INITIAL SAFETY FACTOR ASSESSMENT

40 CFR 257.73 (e)

Ash Pond

Poston Site

Athens, Ohio

May, 2026

Prepared for: Ohio Franklin Realty

Prepared by: American Electric Power Service Corporation

1 Riverside Plaza

Columbus, OH 43215

Poston Ash Pond

Initial Safety Factor Assessment

PREPARED BY Blake Arthur, PE DATE

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David A. Miller, P.E.

Director- Ash Management Services

STATE OF OHIO
DAVID A. MILLER
E-60659
REGISTERED
PROFESSIONAL ENGINEER

I certify to the best of my knowledge, information, and belief that the information contained in this safety factor assessment meets the requirements of 40 CFR § 257.73(e)

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Attachment A: Initial Safety Factor Assessment Report

1.0 OBJECTIVE

The “Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals From Electric Utilities; Legacy CCR Surface Impoundments”, 89 Fed. Reg. 38950 (May 8, 2024) (amending 40 C.F.R. §257) requires owners and operators of facilities with a legacy coal combustion residual (CCR) surface impoundment to prepare an initial safety factor assessment document for each legacy CCR surface impoundment at the facility.

The Ash Pond at the Poston Site is subjected to this rule.

2.0 DESCRIPTION OF THE CCR UNIT

The Former Poston Site is located approximately 2 miles west of The Plains, Ohio. The latitude/longitude of the facility is: 39°23'10" N / 82°10'39" W. The Poston Plant was placed in service in 1949 and subsequently retired in 1987. The Ash Pond Dam was designed by Burgess and Niple, Limited in 1956. The Ash Pond Dam was constructed by H.R. Holderman, Inc. and construction inspection performed by Burgess and Niple, Limited.

The Ash Pond is located north of the former plant. The Ash Pond is formed by cross valley embankment dam and saddle dam. The embankment dam is 100 foot tall and 950 feet in length and the saddle dam is approximately 15 feet tall and 900 feet long. The embankment dam is located on the east side of the reservoir and the saddle dam to the south side of the reservoir. The Ash Pond is approximately 23 acres in surface area.

The crest width of the embankment is 20 feet wide; the upstream slope is 3 Horizontal on 1 Vertical (3H:1V) and the downstream slope varies between 2.5H:1V to 3H:1V. The embankment is zoned with an impervious core with a cutoff trench and a blanket/toe drain.

The spillway is a rectangular concrete chute that discharges into a stilling basin and subsequently to an excavated earthen channel left of the abutment. The stilling basin has a catch basin with an 18-inch pipe to discharge low flow events. The decant water from the Ash Pond discharged into Hamley Run before flowing into the Hocking River.

The pond was graded to drain to the spillway and capped with 2 feet of clay in the 1980s when the Poston Power Plant was closed.

3.0 SAFETY FACTOR ASSESSMENT 257.73(e)

The Initial Safety Factor Assessment was prepared by S&ME, Inc. and is included as Attachment A.

The most critical failure surfaces of the dike of the Ash Pond meet the required FS values. Therefore, it is concluded that the Poston Ash Pond dikes are stable and meet the stability FS required by 40 CFR §257.73(e).

ATTACHMENT A

Initial Safety Factor Assessment Report

Poston Legacy CCR Impoundment
Periodic Safety Factor Assessment
Poston Power Plant
York Township – Athens County, Ohio
S&ME Project No. 25170078

PREPARED FOR:

American Electric Power
1 Riverside Plaza
Columbus, OH 43215

PREPARED BY:

S&ME, Inc.
6190 Enterprise Court
Dublin, OH 43016

April 6, 2026

April 13, 2026

American Electric Power
1 Riverside Plaza
Columbus, OH 43215

Attention: Mr. Blake Arthur

Reference: **Periodic Safety Factor Assessment**
Poston Legacy CCR Impoundment
Poston Power Plant (former), York Township – Athens County, Ohio
S&ME Project No. 25170078

Dear Mr. Arthur:

S&ME, Inc. (S&ME) has completed a Periodic Safety Factor Assessment of the Legacy CCR Impoundment at the former Poston Power Plant in York Township – Athens County, Ohio. This assessment was carried out to fulfill the requirements of CFR §257.73 (e). S&ME prepared the Structural Stability Assessment for this CCR unit concurrently with the preparation of this Periodic Safety Factor Assessment and is referenced in this assessment report.

Sincerely,

S&ME, Inc.

Daniel Tobergte

Daniel J. Tobergte, PE
Project Engineer

DANIEL J.
TOBERGTE
E-87825
4/13/26

Jason S. Reeves

Jason S. Reeves, PE (TN)
Technical Principal

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1.0 Introduction

1.1 Background

S&ME has completed a Periodic Safety Factor Assessment of the coal combustion residuals (CCR) impoundment at the former Poston Power Plant located in York Township – Athens County, Ohio. This assessment was performed to fulfill the requirements of the Code of Federal Regulations, Title 40 § 257.73 (e), *Periodic Safety Factor Assessments*.

1.2 Location, Description of CCR Unit Embankments, and Geologic Conditions

The former Poston Power Plant, as shown in Figure 1-1, is located along a tributary to Hamley Run which drains into the Hocking River, approximately 2.5 miles west of The Plains, Ohio. The CCR impoundment, which began service in 1957, is located immediately north of the former generating plant. The impoundment was created by construction of two saddle embankments, one situated along the east side and one situated along the south side of the impoundment. Natural hills and ridges surround the remainder of the impoundment.

The east embankment is approximately 950 linear feet in length and approximately 100 feet in height at its maximum thickness. The south embankment consists of an approximate 950-foot-long embankment with a maximum fill height of approximately 15 feet. The impoundment covers a footprint of approximately 59 acres.

At the east embankment, the inboard slope was constructed at 3H:1V and the outboard slope was constructed at 2.5H:1V within the upper portion of the slope and 3H:1V within the lower portion of the slope. The inboard and outboard slopes of the south embankment are both 3H:1V.

According to as-built drawings prepared by Burgess and Niple dated 1956, the embankments were generally constructed of a homogenous cohesive fill overlying the natural colluvial foundation soils. A sand blanket drain was reportedly situated within the outboard approximate quarter portion of the embankment. Along the alignment of the embankment, a keyway was installed into the underlying bedrock and consisted of the same embankment material. Grouting of the bedrock was reportedly performed at both abutments.

The CCR impoundment was classified by the Ohio Department of Natural Resources (ODNR) as a Class I dam per Ohio Revised Code Section 1521.062; however, the impoundment has been reclaimed and no longer falls under the code according a letter dated October 31, 1989 from ODNR addressed to Columbus Southern Power Company, the owner of the impoundment at that time. Although no longer a part of the ODNR dam inventory, this impoundment, formerly classified as a Class I dam, has been classified as a “High hazard potential CCR surface impoundment” in accordance with CFR §257.53.

The site is located in the Muskingum-Pittsburgh Plateau Region in the unglaciated portion of Ohio. This region is broadly characterized by a highly dissected plateau with moderate to high relief. The natural soils generally consist of outwash, lacustrine sediments, and colluvium derived from local bedrock. As the CCR impoundment is situated near the upper reaches of the drainage watershed, the natural soils at the site consist of colluvium, confirmed by the recently completed geotechnical borings performed along the embankments. The bedrock in the region generally consists of siltstone, shale, sandstone, mudstone, and minor amounts of limestone and coal from the Mississippian and Pennsylvanian-age.

Additional information related to the construction of the embankment and the site geologic conditions are included in the Periodic Structural Stability Assessment report, provided under separate cover.

Figure 1-1 – Former Poston Plant

1.3 Previous Investigations and Assessments

Available information (refer to Section 3.0) indicates that several studies of the CCR Impoundment have been performed in the past, including a *Phase 1 Inspection Report* by GAI Consultants dated September 1978 that was requested by the U.S. Army Corp of Engineers (USACE) and an *Initial Dam and Dike Inspection* report by GEI Consultants dated January 2025. However, to our knowledge, a safety factor assessment has not been performed since the completion of the embankments.

2.0 Scope

A Periodic Safety Factor Assessment for CCR Surface Impoundments, as defined by CFR §257.73 (e), is intended to assess whether the calculated factors of safety meet or exceed the minimum required factors of safety per the regulation for the CCR unit. One cross-section comprising the most susceptible of all cross-sections to structural failure (based on appropriate engineering considerations and loading conditions) for each unit is to be evaluated. These minimum factors of safety are summarized below:

i. Static, long-term conditions for the maximum storage pool shall meet or exceed a factor of safety of 1.50. As the ground surface of the retained material is at or near the elevation of the crests of the embankments, the existing groundwater table will be considered for the maximum storage pool.
ii. Static conditions for the maximum surcharge pool shall meet or exceed a factor of safety of 1.40. For this condition, the existing groundwater table within the retained material will be used along with a surcharge of free water acting on the ground surface of the retained material based on the design storm (probable maximum flood) as determined by others.
iii. Seismic conditions shall meet or exceed a factor of safety of 1.00.
iv. Dikes (herein identified as "embankment(s)") with soils susceptible to liquefaction shall meet or exceed a factor of safety of 1.20 for liquefaction conditions.

3.0 Information Review and Site Visit

S&ME has completed a subsurface investigation and stability analyses for the embankments for this CCR impoundment. Additionally, S&ME has completed the Structural Stability Assessment, issued under separate cover. In preparation of this Safety Factor Assessment, S&ME conducted a cursory review of documents relating to the construction of the CCR impoundment embankments and conducted a site visit at the facility. S&ME has the following documents in our files; select pages are included in Appendix II:

- *Phase 1 Inspection Report* prepared by GAI Consultants, Inc. dated September 1978
  - Summarizes the characteristics of the embankments and an inspection of the embankments and spillway, and provides recommendations for improvements.
  - Includes as-built drawings (plans and cross-sections of both embankments, geologic profile of both embankments, test boring information of foundation and abutments for east embankment, plan, profile, and cross-sections of spillway, and details of blanket drainage system for the east embankment and spillway features) prepared by Burgess & Niple dated 1956.
- *Poston Fly Ash Dam Field Check* letter prepared by ODNR dated October 31, 1989
  - Indicates that the dam has been reclaimed and no longer falls under the Ohio Revised Code Section 1521.062.
- Ash Pond Complex Closure History/Summary prepared by AEP dated September 2013
  - Includes four borings within the CCR impoundment extending to the foundation soils.
- *Transmittal Letter Report – Geotechnical Engineering Services* prepared by Terracon dated September 27, 2017.
  - Includes two borings performed within the CCR impoundment extending to the foundation soils
- Revised as-built drawing Sheet 3 of 21 titled "General Plan", includes addition of 18" CMP spillway extension dated December 15, 1983.

- *Ash Pond – Initial Dam and Dike Inspection Report* prepared by GEI Consultants dated January 2025.
  - Summarizes observations made during a site visit by GEI Consultants performed on October 15, 2024.
- AEP Drawings No. S-SK81481 titled "Ash Ponds, Landfill & Holding Treatment Basin Site Plan" with inspection notes from 1984 and 1986 inspections performed by Woodward-Clyde Consultants.
  - Depicts the configuration of a toe berm added to the dam. The addition of the berm appears to be related to excess material from the excavation of a treatment basin downstream of the spillway discharge outlet.

On July 8, 2025, Mr. Mike Rowland, Mr. Jason Reeves, and Mr. Dan Tobergte of S&ME met with Mr. Blake Arthur and Mr. Dan Murphy of AEP at the former Poston Plant and conducted a site visit at the CCR impoundment. The group walked the length of the embankments and inspected/assessed the features per the requirements of CFR §257.73 (e). At the time of this site visit, the embankments and spillway areas were generally overgrown with grass and woody vegetation. These areas have since been cleared with the exception of the wetland areas.

On September 19, 2025 (after clearing was completed), Mr. Dan Tobergte with S&ME visited the site to inspect and assess the embankments and spillways after clearing. While not a formal inspection, our site visits did not reveal concerns related to instability of the embankments.

Based on the *Phase 1 Report* (GAI, 1978), instability of the embankments such as cracking, settlement, sloughs, etc. were not reported at that time. Indications of instability of the embankments were not observed during our recent site visits. The *Phase 1 Report* did indicate the presence of gully erosion along the right (south) embankment-abutment interface. At the time of our site visit, this erosion still appeared to be present.

4.0 Slope Stability Analyses

4.1 Limit Equilibrium Analyses

4.1.1 *Overview*

Based on the configuration of the CCR impoundment, the subsurface conditions encountered, and the loading conditions both currently and anticipated during the design storm event, one analysis cross-section was selected to represent the most critical area of the embankments. Subsurface information was obtained by performing test borings through the crest and toe of the east embankment and through the crest of the south embankment. Additionally, four open-standpipe piezometers were installed to obtain groundwater readings within the east embankment. Information from our recent geotechnical exploration including soil boring logs, piezometer installation logs, and a summary of laboratory testing is included in Appendix III.

4.1.2 *Discussion of Embankment and Subsurface Conditions*

Embankment Geometry

As indicated in Section 1.0, the east embankment was constructed between two natural hills and is approximately 100 feet in height and 950 linear feet in length. The inboard slope has an inclination of approximately 3H:1V. The outboard slope has an inclination of approximately 2.5H:1V from the crest (El. ~766.0 feet) to approximately mid-height (El. ~730.0 feet) and an inclination of approximately 3H:1V from the approximate mid-height to the toe (El. ~666.0 feet). The elevation of the toe of the inboard slope is approximately El. 688.0 feet. The crest of the embankment is approximately 20 feet wide. The location of the cross-section of the embankment used for analysis is included as Figure 1 in Appendix V.

The surface contours were obtained from OSIP I data (Ohio Geographically Referenced Information Program, 2007) referencing NAD83 and NAVD88. The record drawings referenced in Section 3.0 were utilized when developing the embankment geometry of the model. The toe berm was not included in the model as the initial constructed configuration of the embankment has been demonstrated to be stable, as discussed in the following sections.

Subsurface Profile

The subsurface cross-section used for the stability model was generated based on the findings and results of the recently completed geotechnical investigation and two historic geotechnical investigations performed at the site (AEP, 2013, and Terracon, 2017). A total of seven soil borings (designated as Borings B-01 through B-07) were performed between August 19, 2025 and August 28, 2025 for the recently completed geotechnical investigation at the locations depicted on the Existing Topo and Plan of Borings (Figure 2) included in Appendix I. The subsurface cross-section analyzed for this periodic safety factor assessment is summarized in the following paragraphs.

The embankment consisted of predominantly cohesive soils consisting of lean clay (CL) and fat clay (CH) with varying amounts of sand and gravel size particles, according to the USCS classification system. These soils ranged in consistency from soft to very stiff. A sand drain layer consisting of well-graded sand (SW) and poorly-graded sand (SP) with varying amounts of fines was encountered within the toe area and the area just upstream of the toe. The thickness of the sand drain layer was estimated to be approximately 1.5 feet thick.

Beneath the embankment soils, approximately 0.7 to 18 feet of natural colluvial soils were encountered consisting primarily of lean clay (CL) with occasional seams of well-graded sand with clay (SW-SC), clayey gravel (GC), poorly-graded sand with clay (SP-SC), and well-graded sand (SW). These soils transitioned into weathered bedrock.

Shale bedrock was encountered at approximate depths ranging from approximately 17.0 feet to 103.5 feet below the existing ground surface. Based on the depth of bedrock encountered at the boring locations, the surface of the bedrock dips from the south to the north-northeast.

Boring logs and laboratory test results for the recent geotechnical exploration are included in Appendix III.

The recent geotechnical exploration did not extend into the capped CCR area. Existing boring information was reviewed including 5 historical borings completed within the capped CCR area. This included Borings P16022004 B-2 and P16022005 B-1 included in the *Ash Pond Complex Closure History/Summary* prepared by AEP dated September, 2013, and B-1301, B-1302, and B-1303 from the *Transmittal Letter Report – Geotechnical Engineering Services* prepared by Terracon dated September 27, 2017. The boring logs, well construction logs, laboratory data, and result summaries attributed to these selected borings are included in Appendix II and were assumed to be representative of the current conditions in the former ash pond area.

The clay cap consisted of predominantly cohesive soils consisting of sandy lean clay (CL) with trace amounts of gravel, lean clay with sand (CL) with trace amounts of gravel, and sandy silty clay (CL-ML) with trace amounts of gravel. These soils ranged in consistency from soft to hard. The thickness of the clay cap layer ranged from approximately 4.5 to 10.5 feet.

Beneath the clay cap soils, approximately 25 to 67 feet of CCR material was encountered consisting of silt (ML) with varying amounts of sand and gravel and silty sand with gravel (SM). The AEP report dated 2013 identifies the CCR material as fly ash. According to the as-built drawings referenced in Section 3.0, it is understood that the CCR material may extend up to a depth of 100 feet at some locations.

Piezometer Data

A total of four Casagrande-style open-standpipe piezometers were installed within the east embankment as part of the recent subsurface investigation. This included two instruments along the embankment crest and two instruments in the area of the sand drain located upslope of the toe (refer to Figure 2 included in Appendix I for the locations of these boring/piezometer locations). The water levels measured in the piezometers by date are summarized in Figure 4-1 on the following page. Note that elevations reference NAVD88. Measurements were obtained between August 29, 2025 and February 19, 2026. This data was used to calibrate the seepage analyses completed as part of the safety factor assessment.

Groundwater Levels – CCR Impoundment

According to the *Ash Pond Complex Closure History/Summary* report (AEP, 2013), the groundwater table has been consistently measured at elevations ranging from approximately 756 to 761 within the CCR material. A groundwater elevation of 760 feet was estimated within the CCR material and was included in our seepage and stability models.

Seismicity

The seismic coefficient used for the stability analysis at this site was estimated using the procedure recommended in the U.S. Environmental Protection Agency (USEPA) RCRA Subtitle D (258) *Seismic Design Guidance for Municipal Solid Waste Landfill Facilities* (EPA/600/R-95/051) dated 1995. The site was classified as “Stiff” (per the guidance document) based on the average shear wave velocity range correlated to the average field N-values indicated in Table 20.3-1 of ASCE 7-10. The base rock peak ground acceleration (PGA) was estimated to be 0.057g per the USGS Unified Hazard Tool (https://earthquake.usgs.gov/hazards/interactive/) for the 2 percent in 50-year earthquake event (2,475-year event). The free field peak ground acceleration and peak acceleration at the top of the embankment were estimated using the figures in the guidance document (Seed and Idriss, 1982; Idriss, 1990; Kavazanjian and Matasović, 1994; and Singh and Sun, 1995) and was estimated to be 0.34g. The peak acceleration at the top of the embankment was then used to estimate the maximum acceleration at the base of the embankment using Figure 4.7 of the guidance document (Kavazanjian and Matasović, 1995). This maximum acceleration at the base of the embankment was estimated to be 0.103g and was used as the seismic coefficient for the pseudo-static stability analysis. A summary of the seismic coefficient calculations is provided in Appendix IV.

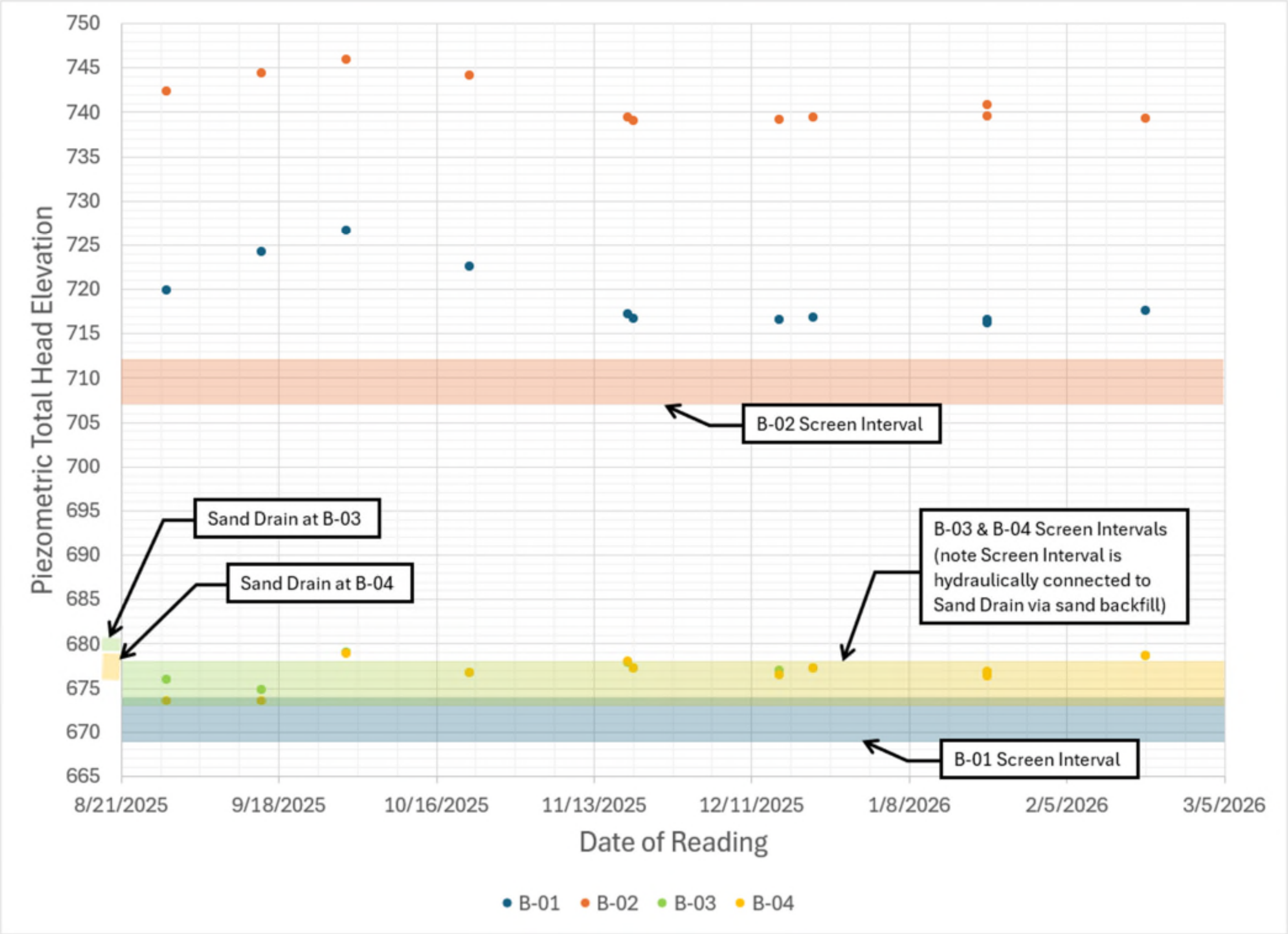


Figure 4-1: Piezometer Readings

4.1.3 Phreatic Surface

Prior to performing the limit equilibrium slope stability analyses, seepage analysis was performed to estimate the phreatic surface and pore pressure conditions within the embankment and foundation materials. The SEEP/W® finite element seepage program, part of GeoStudio version 2024.1.0.1406, was used to perform a steady-state seepage analysis based on the boundary conditions and hydraulic conductivity parameters estimated for the site.

