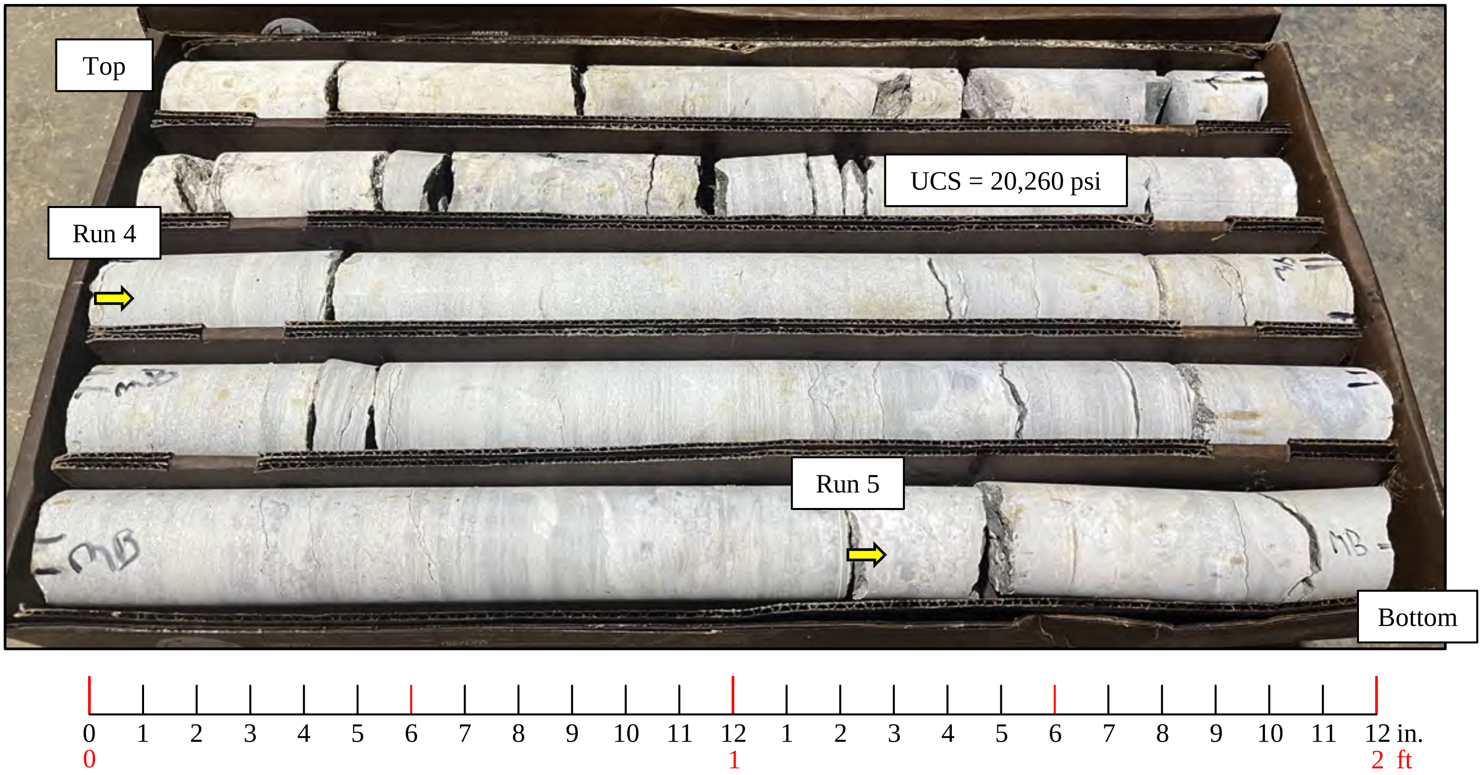
ROCK CORE PHOTOGRAPHS
STEM Focused Start-Up University
Bentonville, Arkansas

Job No. A25186.00132

Boring FB-1: 10’-8” to 20’-8”



Boring FB-1: 20’-8” to 30’-8”

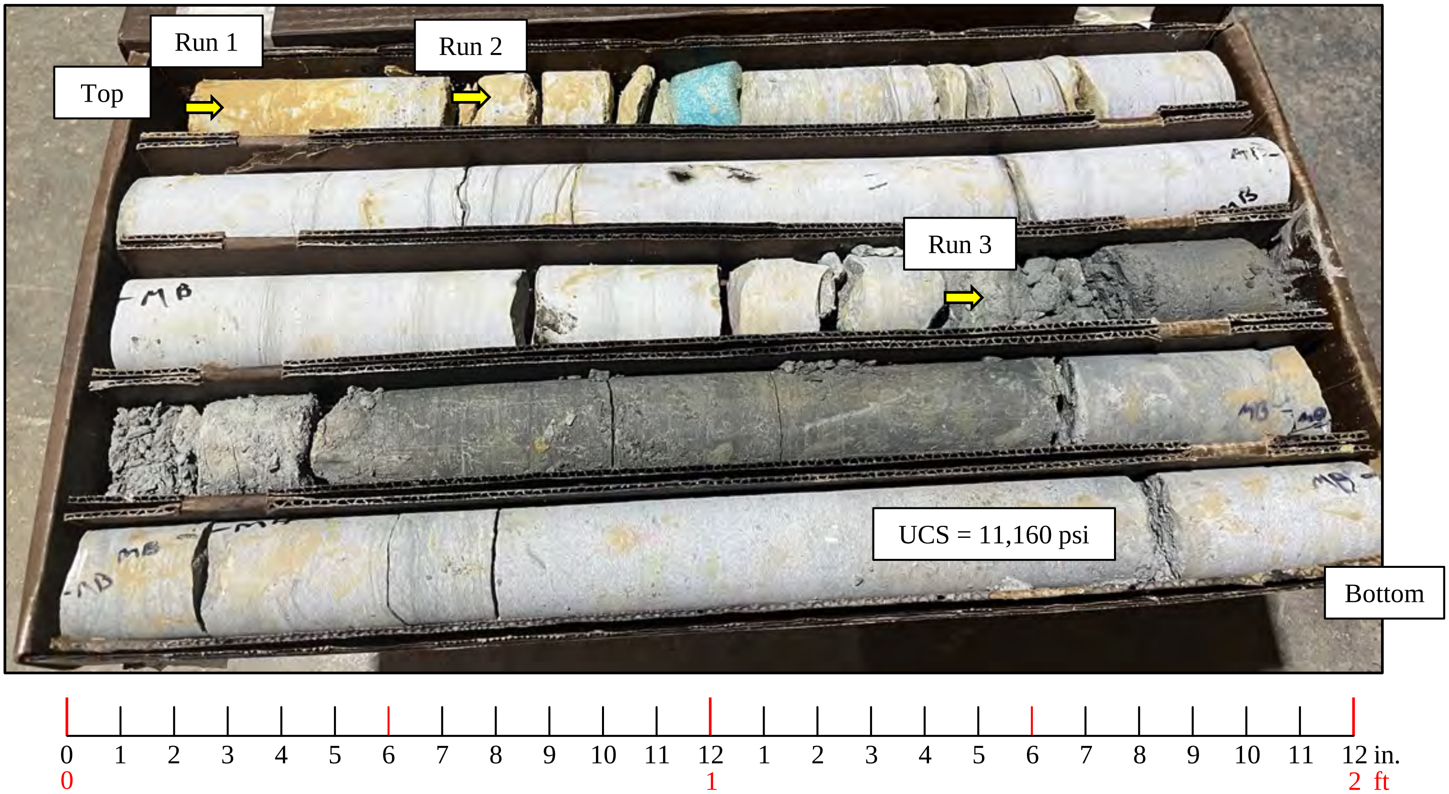


ROCK CORE PHOTOGRAPHS
STEM Focused Start-Up University
Bentonville, Arkansas

Job No. A25186.00132

Boring FB-1: 30'-8" to 39'-10"

Boring FB-4: 14'-6" to 24'-6"

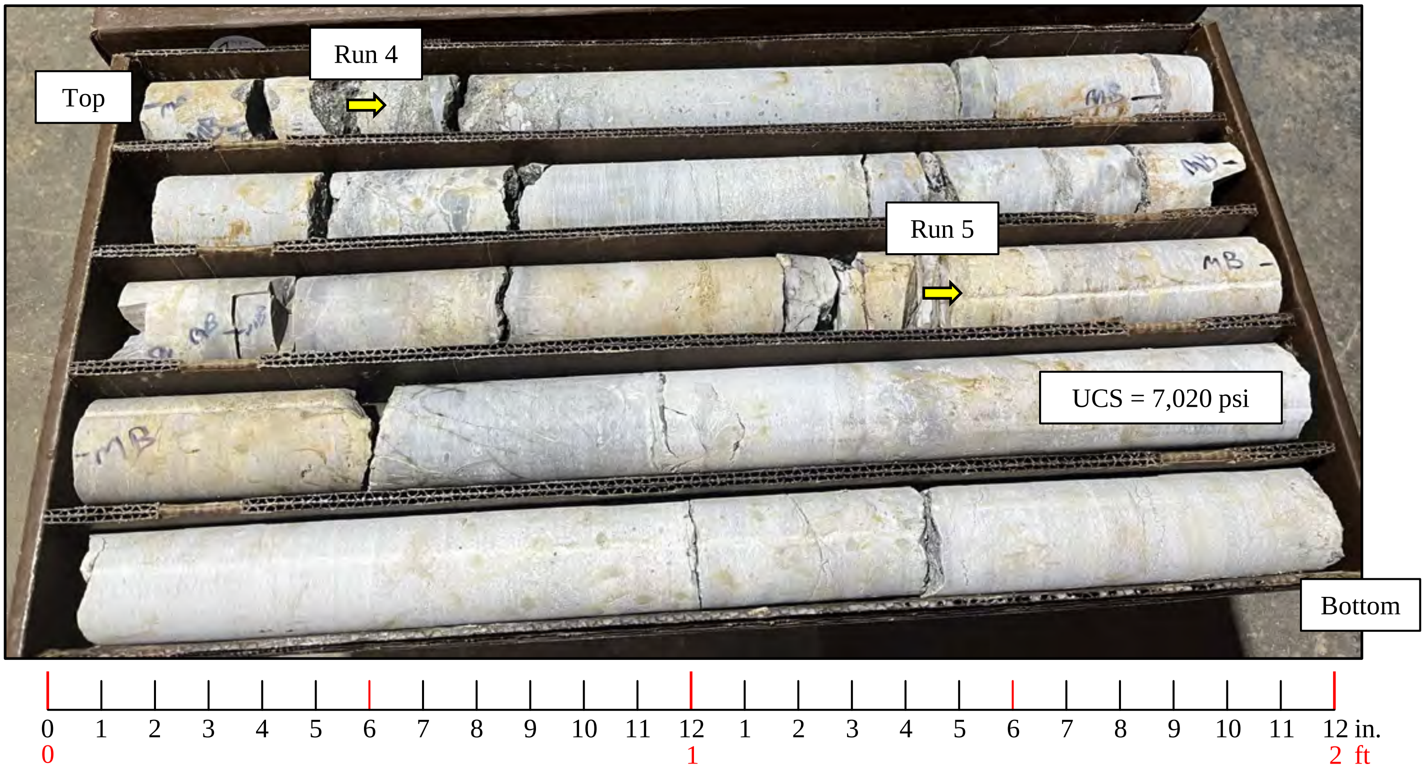


UES™

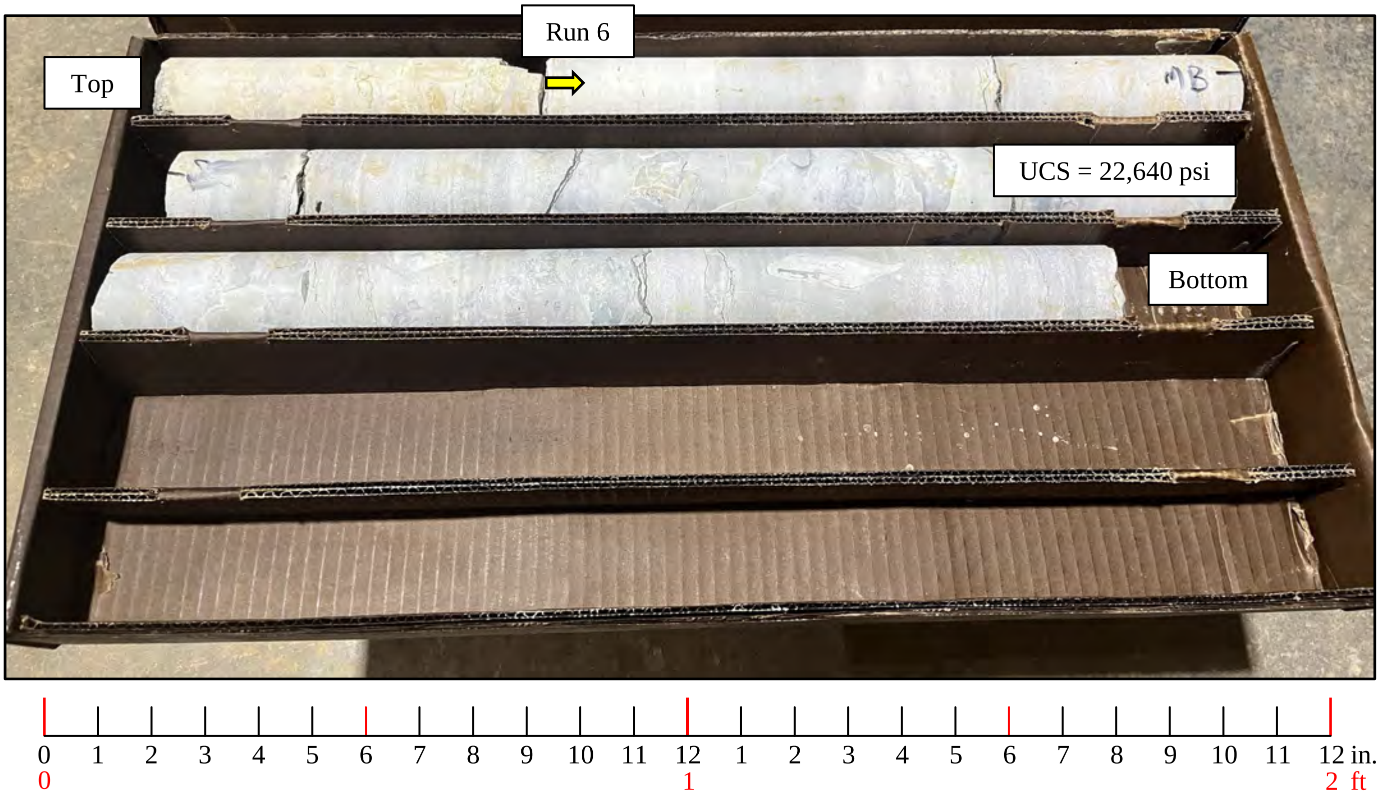
ROCK CORE PHOTOGRAPHS
STEM Focused Start-Up University
Bentonville, Arkansas

Job No. A25186.00132

Boring FB-4: 24’-6” to 34’-6”



Boring FB-4: 34’-6” to 40’-0”

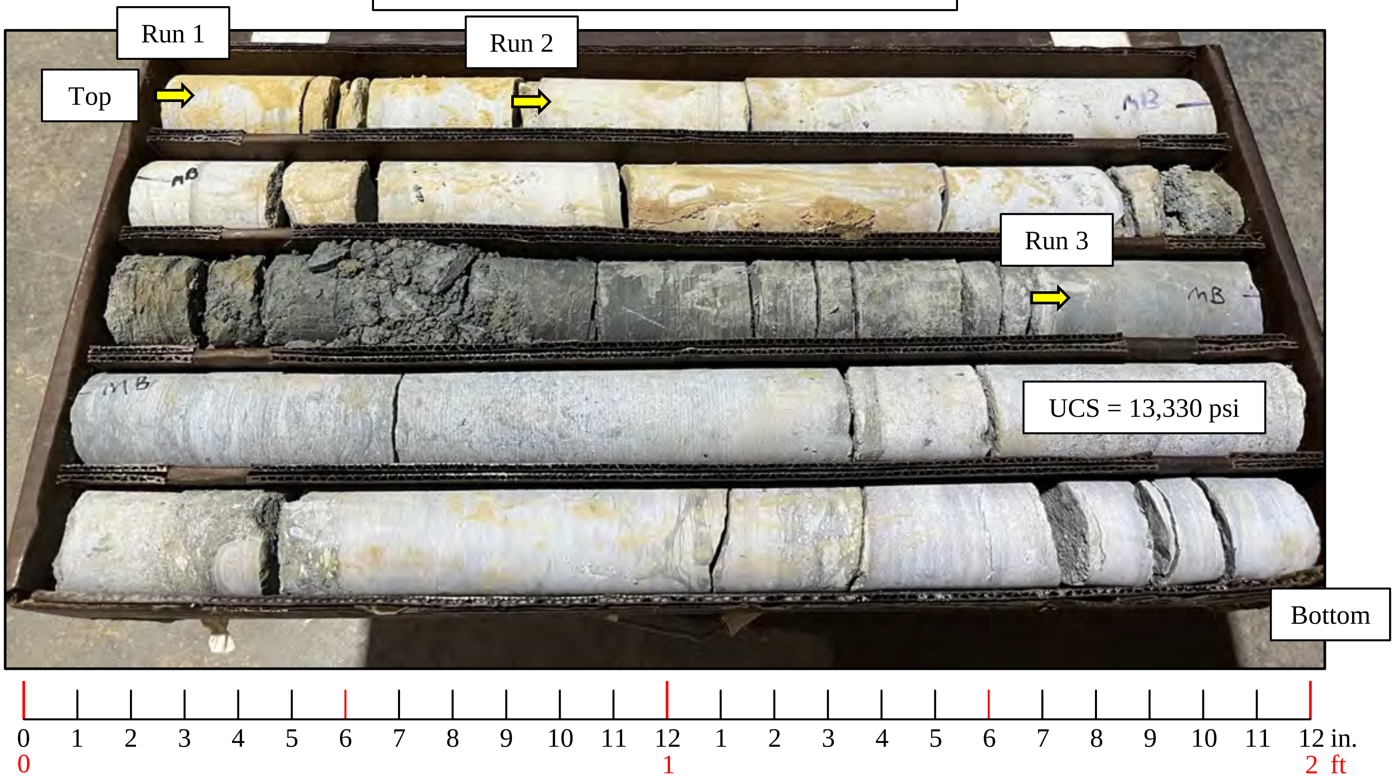


UES

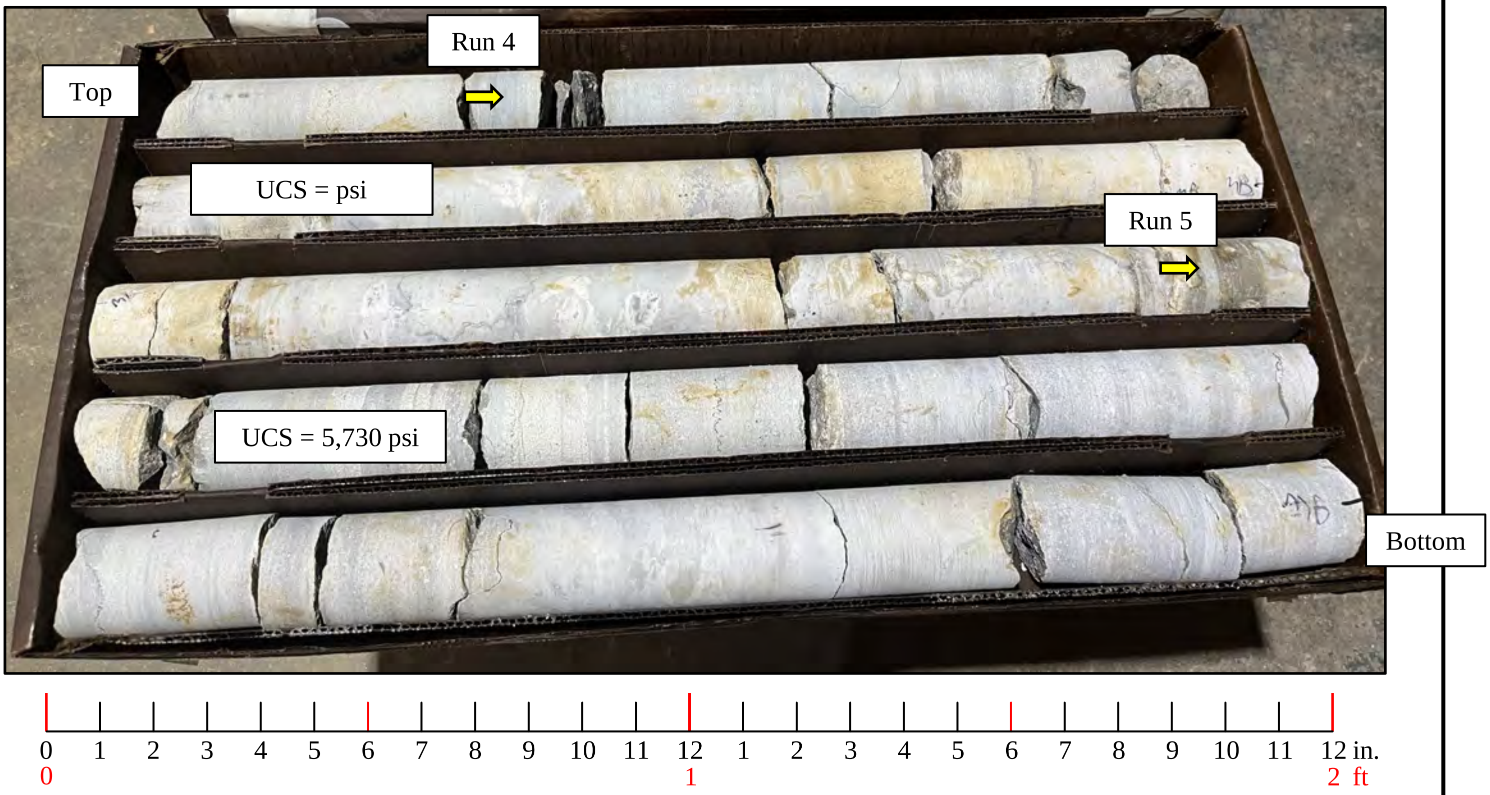
ROCK CORE PHOTOGRAPHS
STEM Focused Start-Up University
Bentonville, Arkansas

Job No. A25186.00132

Boring FB-6: 14'-5" to 24'-5"



Boring FB-6: 24'-5" to 34'-5"



UES

ROCK CORE PHOTOGRAPHS

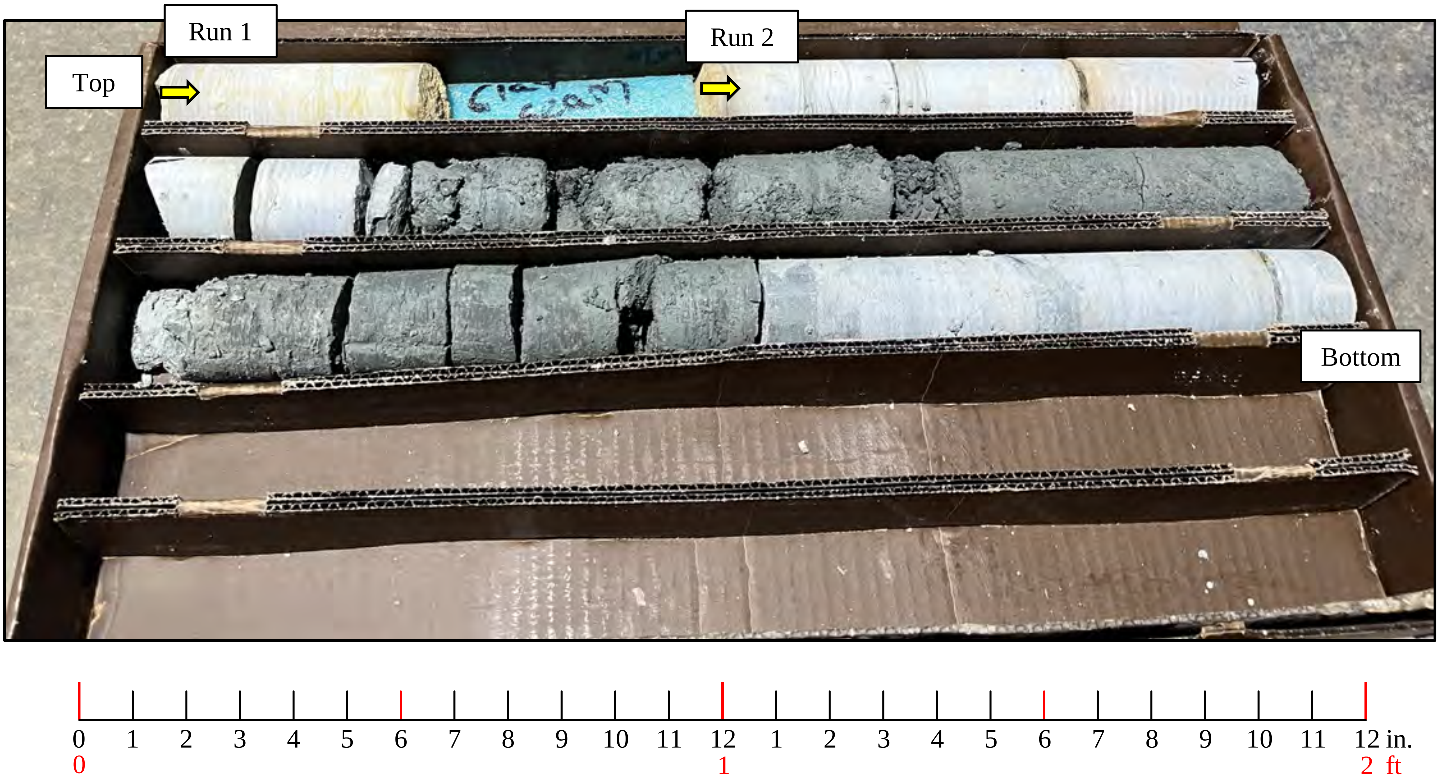
STEM Focused Start-Up University

Bentonville, Arkansas

Job No. A25186.00132

Boring FB-6: 34’-5” to 40’-1”

Boring FB-7: 14’-0” to 20’-0”

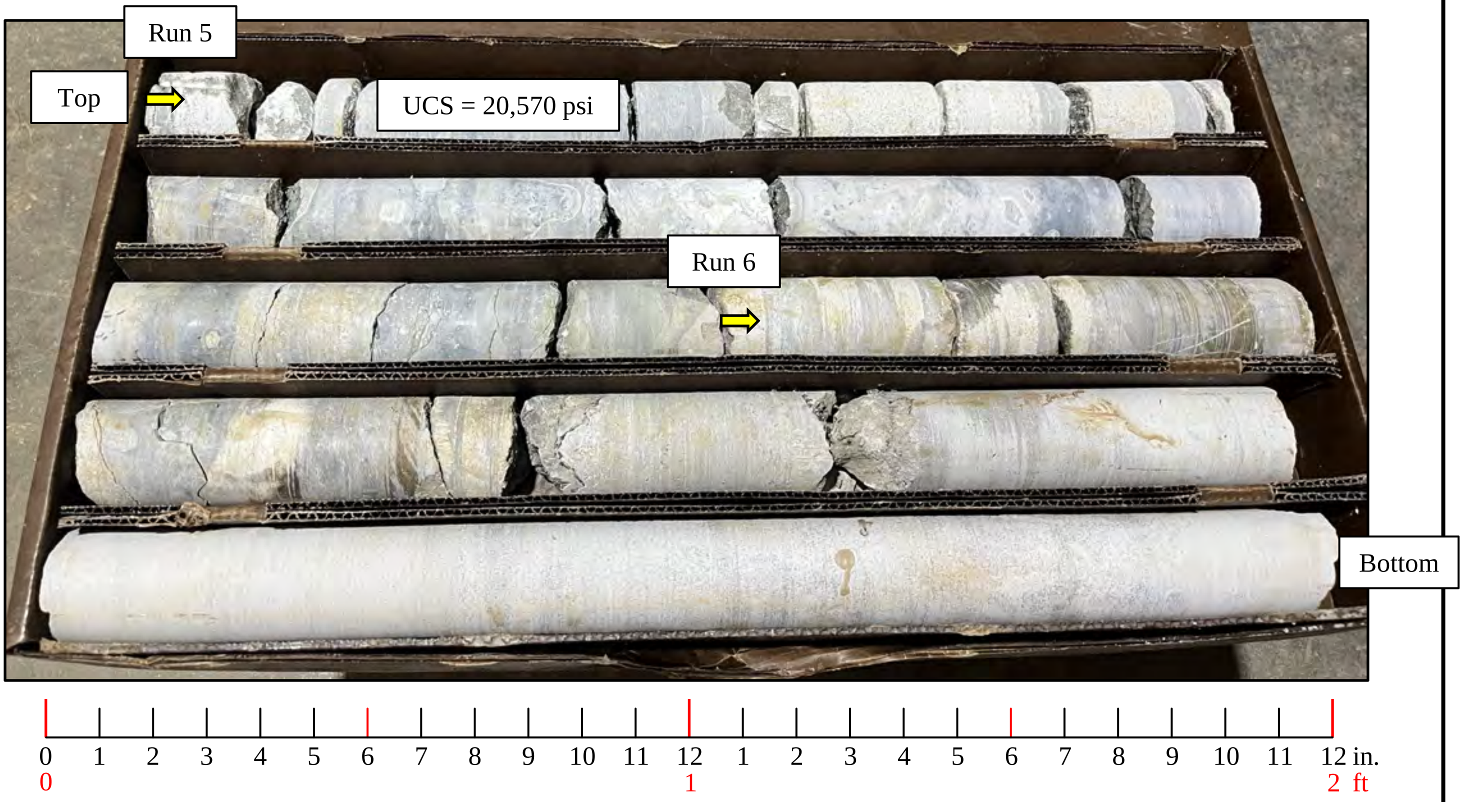


ROCK CORE PHOTOGRAPHS
STEM Focused Start-Up University
Bentonville, Arkansas

Job No. A25186.00132

Boring FB-7: 20’-0” to 30’-0”

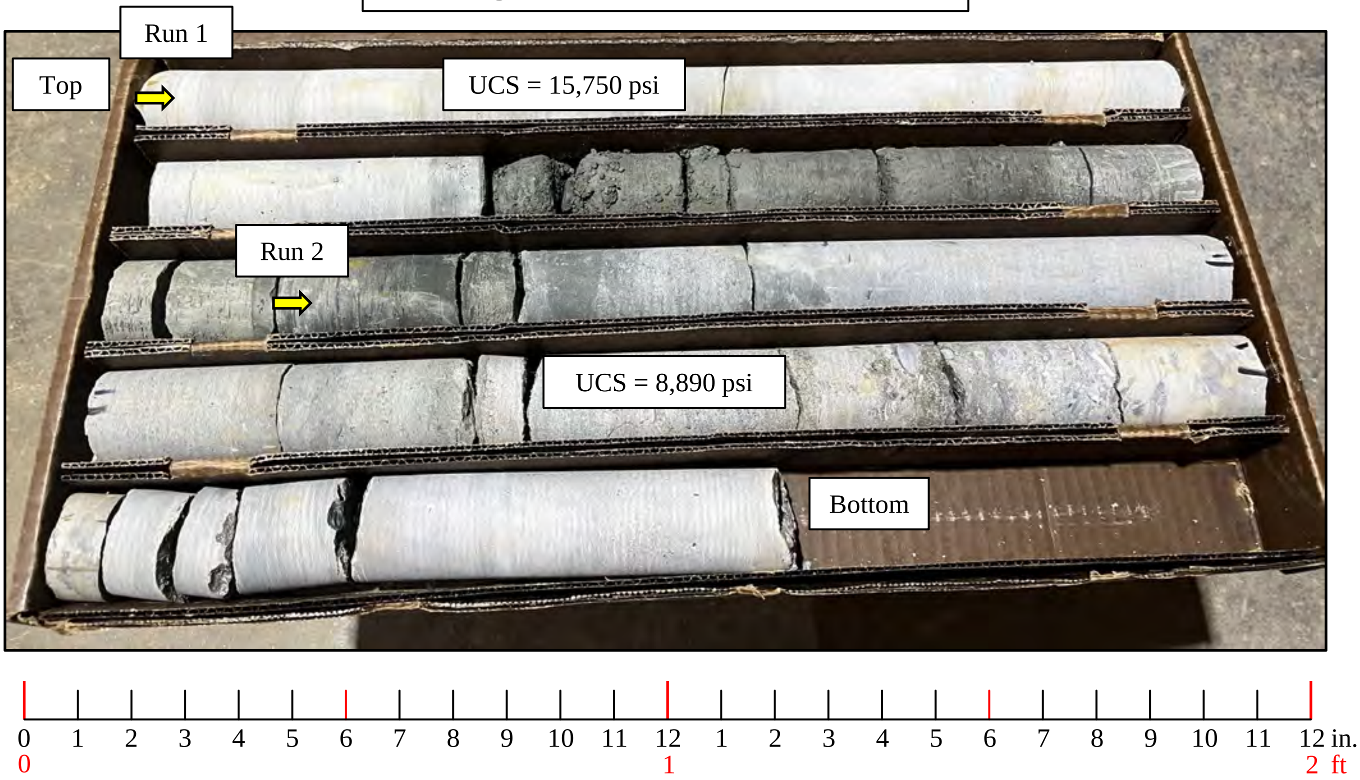
Boring FB-7: 30’-0” to 40’-0”



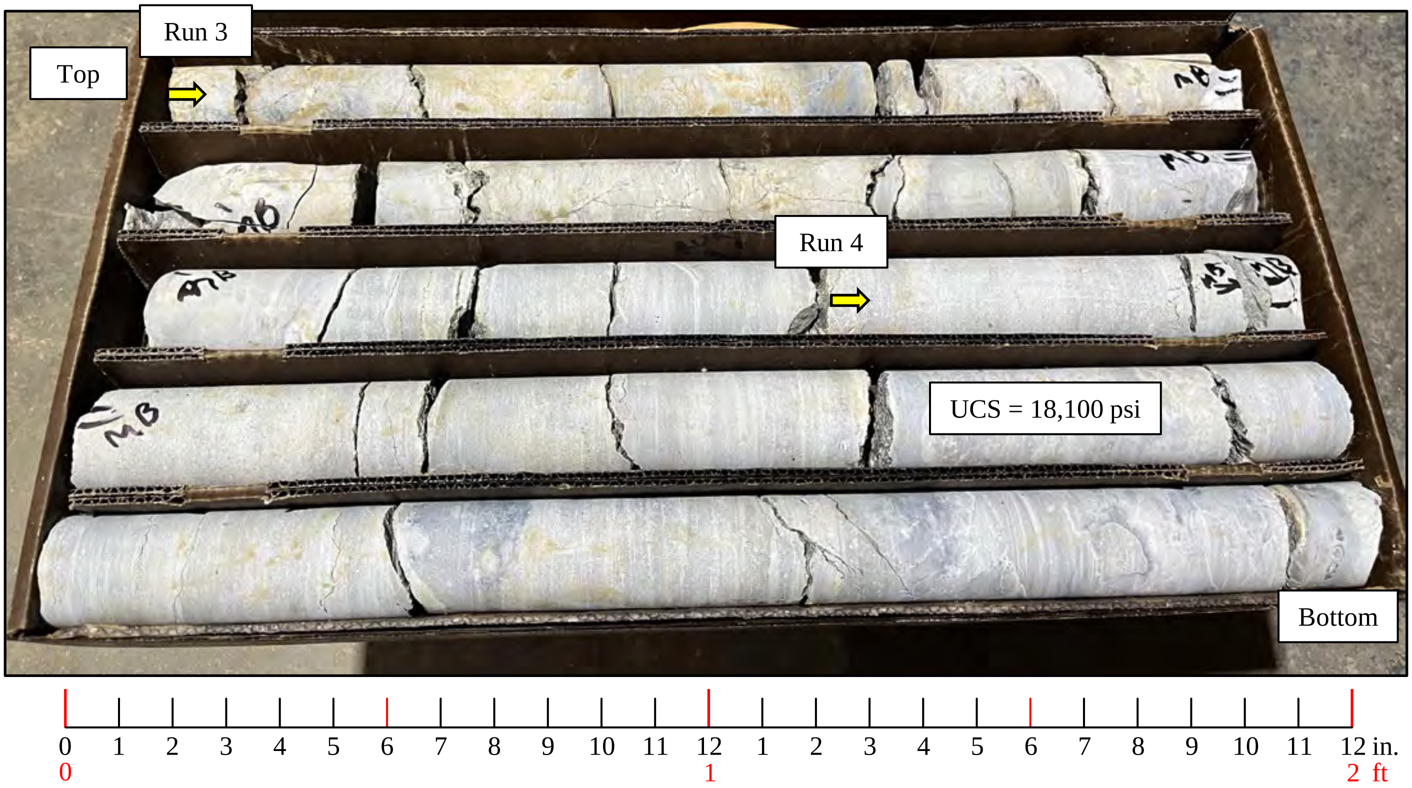
ROCK CORE PHOTOGRAPHS
STEM Focused Start-Up University
Bentonville, Arkansas

Job No. A25186.00132

Boring FB-9: 15’-6” to 24’-10”