Note that the piezometers at the locations of Borings B-01 and B-02 were installed generally along the crest alignment but at different screened intervals or “tip” elevations. The piezometer readings at these locations indicate that the piezometric elevation at the upper piezometer screened interval or “tip” elevation is greater than the piezometric elevation at the lower piezometer screened interval “tip”, suggesting that the flow of water seepage has a downward gradient as it flows through the embankment as expected.

Total head boundary conditions were assumed within the former CCR impoundment as observed in the historical observation well water levels obtained within the CCR impoundment. Vertical and horizontal hydraulic conductivity parameters were estimated for the embankment fill, CCR material, rock, and colluvial layers or were evaluated based on the results of the laboratory testing results and empirical correlations. The seepage model was calibrated and verified based on recent water level measurements in the open-standpipe piezometers installed within the embankment below the crest and within the sand drain. The horizontal permeability values were expressed based on estimated hydraulic conductivity anisotropy ratios, k_x/k_y,

The results of the seepage analysis were compared to the water levels measured in the recently installed open-standpipe piezometers, and the seepage model showed reasonable agreement with the measured phreatic and piezometric water levels indicating the seepage model was reasonably calibrated.

A summary of the hydraulic conductivity parameters used for the seepage analysis are provided in Table 4-2. Justifications of hydraulic conductivity parameters are included in Appendix IV.

Table 4-1 – Hydraulic Conductivity Parameters

Material Description	*k_v (cm/s)*	*k_v (ft/s)*	*k_x/k_y*	*Reference for k_v*
Cohesive – Natural	5.0E-8	1.64E-9	4	Holtz & Kovacs (1981)
Cohesive – Embankment	5.0E-9	1.64E-10	1	Laboratory Permeability Tests
Cohesive – Clay Cap	5.0E-9	1.64E-10	2	Holtz & Kovacs (1981)
Granular – CCR	5.0E-4	1.64E-5	1	Holtz & Kovacs (1981)
Granular – Sand Drain	5.0E-3	1.64E-4	1	Hazen (1911), Kozeny-Carman Equation - Carrier (2003)
Rock	5.8E-10	1.90E-11	5	Davis (1969), Dunn and Leopold (1978), and Freeze and Cherry (1979)

The following boundary conditions were assumed in the model:

- Total head of 760.0 feet along the surface of the CCR cap and the left side of the model (upstream of the embankment) representing the groundwater elevation within the retained CCR material.
- Total head of 689.0 feet along the ground surface and the right side of the model (downstream of the embankment).
- No-flow boundary along the base of the model.
- Unknown potential seepage conditions along the crest and downstream face of the embankment.
- A pressure head of 1.5 feet was applied along the bottom of the sand drain based on the readings of the piezometers at the locations of Borings B-03 and B-04.

The model results, in conjunction with the water level readings, suggest that the phreatic level within the downstream portion of the embankment is controlled by the sand drainage blanket drain situated within the downstream quarter of the embankment closest to the outboard toe. For this reason, it appears that a classically shaped phreatic surface (as expected within an earthen dam constructed on an impermeable foundation, Casagrande 1937) has generally developed within the embankment. The apparent effect of the sand drain is a phreatic surface located well within the embankment and relatively far from the outboard slope face.

The results of the finite element seepage analysis performed using SEEP/W® were incorporated directly into the Geostudio SLOPE/W program as a "parent analysis" for the 2-D limit equilibrium slope stability analysis.

4.1.4 *Shear Strength Parameters*

The shear strength parameters estimated for the embankment fill, CCR material, sand drain, and natural layers for the stability analyses were evaluated considering the laboratory testing results, historical reports, and empirical correlations. A summary of the shear strengths estimated for the stability analysis are provided in Table 4-3. A summary of the development of the estimated shear strength parameters are included in Appendix IV.

Table 4-3 - Shear Strength Parameters

Material Description	γ_T *(pcf)*	*Undrained*		*Effective*		*Reference*
		ϕ (deg)	C (psf)	ϕ' (deg)	c' (psf)	
Cohesive – Natural	125	0	2000	30	100	Unit Weight, Effective: Engineering Experience Undrained: SPT and PP Correlations.
Cohesive – Embankment	115	16	250	26	150	Unit Weight, Undrained, Effective: CU Triaxial Tests.
Cohesive – Clay Cap	115	0	1000	26	100	Unit Weight: Terracon Results Undrained: Terracon Results, SPT, and PP Correlations. Effective: Engineering Experience
Granular – CCR	100	20	200	28	0	Unit Weight, Effective: Terracon Results and SPT Correlations. Undrained: Engineering Experience
Granular – Sand Drain	110	34°	0	34°	0	Unit Weight, Undrained & Effective: SPT Correlations and Engineering Experience.
Rock	-	-	-	-	-	Engineering experience

4.2 Liquefaction Potential of Embankment Soils

Materials located above the water table were considered not to be liquefiable, since saturation is required to initiate liquefaction. In addition, materials with clay-like behavior are resistant to liquefaction or cyclic softening. The Boulanger & Idriss (2008) along with the Bray & Sancio (2006) criteria were considered whether the materials exhibit clay-like behavior including a Plasticity Index (PI) greater than 7, a fines content (FC) greater than 50 percent, and a ratio of water content (w_c) to Liquid Limit (LL) less than 0.85. The screening analysis using these criteria indicated that the fine-grained soils encountered at the site are not susceptible to liquefaction. This screening analysis is included in Appendix V.

Liquefaction screening analysis was also performed for the granular fill and foundation materials based on the Youd et al. (2001) N-value method, which considers the cyclic stress ratio (CSR) at the depth of the respective layer and the cyclic resistance ratio (CRR) of the layer. The analysis used an embankment crest acceleration of 0.34g. For layers situated within the embankment, the acceleration of the respective layers were estimated using the Kavazanjian & Matasović, (1995) method indicated in Section 4.1.2 and were used to calculate the CSR with depth. The CRR of the individual analysis layers was estimated based on the corrected clean sand $(N_1)_{60}$ – values and estimated fines content for each material. The analysis indicates that the factor of safety against liquefaction triggering for the analyzed soils have factors of safety of 1.0 or greater, or are otherwise too stiff/dense to liquefy per this method, and are not considered susceptible to liquefaction. In addition, the Liquefaction Probability Index (LPI) of the soil was estimated to be less than 1, indicating a low probability of liquefaction.

Therefore, post-earthquake slope stability analysis using reduced shear strengths for liquefiable materials was not required and was not performed.

4.3 Slope Stability Analysis

4.3.1 Slope Stability Methodology

The stability analysis was performed using the SLOPE/W® program, part of GeoStudio version 2024.1.0.1406. Slope/W was used to perform a 2-dimensional limit-equilibrium stability analysis.

Critical failure surfaces were determined using the Spencer Method of Slices. The Spencer Method of Slices satisfies horizontal and vertical force equilibrium, as well as overall and individual slice moment equilibrium. Soil slopes often appear to fail on circular slip surfaces. At this site we considered it reasonable to analyze the slope stability using randomly generated circular slip surfaces using a search algorithm contained as a subroutine within the program. The critical surface defined by the search algorithm was then optimized to calculate the lowest factor of safety for that surface. The pore pressure regime generated by the SEEP/W analyses were incorporated directly into the SLOPE/W models. The Grid and Radius Method of SLOPE/W was used to define potential failure limit ranges. Critical failure surfaces were located through a deterministic search, with a minimum assumed failure depth of 2 feet. The program had freedom to search for surfaces with a head anywhere above generally the mid-height of the embankment and the toe anywhere below.

For the pseudo-static analysis, the shear strength parameters of the cohesive fill were estimated using the two-stage pseudo-static method (Duncan et al, 1990) included in Slope/W. A horizontal seismic coefficient was applied to the soil slices to compute a horizontal force on each failure slice based on a percentage of gravity.

4.3.2 Slope Stability Analysis Results

A summary of the computed safety factors for the critical cross-section is provided in Table 4-4 based on two of the four loading conditions (long-term maximum storage pool, maximum surcharge pool, pseudo-static seismic loading, and liquefaction). Also referenced in the table are the minimum factor or safety values defined in 40 CFR § 257.73(e)(1) subparts (i) through (iv). Graphical output corresponding to the analysis cases are presented in Appendix V. The results of the seepage and slope stability analysis are included in Appendix V.

Table 4-4 – Safety Factor Summary

Analysis Case	Minimum Factor of Safety*	Computed Factor of Safety
Long-term, maximum storage pool	1.50	1.55
Maximum surcharge pool	1.40	Not applicable
Pseudo-static seismic loading	1.00	1.03
Embankment Liquefaction	1.20	Non-liquefiable

* Based on 40 CFR § 257.73(e)(1) subparts (i) through (iv).

The post-earthquake analysis considering embankment liquefaction was not evaluated, since liquefaction triggering analysis did not identify liquefiable zones within the embankment.

The CCR material contained by the embankment is covered with a clay cap generally extending to the height of the embankment and above. As such, rainfall is anticipated to runoff towards the emergency concrete spillway and down the embankment rather than pool behind the embankment. Therefore, a maximum surcharge pool condition was not deemed necessary for this embankment.

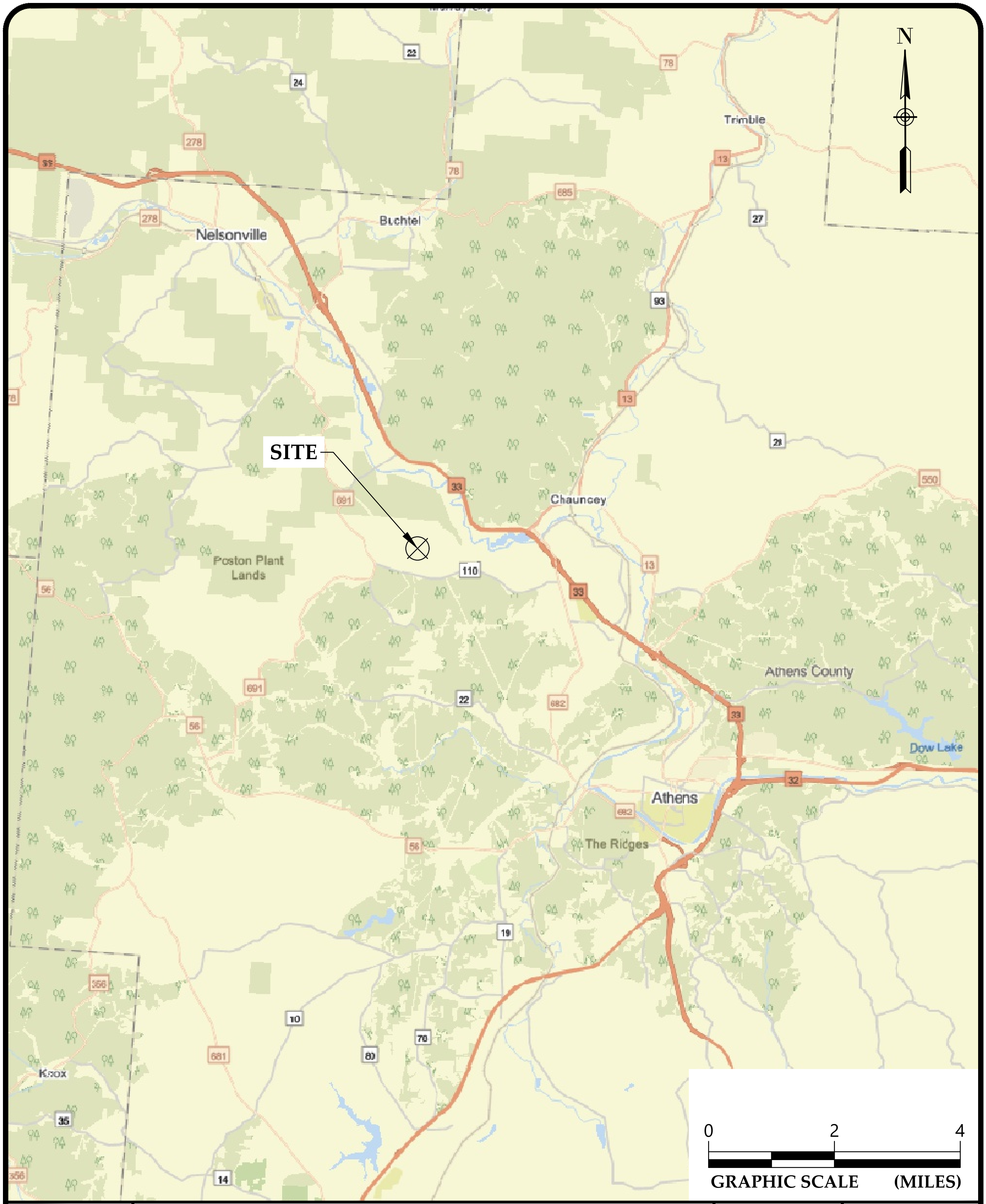
Based on the stability analysis performed, the computed factors of safety meet or exceed the regulatory factors of safety requirements for each loading case analyzed. This conclusion assumes that the modeled embankment geometry, material properties, material strengths, and pore pressure conditions are representative of the actual embankment conditions.

5.0 Certification

Based on our current assessment of the CCR Impoundment facility, S&ME certifies that this assessment meets the requirements of paragraphs (e)(1) and (e)(2) of Part 257.73 for the critical cross-section of the embankment.

Appendices

Appendix I – Site Investigation Figures



S&ME, Inc.

VICINITY MAP

POSTON LEGACY CCR IMPOUNDMENT EVAL
SAFETY FACTOR ASSESSMENT REPORT
YORK TOWNSHIP-ATHENS COUNTY, OHIO

SCALE:
1" = 2 Miles
DATE:
01/21/2026
PROJECT NUMBER
25170078

FIGURE NO.
1

DRAWING PATH: T:\Columbus-1170\Projects\2025\25170078_AEP_Poston Legacy CCR Impoundment Eval\Civil\CAD\DWG\XREF\25170078 BASE_EXISTING.dwg TAB: POB-SF SAVE DATE: 2026-01-21 PAGE SIZE: ANSI full bleed A (11.00 x 8.50 Inches)

EXISTING TOPO AND PLAN OF BORINGS

POSTON LEGACY CCR IMPOUNDMENT EVAL
SAFETY FACTOR ASSESSMENT REPORT
YORK TOWNSHIP-ATHENS COUNTY, OHIO

S&ME, Inc.

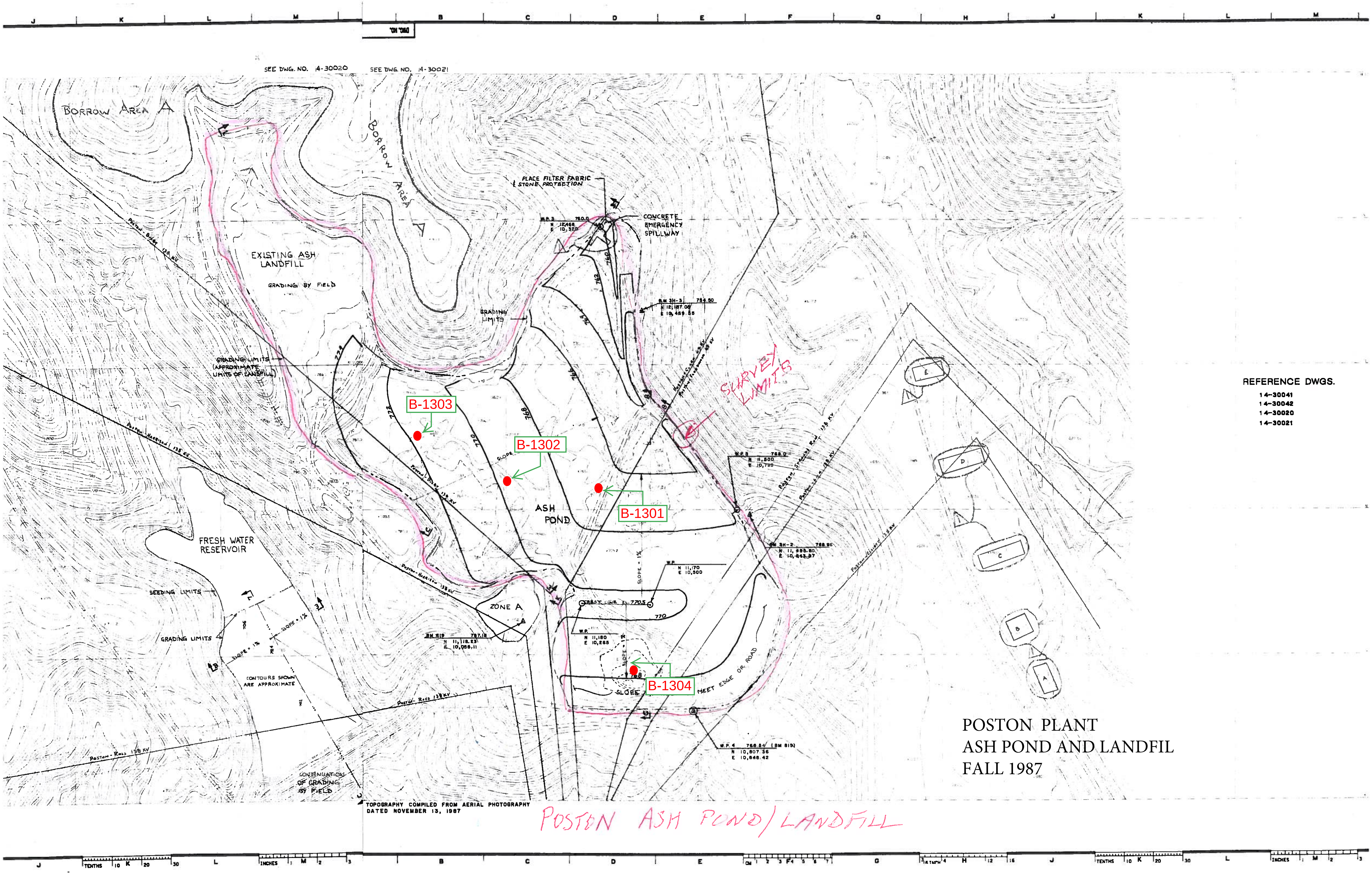
SCALE:	FIGURE NO.
1" = 200'	2
DATE:	
01/21/2026	
PROJECT NUMBER	
25170078	

Appendix II – Historical Information

Appendix II (A):

Ash Pond Complex Closure History/Summary (AEP, Sept. 2013)

- Boring Location Plan
- Boring Logs
- Monitoring Well Construction Logs
- Table 2: Water Level Readings



REFERENCE DWGS.
14-30041
14-30042
14-30020
14-30021

POSTON PLANT
ASH POND AND LANDFIL
FALL 1987

POSTON ASH POND/LANDFILL

AMERICAN ELECTRIC POWER SERVICE CORPORATION

AEP CIVIL ENGINEERING LABORATORY

LOG OF BORING

JOB NUMBER

COMPANY **OHIO POWER COMPANY**

PROJECT **POSTON ASH POND**

COORDINATES **N 505,141.7 E 2,059,462.1**

GROUND ELEVATION **770.4** SYSTEM

BORING NO. **B-1301** DATE **8/21/13** SHEET **1** OF **4**

BORING START **7/23/13** BORING FINISH **7/23/13**

PIEZOMETER TYPE **SS** WELL TYPE **OW**

HGT. RISER ABOVE GROUND **2.49** DIA **2**

DEPTH TO TOP OF WELL SCREEN **56.4** BOTTOM **66.0**

WELL DEVELOPMENT **YES** BACKFILL **HOLEPLUG**

FIELD PARTY RIG

Water Level, ft	▽	▼	▼
TIME			
DATE			

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET FROM	TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	U S C S	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
1	SS	0.0	1.5	2-3-8	1.0					VERY STIFF MODERATE YELLOWISH BROWN 10YR 5/4 CLAY tsf 2.0, w/sandstone fragments, dry		
2	SS	1.5	3.0	3-6-9	1.1					HARD MODERATE YELLOWISH BROWN 10YR 5/4 CLAY tsf 4.0, w/sandstone fragments, dry		
3	SS	3.0	4.5	3-5-10	1.0					VERY STIFF MODERATE YELLOWISH BROWN 10YR 5/4 CLAY w/clayshale fragments, dry		
4	SS	4.5	6.0	3-14-19	1.1		5			MEDIUM DENSE MEDIUM DARK GRAY N4 FLYASH dry		
5	SS	6.0	7.5	4-12-14	1.5							
							10					
6	SS	11.5	13.0	2-4-5	1.5					LOOSE GRAYISH BLACK N2 FLYASH wet		
							15					
7	SS	16.5	18.0	WOH	1.5					VERY LOOSE GRAYISH BLACK N2 FLYASH wet		

TYPE OF CASING USED

	NQ-2 ROCK CORE	
X	6" x 3.25 HSA	
	9" x 6.25 HSA	
	HW CASING ADVANCER	4"
	NW CASING	3"
	SW CASING	6"
	AIR HAMMER	8"

Continued Next Page

PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC

WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON

RECORDER

JOB NUMBER ______

COMPANY **OHIO POWER COMPANY** BORING NO. **B-1301** DATE **8/21/13** SHEET **2** OF **4**

PROJECT **POSTON ASH POND** BORING START **7/23/13** BORING FINISH **7/23/13**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET FROM	TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	U S C S	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
8	SS	21.5	23.0	4-1-1	1.5					VERY LOOSE GRAYISH BLACK N2 FLYASH saturated		
9	SS	26.5	28.0	WOH	1.5		25					
10	SS	31.5	33.0	1-1-1	1.5		30					
11	SS	36.5	38.0	WOH	1.5		35					
12	SS	41.5	43.0	WOR	1.5		40					
							45					

Continued Next Page

AMERICAN ELECTRIC POWER SERVICE CORPORATION

AEP CIVIL ENGINEERING LABORATORY

LOG OF BORING

JOB NUMBER

COMPANY **OHIO POWER COMPANY** BORING NO. **B-1301** DATE **8/21/13** SHEET **3** OF **4**

PROJECT **POSTON ASH POND** BORING START **7/23/13** BORING FINISH **7/23/13**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET FROM	TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	U S C S	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
13	SS	46.5	48.0	WOR	1.5							
14	SS	51.5	53.0	WOR	1.5		50					
15	SS	56.5	58.0	WOR	1.5		55					
16	SS	61.5	63.0	WOR	1.5		60			VERY LOOSE GRAYISH BLACK N2 FLYASH w/white streaks, saturated		
17	SS	66.5	68.0	1-6-9	1.5		65			VERY LOOSE GRAYISH BLACK N2 FLYASH MEDIUM DENSE LIGHT OLIVE GRAY 5Y 5/2 CLAY w/shale fragments		
18	SS	71.5	73.0	6-7-13	1.0		70			VERY STIFF LIGHT OLIVE BROWN 5Y 5/6		