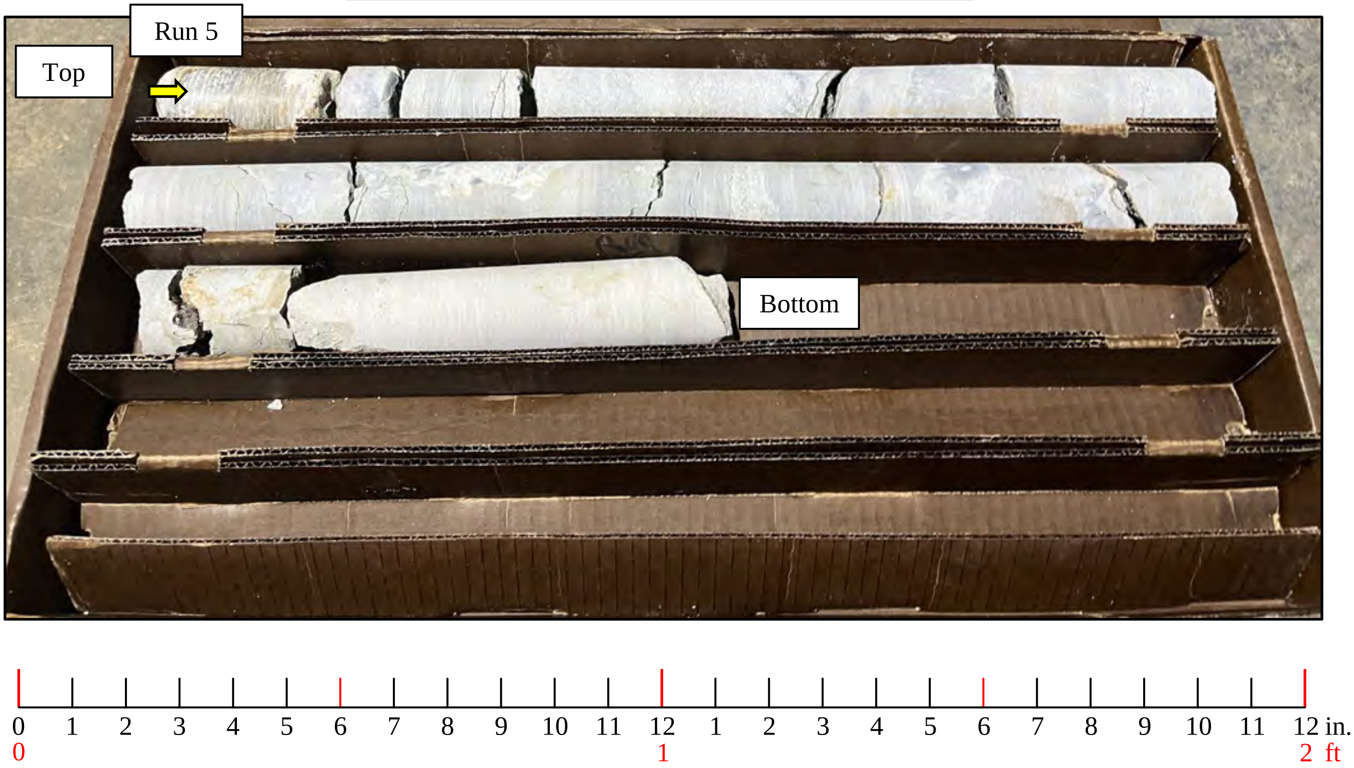
Boring FB-9: 24’-10” to 34’-10”



ROCK CORE PHOTOGRAPHS
STEM Focused Start-Up University
Bentonville, Arkansas

Job No. A25186.00132

Boring FB-9: 34’-10” to 39’-10”



Boring FB-11: 15’-2” to 25’-0”

ROCK CORE PHOTOGRAPHS
STEM Focused Start-Up University
Bentonville, Arkansas

Job No. A25186.00132

Boring FB-11: 25’-0” to 35’-0”

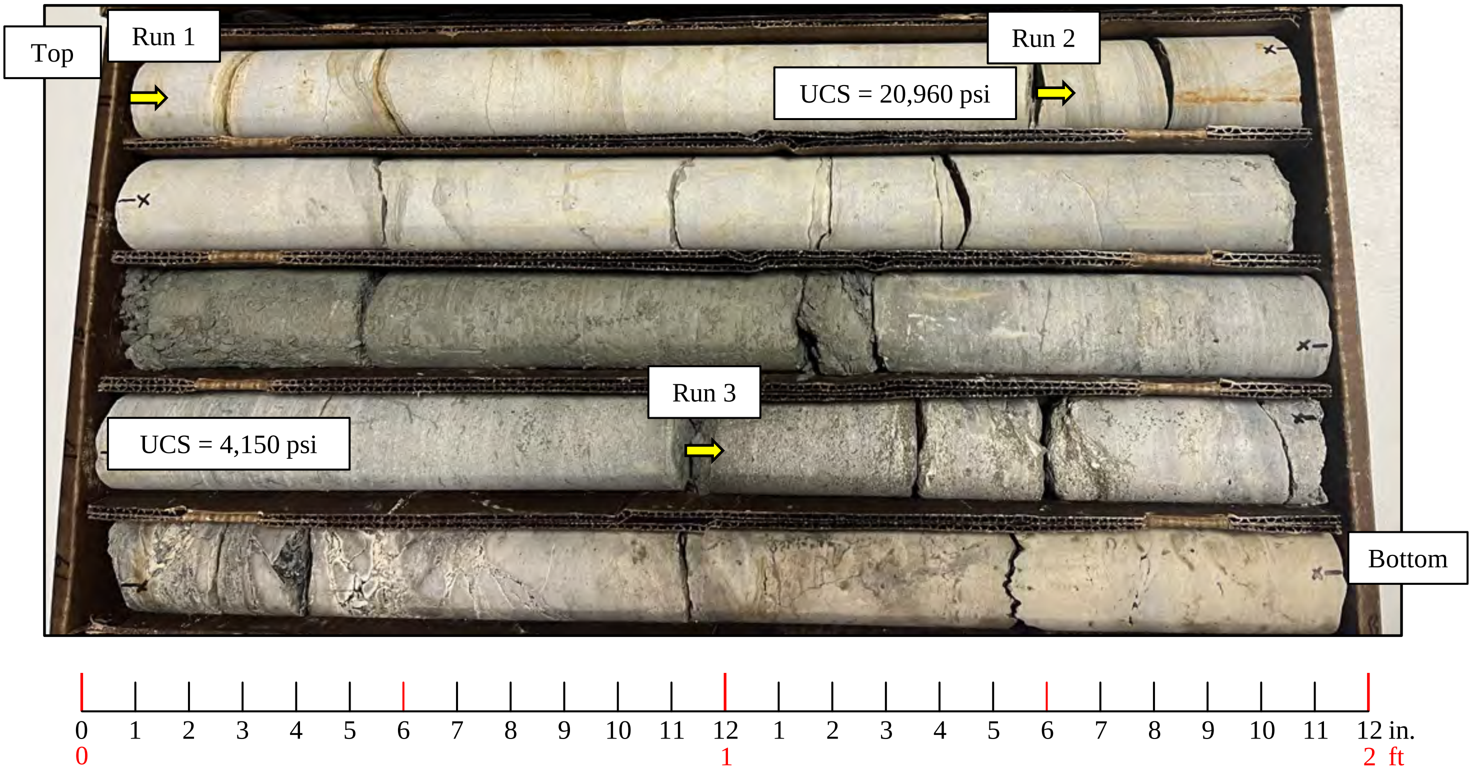
Boring FB-11: 35’-0” to 40’-0”

<u>ROCK CORE PHOTOGRAPHS</u>

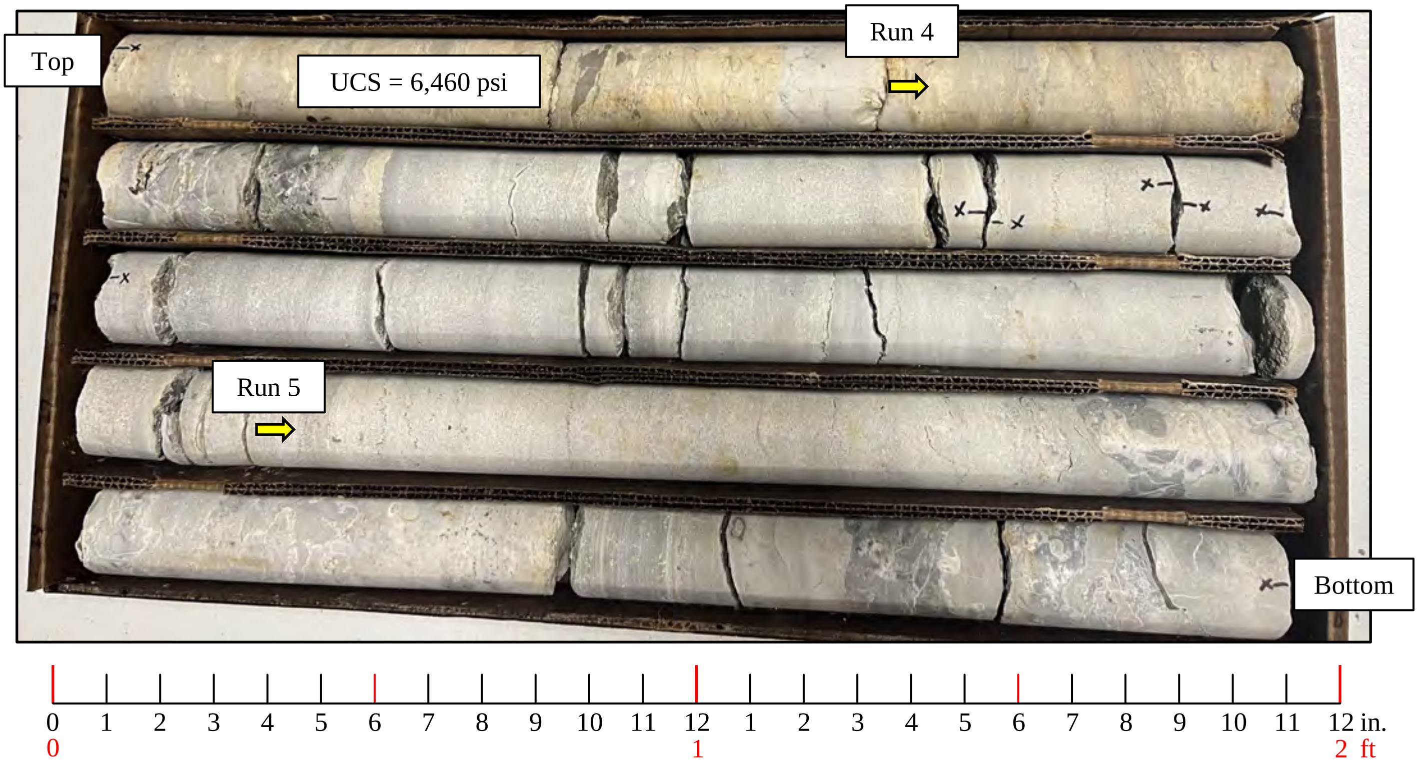
STEM Focused Start-Up University
Bentonville, Arkansas

Job No. A25186.00132

Boring FB-13: 11’-0” to 21’-0”



Boring FB-13: 21’-0” to 31’-0”

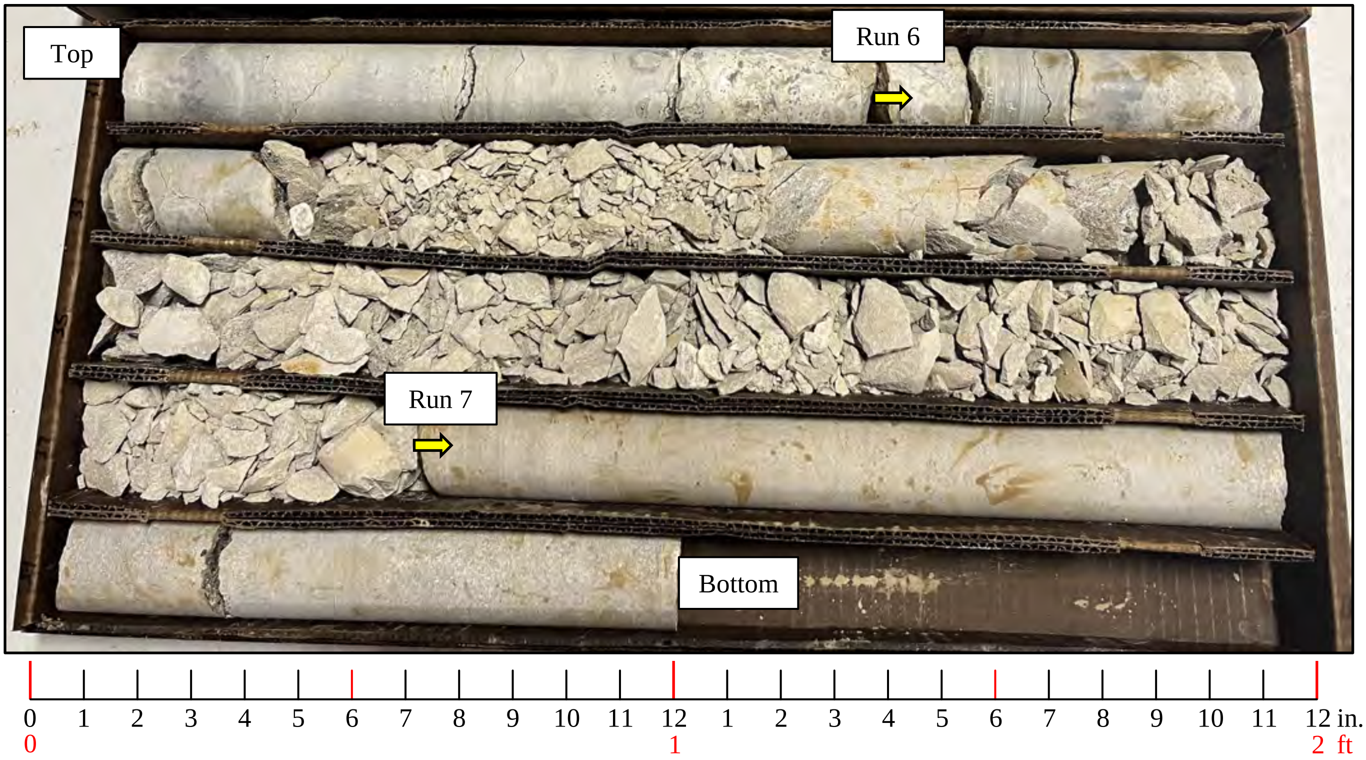


UES™

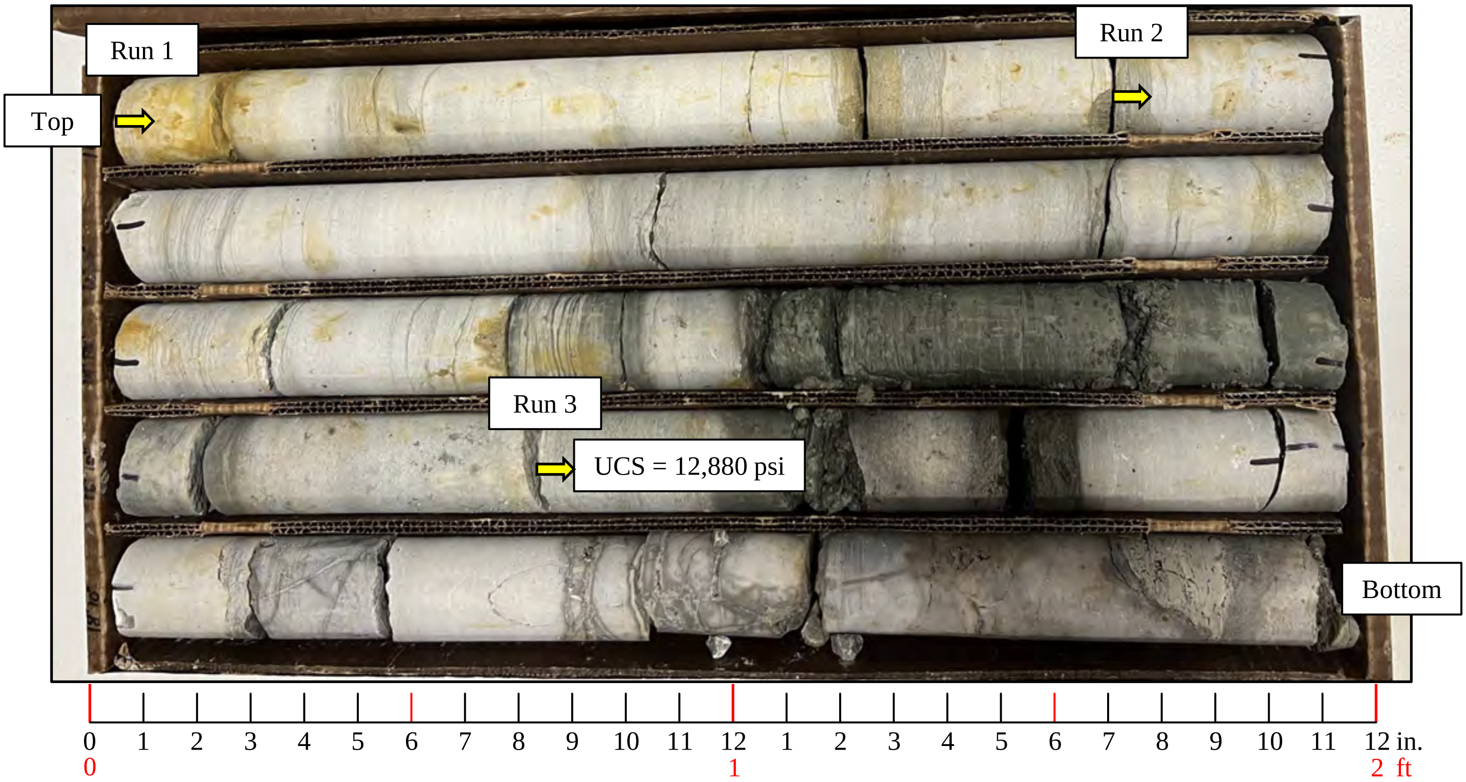
<u>ROCK CORE PHOTOGRAPHS</u>
STEM Focused Start-Up University
Bentonville, Arkansas

Job No. A25186.00132

Boring FB-13: 31’-0” to 40’-0”



Boring FB-16: 10’-10” to 20’-10”