Continued Next Page

AMERICAN ELECTRIC POWER SERVICE CORPORATION

AEP CIVIL ENGINEERING LABORATORY

LOG OF BORING

JOB NUMBER

COMPANY **OHIO POWER COMPANY**

PROJECT **POSTON ASH POND**

BORING NO. **B-1301**

DATE **8/21/13**

SHEET **4** OF **4**

BORING START **7/23/13**

BORING FINISH **7/23/13**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET FROM	TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	U S C S	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
										CLAY w/sandstone and shale fragments		
										TD = 73.0' / BOTTOM OF ASH 67.5'		

AEP POSTON ASH POND.GPJ AEP.GDT 8/21/13

AMERICAN ELECTRIC POWER SERVICE CORPORATION

AEP CIVIL ENGINEERING LABORATORY

LOG OF BORING

JOB NUMBER

COMPANY **OHIO POWER COMPANY**

PROJECT **POSTON ASH POND**

COORDINATES **N 505,221.0 E 2,059,143.0**

GROUND ELEVATION **773.0** SYSTEM

BORING NO. **B-1302** DATE **8/21/13** SHEET **1** OF **3**

BORING START **7/30/13** BORING FINISH **7/30/13**

PIEZOMETER TYPE **SS** WELL TYPE **OW**

HGT. RISER ABOVE GROUND **2.39** DIA **2**

DEPTH TO TOP OF WELL SCREEN **42.9** BOTTOM **52.5**

WELL DEVELOPMENT **YES** BACKFILL **HOLEPLUG**

FIELD PARTY **ZLR/TAS** RIG **D-120**

Water Level, ft	▽	▼	▼
TIME			
DATE			

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET FROM	SAMPLE DEPTH IN FEET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	U S C S	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
1	SS	0.0	1.5	2-3-2	.7					SOFT MODERATE OLIVE BROWN 5Y 4/4 CLAY w/ss frags and trace of veg		GROUNDING PROCEDURE NOT IN USE / 4 1/4 HSA / SAMPLES TO SHOP
2	SS	1.5	3.0	3-6-12	.6					VERY STIFF MODERATE OLIVE BROWN 5Y 4/4 CLAY w/ss frags		
3	SS	3.0	4.5	16-12-7	.8					MEDIUM DENSE MODERATE OLIVE BROWN 5Y 4/4 SANDSTONE weathered w/trace of clay		
4	SS	4.5	6.0	5-7-8	.9		5			MEDIUM DENSE MODERATE OLIVE BROWN 5Y 4/4 CLAY w/ss frags		
5	SS	6.0	7.5	5-5-5	.7					LOOSE MODERATE OLIVE BROWN 5Y 4/4 CLAY w/ss frags		
6	SS	7.5	9.0	4-5-5	.85					LOOSE MODERATE OLIVE BROWN 5Y 4/4 CLAY w/ss frags and .1 flyash		
7	SS	9.0	10.5	3-2-2	1.0		10			STIFF GRAYISH BLACK N2 FLYASH moist		
8	SS	12.0	13.5	2-2-2	.7					VERY LOOSE GRAYISH BLACK N2 FLYASH wet		
							15					
9	SS	17.0	18.5	3-1-1	1.5					VERY LOOSE GRAYISH BLACK N2 FLYASH saturated		

TYPE OF CASING USED

	NQ-2 ROCK CORE	
X	6" x 3.25 HSA	
	9" x 6.25 HSA	
	HW CASING ADVANCER	4"
	NW CASING	3"
	SW CASING	6"
	AIR HAMMER	8"

Continued Next Page

PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC

WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON

RECORDER

JOB NUMBER

COMPANY **OHIO POWER COMPANY**

PROJECT **POSTON ASH POND**

BORING NO. **B-1302** DATE **8/21/13** SHEET **2** OF **3**

BORING START **7/30/13** BORING FINISH **7/30/13**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET FROM	SAMPLE DEPTH IN FEET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	U S C S	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
10	SS	22.0	23.5	4-4-4	1.5					VERY LOOSE GRAYISH BLACK N2 FLYASH moist		
							25					
11	SS	27.0	28.5	WOR	1.5					VERY LOOSE GRAYISH BLACK N2 FLYASH saturated		
							30					
12	SS	32.0	33.5	WOH	1.5					VERY LOOSE GRAYISH BLACK N2 FLYASH saturated		
							35					
13	SS	37.0	38.5	WOR	1.5					VERY LOOSE GRAYISH BLACK N2 FLYASH saturated		
							40					
14	SS	42.0	43.5	WOR	1.5					VERY LOOSE GRAYISH BLACK N2 FLYASH saturated		
							45					

Continued Next Page

AMERICAN ELECTRIC POWER SERVICE CORPORATION

AEP CIVIL ENGINEERING LABORATORY

LOG OF BORING

JOB NUMBER

COMPANY **OHIO POWER COMPANY**

PROJECT **POSTON ASH POND**

BORING NO. **B-1302** DATE **8/21/13** SHEET **3** OF **3**

BORING START **7/30/13** BORING FINISH **7/30/13**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET FROM	TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	U S C S	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
15	SS	47.0	48.5	WOR	1.5					VERY LOOSE GRAYISH BLACK N2 FLYASH saturated		
							50					
16	SS	52.0	53.5	WOR	1.5					VERY LOOSE GRAYISH BLACK N2 FLYASH w/trace of clay, saturated		
							55					
17	SS	57.0	58.5	12-21-44	1.0					HARD MODERATE OLIVE BROWN 5Y 4/4 CLAY w/ss frags		
										TD = 58.5'		

AMERICAN ELECTRIC POWER SERVICE CORPORATION

AEP CIVIL ENGINEERING LABORATORY

LOG OF BORING

JOB NUMBER

COMPANY **OHIO POWER COMPANY**

PROJECT **POSTON ASH POND**

COORDINATES **N 505,422.2 E 2,058,887.4**

GROUND ELEVATION **772.2** SYSTEM

BORING NO. **B-1303** DATE **8/21/13** SHEET **1** OF **3**

BORING START **7/25/13** BORING FINISH **7/25/13**

PIEZOMETER TYPE **SS** WELL TYPE **OW**

HGT. RISER ABOVE GROUND **2.46** DIA **2**

DEPTH TO TOP OF WELL SCREEN **35.4** BOTTOM **45.0**

WELL DEVELOPMENT **YES** BACKFILL **HOLEPLUG**

FIELD PARTY **ZLR/TAS** RIG **D-120**

Water Level, ft	▽	▼	▼̲
TIME			
DATE			

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET FROM	SAMPLE DEPTH IN FEET TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	U S C S	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
1	SS	0.0	1.5	3-3-3	.7					STIFF DARK YELLOWISH BROWN 10YR 4/2 CLAY dry		
2	SS	1.5	3.0	3-6-10	1.0					HARD DARK YELLOWISH BROWN 10YR 4/2 CLAY dry		
3	SS	3.0	4.5	7-12-14	1.1					HARD DARK YELLOWISH BROWN 10YR 4/2 CLAY w/ss frags, dry		
4	SS	4.5	6.0	7-8-5	.8		5			VERY STIFF DARK YELLOWISH BROWN 10YR 4/2 CLAY w/ss frags, dry		
5	SS	6.0	7.5	2-3-4	.7					STIFF DARK YELLOWISH BROWN 10YR 4/2 CLAY w/ss frags, moist		
6	SS	7.5	9.0	3-2-8	.6							
7	SS	9.0	10.5	26-10-5	1.0		10					
8	SS	10.5	12.0	4-3-4	.9					STIFF GRAYISH BLACK N2 FLYASH moist		
9	SS	12.0	13.5	1-2-3	.9					MEDIUM STIFF GRAYISH BLACK N2 FLYASH moist		
							15					
10	SS	17.0	18.5	WOH	1.8					VERY LOOSE GRAYISH BLACK N2 FLYASH saturated		

Continued Next Page

TYPE OF CASING USED

	NQ-2 ROCK CORE	
X	6" x 3.25 HSA	
	9" x 6.25 HSA	
	HW CASING ADVANCER	4"
	NW CASING	3"
	SW CASING	6"
	AIR HAMMER	8"

PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC

WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON

RECORDER

AMERICAN ELECTRIC POWER SERVICE CORPORATION

AEP CIVIL ENGINEERING LABORATORY

LOG OF BORING

JOB NUMBER ______

COMPANY **OHIO POWER COMPANY** BORING NO. **B-1303** DATE **8/21/13** SHEET **2** OF **3**

PROJECT **POSTON ASH POND** BORING START **7/25/13** BORING FINISH **7/25/13**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET FROM	TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	U S C S	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
11	SS	22.0	23.5	1-1-1	1.5					VERY LOOSE GRAYISH BLACK N2 FLYASH saturated		
							25					
12	SS	27.0	28.5	WOR	1.5					VERY LOOSE GRAYISH BLACK N2 FLYASH saturated		
							30					
13	SS	32.0	33.5	1-1-1	1.5					VERY LOOSE GRAYISH BLACK N2 FLYASH saturated		
							35					
14	SS	37.0	38.5	WOR	1.5					VERY LOOSE GRAYISH BLACK N2 FLYASH saturated		
							40					
15	SS	42.0	43.5	WOR	1.5					VERY LOOSE GRAYISH BLACK N2 FLYASH saturated		
							45					

Continued Next Page

AMERICAN ELECTRIC POWER SERVICE CORPORATION

AEP CIVIL ENGINEERING LABORATORY

LOG OF BORING

JOB NUMBER

COMPANY **OHIO POWER COMPANY**

PROJECT **POSTON ASH POND**

BORING NO. **B-1303** DATE **8/21/13** SHEET **3** OF **3**

BORING START **7/25/13** BORING FINISH **7/25/13**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET FROM	TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	U S C S	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
16	SS	47.0	48.5	4-4-7	1.2					STIFF PALE OLIVE 10Y 6/2 CLAY w/shale frags		
							50					
17	SS	52.0	53.5	7-8-12	1.5					VERY STIFF YELLOWISH BROWN 10YR 4/2 CLAY w/ss frags		
										TD = 53.5'		

AMERICAN ELECTRIC POWER SERVICE CORPORATION

AEP CIVIL ENGINEERING LABORATORY

LOG OF BORING

JOB NUMBER

COMPANY **OHIO POWER COMPANY**

PROJECT **POSTON ASH POND**

COORDINATES

GROUND ELEVATION SYSTEM

BORING NO. **B-1304** DATE **8/21/13** SHEET **1** OF **1**

BORING START **7/31/13** BORING FINISH **7/31/13**

PIEZOMETER TYPE WELL TYPE

HGT. RISER ABOVE GROUND DIA

DEPTH TO TOP OF WELL SCREEN BOTTOM

WELL DEVELOPMENT BACKFILL

FIELD PARTY RIG

Water Level, ft	▽	▼	▼
TIME			
DATE			

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET FROM	TO	STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	U S C S	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
1	SS	1.5	3.0	4-5-6	1.0					STIFF MODERATE YELLOWISH BROWN 10YR 3/4 SANDY CLAY 1.5 tsf		GROUNDING PROCEDURE NOT IN USE / 4 1/4 HSA USED / SAMPLES TO SHOP
							5					
							10					
							15					
2	SS	16.5	18.0	3-7-17	1.4					STIFF MODERATE YELLOWISH BROWN 10YR 3/4 SANDY CLAY 1.0 tsf		

TYPE OF CASING USED

	NQ-2 ROCK CORE	
X	6" x 3.25 HSA	
	9" x 6.25 HSA	
	HW CASING ADVANCER	4"
	NW CASING	3"
	SW CASING	6"
	AIR HAMMER	8"

PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC

WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON

RECORDER

AMERICAN ELECTRIC POWER SERVICE CORPORATION

AEP CIVIL ENGINEERING LABORATORY

MONITORING WELL CONSTRUCTION

JOB NUMBER

COMPANY **OHIO POWER COMPANY**

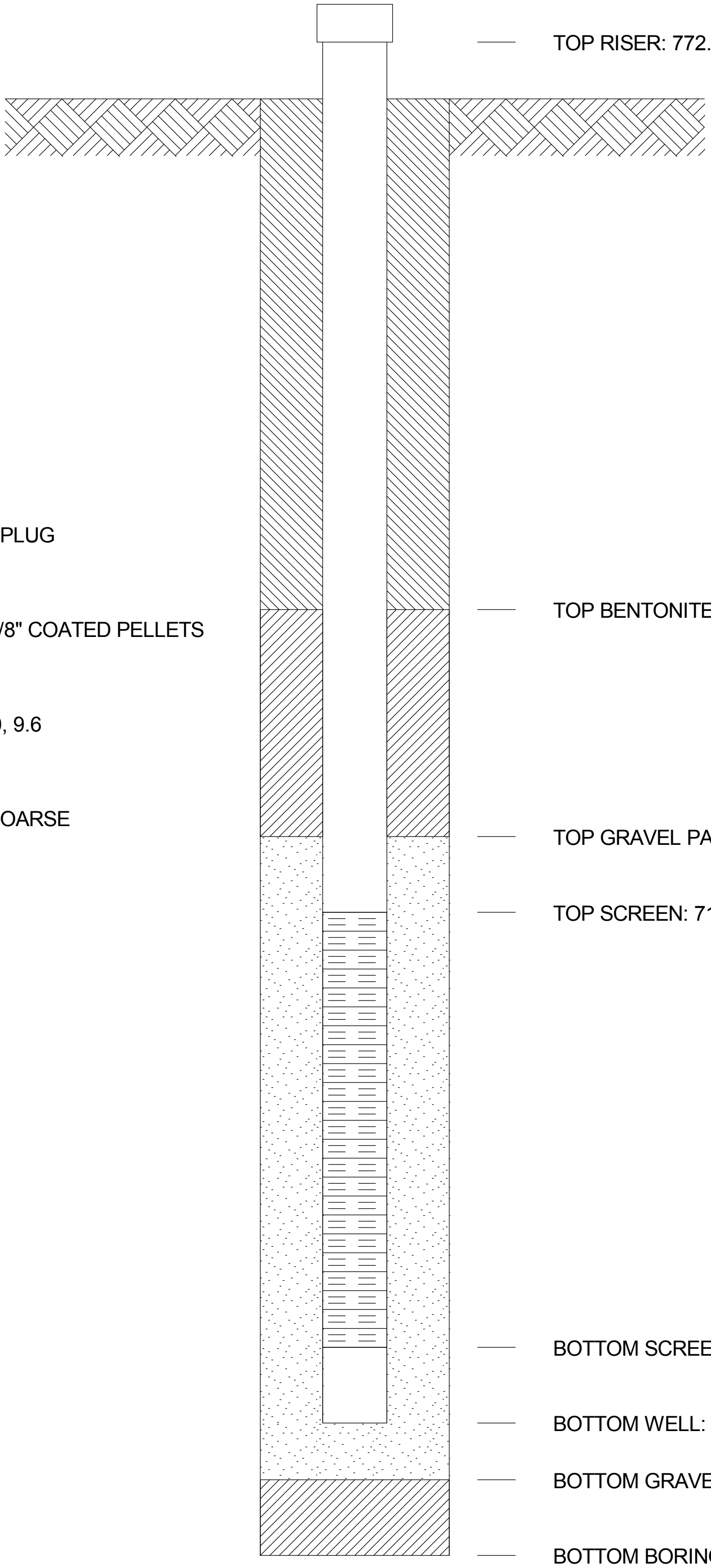
WELL No. **PZ-1301** BORING No. **B-1301** INSTALLED **7/23/13**

PROJECT **POSTON ASH POND**

COORDINATES **N 505,141.7 E 2,059,462.1**

SYSTEM

GROUND ELEVATION 770.41 FT.



TOP RISER: 772.90 FT.

TOP BENTONITE SEAL: 734.41 FT.

TOP GRAVEL PACK: 729.41 FT.

TOP SCREEN: 714.01 FT.

BOTTOM SCREEN: 704.41 FT.

BOTTOM WELL: 703.91 FT.

BOTTOM GRAVEL PACK: 702.91 FT.

BOTTOM BORING: 697.41 FT.

▧	GROUT SEAL: 300 LBS HOLEPLUG
▨	BENTONITE SEAL: 100 LBS 3/8" COATED PELLETS
☰	SCREEN: 2.0 dia., SLOT 0.020, 9.6
⁘	GRAVEL PACK: 850 LBS #5 COARSE
☐	RISER PIPE: 2.0, dia., PVC
∿	SPACERS, DEPTH: N/A

GEOMCNST POSTON ASH POND.GPJ AEP.GDT 8/21/13

AMERICAN ELECTRIC POWER SERVICE CORPORATION

AEP CIVIL ENGINEERING LABORATORY

MONITORING WELL CONSTRUCTION

JOB NUMBER

COMPANY **OHIO POWER COMPANY**

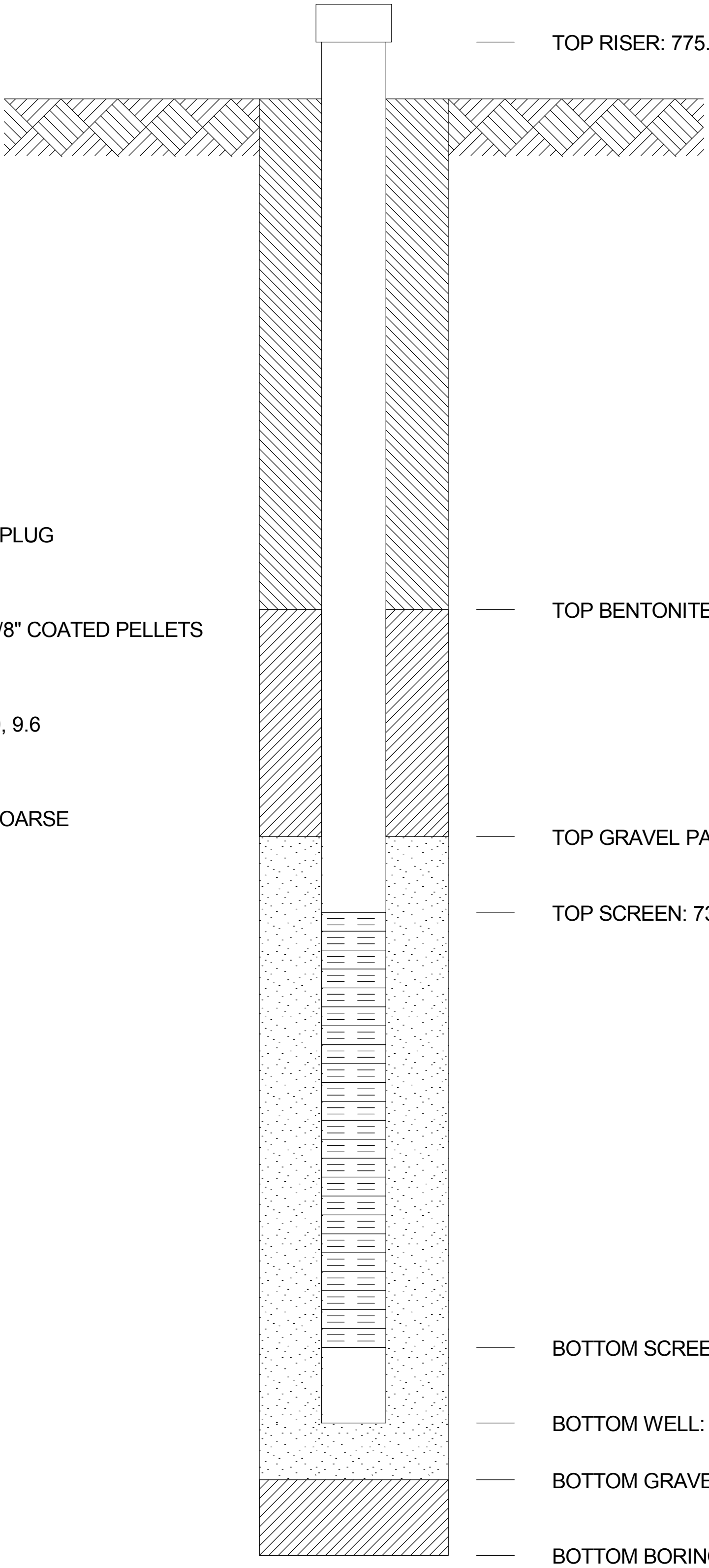
WELL No. **PZ-1302** BORING No. **B-1302** INSTALLED **7/30/13**

PROJECT **POSTON ASH POND**

COORDINATES **N 505,221.0 E 2,059,143.0**

SYSTEM

GROUND ELEVATION 772.95 FT.