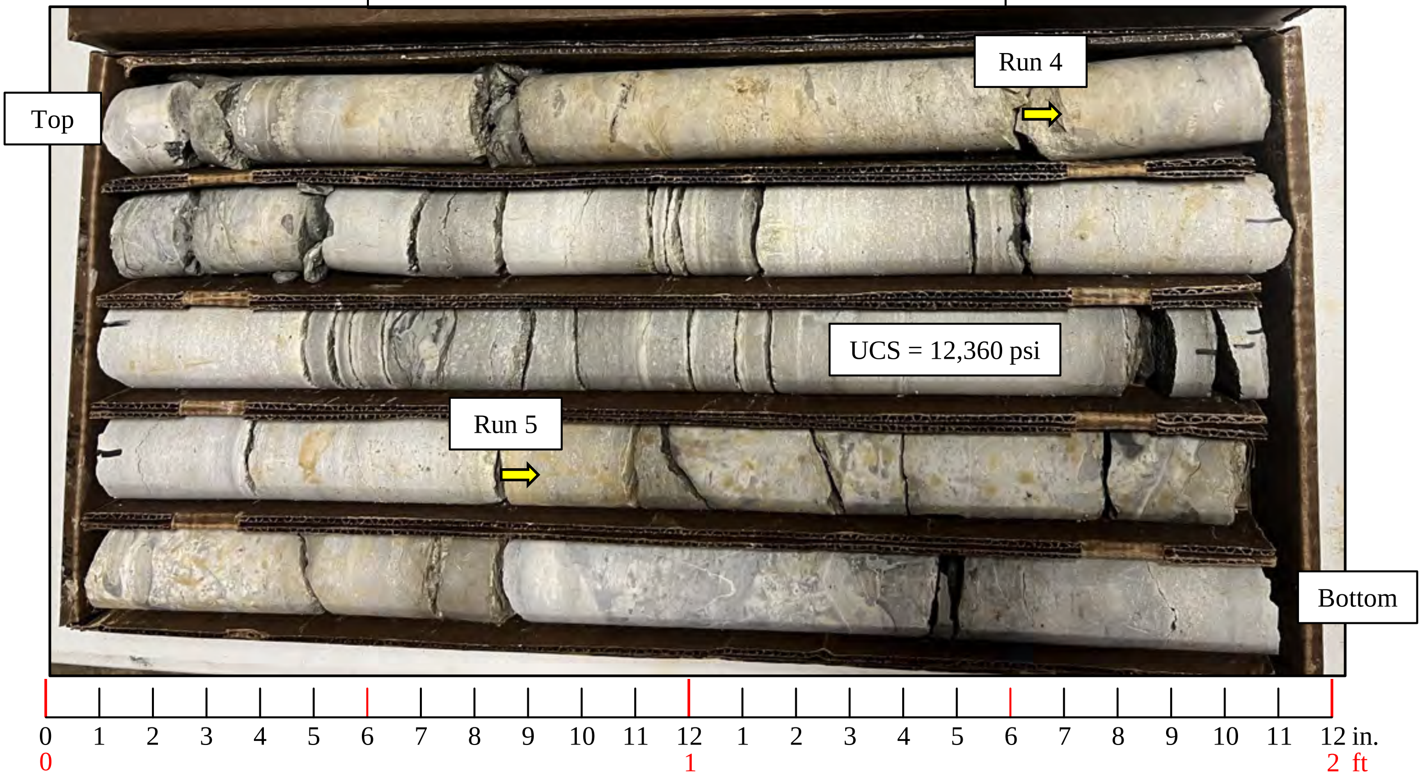


UCS = 12,880 psi

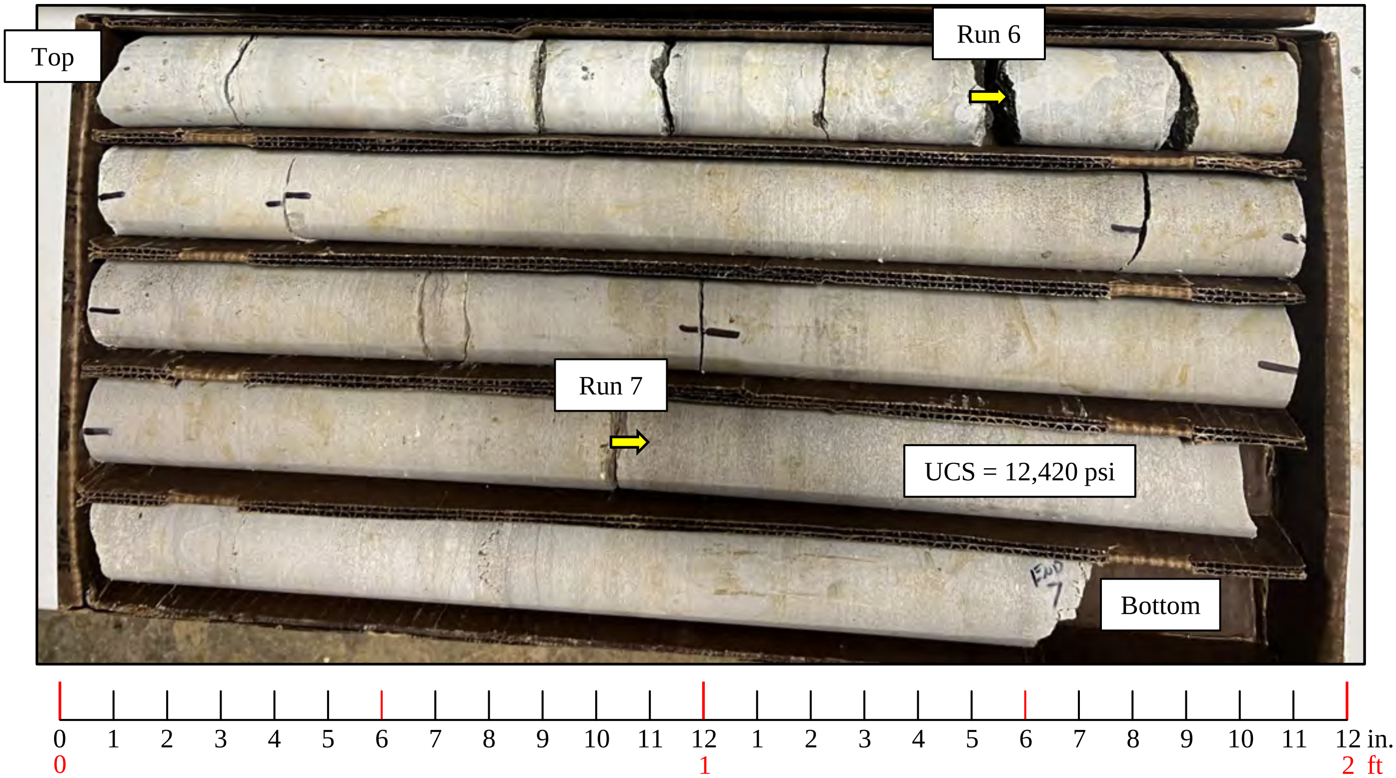
ROCK CORE PHOTOGRAPHS
STEM Focused Start-Up University
Bentonville, Arkansas

Job No. A25186.00132

Boring FB-16: 20’-10” to 30’-10”



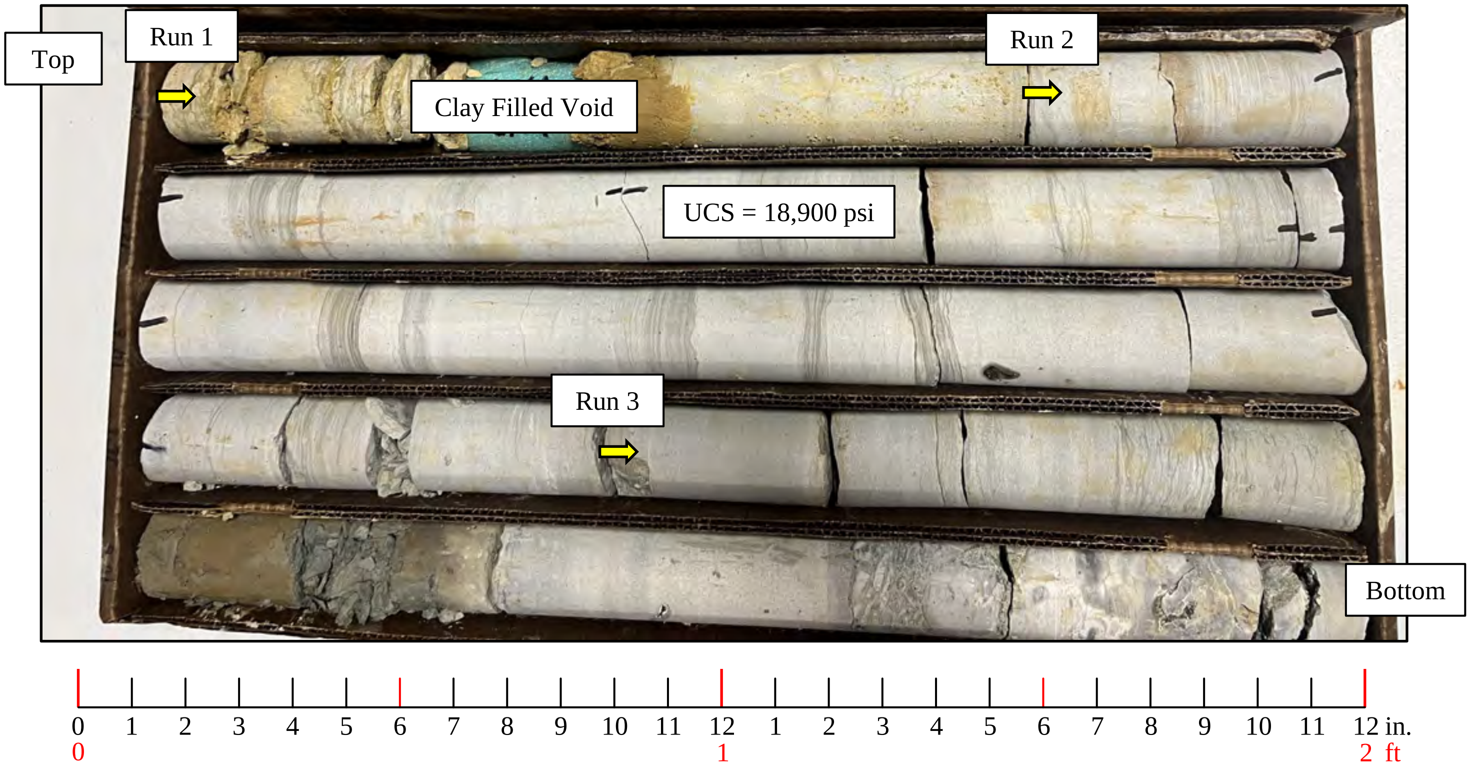
Boring FB-16: 30’-10” to 40’-2”



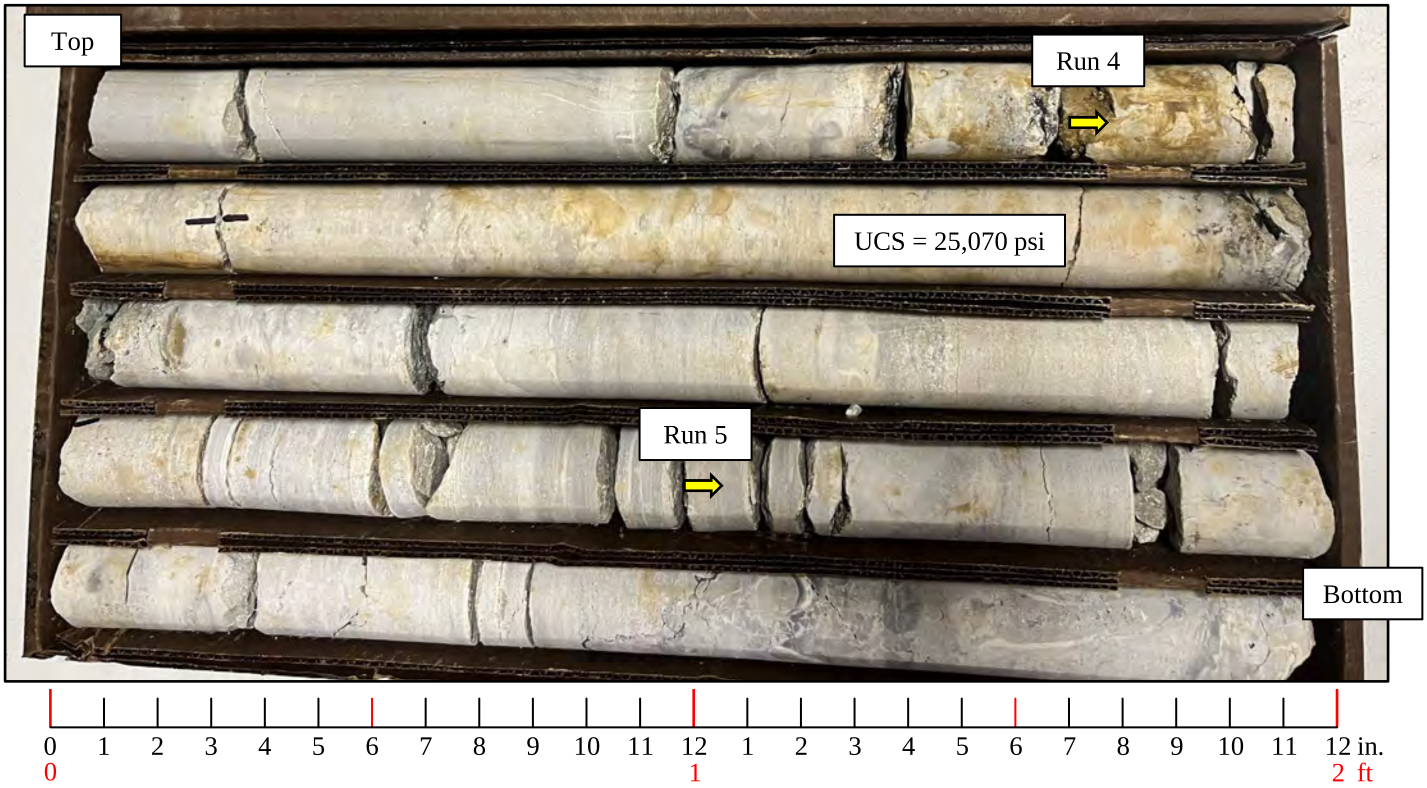
ROCK CORE PHOTOGRAPHS
STEM Focused Start-Up University
Bentonville, Arkansas

Job No. A25186.00132

Boring FB-18: 10’-6” to 20’-6”



Boring FB-18: 20’-6” to 30’-6”



ROCK CORE PHOTOGRAPHS
STEM Focused Start-Up University
Bentonville, Arkansas

Job No. A25186.00132

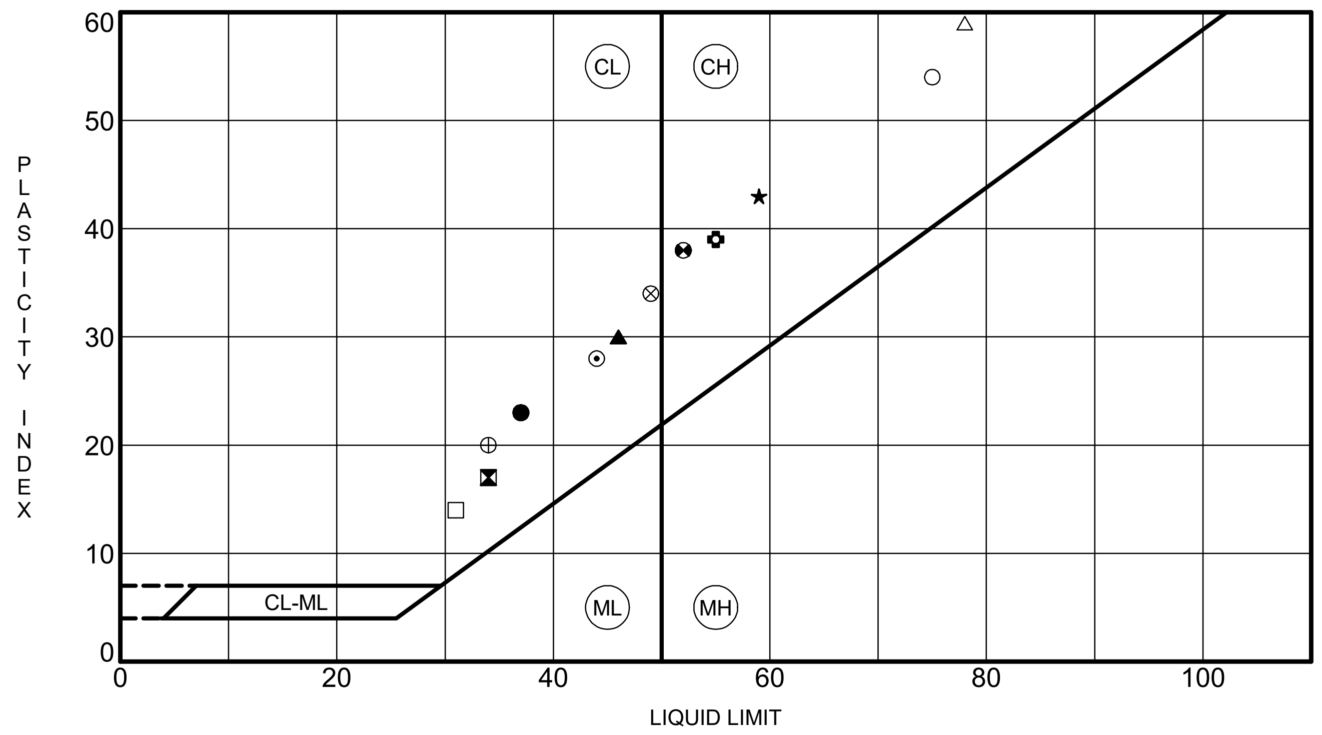
Boring FB-18: 30’-6” to 40’-2”