▧ GROUT SEAL: 200 LBS HOLEPLUG

▨ BENTONITE SEAL: 100 LBS 3/8" COATED PELLETS

☰ SCREEN: 2.0 dia., SLOT 0.020, 9.6

░ GRAVEL PACK: 900 LBS #5 COARSE

□ RISER PIPE: 2.0, dia., PVC

∿ SPACERS, DEPTH: N/A

AMERICAN ELECTRIC POWER SERVICE CORPORATION

AEP CIVIL ENGINEERING LABORATORY

MONITORING WELL CONSTRUCTION

JOB NUMBER

COMPANY **OHIO POWER COMPANY**

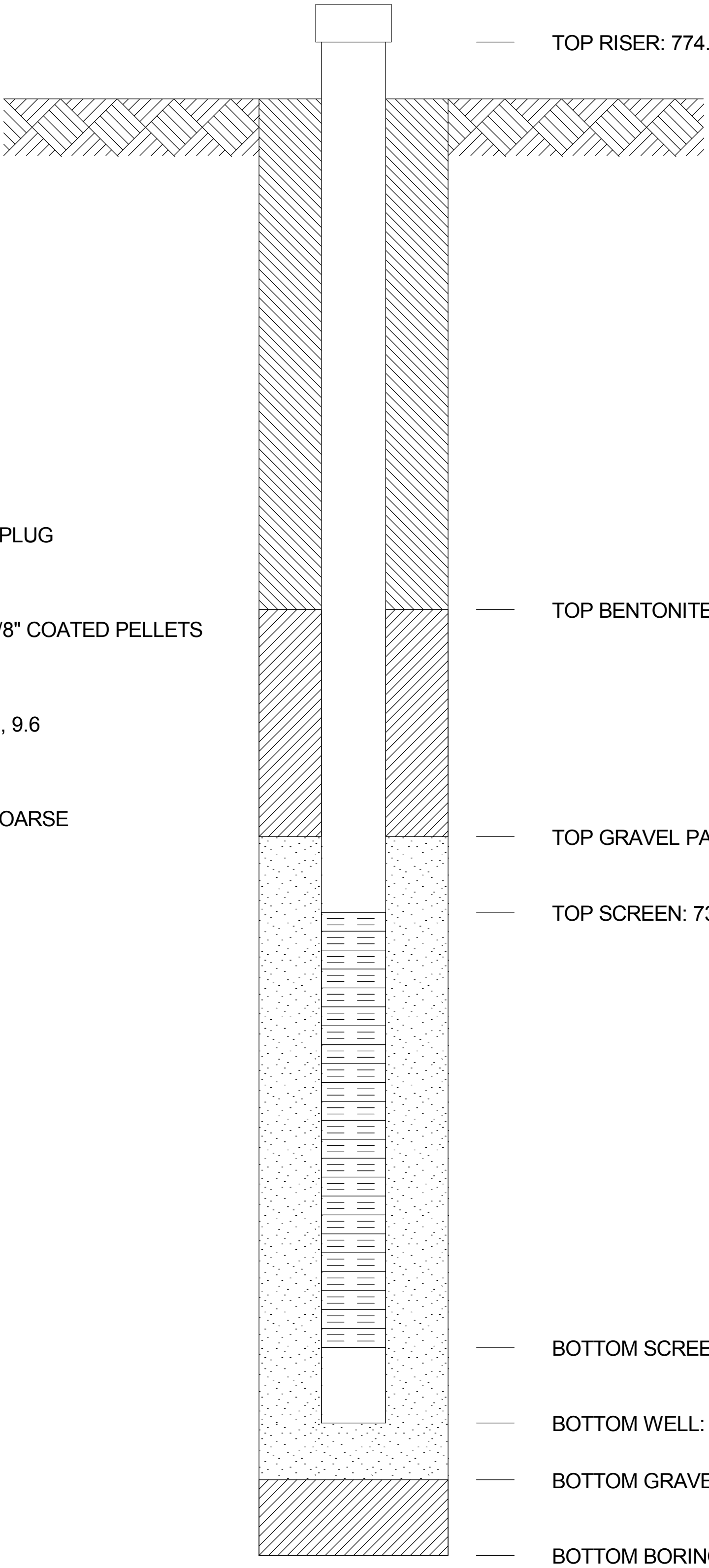
WELL No. **PZ-1303** BORING No. **B-1303** INSTALLED **7/25/13**

PROJECT **POSTON ASH POND**

COORDINATES **N 505,422.2 E 2,058,887.4**

SYSTEM

GROUND ELEVATION 772.17 FT.



TOP RISER: 774.63 FT.

TOP BENTONITE SEAL: 758.17 FT.

TOP GRAVEL PACK: 752.17 FT.

TOP SCREEN: 736.77 FT.

BOTTOM SCREEN: 727.17 FT.

BOTTOM WELL: 726.67 FT.

BOTTOM GRAVEL PACK: 725.67 FT.

BOTTOM BORING: 718.67 FT.

- ▧ GROUT SEAL: 150 LBS HOLEPLUG
- ▨ BENTONITE SEAL: 100 LBS 3/8" COATED PELLETS
- ☰ SCREEN: 2.0 dia., SLOT 0.020, 9.6
- ░ GRAVEL PACK: 950 LBS #5 COARSE
- ☐ RISER PIPE: 2.0, dia., PVC
- ∿ SPACERS, DEPTH: N/A

GEOMCNST POSTON ASH POND.GPJ AEP.GDT 8/21/13

TABLE 2

Poston ash pond summary
Based on 1986 topography; 1988 as-built closure topography; 2013 borings.

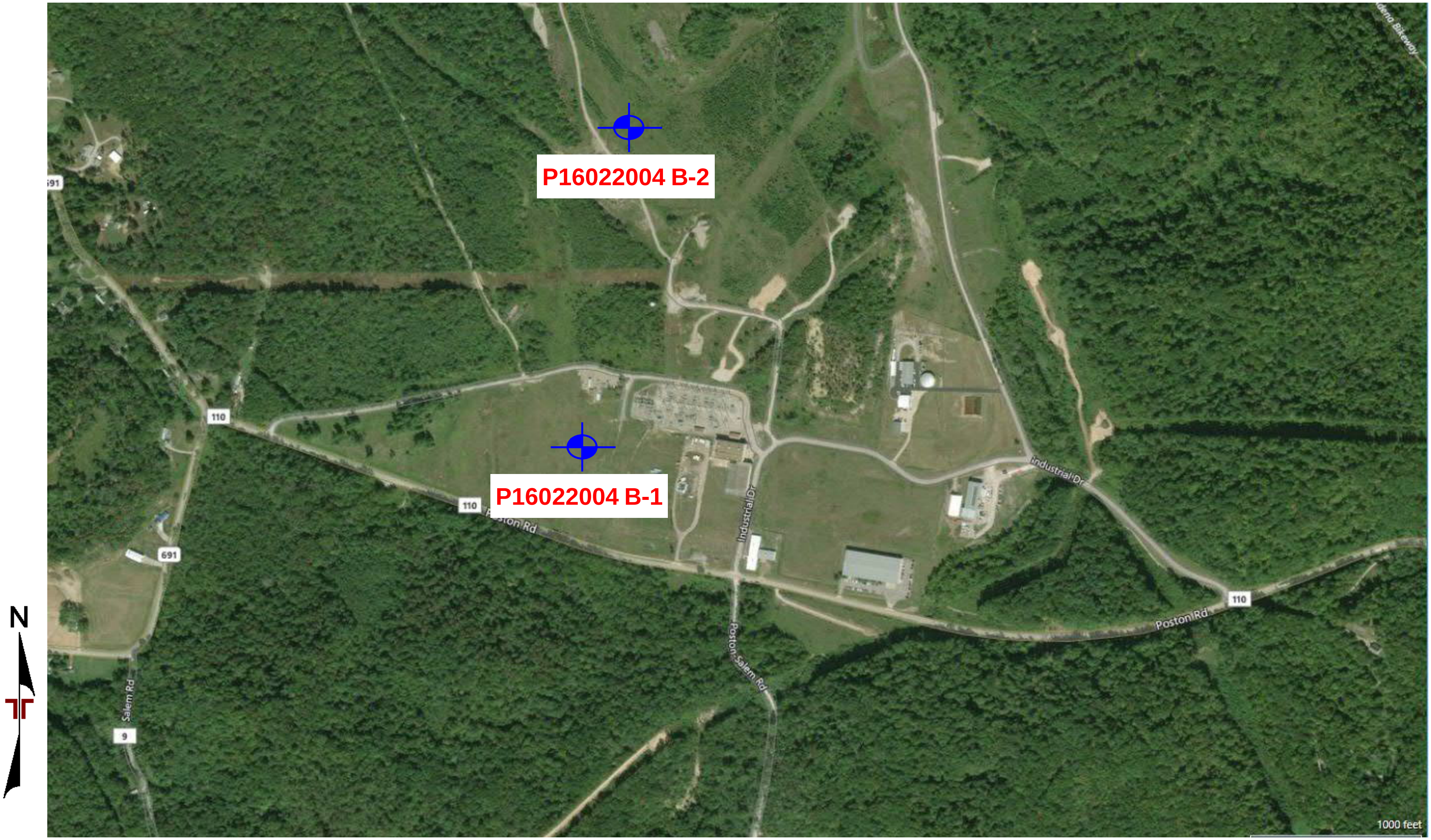
Boring	initial ash elev	final cap elev	Cap/subgrade depth from boring	Depth from topo	
1301	768.2	770.4	4.6	2.2	
1302	763	773	8.9	10	near old splitter dike
1303	764.2	772.2	10.5	8	

		aug		sep		oct	
Piez	t/pipe	depth	WSEL	depth	WSEL	depth	WSEL
1301	772.9	15.9	757	16.05	756.85	16.20	756.7
1302	775.34	17.43	757.91	18.1	757.24	18.13	757.21
1303	774.63	13.15	761.48	13.05	761.58	13.50	761.13

Appendix II (B):

Transmittal Letter Report – Geotechnical Engineering Services (Terracon, Sept. 2017)

- Boring Location Plans
- Boring Logs (borings performed within ash pond only)
- Laboratory Test Data



⊕ **APPROXIMATE BORING LOCATION**

DIAGRAM IS FOR GENERAL LOCATION
ONLY, AND IS NOT INTENDED FOR
CONSTRUCTION PURPOSES

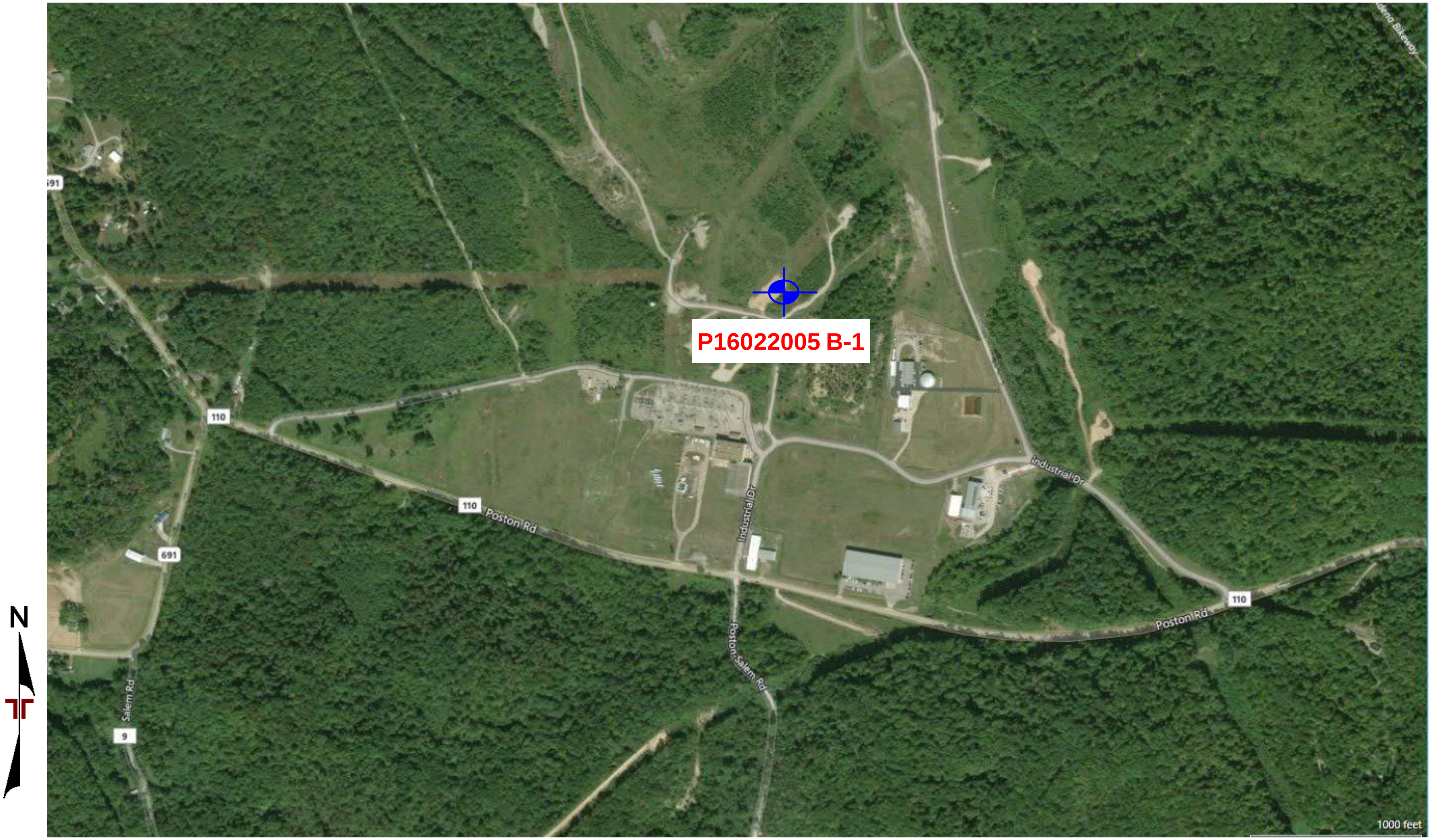
Project Manager: NZ	Project No. N4175119
Drawn by: NZ	Scale: N.T.S.
Checked by: KME	File Name: N4175119 BLP
Approved by: KME	Date: Sept. 2017

Terracon
Consulting Engineers & Scientists
800 Morrison Road Columbus, Ohio 43230
PH. (614) 863-3113 FAX. (614) 863-0475

BORING LOCATION PLAN

AEP Poston 138kV T-Line Project
Various Locations
Athens County, Ohio

Exhibit
A-5



APPROXIMATE BORING LOCATION

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Manager: NZ	Project No. N4175119
Drawn by: NZ	Scale: N.T.S.
Checked by: KME	File Name: N4175119 BLP
Approved by: KME	Date: Sept. 2017

Terracon
Consulting Engineers & Scientists
800 Morrison Road Columbus, Ohio 43230
PH. (614) 863-3113 FAX. (614) 863-0475

BORING LOCATION PLAN

AEP Poston 138kV T-Line Project
Various Locations
Athens County, Ohio

Exhibit
A-6

BORING LOG NO. B-2

PROJECT: AEP Poston-West Lancaster 138 kV Line (P16022004)

CLIENT: Transmission Partners
Lenexa, KS

SITE: 5850 Industrial Drive
Athens, Ohio

GRAPHIC LOG	LOCATION See latitude and longitude below Latitude: 39.387035° Longitude: -82.180556° Approximate Surface Elev: 774 (Ft.) +/- DEPTH / ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	RQD (%)	LABORATORY HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
	0.2 **TOPSOIL (2")** 774+/- **LEAN CLAY WITH SAND (CL)**, trace gravel, trace organics, brown, medium stiff, moist			☒	12	2-3-3 N=6		3.0 (HP)		31	
	3.0 771+/-			☒	8	2-3-5 N=8		2.25 (HP)		25	
	SANDY SILTY CLAY (CL-ML), trace gravel, brown to black, very stiff, moist 4.5 769.5+/-			☒	14	8-7-12 N=19		2.5 (HP)		18	25-20-5
	SILT WITH SAND (ML), trace gravel, black, medium dense, moist	5		☒	16	5-12-17 N=29		-			
				☒	16	5-7-9 N=16		-			
	9.0 765+/-			☒	16	5-5-6 N=11		-			
	SILT (ML), trace sand, trace gravel, black, loose to very loose, moist to wet	10		☒	16	1-3-3 N=6		-			
			▽								
				☒	18	1-2-1 N=3		-			
		15		☒	18	0-0-1 N=1		-			NP
		20		☒	18	0-0-0 N=0		-			
		25		☒	18	0-0-0 N=0		-			

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" Hollow Stem Auger

Abandonment Method:
Boring backfilled with cement-bentonite grout upon completion.

See Exhibit A-8 for description of field procedures

See Appendix B for description of laboratory procedures and additional data (if any).

See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Water encountered @ 11 feet while sampling*

Terracon
800 Morrison Rd
Gahanna, OH

Boring Started: 08-31-2017	Boring Completed: 08-31-2017
Drill Rig: CME55	Driller: C. Knisley
Project No.: N4175119	Exhibit: A-15

BORING LOG NO. B-2

PROJECT: AEP Poston-West Lancaster 138 kV Line (P16022004)

CLIENT: Transmission Partners
Lenexa, KS

SITE: 5850 Industrial Drive
Athens, Ohio

GRAPHIC LOG	LOCATION See latitude and longitude below Latitude: 39.387035° Longitude: -82.180556° Approximate Surface Elev: 774 (Ft.) +/- DEPTH ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	RQD (%)	LABORATORY HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
	SILT (ML), trace sand, trace gravel, black, loose to very loose, moist to wet *(continued)*										
		30		☒	18	0-0-0 N=0		-			
		35		☒	18	0-0-0 N=0		-			
		40		☒	18	0-0-0 N=0		-			NP
		45		☒	18	0-0-0 N=0		-			
		50		☒	18	0-0-0 N=0					

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" Hollow Stem Auger

Abandonment Method:
Boring backfilled with cement-bentonite grout upon completion.

See Exhibit A-8 for description of field procedures

See Appendix B for description of laboratory procedures and additional data (if any).

See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Water encountered @ 11 feet while sampling*

Terracon
800 Morrison Rd
Gahanna, OH

Boring Started: 08-31-2017	Boring Completed: 08-31-2017
Drill Rig: CME55	Driller: C. Knisley
Project No.: N4175119	Exhibit: A-15

BORING LOG NO. B-2

PROJECT: AEP Poston-West Lancaster 138 kV Line (P16022004)	**CLIENT:** Transmission Partners Lenexa, KS
SITE: 5850 Industrial Drive Athens, Ohio	

LOCATION See latitude and longitude below

Latitude: 39.387035° Longitude: -82.180556°

Approximate Surface Elev: 774 (Ft.) +/-

GRAPHIC LOG	DEPTH / ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	RQD (%)	LABORATORY HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
	SILT (ML), trace sand, trace gravel, black, loose to very loose, moist to wet *(continued)*										
	53.5 — 720.5+/-										
	SHALE, very severely weathered, very soft, gray			☒	5	50/5"		-			
		55									
				☒	3	50/3"		-			
	60.0 — 714+/-	60									
	Boring Terminated at 60 Feet										

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method: 3.25" Hollow Stem Auger	See Exhibit A-8 for description of field procedures See Appendix B for description of laboratory procedures and additional data (if any). See Appendix C for explanation of symbols and abbreviations.	Notes:
Abandonment Method: Boring backfilled with cement-bentonite grout upon completion.		

WATER LEVEL OBSERVATIONS

▽ *Water encountered @ 11 feet while sampling*

Terracon
800 Morrison Rd
Gahanna, OH

Boring Started: 08-31-2017	Boring Completed: 08-31-2017
Drill Rig: CME55	Driller: C. Knisley
Project No.: N4175119	Exhibit: A-15

BORING LOG NO. B-1

PROJECT: AEP Poston-Strouds Run 138 kV Line (P16022005)

CLIENT: Transmission Partners
Lenexa, KS

SITE: 5850 Industrial Drive
Athens, Ohio

LOCATION See latitude and longitude below

Latitude: 39.384503° Longitude: -82.177481°

Approximate Surface Elev: 770 (Ft.) +/-

DEPTH		ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	RQD (%)	LABORATORY HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
0.3	**TOPSOIL (3.5")** **SANDY LEAN CLAY (CL)**, trace gravel, brown, stiff, moist	769.5+/-			☒	12	3-5-6 N=11		4.5+ (HP)		11	
					☒	10	3-5-7 N=12		4.5+ (HP)		12	
4.5		765.5+/-			☒	10	4-5-7 N=12		4.5+ (HP)		16	36-18-18
	SILTY SAND (SM), trace gravel, black, medium dense, moist		5		☒	18	7-11-16 N=27		-			
					☒	18	9-9-6 N=15		-			NP
9.0		761+/-			☒	16	4-5-6 N=11		-			
	SILTY SAND WITH GRAVEL (SM), black, loose, moist to wet		10		☒	14	4-3-3 N=6		-			
				▽								
			15		☒	11	3-5-4 N=9		-			NP
			20		☒	10	3-4-4 N=8		-			
				▼								
25.0		745+/-			☒	16	13-40-50/3"		-			
			25		▮	48						

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" Hollow Stem Augers

Abandonment Method:
Boring backfilled with cement-bentonite grout upon completion.

See Exhibit A-8 for description of field procedures

See Appendix B for description of laboratory procedures and additional data (if any).

See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Water encountered @ 13.5 feet while sampling*

▼ *Water level inside auger at completion is 22.5 feet*

Terracon
800 Morrison Rd
Gahanna, OH

Boring Started: 09-01-2017	Boring Completed: 09-01-2017
Drill Rig: D-90	Driller: P. Tuttle
Project No.: N4175119	Exhibit: A-16

BORING LOG NO. B-1

PROJECT: AEP Poston-Strouds Run 138 kV Line (P16022005)

CLIENT: Transmission Partners
Lenexa, KS

SITE: 5850 Industrial Drive
Athens, Ohio

LOCATION See latitude and longitude below

Latitude: 39.384503° Longitude: -82.177481°

Approximate Surface Elev: 770 (Ft.) +/-

GRAPHIC LOG	DEPTH / ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	RQD (%)	LABORATORY HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
× × ×	**SILTSTONE**, severely weathered, soft, close joint spacing, thin bedded, poor RQD, slightly open joints, brown, interebedded with sandstone *(continued)*				48		25				
	31.2 / 739+/-	30									
· · ·	**SANDSTONE**, slightly weathered, hard, close joint spacing, thin bedded, fair RQD, tight to slightly open joints, gray				69		54		315.94	0	
	35.0 / 735+/-	35									
	Boring Terminated at 35 Feet										

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" Hollow Stem Augers

Abandonment Method:
Boring backfilled with cement-bentonite grout upon completion.

See Exhibit A-8 for description of field procedures

See Appendix B for description of laboratory procedures and additional data (if any).