UES

ROCK CORE PHOTOGRAPHS
STEM Focused Start-Up University
Bentonville, Arkansas

Job No. A25186.00132

APPENDIX D – LABORATORY TEST DATA

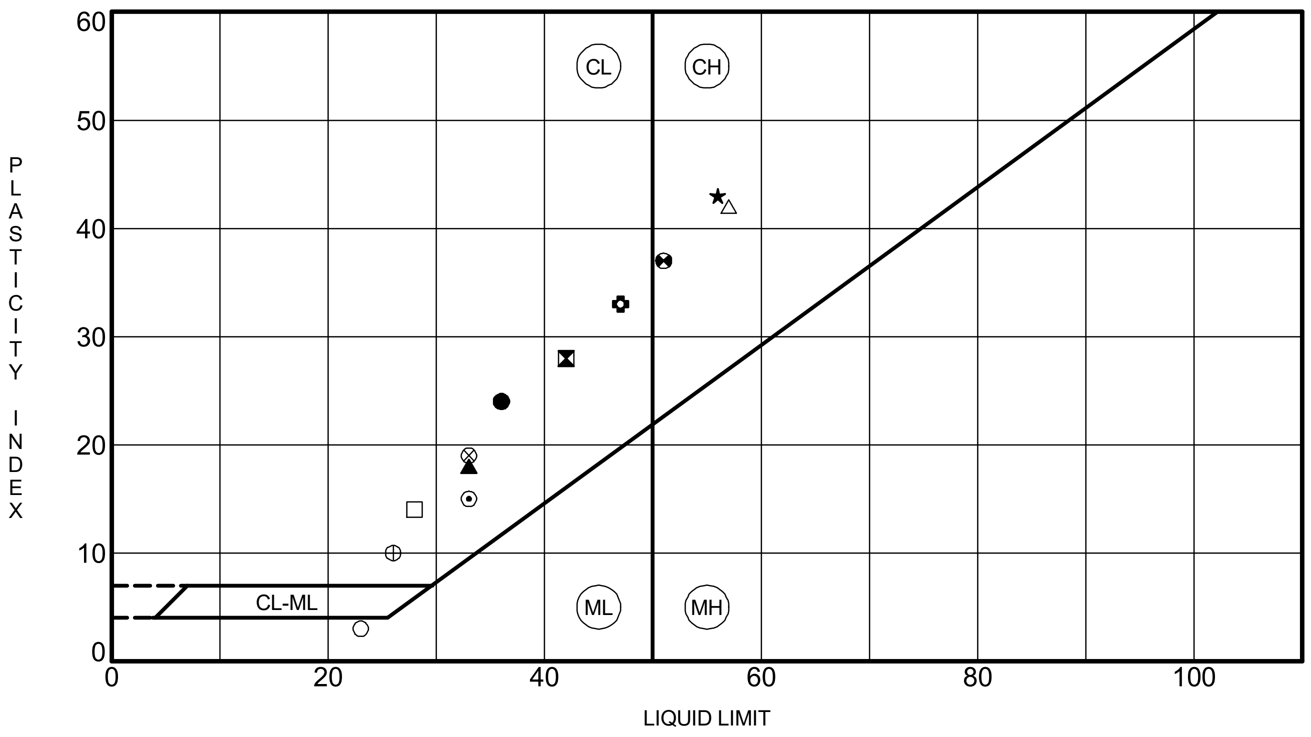


Specimen Identification			LL	PL	PI	Fines	Classification
●	**B- 1**	**5.0**	**37**	**14**	**23**	**80**	**LEAN CLAY with SAND(CL)**
⧗	**B- 2**	**3.5**	**34**	**17**	**17**	**83**	**LEAN CLAY (CL)**
▲	**B- 4**	**3.0**	**46**	**16**	**30**	**77**	**LEAN CLAY with SAND(CL)**
★	**B- 5**	**3.5**	**59**	**16**	**43**	**82**	**FAT CLAY (CH)**
⊙	**B- 6**	**3.0**	**44**	**16**	**28**	**78**	**LEAN CLAY with SAND(CL)**
✤	**B- 7**	**5.0**	**55**	**16**	**39**	**74**	**FAT CLAY with SAND(CH)**
○	**B-10**	**3.0**	**75**	**21**	**54**	**83**	**FAT CLAY with SAND(CH)**
△	**B-12**	**5.0**	**78**	**19**	**59**		**FAT CLAY (CH)**
⊗	**MP-1**	**3.0**	**49**	**15**	**34**		**LEAN CLAY (CL)**
⊕	**MP-3**	**3.0**	**34**	**14**	**20**		**LEAN CLAY (CL)**
□	**MP-4**	**3.0**	**31**	**17**	**14**		**LEAN CLAY (CL)**
⨂	**MP-5**	**3.0**	**52**	**14**	**38**		**FAT CLAY (CH)**

UES™

ATTERBERG LIMITS RESULTS

STEM Focused Start-Up University
Bentonville, Arkansas
A25186.00132.000

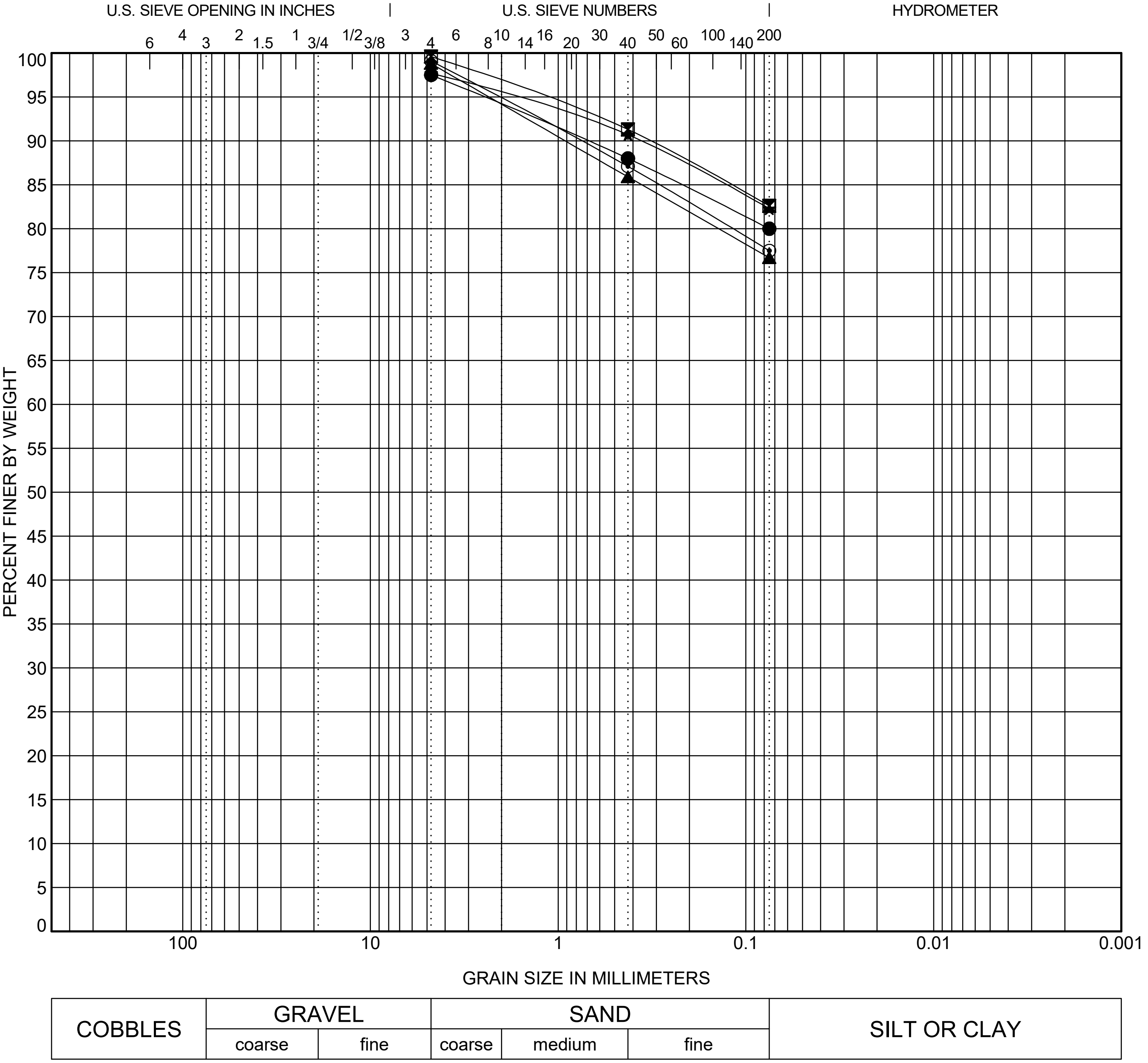


	Specimen Identification		LL	PL	PI	Fines	Classification
●	**FB -1**	**5.0**	**36**	**12**	**24**	**92**	**LEAN CLAY(CL)**
⧗	**FB -5**	**7.0**	**42**	**14**	**28**	**80**	**LEAN CLAY with SAND(CL)**
▲	**FB -6**	**3.0**	**33**	**15**	**18**	**82**	**LEAN CLAY with SAND(CL)**
★	**FB -7**	**5.0**	**56**	**13**	**43**	**84**	**FAT CLAY with SAND(CH)**
⊙	**FB -9**	**5.0**	**33**	**18**	**15**	**84**	**LEAN CLAY with SAND(CL)**
✿	**FB-12**	**8.5**	**47**	**14**	**33**	**83**	**LEAN CLAY with SAND(CL)**
○	**FB-12**	**13.5**	**23**	**20**	**3**	**48**	**SILTY SAND(SM)**
△	**FB-13**	**4.0**	**57**	**15**	**42**	**92**	**FAT CLAY(CH)**
⊗	**FB-14**	**2.0**	**33**	**14**	**19**	**91**	**LEAN CLAY(CL)**
⊕	**FB-15**	**2.0**	**26**	**16**	**10**	**67**	**SANDY LEAN CLAY(CL)**
□	**FB-16**	**4.0**	**28**	**14**	**14**	**59**	**SANDY LEAN CLAY with GRAVEL(CL)**
⊛	**FB-17**	**2.0**	**51**	**14**	**37**	**78**	**FAT CLAY with GRAVEL(CH)**

UES™

ATTERBERG LIMITS RESULTS

STEM University Academics
Bentonville, Arkansas
A25186.00132

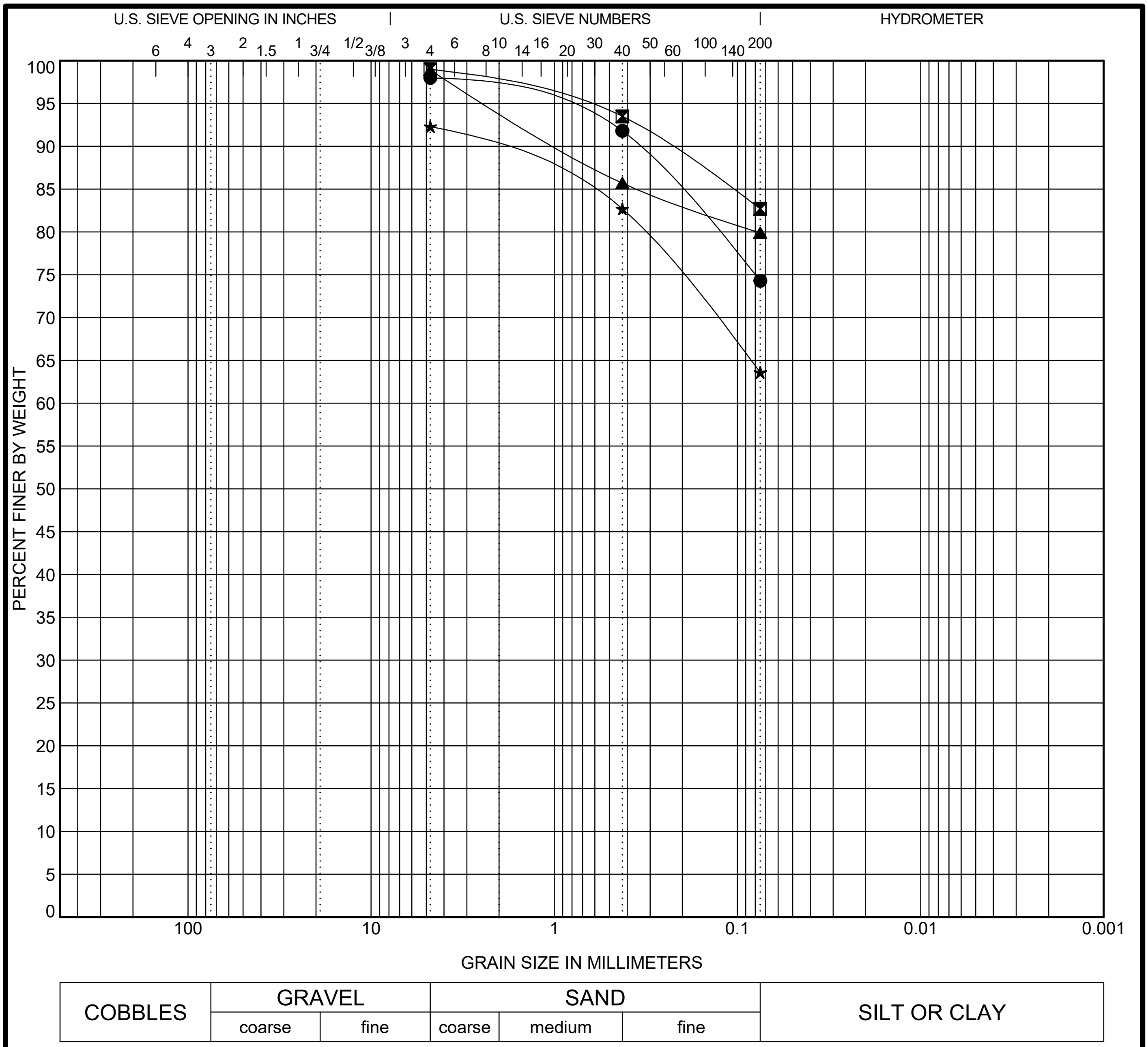


Specimen Identification			Classification	LL	PL	PI	Cc	Cu
●	**B- 1**	**5.0**	**LEAN CLAY with SAND(CL)**	**37**	**14**	**23**		
⧗	**B- 2**	**3.5**	**LEAN CLAY (CL)**	**34**	**17**	**17**		
▲	**B- 4**	**3.0**	**LEAN CLAY with SAND(CL)**	**46**	**16**	**30**		
★	**B- 5**	**3.5**	**FAT CLAY (CH)**	**59**	**16**	**43**		
⊙	**B- 6**	**3.0**	**LEAN CLAY with SAND(CL)**	**44**	**16**	**28**		

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**B- 1**	**5.0**	**4.75**				**0.0**	**17.5**	**80.0**	
⧗	**B- 2**	**3.5**	**4.75**				**0.0**	**17.0**	**82.6**	
▲	**B- 4**	**3.0**	**4.75**				**0.0**	**22.1**	**76.7**	
★	**B- 5**	**3.5**	**4.75**				**0.0**	**15.4**	**82.3**	
⊙	**B- 6**	**3.0**	**4.75**				**0.0**	**21.6**	**77.5**	

GRAIN SIZE DISTRIBUTION

STEM Focused Start-Up University
Bentonville, Arkansas
A25186.00132.000



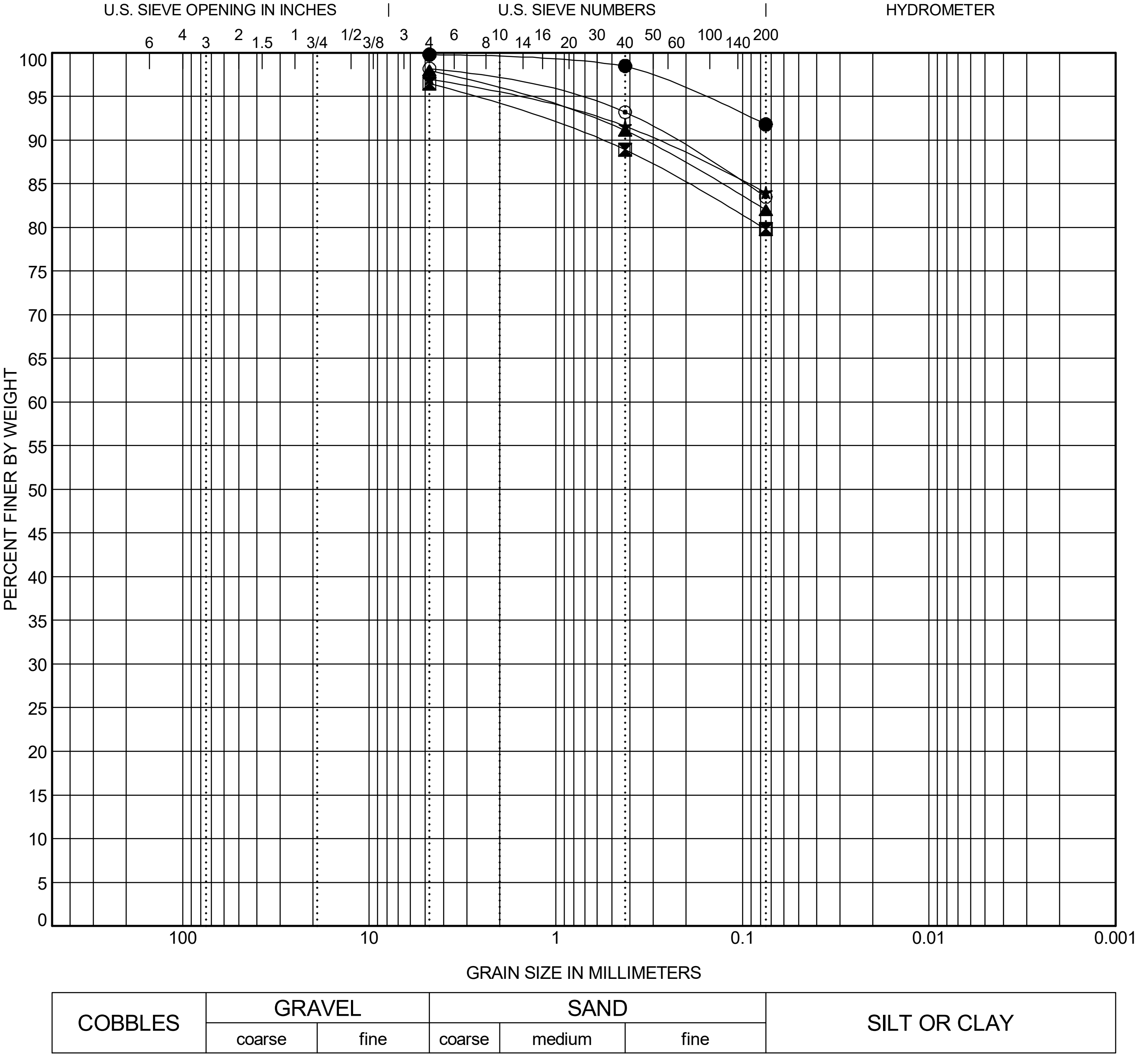
Specimen Identification			Classification	LL	PL	PI	Cc	Cu
●	**B- 7**	**5.0**	**FAT CLAY with SAND(CH)**	**55**	**16**	**39**		
⧗	**B-10**	**3.0**	**FAT CLAY with SAND(CH)**	**75**	**21**	**54**		
▲	**B-12**	**4.5**	**FAT CLAY (CH)**					
★	**MP-2**	**1.0**	**SANDY SILT (ML)**					

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**B- 7**	**5.0**	**4.75**				**0.0**	**23.7**	**74.3**	
⧗	**B-10**	**3.0**	**4.75**				**0.0**	**16.3**	**82.7**	
▲	**B-12**	**4.5**	**4.75**				**0.0**	**19.0**	**79.9**	
★	**MP-2**	**1.0**	**4.75**				**0.0**	**28.7**	**63.6**	

UES™

GRAIN SIZE DISTRIBUTION

STEM Focused Start-Up University
Bentonville, Arkansas
A25186.00132.000



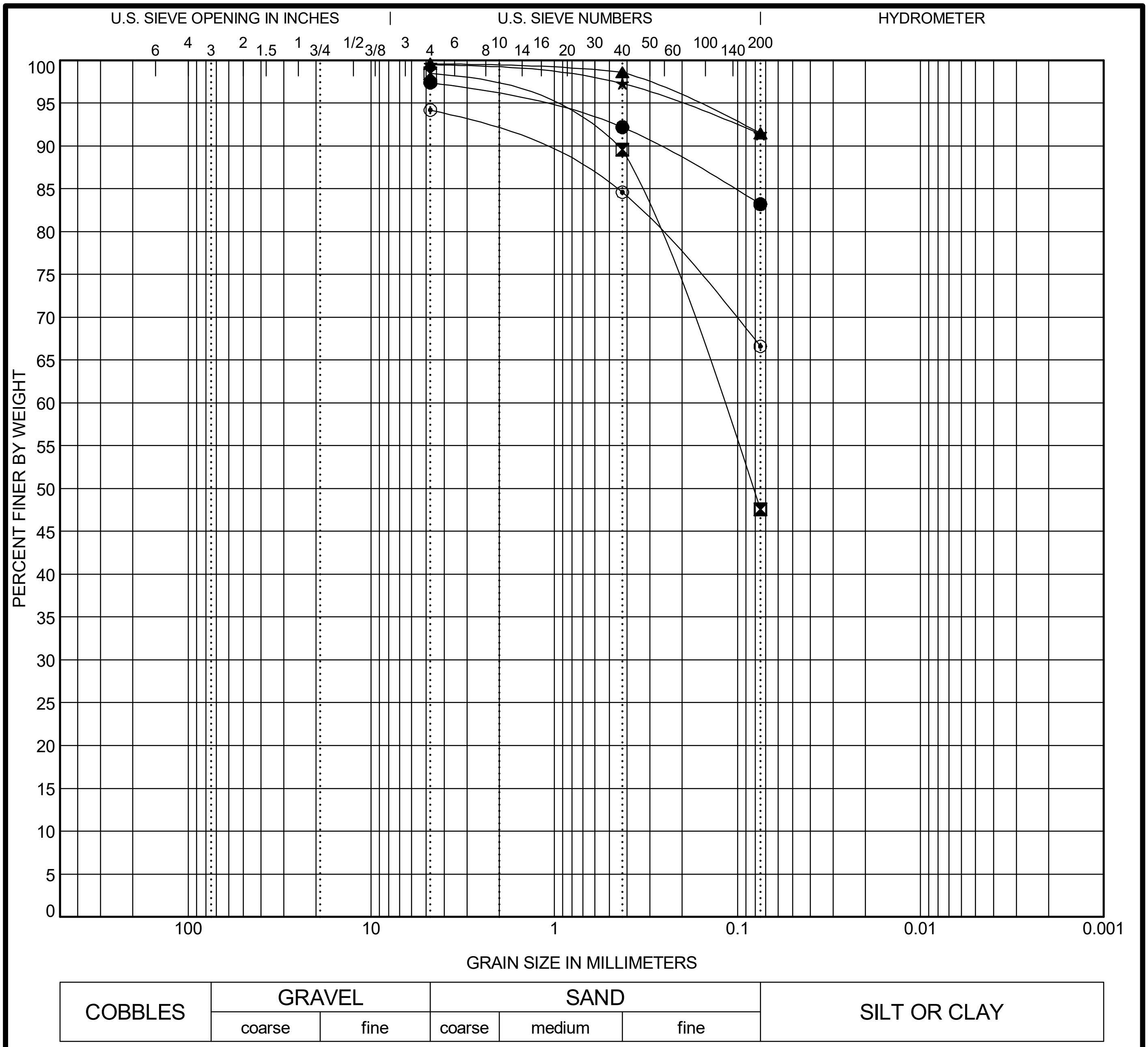
Specimen Identification			Classification	LL	PL	PI	Cc	Cu
●	**FB -1**	**5.0**	**LEAN CLAY(CL)**	**36**	**12**	**24**		
⧗	**FB -5**	**7.0**	**LEAN CLAY with SAND(CL)**	**42**	**14**	**28**		
▲	**FB -6**	**3.0**	**LEAN CLAY with SAND(CL)**	**33**	**15**	**18**		
★	**FB -7**	**5.0**	**FAT CLAY with SAND(CH)**	**56**	**13**	**43**		
⊙	**FB -9**	**5.0**	**LEAN CLAY with SAND(CL)**	**33**	**18**	**15**		

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**FB -1**	**5.0**	**4.75**				**0.0**	**8.0**	**91.8**	
⧗	**FB -5**	**7.0**	**4.75**				**0.0**	**16.7**	**79.8**	
▲	**FB -6**	**3.0**	**4.75**				**0.0**	**16.0**	**82.0**	
★	**FB -7**	**5.0**	**4.75**				**0.0**	**13.0**	**84.0**	
⊙	**FB -9**	**5.0**	**4.75**				**0.0**	**14.7**	**83.5**	

UES™

GRAIN SIZE DISTRIBUTION

STEM University Academics
Bentonville, Arkansas
A25186.00132



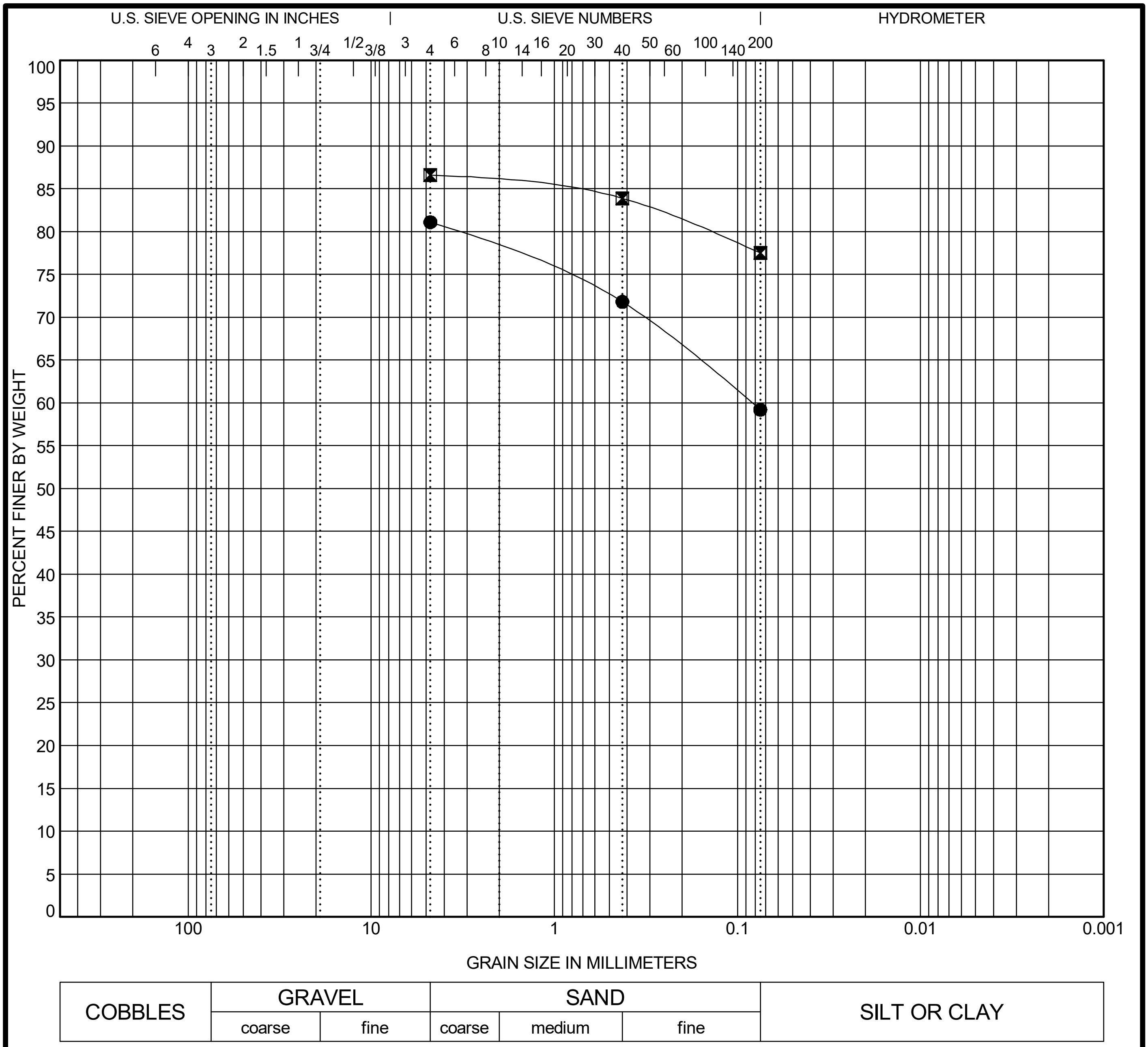
Specimen Identification			Classification	LL	PL	PI	Cc	Cu
●	**FB-12**	**8.5**	**LEAN CLAY with SAND(CL)**	**47**	**14**	**33**		
⧗	**FB-12**	**13.5**	**SILTY SAND(SM)**	**23**	**20**	**3**		
▲	**FB-13**	**4.0**	**FAT CLAY(CH)**	**57**	**15**	**42**		
★	**FB-14**	**2.0**	**LEAN CLAY(CL)**	**33**	**14**	**19**		
⊙	**FB-15**	**2.0**	**SANDY LEAN CLAY(CL)**	**26**	**16**	**10**		

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**FB-12**	**8.5**	**4.75**				**0.0**	**14.2**	**83.2**	
⧗	**FB-12**	**13.5**	**4.75**	**0.125**			**0.0**	**50.9**	**47.6**	
▲	**FB-13**	**4.0**	**4.75**				**0.0**	**8.1**	**91.5**	
★	**FB-14**	**2.0**	**4.75**				**0.0**	**8.1**	**91.4**	
⊙	**FB-15**	**2.0**	**4.75**				**0.0**	**27.6**	**66.6**	

UES™

GRAIN SIZE DISTRIBUTION

STEM University Academics
Bentonville, Arkansas
A25186.00132



Specimen Identification			Classification	LL	PL	PI	Cc	Cu
●	**FB-16**	**4.0**	**SANDY LEAN CLAY with GRAVEL(CL)**	**28**	**14**	**14**		
☒	**FB-17**	**2.0**	**FAT CLAY with GRAVEL(CH)**	**51**	**14**	**37**		

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**FB-16**	**4.0**	**4.75**	**0.084**			**0.0**	**21.9**	**59.2**	
☒	**FB-17**	**2.0**	**4.75**				**0.0**	**9.1**	**77.5**	

UES™

GRAIN SIZE DISTRIBUTION

STEM University Academics
Bentonville, Arkansas
A25186.00132

UNCONFINED COMPRESSIVE STRENGTH OF ROCK/CONCRETE CORE SPECIMENS

ASTM D7012

STEM Focused Start-Up University

Bentonville, Arkansas

A25186.00132.000

Date	SAMPLE ID	DEPTH FT	DIAMETER IN	LENGTH IN	AREA IN²	VOLUME IN³	WEIGHT LBS	DENSITY LBS/FT³	L/D RATIO	LOAD LBS	STRENGTH PSI
01/07/26	B-1	13.5	2.00	3.767	3.140	11.83	1.130	165.1	1.88	69,020	21,980
01/07/26		20.0	2.00	3.720	3.140	11.68	1.106	163.6	1.86	38,790	12,350
01/07/26	B-4	10.5	2.00	3.767	3.140	11.83	1.126	164.5	1.88	71,980	22,920
01/14/26		14.5	2.00	3.514	3.140	11.03	0.989	154.9	1.76	5,890	1,880
01/07/26		15.5	2.00	3.780	3.140	11.87	1.145	166.7	1.89	51,930	16,540
01/07/26	B-8	12.5	2.00	3.749	3.140	11.77	1.122	164.7	1.87	62,360	19,860
01/07/26		14.0	2.00	3.749	3.140	11.77	1.122	164.7	1.87	67,500	21,500
01/07/26	B-9	10.0	2.00	3.757	3.140	11.80	1.120	164.1	1.88	69,200	22,040
01/07/26		17.0	2.00	3.701	3.140	11.62	1.086	161.5	1.85	30,630	9,750
01/07/26	B-12	12.5	2.00	3.773	3.140	11.85	1.111	162.0	1.89	30,940	9,850
01/07/26		17.5	2.00	3.726	3.140	11.70	1.121	165.6	1.86	60,730	19,340

UNCONFINED COMPRESSIVE STRENGTH OF ROCK/CONCRETE CORE SPECIMENS

ASTM D7012

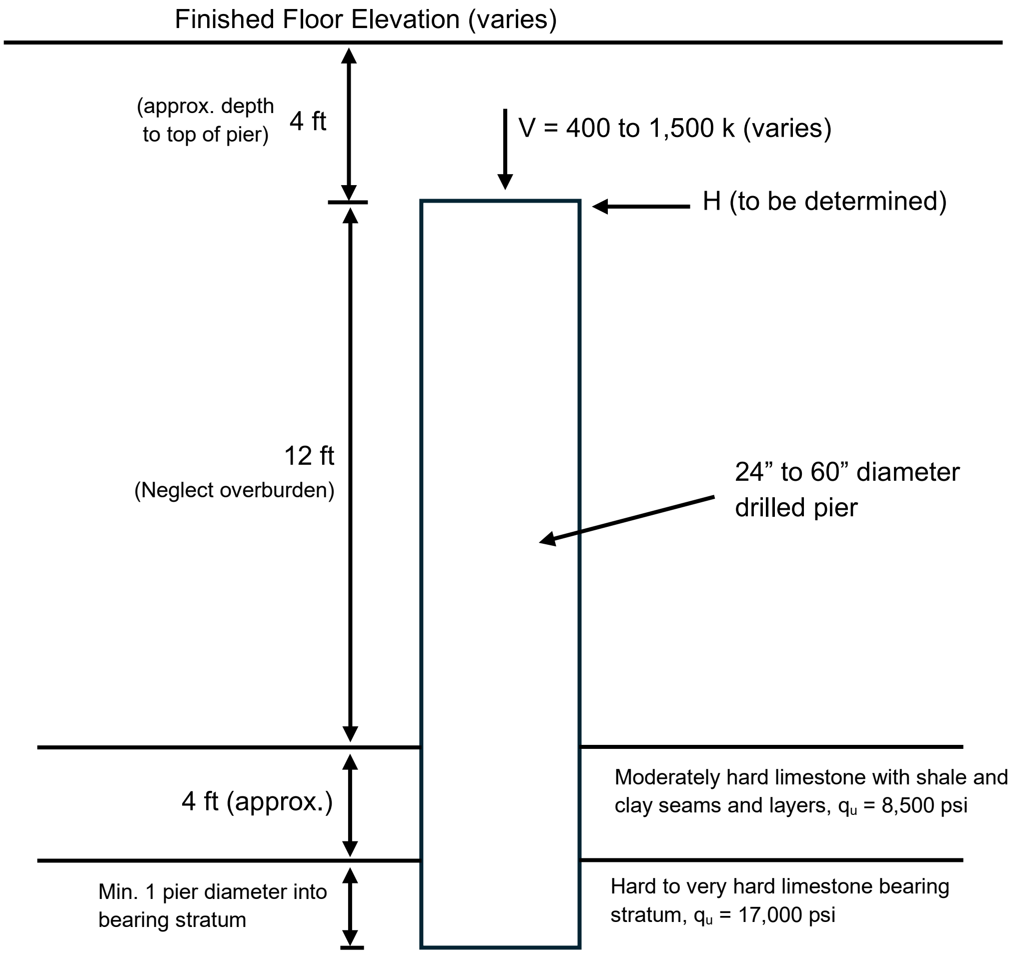
STEM Focused Start-Up University
Bentonville, Arkansas
A25186.00132.000

Date	SAMPLE ID	DEPTH FT	DIAMETER IN	LENGTH IN	AREA IN^2	VOLUME IN^3	WEIGHT LBS	DENSITY LBS/FT^3	L/D RATIO	LOAD LBS	STRENGTH PSI
07/07/26	FB-1	12	1.99	3.850	3.109	11.97	1.121	161.9	1.93	58,420	18,790
07/07/26		19	1.99	3.730	3.109	11.60	1.104	164.5	1.87	41,540	13,360
07/07/26		24	1.99	3.870	3.109	12.03	1.127	161.9	1.94	62,980	20,260
07/07/26	FB-4	24	1.99	3.880	3.109	12.06	1.138	163.0	1.95	34,700	11,160
07/07/26		32	2.00	3.880	3.140	12.18	1.099	155.9	1.94	22,030	7,020
07/07/26		38	2.00	3.860	3.140	12.12	1.126	160.5	1.93	71,100	22,640
07/07/26	FB-6	22	1.99	3.830	3.109	11.91	1.209	175.5	1.92	41,440	13,330
07/07/26		30	1.99	3.860	3.109	12.00	1.089	156.8	1.94	17,820	5,730
07/07/26	FB-7	20.5	1.99	3.840	3.109	11.94	1.138	164.7	1.93	44,920	14,450
07/07/26		30.5	1.99	3.840	3.109	11.94	1.142	165.3	1.93	63,950	20,570
07/07/26	FB-9	16.25	1.99	3.850	3.109	11.97	1.101	159.0	1.93	48,950	15,750
07/07/26		22.5	1.99	3.870	3.109	12.03	1.173	168.5	1.94	27,640	8,890
07/07/26		32	1.99	3.850	3.109	11.97	1.127	162.7	1.93	56,280	18,100
07/07/26	FB-11	24	1.99	3.840	3.109	11.94	1.161	168.1	1.93	20,060	6,450
07/07/26		31.5	1.99	3.860	3.109	12.00	1.118	161.0	1.94	23,760	7,640
06/02/26	FB-13	12.5	1.99	3.830	3.109	11.91	1.129	163.9	1.92	65,160	20,960
06/02/26		17	1.99	3.770	3.109	11.72	1.116	164.5	1.89	12,900	4,150
06/02/26		21.5	1.99	3.830	3.109	11.91	1.003	145.6	1.92	20,085	6,460
06/02/26	FB-16	17.5	1.99	3.840	3.109	11.94	1.134	164.2	1.93	40,050	12,880
06/02/26		25	1.99	3.700	3.109	11.50	1.095	164.5	1.86	38,420	12,360
06/02/26		38	1.99	3.840	3.109	11.94	1.112	161.0	1.93	38,600	12,420
06/02/26	FB-18	13	1.99	3.850	3.109	11.97	1.140	164.6	1.93	58,750	18,900
06/02/26		23	1.99	3.830	3.109	11.91	1.044	151.5	1.92	77,920	25,070

APPENDIX E – LATERAL LOADING ANALYSIS RESULTS

Generalized Model for Lateral Loading Analysis

(not to scale)