See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Water encountered @ 13.5 feet while sampling*

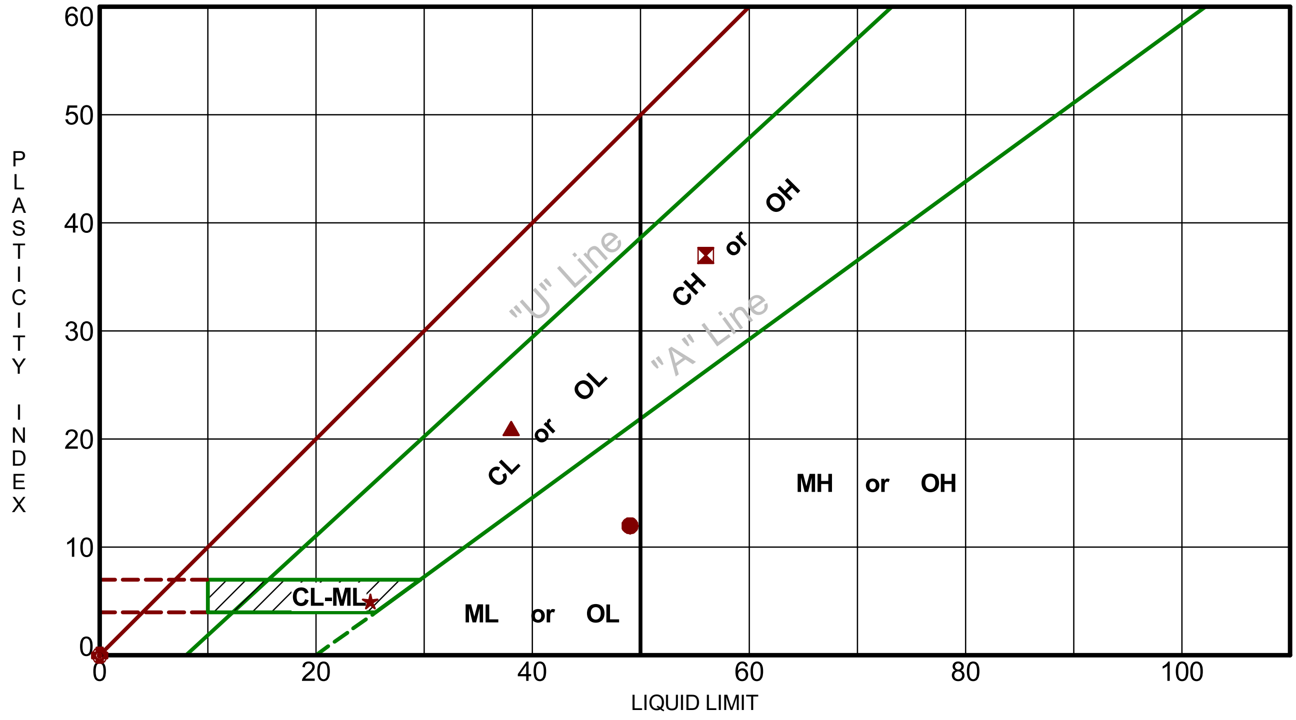
▼ *Water level inside auger at completion is 22.5 feet*

Terracon
800 Morrison Rd
Gahanna, OH

Boring Started: 09-01-2017	Boring Completed: 09-01-2017
Drill Rig: D-90	Driller: P. Tuttle
Project No.: N4175119	Exhibit: A-16

ATTERBERG LIMITS RESULTS

ASTM D4318



	Boring ID	Depth	LL	PL	PI	Fines	USCS	Description
●	**B-1**	**3 - 4.5**	**49**	**37**	**12**	**86**	**ML**	**SILT**
☒	**B-1**	**9 - 10.5**	**56**	**19**	**37**	**85**	**CH**	**FAT CLAY**
▲	**B-1**	**18.5 - 20**	**38**	**17**	**21**	**97**	**CL**	**LEAN CLAY**
★	**B-2**	**3 - 4.5**	**25**	**20**	**5**	**62**	**CL-ML**	**SANDY SILTY CLAY**
⊙	**B-2**	**13.5 - 15**	**NP**	**NP**	**NP**	**96**	**ML**	**SILT**
✿	**B-2**	**38.5 - 40**	**NP**	**NP**	**NP**	**98**	**ML**	**SILT**

PROJECT: AEP Poston-West Lancaster 138 kV
Line (P16022004)

SITE: 5850 Industrial Drive
Athens, Ohio

Terracon
800 Morrison Rd
Gahanna, OH

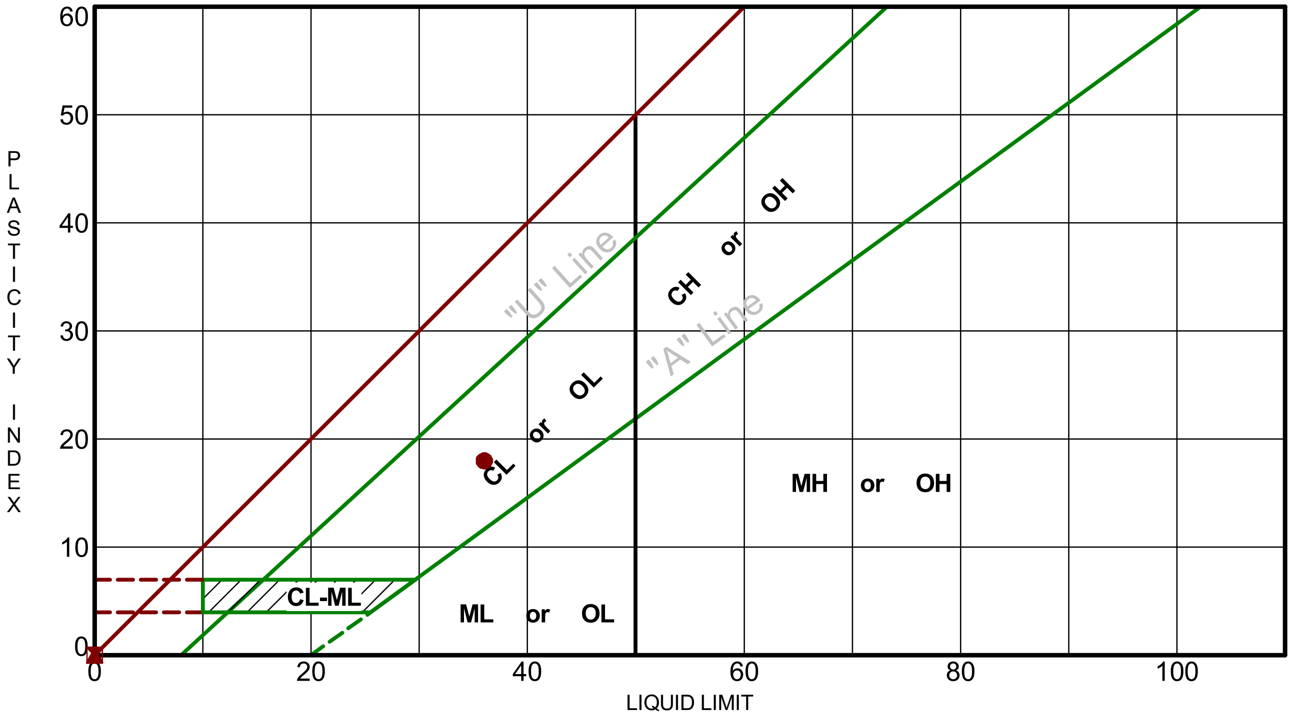
PROJECT NUMBER: N4175119

CLIENT: Transmission Partners
Lenexa, KS

EXHIBIT: B-5

ATTERBERG LIMITS RESULTS

ASTM D4318



Boring ID		Depth	LL	PL	PI	Fines	USCS	Description
●	**B-1**	**3 - 4.5**	**36**	**18**	**18**	**63**	**CL**	**SANDY LEAN CLAY**
☒	**B-1**	**6 - 7.5**	**NP**	**NP**	**NP**	**33**	**SM**	**SILTY SAND**
▲	**B-1**	**13.5 - 15**	**NP**	**NP**	**NP**	**29**	**SM**	**SILTY SAND with GRAVEL**

PROJECT: AEP Poston-Strouds Run 138 kV
Line (P16022005)

SITE: 5850 Industrial Drive
Athens, Ohio

Terracon
800 Morrison Rd
Gahanna, OH

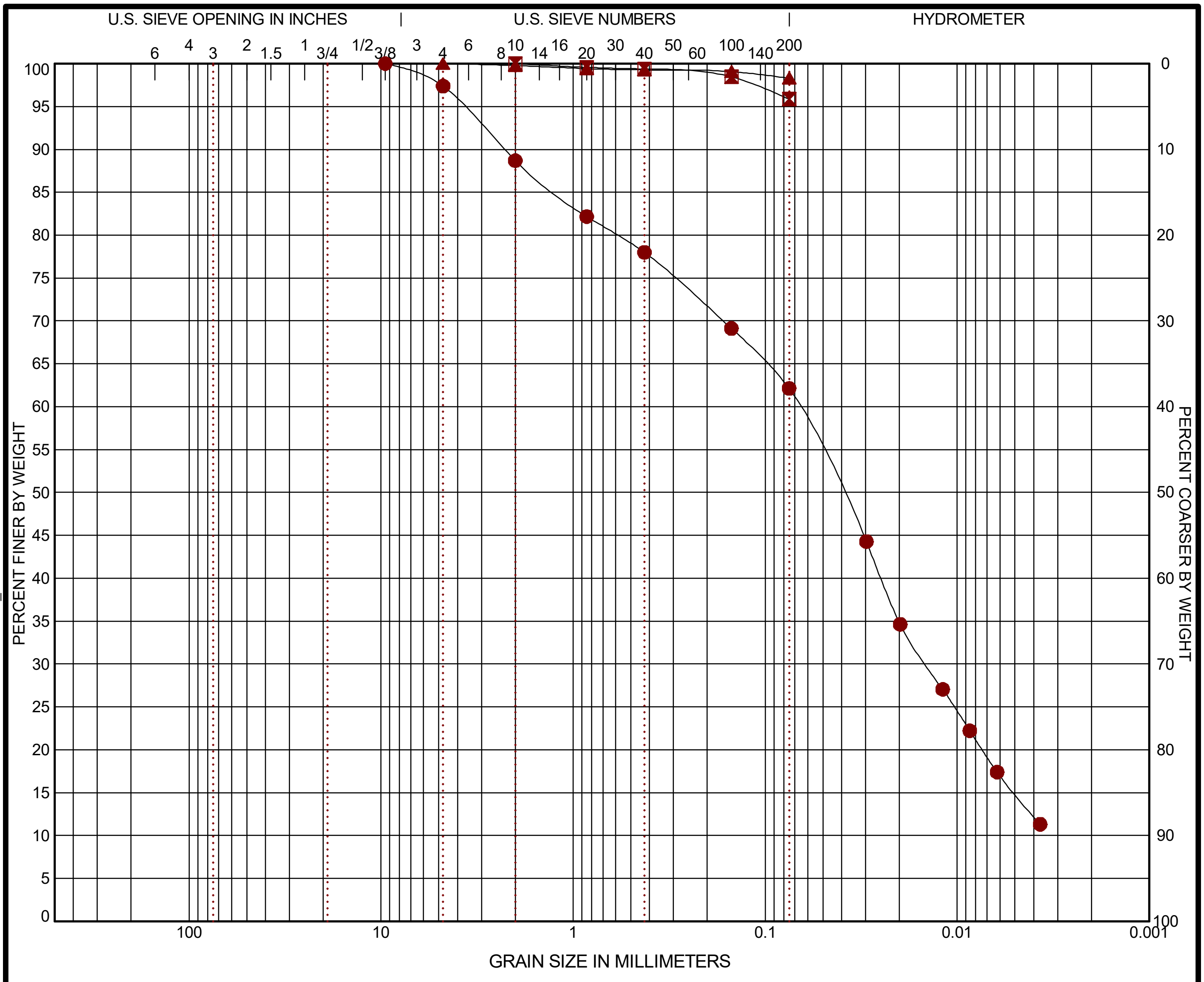
PROJECT NUMBER: N4175119

CLIENT: Transmission Partners
Lenexa, KS

EXHIBIT: B-6

GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING ID	DEPTH	% COBBLES	% GRAVEL	% SAND	% SILT	% FINES	% CLAY	USCS
●	**B-2**	**3 - 4.5**	**0.0**	**2.6**	**35.2**	**47.3**		**14.9**	**CL-ML**
☒	**B-2**	**13.5 - 15**	**0.0**	**0.0**	**4.1**		**95.9**		**ML**
▲	**B-2**	**38.5 - 40**	**0.0**	**0.0**	**1.7**		**98.3**		**ML**

	GRAIN SIZE		
	●	☒	▲
D_{60}	**0.067**		
D_{30}	**0.015**		
D_{10}			
	COEFFICIENTS		
C_C			
C_U			

●		☒		▲	
Sieve	% Finer	Sieve	% Finer	Sieve	% Finer
3/8" **#4** **#10** **#20** **#40** **#100** **#200**	**100.0** **97.38** **88.69** **82.17** **78.0** **69.13** **62.14**	**#10** **#20** **#40** **#100** **#200**	**100.0** **99.57** **99.38** **98.47** **95.87**	**#4** **#10** **#20** **#40** **#100** **#200**	**100.0** **99.78** **99.41** **99.27** **99.07** **98.3**

SOIL DESCRIPTION
- ● SANDY SILTY CLAY (CL-ML)
- ☒ SILT (ML)
- ▲ SILT (ML)

REMARKS
- ●
- ☒
- ▲

PROJECT: AEP Poston-West Lancaster 138 kV Line (P16022004)

SITE: 5850 Industrial Drive
Athens, Ohio

Terracon
800 Morrison Rd
Gahanna, OH

PROJECT NUMBER: N4175119

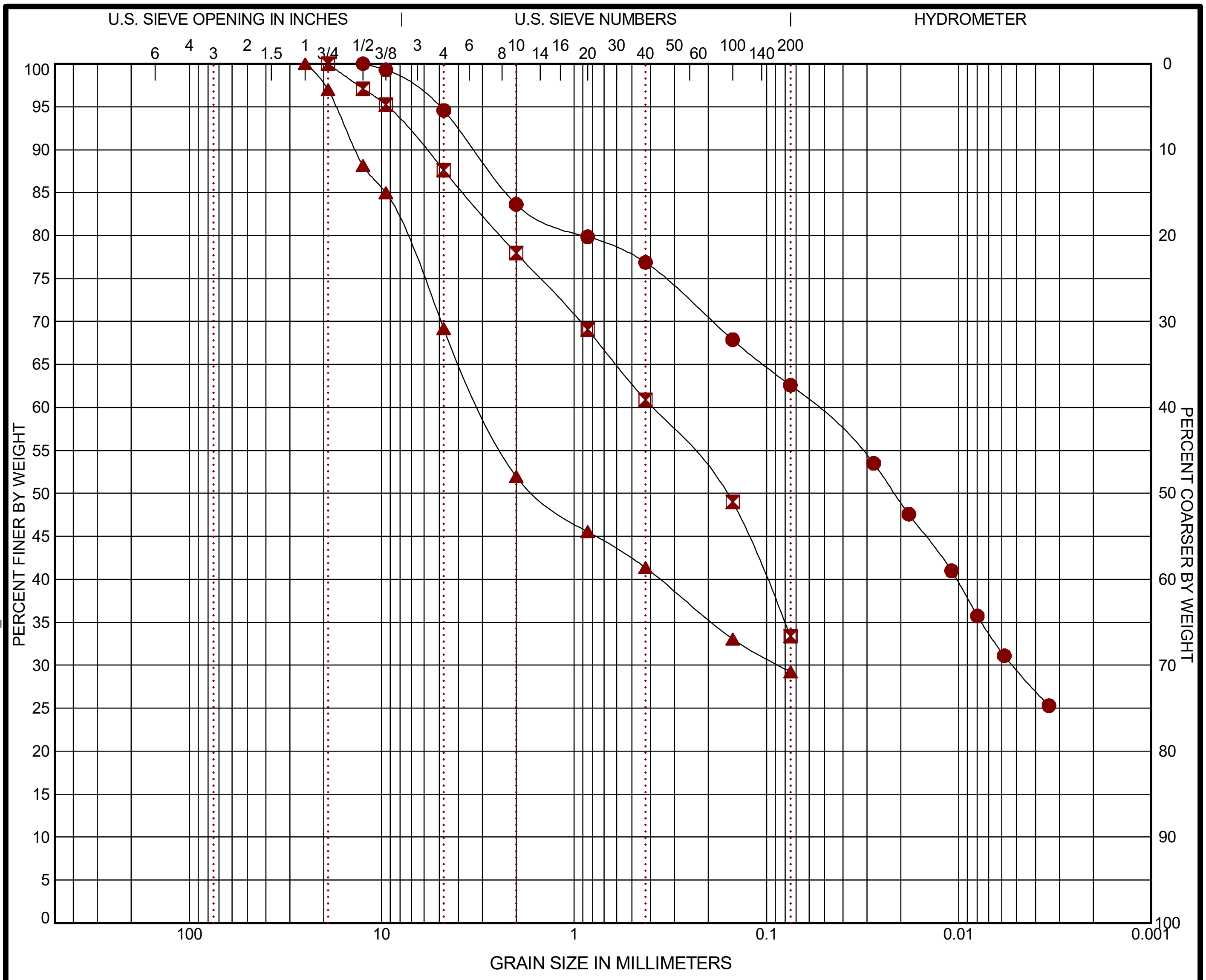
CLIENT: Transmission Partners
Lenexa, KS

EXHIBIT: B-13

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS 1 N4175119 POSTON-WEST LANCASTER.GPJ TERRACON_DATATEMPLATE.GDT 9/19/17

GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING ID	DEPTH	% COBBLES	% GRAVEL	% SAND	% SILT	% FINES	% CLAY	USCS
●	**B-1**	**3 - 4.5**	**0.0**	**5.4**	**32.0**	**33.1**		**29.5**	**CL**
☒	**B-1**	**6 - 7.5**	**0.0**	**12.4**	**54.2**		**33.4**		**SM**
▲	**B-1**	**13.5 - 15**	**0.0**	**30.8**	**39.9**		**29.3**		**SM**

	GRAIN SIZE		
	●	☒	▲
D_{60}	**0.056**	**0.393**	**2.996**
D_{30}	**0.005**		**0.086**
D_{10}			
	COEFFICIENTS		
C_C			
C_U			

●		☒		▲	
Sieve	% Finer	Sieve	% Finer	Sieve	% Finer
1/2"	**100.0**	**3/4"**	**100.0**	**1"**	**100.0**
3/8"	**99.28**	**1/2"**	**97.11**	**3/4"**	**96.98**
#4	**94.57**	**3/8"**	**95.22**	**1/2"**	**88.15**
#10	**83.63**	**#4**	**87.62**	**3/8"**	**85.01**
#20	**79.86**	**#10**	**77.96**	**#4**	**69.17**
#40	**76.88**	**#20**	**69.07**	**#10**	**51.96**
#100	**67.89**	**#40**	**60.88**	**#20**	**45.54**
#200	**62.59**	**#100**	**49.04**	**#40**	**41.35**
		#200	**33.39**	**#100**	**33.07**
				#200	**29.26**

SOIL DESCRIPTION
- ● SANDY LEAN CLAY (CL)
- ☒ SILTY SAND (SM)
- ▲ SILTY SAND with GRAVEL (SM)

REMARKS
- ●
- ☒
- ▲

PROJECT: AEP Poston-Strouds Run 138 kV
Line (P16022005)

SITE: 5850 Industrial Drive
Athens, Ohio

Terracon
800 Morrison Rd
Gahanna, OH

PROJECT NUMBER: N4175119

CLIENT: Transmission Partners
Lenexa, KS

EXHIBIT: B-14

GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

SAMPLING

▯ Auger	■ Shelby Tube	⊠ Split Spoon
▮ Rock Core	▮ Macro Core	⧗ Modified California Ring Sampler
✋ Grab Sample	⧄ No Recovery	⧗ Modified Dames & Moore Ring Sampler

WATER LEVEL

- ▽ Water Initially Encountered
- ▽ Water Level After a Specified Period of Time
- ▼ Water Level After a Specified Period of Time

Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.

FIELD TESTS

(HP)	Hand Penetrometer
(T)	Torvane
(b/f)	Standard Penetration Test (blows per foot)
N	N value
(PID)	Photo-Ionization Detector
(OVA)	Organic Vapor Analyzer

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification is based on the Unified Soil Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

LOCATION AND ELEVATION NOTES

Unless otherwise noted, Latitude and Longitude are approximately determined using a hand-held GPS device. The accuracy of such devices is variable. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

STRENGTH TERMS

RELATIVE DENSITY OF COARSE-GRAINED SOILS (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance Includes gravels, sands and silts.			**CONSISTENCY OF FINE-GRAINED SOILS** (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance			
Descriptive Term (Density)	**Standard Penetration or N-Value Blows/Ft.**	**Ring Sampler Blows/Ft.**	**Descriptive Term (Consistency)**	**Unconfined Compressive Strength, Qu, tsf**	**Standard Penetration or N-Value Blows/Ft.**	**Ring Sampler Blows/Ft.**
Very Loose	0 - 3	0 - 6	Very Soft	less than 0.25	0 - 1	< 3
Loose	4 - 9	7 - 18	Soft	0.25 to 0.50	2 - 4	3 - 4
Medium Dense	10 - 29	19 - 58	Medium-Stiff	0.50 to 1.00	4 - 8	5 - 9
Dense	30 - 50	59 - 98	Stiff	1.00 to 2.00	8 - 15	10 - 18
Very Dense	> 50	≥ 99	Very Stiff	2.00 to 4.00	15 - 30	19 - 42
			Hard	> 4.00	> 30	> 42

RELATIVE PROPORTIONS OF SAND AND GRAVEL

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 15
With	15 - 29
Modifier	> 30

GRAIN SIZE TERMINOLOGY

Major Component of Sample	Particle Size
Boulders	Over 12 in. (300 mm)
Cobbles	12 in. to 3 in. (300mm to 75mm)
Gravel	3 in. to #4 sieve (75mm to 4.75 mm)
Sand	#4 to #200 sieve (4.75mm to 0.075mm
Silt or Clay	Passing #200 sieve (0.075mm)

RELATIVE PROPORTIONS OF FINES

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 5
With	5 - 12
Modifier	> 12

PLASTICITY DESCRIPTION

Term	Plasticity Index
Non-plastic	0
Low	1 - 10
Medium	11 - 30
High	> 30

Terracon

Exhibit C-1

UNIFIED SOIL CLASSIFICATION SYSTEM

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]					Soil Classification	
					Group Symbol	Group Name [B]
Coarse Grained Soils: More than 50% retained on No. 200 sieve	**Gravels:** More than 50% of coarse fraction retained on No. 4 sieve	**Clean Gravels:** Less than 5% fines [C]	$Cu \geq 4$ and $1 \leq Cc \leq 3$ [E]		GW	Well-graded gravel [F]
			$Cu < 4$ and/or $1 > Cc > 3$ [E]		GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH		GM	Silty gravel [F,G,H]
			Fines classify as CL or CH		GC	Clayey gravel [F,G,H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	**Clean Sands:** Less than 5% fines [D]	$Cu \geq 6$ and $1 \leq Cc \leq 3$ [E]		SW	Well-graded sand [I]
			$Cu < 6$ and/or $1 > Cc > 3$ [E]		SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH		SM	Silty sand [G,H,I]
			Fines classify as CL or CH		SC	Clayey sand [G,H,I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	**Silts and Clays:** Liquid limit less than 50	**Inorganic:**	$PI > 7$ and plots on or above "A" line [J]		CL	Lean clay [K,L,M]
			$PI < 4$ or plots below "A" line [J]		ML	Silt [K,L,M]
		Organic:	Liquid limit - oven dried	< 0.75	OL	Organic clay [K,L,M,N]
			Liquid limit - not dried			Organic silt [K,L,M,O]
	Silts and Clays: Liquid limit 50 or more	**Inorganic:**	PI plots on or above "A" line		CH	Fat clay [K,L,M]
			PI plots below "A" line		MH	Elastic Silt [K,L,M]
		Organic:	Liquid limit - oven dried	< 0.75	OH	Organic clay [K,L,M,P]
			Liquid limit - not dried			Organic silt [K,L,M,Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor				PT	Peat

[A] Based on the material passing the 3-inch (75-mm) sieve

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay

[E] $Cu = D_{60}/D_{10} \qquad Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥ 15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.