Project: STEM-Focused University

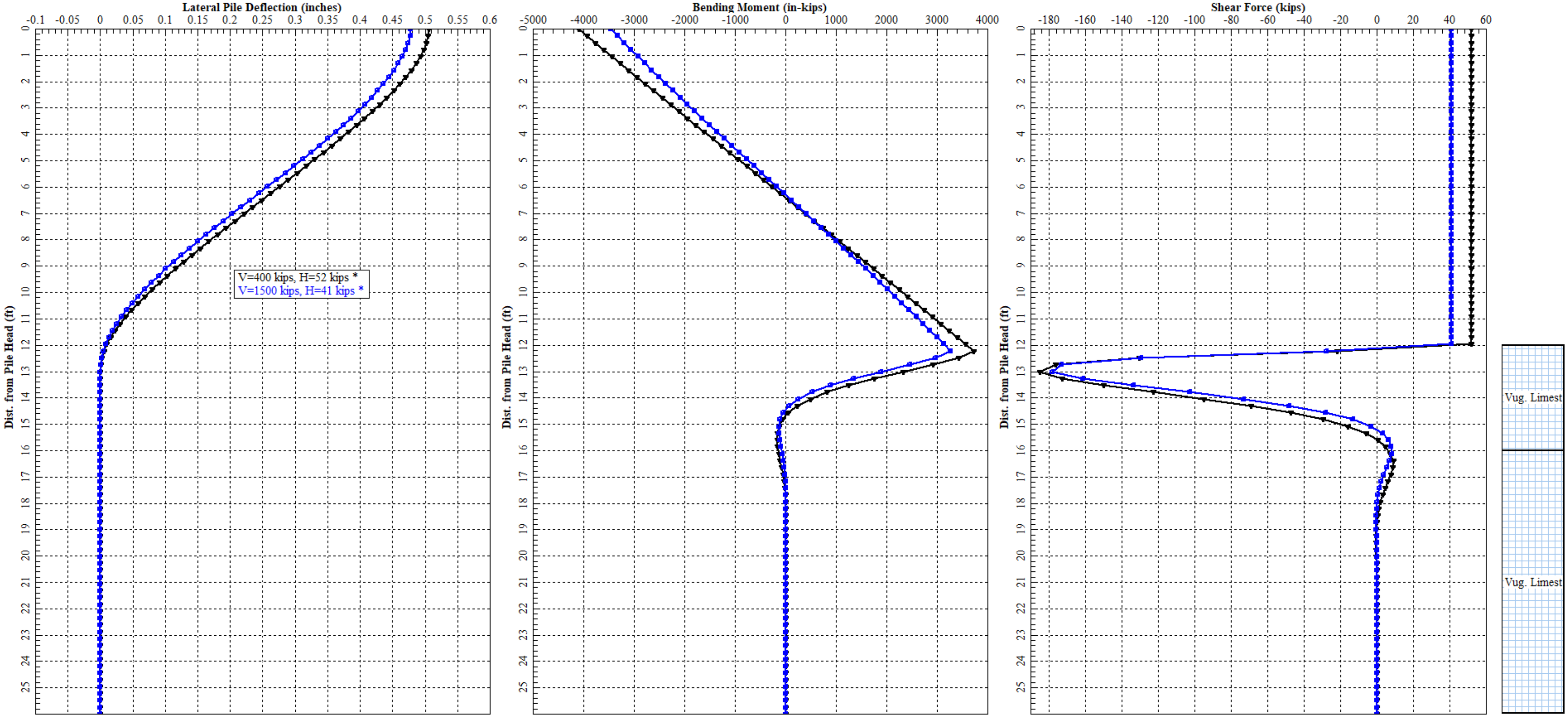
Location: Bentonville, Arkansas

Project No. A25186.00132

Shaft Diameter, inch	Pile Head Loading Condition	Axial Load, kips	Head Deflection, inch	Lateral Load, kips
24	Fixed Head	400	0.5	52
24	Fixed Head	1500	0.48	41
24	Free Head	400	0.96	24
24	Free Head	1500	0.98	17
36	Fixed Head	400	0.48	157
36	Fixed Head	1500	0.48	240
36	Free Head	400	0.97	90
36	Free Head	1500	0.91	120
48	Fixed Head	400	0.5	348
48	Fixed Head	1500	0.49	505
48	Free Head	400	0.99	220
48	Free Head	1500	0.96	290

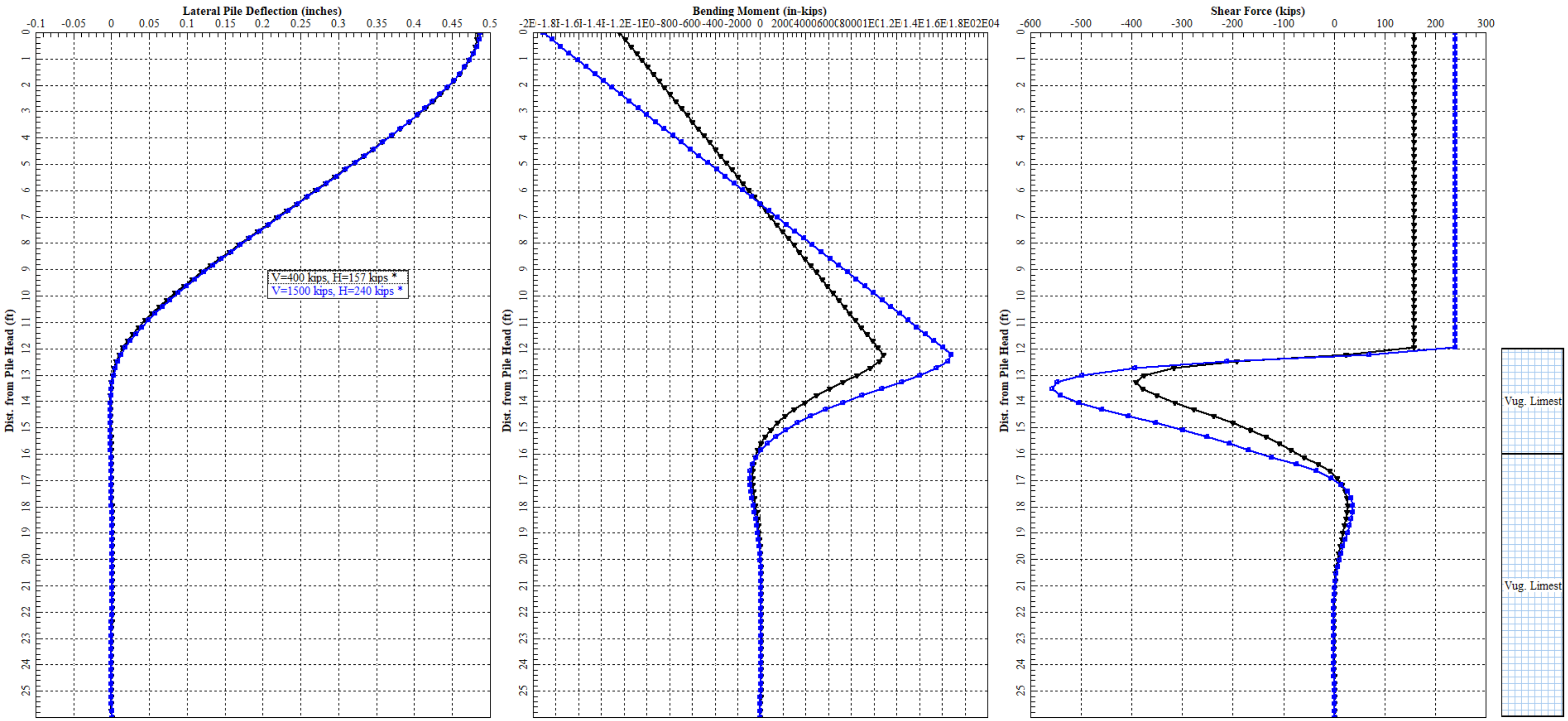
Project: STEM-Focused University
Location: Bentonville, Arkansas
Project No. A25186.004132

Shaft Diameter, inch	Pile Head Loading Condition	Axial Load, kips	Head Deflection, inch	Lateral Load, kips
30	Fixed Head	700	0.49	122
30	Fixed Head	1000	0.50	140
30	Fixed Head	1200	0.50	146
30	Fixed Head	1500	0.51	149
42	Fixed Head	800	0.50	305
42	Fixed Head	1000	0.50	330
42	Fixed Head	1200	0.50	352
42	Fixed Head	1500	0.49	378
48	Fixed Head	1300	0.50	503
48	Fixed Head	1500	0.50	527
48	Fixed Head	1700	0.50	548
48	Fixed Head	1900	0.50	569
54	Fixed Head	1600	0.50	706
54	Fixed Head	1900	0.50	748
54	Fixed Head	2200	0.50	784



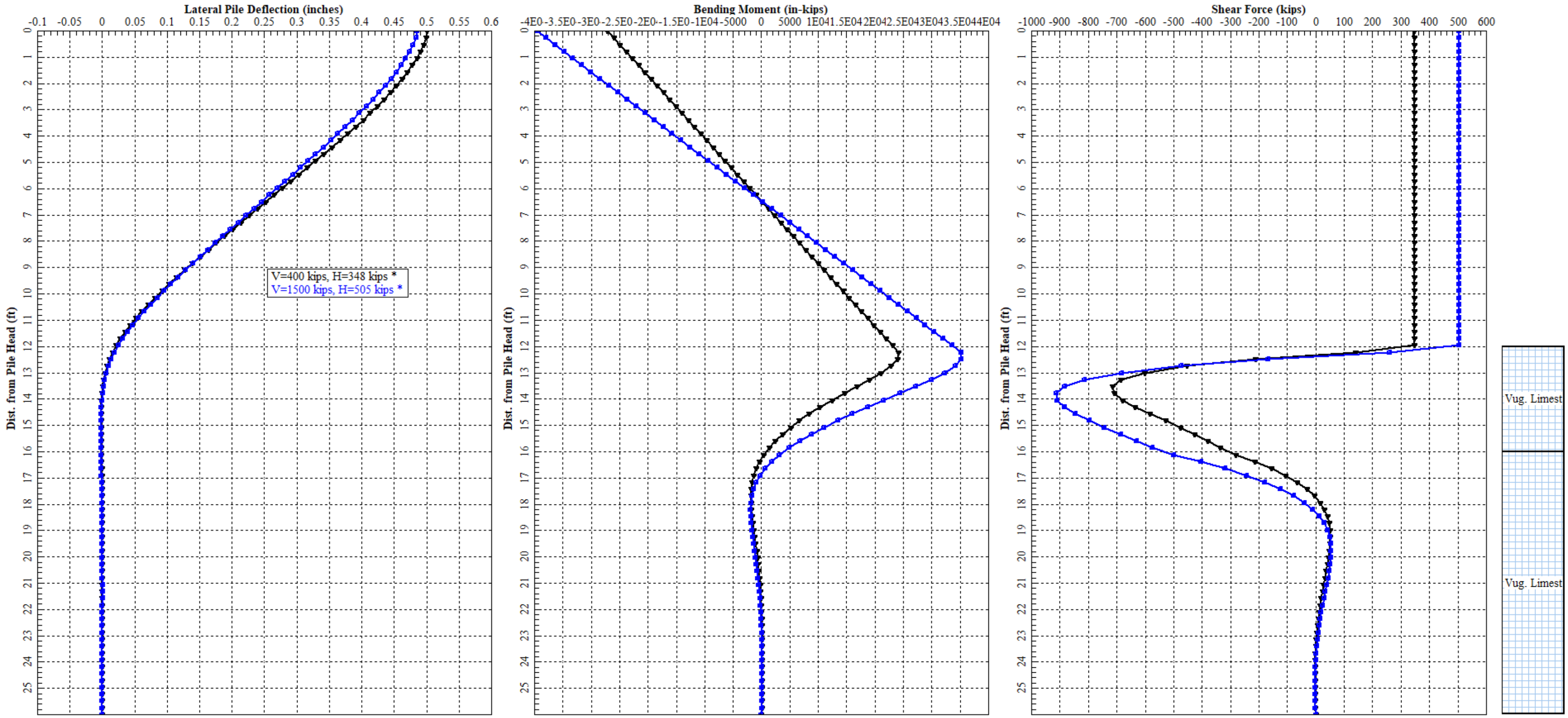
RESULTS OF LATERAL LOAD ANALYSES

24-inch-Diameter Drilled Shaft – Fixed Head
STEM-Focused University
Bentonville, Arkansas
UES Job No. A25186.00132



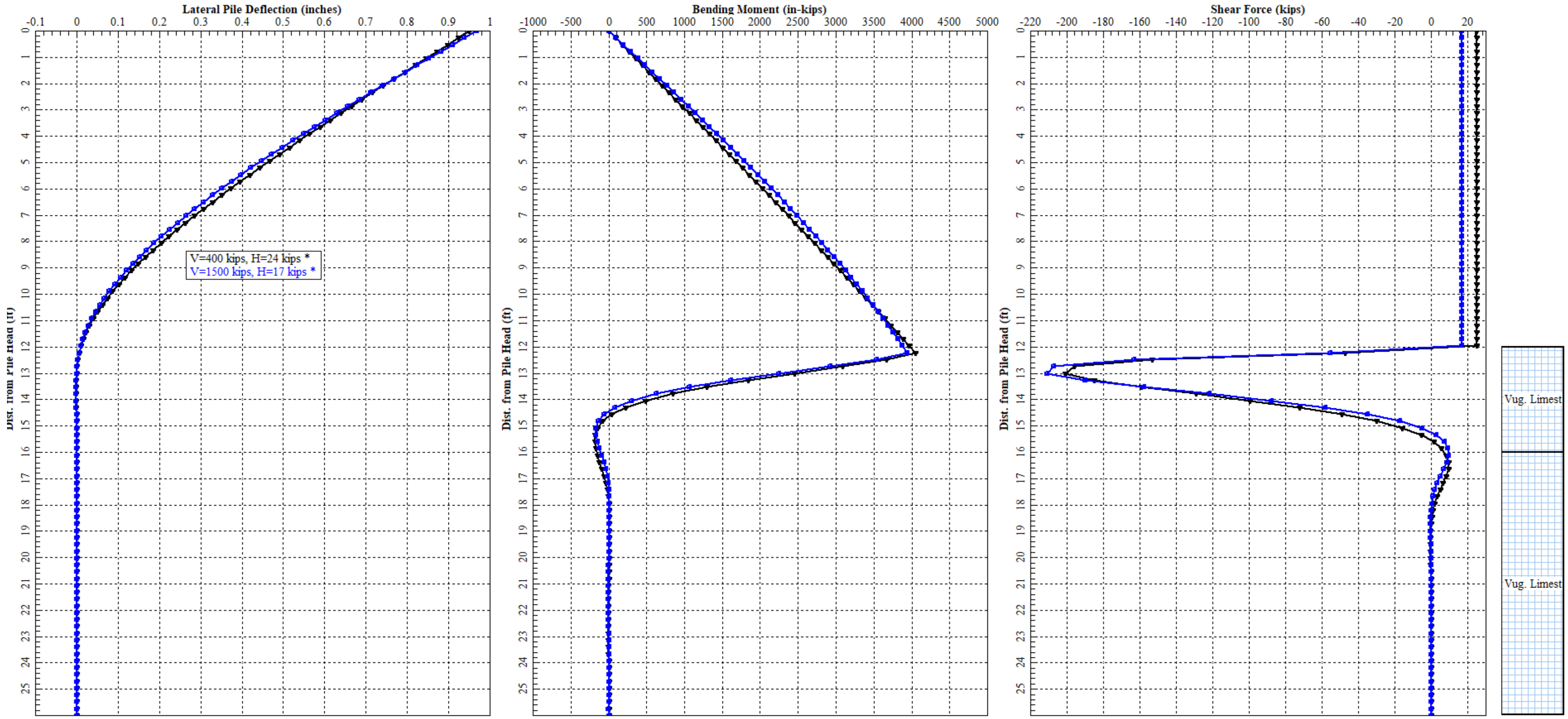
RESULTS OF LATERAL LOAD ANALYSES

36-inch-Diameter Drilled Shaft – Fixed Head
STEM-Focused University
Bentonville, Arkansas
UES Job No. A25186.00132



RESULTS OF LATERAL LOAD ANALYSES

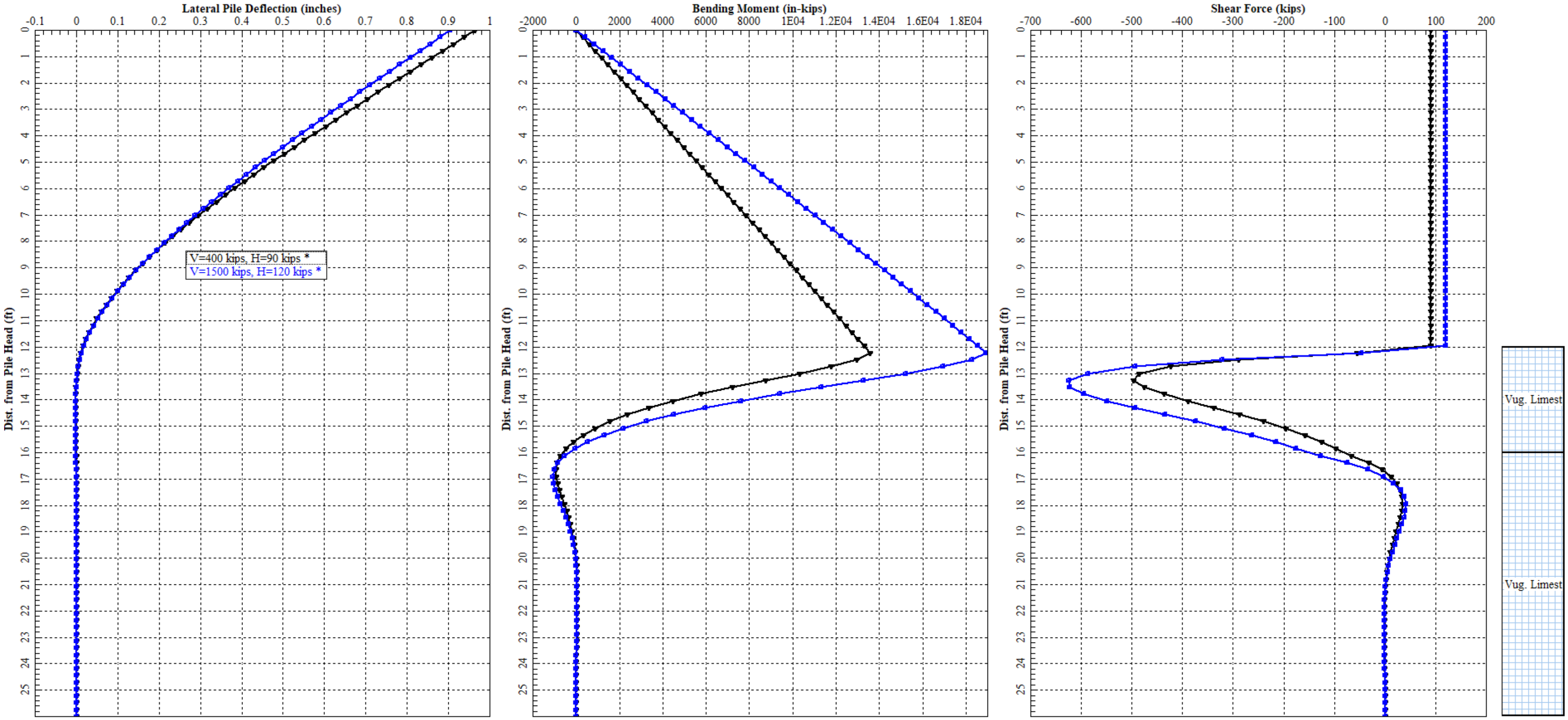
48-inch-Diameter Drilled Shaft – Fixed Head
STEM-Focused University
Bentonville, Arkansas
UES Job No. A25186.00132