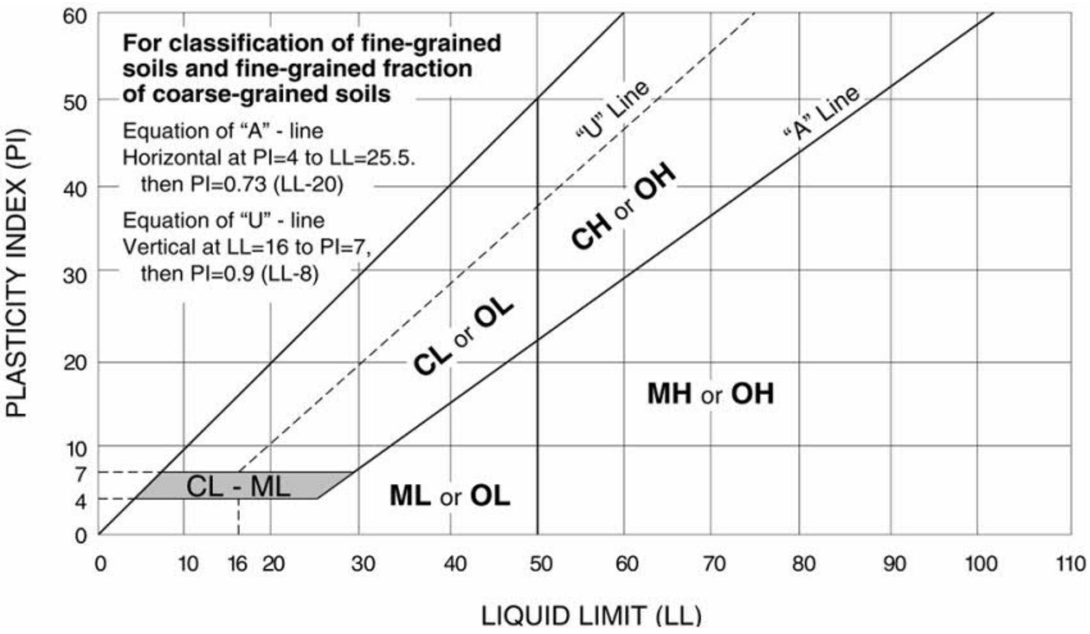
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] $PI \geq 4$ and plots on or above "A" line.

[O] $PI < 4$ or plots below "A" line.

[P] PI plots on or above "A" line.

[Q] PI plots below "A" line.



Terracon

Exhibit C-2

DESCRIPTION OF ROCK PROPERTIES

WEATHERING

Fresh	Rock fresh, crystals bright, few joints may show slight staining. Rock rings under hammer if crystalline.
Very slight	Rock generally fresh, joints stained, some joints may show thin clay coatings, crystals in broken face show bright. Rock rings under hammer if crystalline.
Slight	Rock generally fresh, joints stained, and discoloration extends into rock up to 1 in. Joints may contain clay. In granitoid rocks some occasional feldspar crystals are dull and discolored. Crystalline rocks ring under hammer.
Moderate	Significant portions of rock show discoloration and weathering effects. In granitoid rocks, most feldspars are dull and discolored; some show clayey. Rock has dull sound under hammer and shows significant loss of strength as compared with fresh rock.
Moderately severe	All rock except quartz discolored or stained. In granitoid rocks, all feldspars dull and discolored and majority show kaolinization. Rock shows severe loss of strength and can be excavated with geologist's pick.
Severe	All rock except quartz discolored or stained. Rock "fabric" clear and evident, but reduced in strength to strong soil. In granitoid rocks, all feldspars kaolinized to some extent. Some fragments of strong rock usually left.
Very severe	All rock except quartz discolored or stained. Rock "fabric" discernible, but mass effectively reduced to "soil" with only fragments of strong rock remaining.
Complete	Rock reduced to "soil". Rock "fabric" not discernible or discernible only in small, scattered locations. Quartz may be present as dikes or stringers.

HARDNESS (for engineering description of rock – not to be confused with Moh's scale for minerals)

Very hard	Cannot be scratched with knife or sharp pick. Breaking of hand specimens requires several hard blows of geologist's pick.
Hard	Can be scratched with knife or pick only with difficulty. Hard blow of hammer required to detach hand specimen.
Moderately hard	Can be scratched with knife or pick. Gouges or grooves to ¼ in. deep can be excavated by hard blow of point of a geologist's pick. Hand specimens can be detached by moderate blow.
Medium	Can be grooved or gouged 1/16 in. deep by firm pressure on knife or pick point. Can be excavated in small chips to pieces about 1-in. maximum size by hard blows of the point of a geologist's pick.
Soft	Can be gouged or grooved readily with knife or pick point. Can be excavated in chips to pieces several inches in size by moderate blows of a pick point. Small thin pieces can be broken by finger pressure.
Very soft	Can be carved with knife. Can be excavated readily with point of pick. Pieces 1-in. or more in thickness can be broken with finger pressure. Can be scratched readily by fingernail.

Joint, Bedding, and Foliation Spacing in Rock [a]

Spacing	Joints	Bedding/Foliation
Less than 2 in.	Very close	Very thin
2 in. – 1 ft.	Close	Thin
1 ft. – 3 ft.	Moderately close	Medium
3 ft. – 10 ft.	Wide	Thick
More than 10 ft.	Very wide	Very thick

a. Spacing refers to the distance normal to the planes, of the described feature, which are parallel to each other or nearly so.

Rock Quality Designator (RQD) a

RQD, as a percentage	Diagnostic description
Exceeding 90	Excellent
90 – 75	Good
75 – 50	Fair
50 – 25	Poor
Less than 25	Very poor

a. RQD (given as a percentage) = length of core in pieces 4 in. and longer/length of run.

Joint Openness Descriptors

Openness	Descriptor
No Visible Separation	Tight
Less than 1/32 in.	Slightly Open
1/32 to 1/8 in.	Moderately Open
1/8 to 3/8 in.	Open
3/8 in. to 0.1 ft.	Moderately Wide
Greater than 0.1 ft.	Wide

References: American Society of Civil Engineers. Manuals and Reports on Engineering Practice - No. 56. Subsurface Investigation for Design and Construction of Foundations of Buildings. New York: American Society of Civil Engineers, 1976. U.S. Department of the Interior, Bureau of Reclamation, Engineering Geology Field Manual.

Terracon

Exhibit C-3

Test Boring: P16022004 B-2

Layer Number	Material Type	Approximate Depth to Bottom of Layer (feet)	Total Unit Weight (pcf)	Deformation Modulus (ksi)	Friction Angle (degrees)	Un-drained Shear Strength (ksf)
1	Clay	3.0	124	0.2	--	0.75
2	Clay	4.5	130	1.75	--	3.0
3	Sand	7.5	125	1.5	34	--
4	Sand	10.5	115	0.6	30	--
5	Sand	53.5	110	0.35	28	--
6	Clay	60.0	131	2.75	--	4.5

Groundwater was encountered at 11.0 feet during sampling.

Test Boring: P16022005 B-1

Layer Number	Material Type	Approximate Depth to Bottom of Layer (feet)	Total Unit Weight (pcf)	Deformation Modulus (ksi)	Friction Angle (degrees)	Un-drained Shear Strength (ksf)
1	Clay	4.5	125	0.6	--	1.0
2	Sand	7.5	123	1.1	33	--
3	Sand	25.0	115	0.6	30	--
4	Siltstone bedrock	31.2	150	See Table Below		
5	Sandstone bedrock	35.0	159	See Table Below		

Groundwater was encountered at 13.5 feet during sampling.

Layer No.	Material Type	Depth to Bottom of Layer (feet)	Effective Rock Cohesion (ksf)	Effective Friction Angle for Rock (degrees)	Rock/ Concrete Bond Strength (ksf)	Deformation Modulus (ksi)
4	Siltstone bedrock	31.2	2.9	33	15	700
5	Sandstone bedrock	35.0	3.7	37	25	1100

Test Boring: P16022004 B-2

Layer Number	Material Type	Approximate Depth to Bottom of Layer (feet)	Total Unit Weight (pcf)	Deformation Modulus (ksi)	Friction Angle (degrees)	Un-drained Shear Strength (ksf)
1	Clay	3.0	124	0.2	--	0.75
2	Clay	4.5	130	1.75	--	3.0
3	Sand	7.5	125	1.5	34	--
4	Sand	10.5	115	0.6	30	--
5	Sand	53.5	110	0.35	28	--
6	Clay	60.0	131	2.75	--	4.5

Groundwater was encountered at 11.0 feet during sampling.

Test Boring: P16022005 B-1

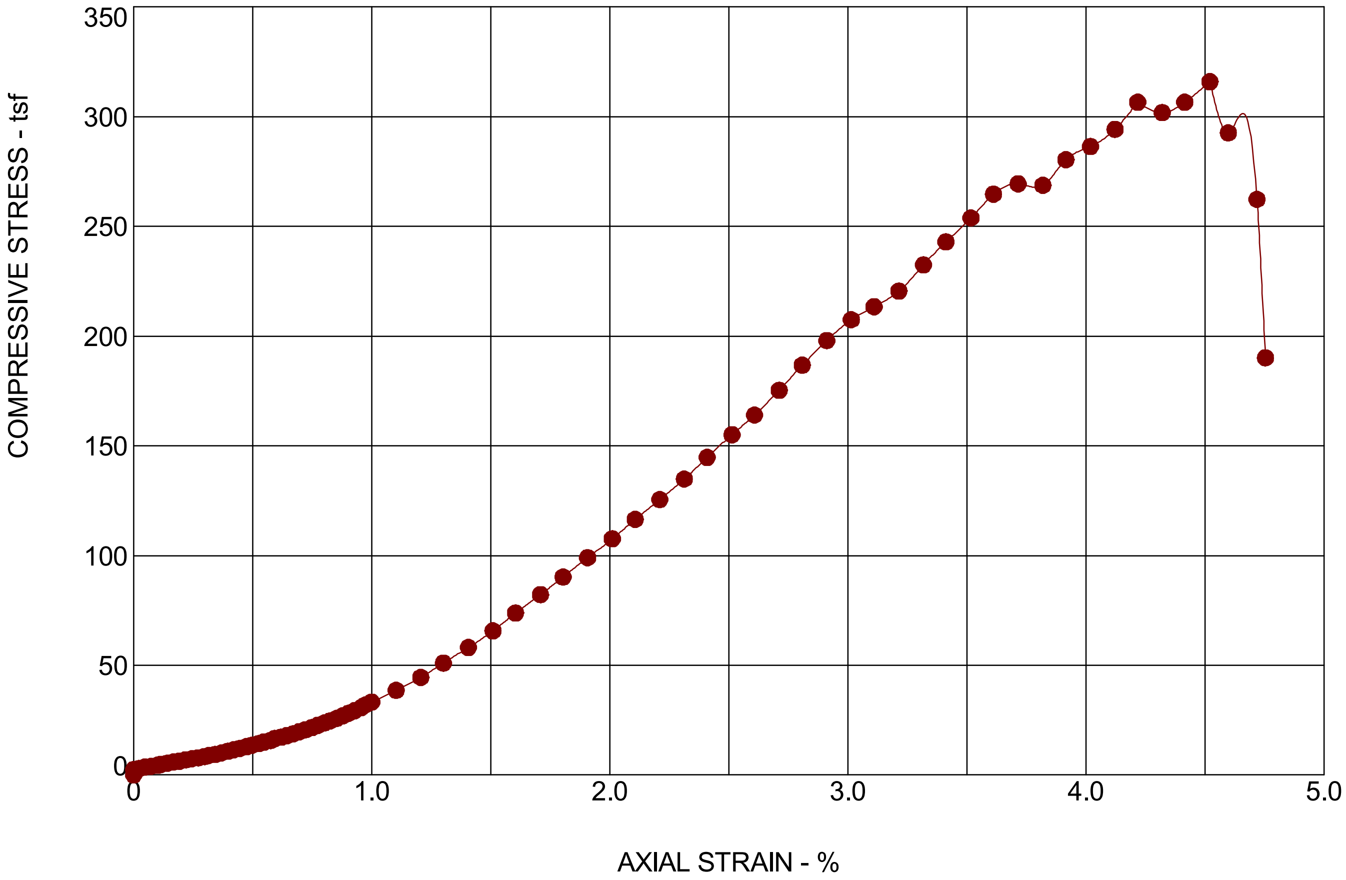
Layer Number	Material Type	Approximate Depth to Bottom of Layer (feet)	Total Unit Weight (pcf)	Deformation Modulus (ksi)	Friction Angle (degrees)	Un-drained Shear Strength (ksf)
1	Clay	4.5	125	0.6	--	1.0
2	Sand	7.5	123	1.1	33	--
3	Sand	25.0	115	0.6	30	--
4	Siltstone bedrock	31.2	150	See Table Below		
5	Sandstone bedrock	35.0	159	See Table Below		

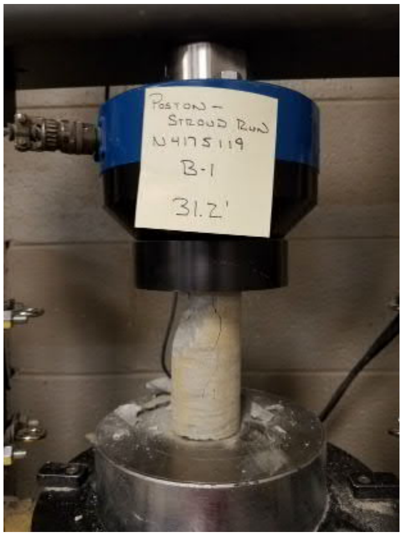
Groundwater was encountered at 13.5 feet during sampling.

Layer No.	Material Type	Depth to Bottom of Layer (feet)	Effective Rock Cohesion (ksf)	Effective Friction Angle for Rock (degrees)	Rock/ Concrete Bond Strength (ksf)	Deformation Modulus (ksi)
4	Siltstone bedrock	31.2	2.9	33	15	700
5	Sandstone bedrock	35.0	3.7	37	25	1100

UNCONFINED COMPRESSION TEST

ASTM D7012



SPECIMEN FAILURE PHOTOGRAPH	SPECIMEN TEST DATA		
	Moisture Content:	%	0
	Dry Density:	pcf	159
	Diameter:	in.	1.99
	Height:	in.	3.99
	Height / Diameter Ratio:		2.01
	Calculated Saturation:	%	
	Calculated Void Ratio:		
	Assumed Specific Gravity:		
	Failure Strain:	%	4.52
	Unconfined Compressive Strength	(tsf)	315.94
	Undrained Shear Strength:	(tsf)	157.97
	Strain Rate:	in/min	0.0399
	Remarks:		

SAMPLE TYPE: CORE	SAMPLE LOCATION: B-1 @ 31.2 feet			
SAMPLE DESCRIPTION: SANDSTONE	LL	PL	PI	Percent < #200 Sieve

PROJECT: AEP Poston-Strouds Run 138 kV Line (P16022005)

SITE: 5850 Industrial Drive
Athens, Ohio

Terracon
800 Morrison Rd
Gahanna, OH

PROJECT NUMBER: N4175119

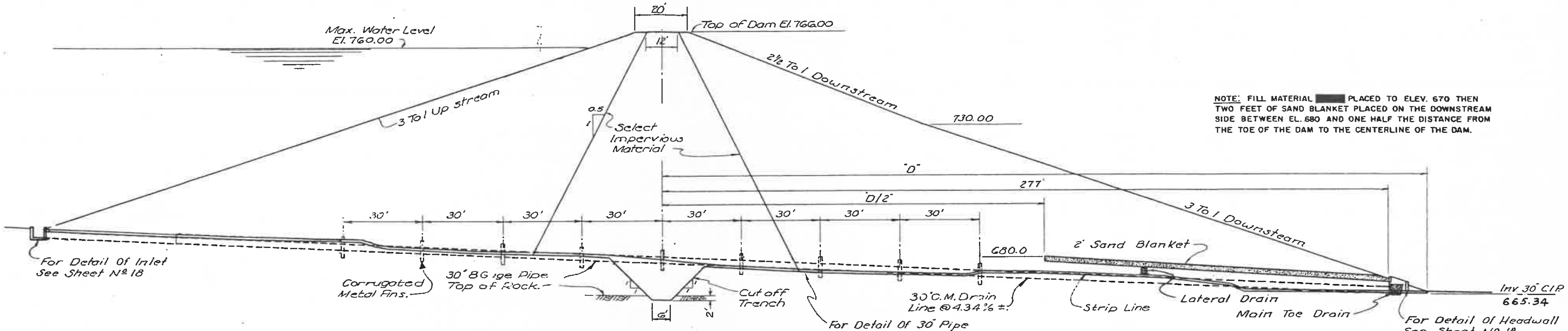
CLIENT: Transmission Partners
Lenexa, KS

EXHIBIT: B-19

Appendix II (C):

Phase 1 Inspection Report (GAI Consultants, Sept. 1978)

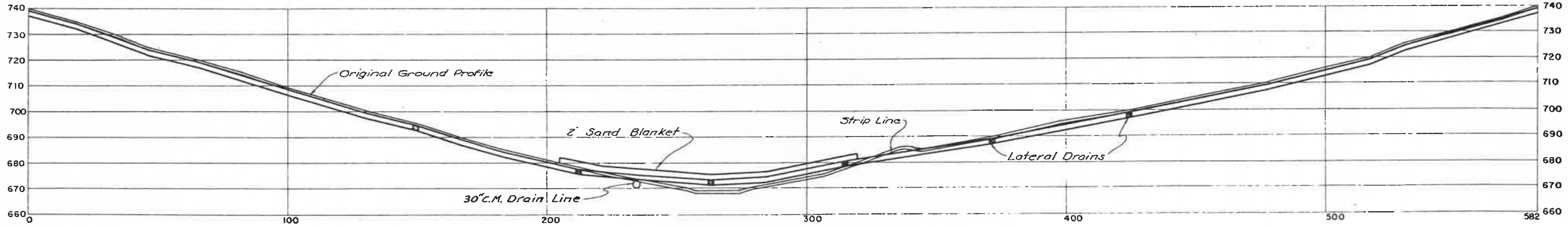
- Figure 11: Earth Embankment and Gravel Drain Details plan
- Figure 7: Geologic Profile of Dam Site
- Figure 8: Logs of Test Holes in Vicinity of Dam Site



NOTE: FILL MATERIAL ■ PLACED TO ELEV. 670 THEN TWO FEET OF SAND BLANKET PLACED ON THE DOWNSTREAM SIDE BETWEEN EL. 680 AND ONE HALF THE DISTANCE FROM THE TOE OF THE DAM TO THE CENTERLINE OF THE DAM.

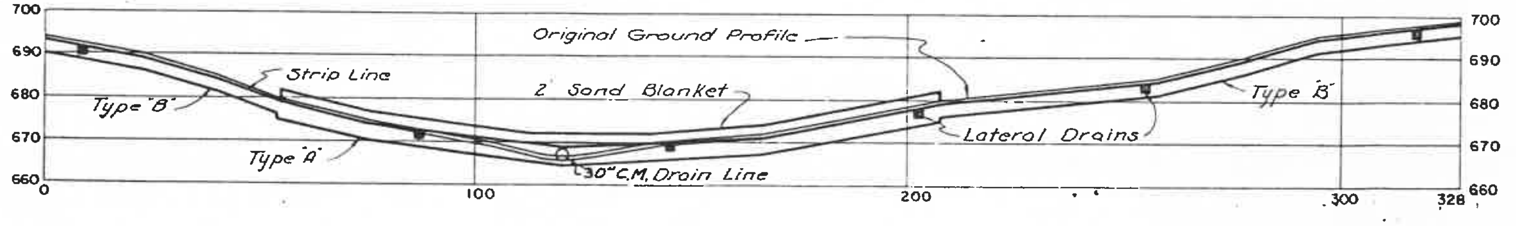
TYPICAL SECTION THRU DAM

SCALE 1" = 20'



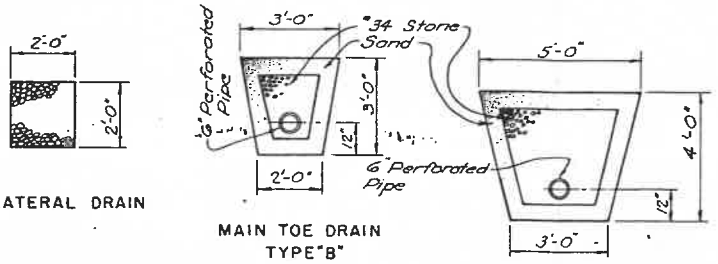
PROFILE OF LATERAL DRAIN - LOOKING WEST

SCALE 1" = 20'



PROFILE OF MAIN TOE DRAIN - LOOKING WEST

SCALE 1" = 20'



LATERAL DRAIN

MAIN TOE DRAIN
TYPE "B"

MAIN TOE DRAIN
TYPE "A"

DRAIN DETAILS

SCALE 3/8" = 1'-0"