RESULTS OF LATERAL LOAD ANALYSES

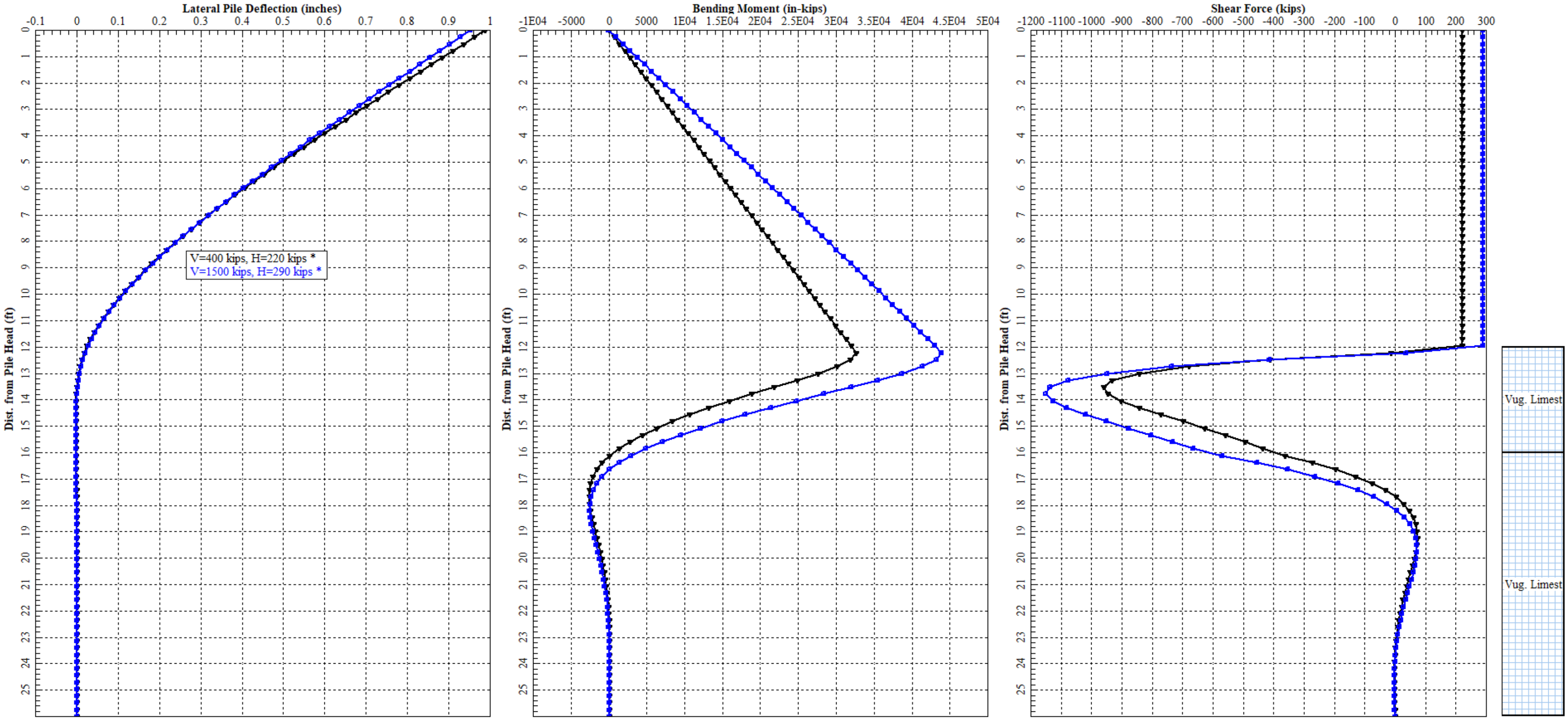
24-inch-Diameter Drilled Shaft – Free Head
STEM-Focused University
Bentonville, Arkansas
UES Job No. A25186.00132

UES™



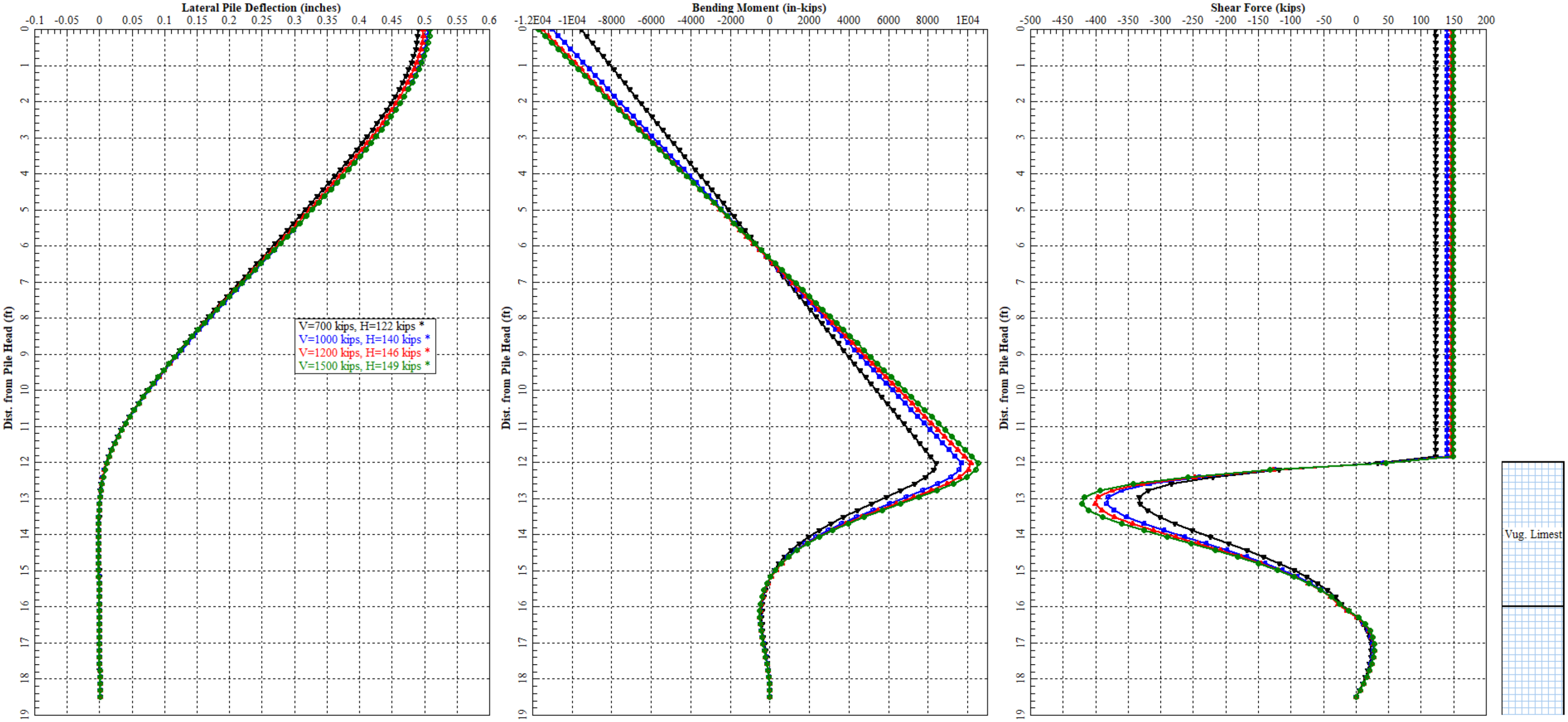
RESULTS OF LATERAL LOAD ANALYSES

36-inch-Diameter Drilled Shaft – Free Head
STEM-Focused University
Bentonville, Arkansas
UES Job No. A25186.00132



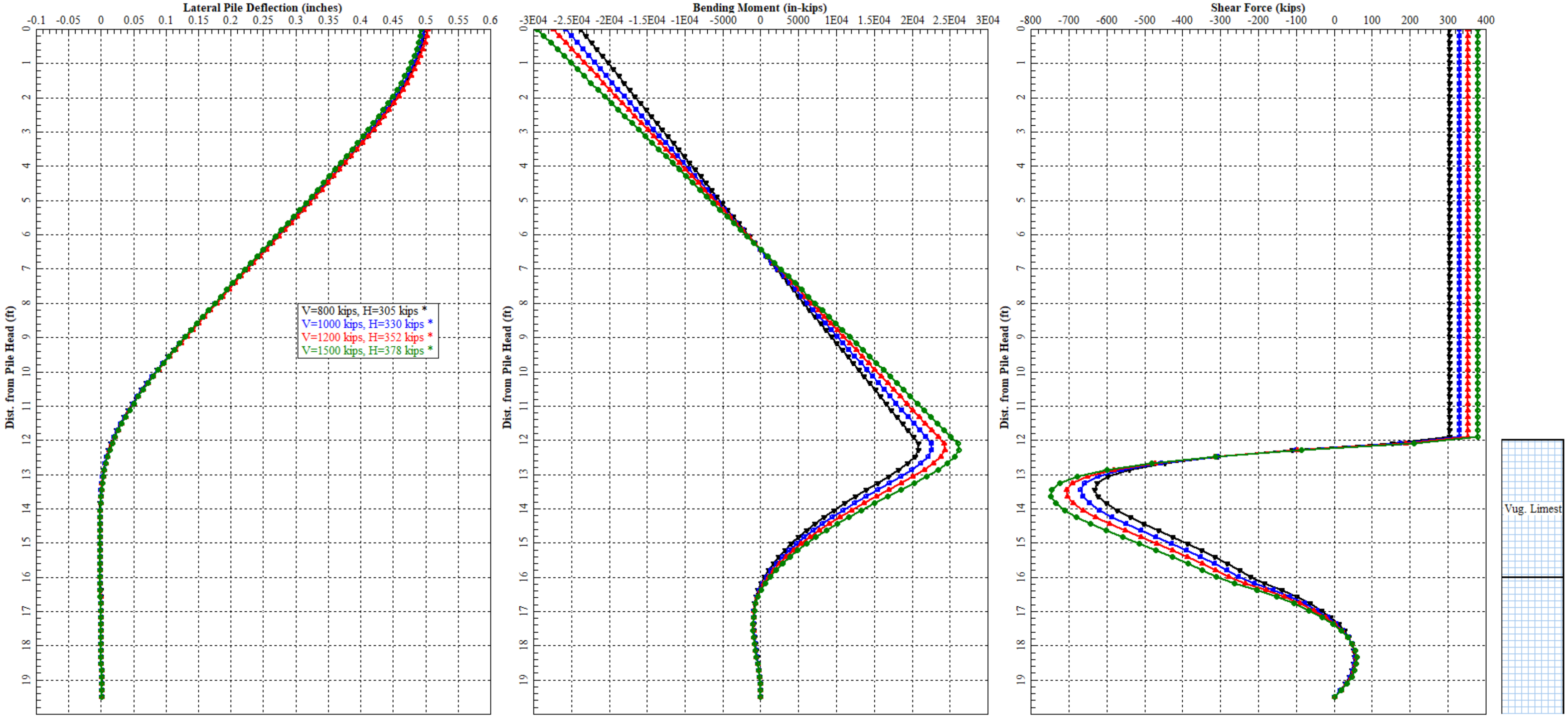
RESULTS OF LATERAL LOAD ANALYSES

48-inch-Diameter Drilled Shaft – Free Head
STEM-Focused University
Bentonville, Arkansas
UES Job No. A25186.00132



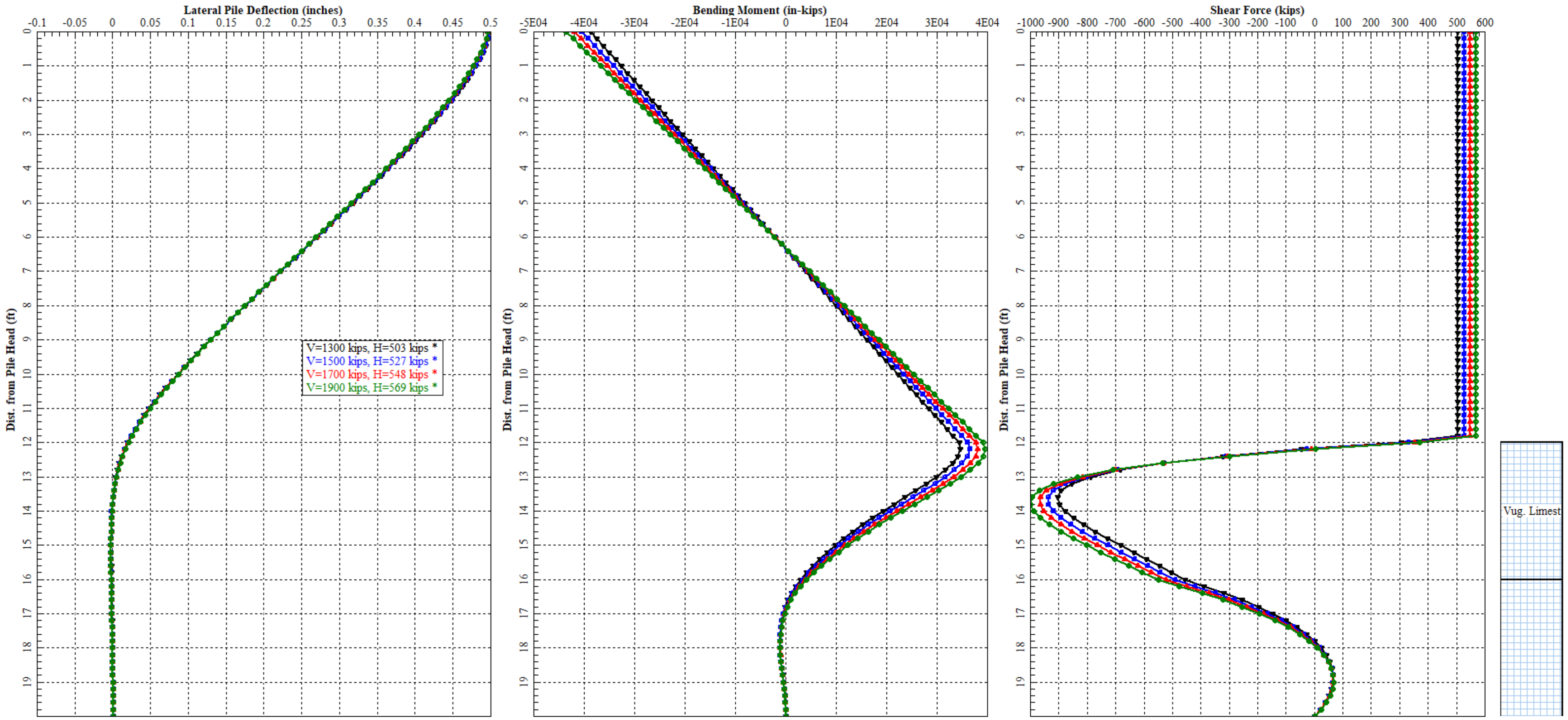
RESULTS OF LATERAL LOAD ANALYSES

30-inch-Diameter Drilled Shaft – Fixed Head
STEM-Focused University
Bentonville, Arkansas
UES Job No. A25186.00132



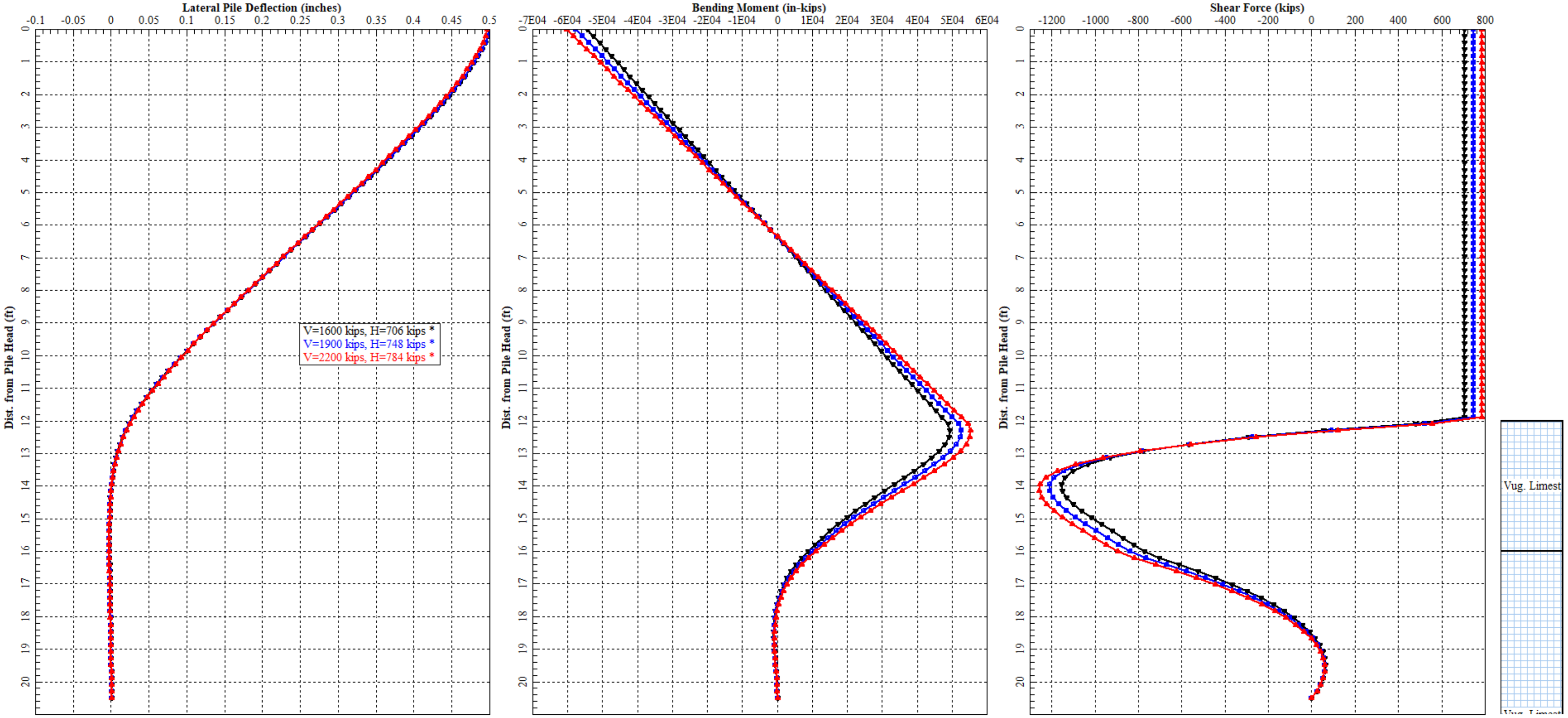
RESULTS OF LATERAL LOAD ANALYSES

42-inch-Diameter Drilled Shaft – Fixed Head
STEM-Focused University
Bentonville, Arkansas
UES Job No. A25186.00132



RESULTS OF LATERAL LOAD ANALYSES

48-inch-Diameter Drilled Shaft – Fixed Head
STEM-Focused University
Bentonville, Arkansas
UES Job No. A25186.00132



RESULTS OF LATERAL LOAD ANALYSES

54-inch-Diameter Drilled Shaft – Fixed Head
STEM-Focused University
Bentonville, Arkansas
UES Job No. A25186.00132