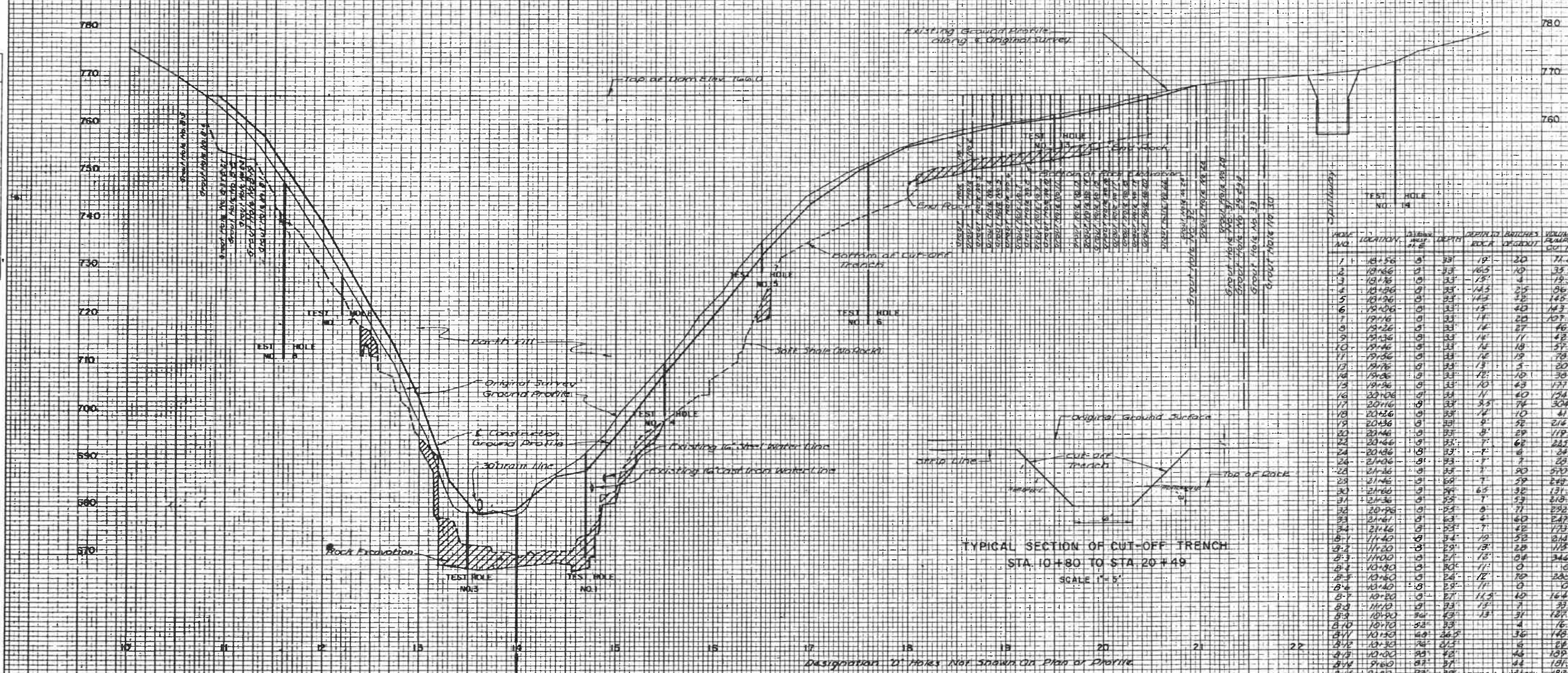
FIGURE 11

BURGESS AND NIPLE CONSULTING ENGINEERS
COLUMBUS, OHIO

COLUMBUS AND SOUTHERN OHIO ELECTRIC CO.
E. M. POSTON STATION
FLY ASH STORAGE DAM

EARTH EMBANKMENT AND GRAVEL DRAIN DETAILS

REVISIONS AS CONSTRUCTED DEC. 1957
TRACED BY DBC
JULY 1956
SCALE AS NOTED
SHEET 17 OF 21



TYPICAL SECTION OF CUT-OFF TRENCH
STA. 10+80 TO STA. 20+49
SCALE 1" = 5'

HOLE NO.	LOCATION	DISTANCE WEST of ℄	DEPTH	DEPTH TO ROCK	BATCHES OF GROUT	VOLUME PUMPED CU. FT.
1	18+56	8'	33'	19'	20	71.80
2	18+66	8'	33'	16.5	10	35.90
3	18+76	8'	33'	15'	4	19.36
4	18+86	8'	33'	14.5	25	86.50
5	18+96	8'	33'	14.5	32	146.32
6	19+06	8'	33'	15	40	143.60
7	19+16	8'	33'	14'	28	107.80
8	19+26	8'	33'	14'	27	46.67
9	19+36	8'	33'	14'	11	42.35
10	19+46	8'	33'	14'	18	57.96
11	19+56	8'	33'	14'	19	78.28
13	19+76	8'	33'	13'	5	20.65
14	19+86	8'	33'	12'	10	38.50
15	19+96	8'	33'	10'	43	177.59
16	20+06	8'	33'	11'	40	154.00
17	20+16	8'	33'	9.5'	74	304.88
18	20+26	8'	33'	14'	10	41.20
19	20+36	8'	33'	9'	52	216.29
20	20+46	8'	33'	8'	29	119.48
22	20+66	8'	33'	7'	62	225.12
24	20+86	8'	33'	7'	6	24.72
26	21+06	8'	33'	7'	7	28.84
28	21+26	8'	33'	7'	90	570.80
29	21+46	8'	69'	7'	59	243.08
30	21+66	8'	56'	6.5'	32	131.84
31	21+36	8'	55'	7'	53	218.36
32	20+96	8'	55'	8'	71	292.52
33	21+61	8'	63'	6'	60	247.20
34	21+46	8'	53'	7'	42	173.04
B-1	11+40	8'	34'	19'	52	214.24
B-2	11+20	8'	29'	13'	28	115.36
B-3	11+00	8'	21'	18'	84	346.08
B-4	10+80	8'	30'	11'	0	0
B-5	10+60	8'	24'	12'	70	288.40
B-6	10+40	8'	29'	11'	0	0
B-7	10+20	8'	27'	11.5'	40	164.80
B-8	11+10	8'	33'	13'	7	33.44
B-9	10+90	36'	43'	13'	31	127.72
B-10	10+70	52'	33'		4	16.48
B-11	10+50	68'	26.5'		36	148.32
B-12	10+30	76'	21.5'		6	24.72
B-13	10+00	98'	42'		46	189.52
B-14	9+60	87'	37'		44	181.28
B-15	9+80	92'	39'		31	127.72
B-16	10+35	74'	33'		67	276.04
B-17	10+65	60	41'		0	0
B-18	10+95	8'	41'		24	98.80

Designation "D" Holes Not Shown On Plan or Profile

HOLE NO.	LOCATION	DISTANCE WEST of ℄	DEPTH	DEPTH TO ROCK	BATCHES OF GROUT	VOLUME PUMPED CU. FT.
B-19	11+30	8'	43'		78	321.44
B-20	10+45	56'	49'		84	346.08
B-21	11+00	8'	37'		47	193.64
B-22	10+86	12'	31'		28	115.36
D-1	10+70	8'	10'	10'	7	28.84
D-1	18+51	8'	14'	14	30	103.80
D-1	18+56	8'	14.5'	14.5'	25	93.10
D-2	11+10	8'	15'	15'	8	32.96
D-2	18+66	8'	14.5'	14.5'	25	93.10
D-3	18+61	8'	15'	15'	17	58.88
D-4	18+91	8'	14'	14'	16	55.36
D-6	19+06	8'	14'	14'	20	69.20
D-7	18+61	8'	14'	14'	7	22.95
D-8	18+71	8'	14'	14'	20	74.40
D-9	18+81	8'	14'	14'	11	39.48
D-10	18+91	8'	15'	15'	19	60.48
D-11	19+01	8'	14'	14'	4	14.36
D-12	19+11	8'	14'	14'	4	14.40
D-13	19+21	8'	14'	14'	4	14.40
D-14	19+31	8'	15'	15'	6	24.72

HOLE NO.	LOCATION	DISTANCE WEST of ℄	DEPTH	DEPTH TO ROCK	BATCHES OF GROUT	VOLUME PUMPED CU. FT.
D-16	19+51	8'	12'	12'	3	12.39
D-17	19+61	8'	14'	14'	9	37.08
D-19	19+51	8'	14'	14'	5	20.60
D-20	19+61	8'	11'	11'	8	32.96
D-21	19+71	8'	11'	11'	4	16.52
D-22	19+81	8'	10'	10'	5	20.65
D-23	19+91	8'	11'	11'	2	8.24
D-24	20+01	8'	10'	10'	4	16.48
D-24	20+11	8'	11'	11'	5	20.65
D-26	20+21	8'	10'	10'	2	8.24
D-27	20+31	8'	9'	9'	3	12.36
D-28	20+36	8'	10'	10'	5	20.60
D-29	20+71	8'	7'	7'	1	4.12
D-30	20+56	8'	9'	9'	6	24.72
D-31	20+71	8'	6'	6'	2	8.24
D-32	20+91	8'	5'	5'	2	8.24

BURGESS AND NIPLE CONSULTING ENGINEERS
COLUMBUS, OHIO

COLUMBUS AND SOUTHERN OHIO ELECTRIC CO.
E. M. POSTON STATION
FLY ASH STORAGE DAM

GEOLOGIC PROFILE OF DAM SITE

REVISIONS AS CONSTRUCTED DEC. 1957
TRACED BY W.R.D.
JULY 1956
SCALE: HORIZ. 1" = 50' VERT. 1" = 10'
SHEET 5 OF 21

FINAL SURVEY
SURVEYED
PLOTTED
NOTE BOOK
TEMPLATE
AREAS
AREAS CHECKED
NO.
BY
DATE

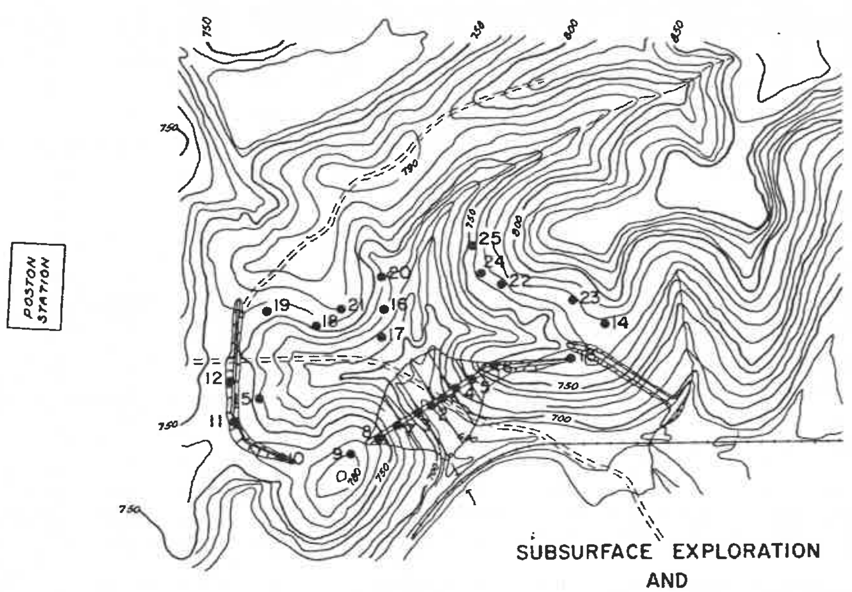
ORIGINAL SURVEY
SURVEYED
PLOTTED
NOTE BOOK
TEMPLATE
AREAS
AREAS CHECKED
NO.
BY
DATE

FIGURE 7

LEGEND AND CLASSIFICATION FOR PROJECT

AVERAGE RESULTS OF TESTS

DESCRIPTION	CLASS	% AGG.	% C. SAND	% F. SAND	% SILT	% CLAY	LIQUID LIMIT	PLASTICITY INDEX	APPROX. MAX. DRY WTS.	APPROX. OPT. MOIST.	SAMPLES TESTED
⁙ SILT	A4b	0	3	8	62	27	28	8	100 Lbs. per cu. ft.	19 %	1
▥ SANDY SILT	A4a	11	11	18	38	24	29	8	110 Lbs. per cu. ft.	15 %	9
▨ SILT & CLAY	A6	2	7	8	47	36	35	14	107 Lbs. per cu. ft.	17 %	6
▦ CLAY	A7-6	1	5	4	37	51	49	26	101 Lbs. per cu. ft.	21%	6
☰ SHALE	—		CLASSIFIED BY VISUAL INSPECTION								
⁘ SANDSTONE			CLASSIFIED BY VISUAL INSPECTION								



SUBSURFACE EXPLORATION
AND
SITE PLAN
SCALE: 1" = 400'

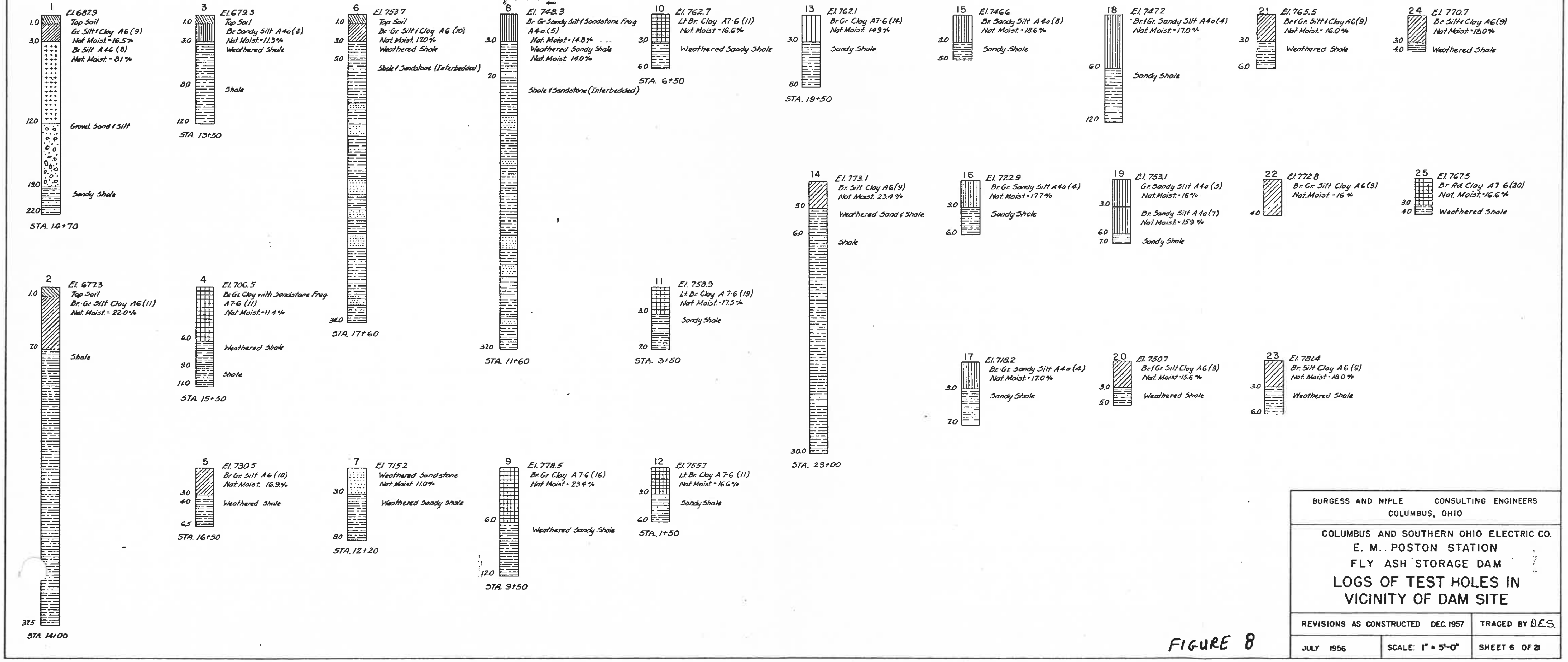


FIGURE 8

BURGESS AND NIPLE CONSULTING ENGINEERS
COLUMBUS, OHIO

COLUMBUS AND SOUTHERN OHIO ELECTRIC CO.
E. M.. POSTON STATION
FLY ASH STORAGE DAM

LOGS OF TEST HOLES IN VICINITY OF DAM SITE

REVISIONS AS CONSTRUCTED DEC. 1957
TRACED BY D.E.S.
JULY 1956
SCALE: 1" = 5'-0"
SHEET 6 OF 21

Appendix III – Recent Geotechnical Boring and Laboratory Data

SOIL LOG LEGEND

SOIL PROPERTY SYMBOLS

N - Standard Penetration, bpf

NMC - Natural Moisture Content, %

F - Fines Content, %

LL - Liquid Limit, %

PL - Plastic Limit, %

PI - Plasticity Index, %

PPV - Pocket Penetrometer Value, tsf

Qu - Unconfined Compressive Strength

γd - Dry Unit Weight, pcf

The STANDARD PENETRATION TEST (SPT) as defined by ASTM D1586 (or AASHTO T206) is a method to obtain a disturbed soil sample for examination and testing and to obtain relative density and consistency information. A standard 1.4-inch I.D./2-inch O.D. split-barrel sampler is driven three 6-inch increments with a 140 lb. hammer freely falling 30 inches. The hammer can either be of a trip, free-fall design, or actuated by a rope and cathead. The SPT N Value is determined by adding the number of blows from the 2nd and 3rd 6-inch increments. A normalized blowcount (N_{60}) may be determined by the following equation: N_{60} = [Rig Energy Ratio (%) / 60] * N.

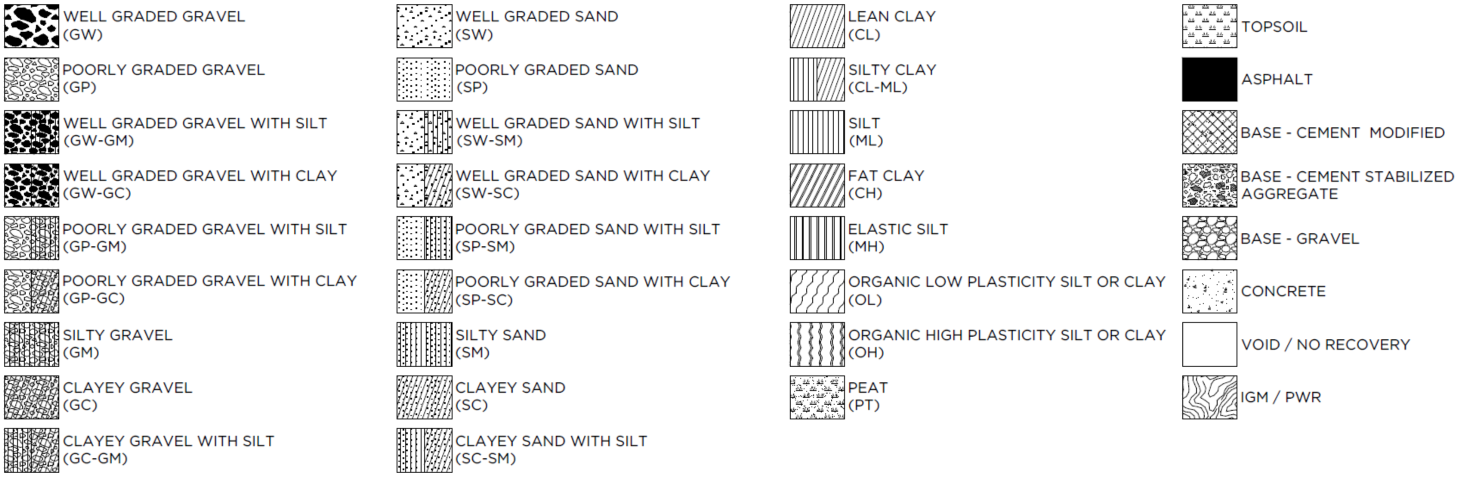
SHELBY TUBE (ST) samples are obtained by hydraulically pushing a thin-walled tube (typically 3-inches in diameter) to obtain a relatively undisturbed sample for testing of fine-grained soils to determine engineering properties such as strength, compressibility, permeability, and density. Shelby tubes are sampled in general accordance with ASTM D1587 (AASHTO T207).

☒ **SPT**

▯ **ST**

Descriptive Order of Soil Strata: Geologic Disposition (i.e., Fill, Colluvium, Alluvium, etc.), ASTM Group Name (ASTM Group Symbol), quantified/qualified soil constituents, misc. constituents, consistency/density, color, organic description, moisture. ASTM group classifications is determined per ASTM D2487 where lab testing has been performed and ASTM D2488 where lab testing has not been performed.

ASTM GROUP NAME (SYMBOL) AND GRAPHIC


WELL GRADED GRAVEL (GW)
POORLY GRADED GRAVEL (GP)
WELL GRADED GRAVEL WITH SILT (GW-GM)
WELL GRADED GRAVEL WITH CLAY (GW-GC)
POORLY GRADED GRAVEL WITH SILT (GP-GM)
POORLY GRADED GRAVEL WITH CLAY (GP-GC)
SILTY GRAVEL (GM)
CLAYEY GRAVEL (GC)
CLAYEY GRAVEL WITH SILT (GC-GM)
WELL GRADED SAND (SW)
POORLY GRADED SAND (SP)
WELL GRADED SAND WITH SILT (SW-SM)
WELL GRADED SAND WITH CLAY (SW-SC)
POORLY GRADED SAND WITH SILT (SP-SM)
POORLY GRADED SAND WITH CLAY (SP-SC)
SILTY SAND (SM)
CLAYEY SAND (SC)
CLAYEY SAND WITH SILT (SC-SM)
LEAN CLAY (CL)
SILTY CLAY (CL-ML)
SILT (ML)
FAT CLAY (CH)
ELASTIC SILT (MH)
ORGANIC LOW PLASTICITY SILT OR CLAY (OL)
ORGANIC HIGH PLASTICITY SILT OR CLAY (OH)
PEAT (PT)
TOPSOIL
ASPHALT
BASE - CEMENT MODIFIED
BASE - CEMENT STABILIZED AGGREGATE
BASE - GRAVEL
CONCRETE
VOID / NO RECOVERY
IGM / PWR

FINE-GRAINED SOIL
(Relative Consistency)

	N	PPV
Very Soft	< 2 bpf	< 0.25 tsf
Soft	2 - 4 bpf	> 0.25 - 0.5 tsf
Firm	5 - 8 bpf	> 0.5 - 1.0 tsf
Stiff	9 - 15 bpf	> 1.0 - 2.0 tsf
Very Stiff	16 - 30 bpf	> 2.0 - 4.0 tsf
Hard	> 30 bpf	> 4.0 tsf

COARSE-GRAINED SOIL
(Relative Density)

	N
Very Loose	< 5 bpf
Loose	5 - 10 bpf
Medium Dense	11 - 30 bpf
Dense	31 - 50 bpf
Very Dense	> 50 bpf

MINOR CONSTITUENTS
(% By Weight)

	Percentage
Trace	0% - 10%
Little	11% - 20%
Some	21% - 35%
"And"	≥ 36%

ORGANIC CONTENT OF SOIL
(Determined by ASTM D2974 or AASHTO T267)

Classification	Percentage
With Organic Matter	4% - 15%
Organic Soil	16% - 30%
Peat	> 30%

MOISTURE CONDITION

Dry	Absense of moisture, dusty, dry to touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

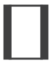
▽	**At Time of Drilling (ATD)**	Groundwater observation made anytime during the drilling process. Depending on time of reading and drilling methodologies, this value may be influenced by the drilling process.
▽	**End of Drilling**	Groundwater measurement soon after the drilling processes are complete, and the borehole is at final depth. Drilling fluids, if introduced during drilling, may influence this measurement.
▼	**After Drilling**	Groundwater measurements made in a borehole hours to days after drilling is complete. Depending on subsurface conditions, elapsed time, drilling process, etc. this observation may reflect a stabilized level.

REFERENCES:

FHWA NHI-16-072, Geotechnical Engineering Circular No. 5 "Geotechnical Site Characterization"
ASTM Specifications D2487 and D2488
DOT Specifications & Design Manuals from NC, SC, OH, MI, IN, PA, VA.

ROCK CORE LOG LEGEND

ROCK CORE RECOVERY

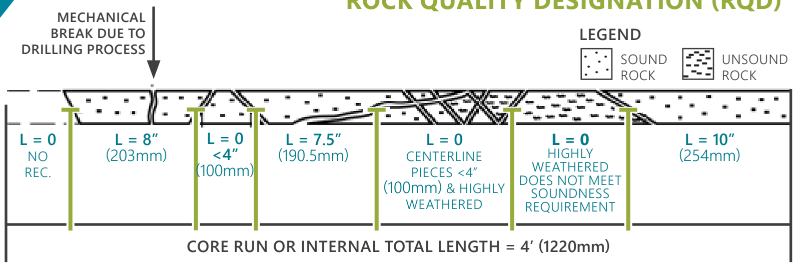


Core Diameter (I.D.)	Inches
BQ	1-7/16
NQ	1-7/8
HQ	2-1/2

$$\text{REC} = \frac{\text{Length of Rock Core Recovered}}{\text{Length of Core Run}} \text{ x100}$$

(Recovery)

ROCK QUALITY DESIGNATION (RQD)



$$\text{RQD} = \left(\frac{\sum \text{Sound Core with Length (L)} \geq 4'' \text{ (100mm)}}{\text{Core Run or Interval Total Length}} \right) \text{x}\,100$$

(Equation)

$$\text{RQD} = \left(\frac{8''+7.5''+10''}{48''} \right) \text{x}\,100 = 53\%$$

(Example) (FAIR)

ROCK QUALITY

Percent	Quality
>90–100	Excellent
>75–90	Good
>50–75	Fair
>25–50	Poor
0–25	Very Poor

(ASTM D6032)

GRAIN SIZE

Very Fine-Grained	<0.003 in. (<0.075 mm)
Fine-Grained	0.003 – 0.02 in. (0.075 – 0.425 mm)
Medium-Grained	0.02 – 0.8 in. (0.425 – 2 mm)
Coarse-Grained	0.8 – 2 in. (2 – 4.75 mm)
Very Coarse-Grained	>2 in. (>4.75 mm)

BEDDING

Very Thickly Bedded	>3 ft.
Thickly Bedded	3 ft. – 18 in.
Thinly Bedded	18 in. – 2 in.
Very Thinly Bedded	2 in. – 0.4 in.
Laminated	0.4 in. – 0.1 in.
Thinly Laminated	<0.1 in.

FRACTURE RATE / SPACING

Unfractured	>10 ft.
Intact	10 ft. – 3 ft.
Slightly Fractured	3 ft. – 1 ft.
Moderately Fractured	12 in. – 4 in.
Fractured	4 in. – 2 in.
Highly Fractured	< 2 in.

SURFACE ROUGHNESS

Very Rough	Near vertical steps and ridges occur on the discontinuity surface.
Slightly Rough	Asperities on the discontinuity surface are distinguishable and can be felt.
Smooth	Surface appears smooth and feels so to the touch.
Slickensided	Surface has a smooth, glassy finish with visual evidence of striation.

WEATHERING

Fresh	No visible sign of rock material weathering; slight discoloration on major discontinuity surfaces is possible.
Slightly Weathered	Discoloration indicates weathering of rock material and discontinuity surfaces. All rock material may be discolored by weathering and the external surface may be somewhat weaker than in its fresh condition.
Moderately Weathered	Less than half of the rock material is decomposed and/or disintegrated to a soil. Fresh or discolored rock is present either as a discontinuous framework or as corestones. A minimum 2 in. diameter sample cannot be broken readily by hand.
Highly Weathered	More than half the rock is decomposed or disintegrated to soil. Fresh or discolored rock is present either as a discontinuous framework or as corestones. A minimum 2 in. diameter sample can be broken readily by hand across the rock fabric.
Completely Weathered	All rock material is decomposed and/or disintegrated to soil. The original mass structure is largely still intact. Material can by granulated by hand.
Residual Soil	All rock material is converted to soil. Material can be easily broken apart by hand.

STRENGTH

		APPROX. UNCONFINED COMPRESSIVE STRENGTH (PSI)
Extremely Strong Rock	Specimen can only be chipped with firm blows from the hammer end of a geological hammer.	> 36,250
Very Strong Rock	Specimen requires many firm blows from the hammer end of a geological hammer to fracture.	36,250 – 14,500
Strong Rock	Specimen requires more than one firm blow of the point of a geological hammer to fracture.	14,500 – 7,250
Medium Strong Rock	Specimen cannot be scraped or cut with a pocket knife. Specimen can be fractured with a single firm blow with a geological hammer point.	7,250 – 3,500
Weak Rock	Shallow cuts or scrapes can be made in a specimen with a pocket knife. A firm blow with a geological hammer creates shallow indents.	3,500 – 725
Very Weak Rock	Specimen crumbles under sharp blow with point of geological hammer and can be peeled with a pocket knife.	725 – 150
Extremely Weak Rock	Specimen can be indented by thumbnail.	150 – 35

HARDNESS

Very Hard	Cannot be scratched with a pocket knife; leaves knife steel marks on surface.
Hard	Can be scratched by a pocket knife with difficulty; scratch produces little powder and is only faintly visible; trace of knife's steel may be visible.
Moderately Hard	Can be readily scratched by a pocket knife; scratch leaves a heavy trace of dust and scratch is readily visible after the powder has been blown away.
Low Hardness	Can be gouged deeply or carved with a pocket knife.
Friable	Easily crumbled by hand, pulverized or reduced to powder sand is too soft to be cut by a pocket knife.
Soft	Very weak plastic material.

REFERENCES:

FHWA NHI-16-072, GEOTECHNICAL ENGINEERING CIRCULAR NO. 5 "GEOTECHNICAL SITE CHARACTERIZATION"
DOT SPECIFICATIONS & DESIGN MANUALS FROM NC, SC, OH, MI, IN, PA.

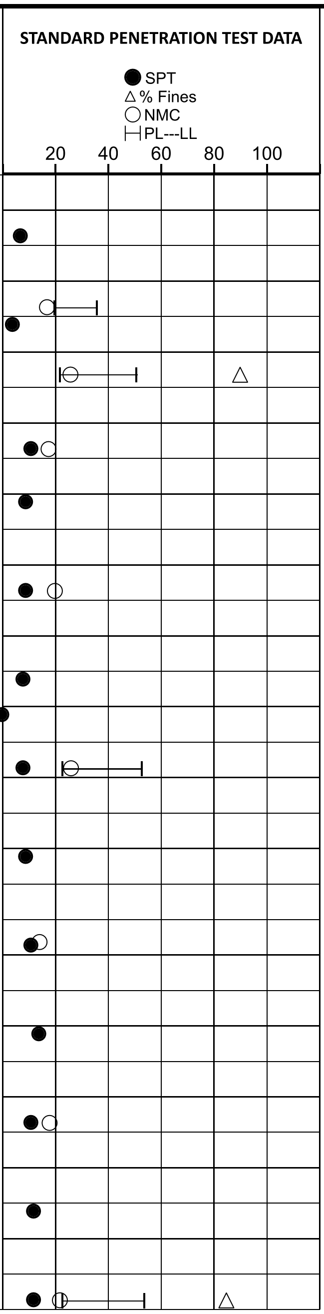
PROJECT: Poston Plant Legacy CCR Impoundment
York Township - Athens County, Ohio
S&ME Project No. 25170078

BORING LOG: B-01

Sheet 1 of 4

DATE DRILLED: 08/19/2025
ELEVATION: 766 ft
NOTES: Elevation estimated from Google Earth
DRILL RIG: B-57 (Track)
DATUM: NAVD88
DRILLER: A. Unverzagt
BORING DEPTH: 123.5 ft
HAMMER TYPE: Auto Hammer (140 lb)
CLOSURE: Installed Piezometer
DRILLING METHOD: 3-1/4" HSA, NQ
LOGGED BY: M.S. Ansari
LATITUDE: 39.386850 **LONGITUDE:** -82.177165
SAMPLING METHOD: UD, SS, RC
PROJECT COORDINATE SYSTEM - NAD 1983 StatePlane Ohio South FIPS 3402 Feet

DEPTH (feet)	NOTES		Origin/Identifier	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	ELEVATION
0		0.4			ROOTMAT - 5 INCHES		766
	PPV = 1.7-2.0			S-01 (18 in)	FILL: LEAN CLAY WITH SAND (CL), trace to little fine to coarse gravel, firm to stiff, few organics roots, brown, moist.	3-3-4 N = 7	
	PPV = 0.7			S-02 (18 in)		3-2-2 N = 4	
5	450 psi	5.0		S-03 REC-65%	FILL: FAT CLAY (CH), trace fine to coarse sand, trace fine gravel, firm to stiff, brown mottled with gray, moist.		761
	PPV = 1.0-1.2						
		7.0					
	PPV = 1.2-2.2			S-04 (18 in)	FILL: LEAN CLAY WITH SAND (CL), trace fine to coarse gravel, stiff to very stiff, brown mottled with gray, moist.	2-5-6 N = 11	
	PPV = 1.2-2.5			S-05 (18 in)		3-4-5 N = 9	
10							756
	PPV = 1.2-1.5 Slight seepage at 13.0'			S-06 (18 in)		3-4-5 N = 9	
						3-4-4 N = 8	
15	PPV = 1.5-1.7	15.0		(0 in) S-07/07A (6 in)	FILL: FAT CLAY (CH), trace fine to coarse sand, trace fine gravel, stiff to very stiff, brown mottled with gray, damp	10 N = WOH	751
	PPV = 1.5-1.7			S-08 (18 in)		2-4-4 N = 8	
	PPV = 1.2-1.7			S-09 (18 in)		2-4-5 N = 9	
20		20.5					746
	PPV = 2.5-2.7		▼	S-10 (16 in)	FILL: LEAN CLAY WITH SAND (CL), trace to little fine to coarse gravel, stiff to very stiff, brown mottled with gray, damp to moist.	4-5-6 N = 11	
	PPV = 1.2-1.5			S-11 (18 in)		4-7-7 N = 14	
25		25.5					741
	PPV = 1.2-2.2			S-12 (18 in)	FILL: LEAN CLAY WITH SAND (CL), trace to little fine to coarse gravel, stiff to very stiff, brown mottled with gray, few iron oxide stains, moist.	3-5-6 N = 11	
	PPV = 1.7-2.0			S-13 (18 in)		3-6-6 N = 12	
30		30.0			FILL: FAT CLAY WITH SAND (CH), trace fine gravel, very stiff, brown mottled with gray, few iron oxide stains, moist.		736
	PPV = 2.5-2.7						


STANDARD PENETRATION TEST DATA

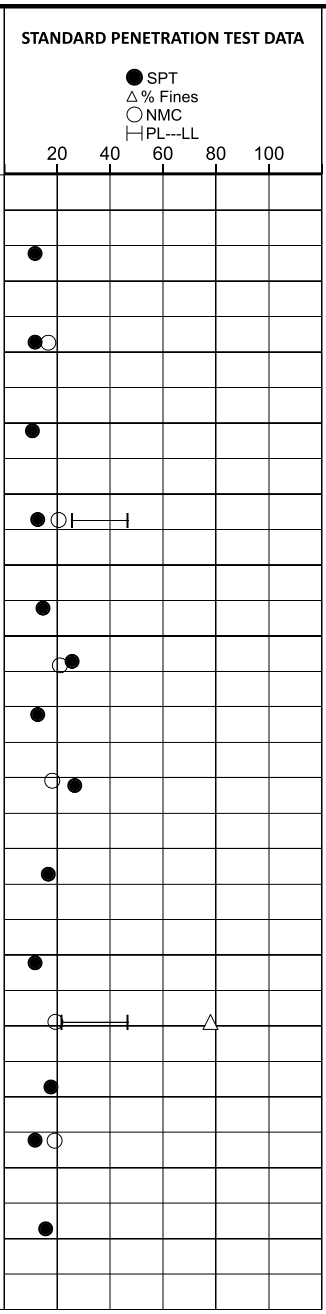
GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽	08/19/2025		Dry during drilling; slight seepage encountered at 13.0' and 44.8'.
END OF DRILLING	▼	08/21/2025		Dry prior to rock core; slight seepage at 101.5'
AFTER DRILLING	▼	08/21/2025	22.1	Prior to auger removal; after rock core.
AFTER DRILLING	▼			

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf),
AR = Auger Refusal, IGM = Intermediate Geomaterial

PROJECT:	Poston Plant Legacy CCR Impoundment York Township - Athens County, Ohio **S&ME Project No. 25170078**	**BORING LOG: B-01** *Sheet 2 of 4*

DATE DRILLED: 08/19/2025
ELEVATION: 766 ft
NOTES: Elevation estimated from Google Earth
DRILL RIG: B-57 (Track)
DATUM: NAVD88
DRILLER: A. Unverzagt
BORING DEPTH: 123.5 ft
HAMMER TYPE: Auto Hammer (140 lb)
CLOSURE: Installed Piezometer
DRILLING METHOD: 3-1/4" HSA, NQ
LOGGED BY: M.S. Ansari
LATITUDE: 39.386850 **LONGITUDE:** -82.177165
SAMPLING METHOD: UD, SS, RC
PROJECT COORDINATE SYSTEM - NAD 1983 StatePlane Ohio South FIPS 3402 Feet

DEPTH (feet)	NOTES	Origin/Identifier	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	ELEVATION
			S-14 (18 in)	FILL: FAT CLAY WITH SAND (CH), trace fine gravel, very stiff, brown mottled with gray, few iron oxide stains, moist.	3-5-7 N = 12	
35	PPV = 3.0-3.2		S-15 (18 in)		3-5-7 N = 12	731
	35.5			FILL: SANDY LEAN CLAY (CL), trace fine gravel, firm to stiff, brown, few iron oxide stains, moist.		
	PPV = 1.0-1.5		S-16 (18 in)		3-6-6 N = 12	
40	PPV = 1.0-1.5		S-17 (18 in)		3-5-6 N = 11	726
	40.0			FILL: LEAN CLAY (CL), trace fine to coarse sand, trace fine gravel, firm to stiff, brown and gray, few shale fragments, moist.		
	PPV = 1.0-1.5		S-18 (18 in)		4-5-8 N = 13	
	Slight seepage at 44.8' PPV = 1.0-1.2		S-19 A/B (18 in)		4-5-10 N = 15	
45	44.8			FILL: CLAYEY SAND WITH GRAVEL (SC), medium dense, brown, wet.		721
	45.2 Slight seepage at 44.8 PPV = 2.0-2.5		S-20 A/B (18 in)	FILL: LEAN CLAY WITH SAND (CL), trace fine to coarse gravel, stiff to very stiff, brown and gray, moist.	10-12-14 N = 26	
	PPV = 2.5-2.7		S-21 (18 in)		4-5-8 N = 13	
50	PPV = 2.0-2.2		S-22 (16 in)		7-17-10 N = 27	716
			S-23 (6 in)		5-7-10 N = 17	
	52.5			FILL: LEAN CLAY WITH SAND (CL), trace fine gravel, firm, brown, moist.		
55	PPV = 0.7-1.0		S-24 (18 in)		3-5-7 N = 12	711
	55.0			FILL: LEAN CLAY WITH SAND (CL), trace fine gravel, stiff to very stiff, brown, moist.		
	PPV = 2.0-2.2 900 psi		S-25 REC-90%			
	PPV = 2.0-2.5		S-26 (18 in)		3-8-10 N = 18	
	58.5			FILL: LEAN CLAY (CL), trace fine to coarse sand, stiff to very stiff, brown, moist.		
60	PPV = 1.7-2.0		S-27 (18 in)		5-6-6 N = 12	706
	61.0			FILL: LEAN CLAY WITH SAND (CL), trace little fine to coarse gravel, stiff to very stiff, brown, moist.		
	PPV = 1.7-2.2		S-28 (18 in)		9-7-9 N = 16	



GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽	08/19/2025		Dry during drilling; slight seepage encountered at 13.0' and 44.8'.
END OF DRILLING	▼	08/21/2025		Dry prior to rock core; slight seepage at 101.5'
AFTER DRILLING	▼	08/21/2025	22.1	Prior to auger removal; after rock core.
AFTER DRILLING	▼			

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf),
AR = Auger Refusal, IGM = Intermediate Geomaterial

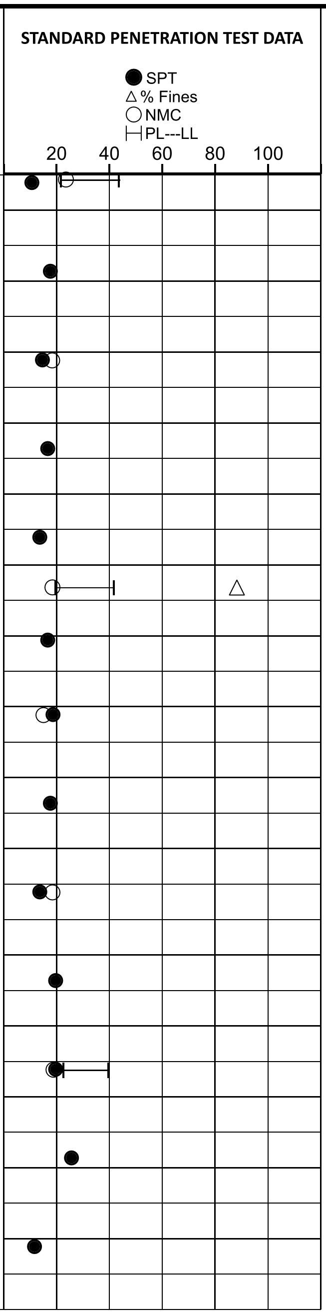
PROJECT: Poston Plant Legacy CCR Impoundment
York Township - Athens County, Ohio
S&ME Project No. 25170078

BORING LOG: B-01

Sheet 3 of 4

DATE DRILLED: 08/19/2025	**ELEVATION:** 766 ft	**NOTES:** Elevation estimated from Google Earth
DRILL RIG: B-57 (Track)	**DATUM:** NAVD88	
DRILLER: A. Unverzagt	**BORING DEPTH:** 123.5 ft	
HAMMER TYPE: Auto Hammer (140 lb)	**CLOSURE:** Installed Piezometer	
DRILLING METHOD: 3-1/4" HSA, NQ	**LOGGED BY:** M.S. Ansari	**LATITUDE:** 39.386850 **LONGITUDE:** -82.177165
SAMPLING METHOD: UD, SS, RC	**PROJECT COORDINATE SYSTEM -** NAD 1983 StatePlane Ohio South FIPS 3402 Feet	

DEPTH (feet)	NOTES	Origin/Identifier	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	ELEVATION
65	PPV = 1.2-1.7		S-29 (16 in)	FILL: LEAN CLAY WITH SAND (CL), trace little fine to coarse gravel, stiff to very stiff, brown, moist.	3-5-6 N = 11	701
	PPV = 2.2-2.5		S-30 (18 in)		7-9-9 N = 18	
70	PPV = 2.0-2.2		S-31 (18 in)		4-7-8 N = 15	696
	70.5			FILL: LEAN CLAY WITH SAND (CL), trace little fine to coarse gravel, stiff, few organics wood chips, brown and gray, moist.		
	PPV = 2.5-2.7		S-32 (18 in)		7-6-11 N = 17	
	73.0			FILL: LEAN CLAY WITH SAND (CL), stiff to very stiff, brownish gray, moist.		
75	PPV = 1.5-2.5		S-33 (18 in)		6-6-8 N = 14	691
	75.0			FILL: LEAN CLAY (CL), little fine to coarse sand, trace fine to coarse gravel, stiff to very stiff, brown mottled with gray, moist.		
	PPV = 3.5 1200 psi		S-34 REC-93%			
	PPV = 1.7-2.2		S-35 (18 in)		5-7-10 N = 17	
80	PPV = 2.7-3.2		S-36 (18 in)		5-9-10 N = 19	686
	PPV = 1.7-2.0		S-37 (18 in)		4-9-9 N = 18	
85	PPV = 2.5-2.7		S-38 (18 in)		7-7-7 N = 14	681
	85.0			FILL: LEAN CLAY (CL), trace fine to coarse sand, trace fine to coarse gravel, firm to stiff, brown, moist.		
	PPV = 2.5-2.7		S-39 (18 in)		5-8-12 N = 20	
90	PPV = 2.2-3.0		S-40 (18 in)		4-8-12 N = 20	676
	PPV = 1.7-2.2		S-41 (18 in)		7-16-10 N = 26	
95	PPV = 1.5-1.7		S-42 (18 in)		5-7-5 N = 12	671



GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽	08/19/2025		Dry during drilling; slight seepage encountered at 13.0' and 44.8'.
END OF DRILLING	▼	08/21/2025		Dry prior to rock core; slight seepage at 101.5'
AFTER DRILLING	▼	08/21/2025	22.1	Prior to auger removal; after rock core.
AFTER DRILLING	▼			

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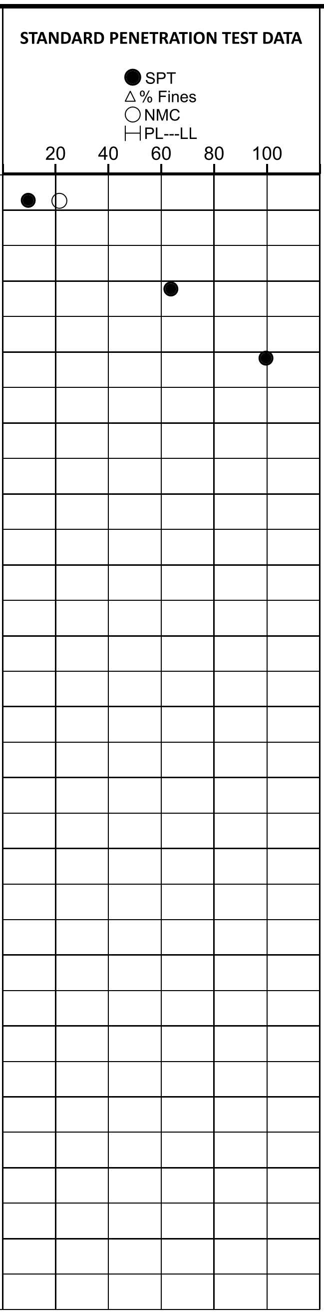
PROJECT: Poston Plant Legacy CCR Impoundment
York Township - Athens County, Ohio
S&ME Project No. 25170078

BORING LOG: B-01

Sheet 4 of 4

DATE DRILLED: 08/19/2025
ELEVATION: 766 ft
NOTES: Elevation estimated from Google Earth
DRILL RIG: B-57 (Track)
DATUM: NAVD88
DRILLER: A. Unverzagt
BORING DEPTH: 123.5 ft
HAMMER TYPE: Auto Hammer (140 lb)
CLOSURE: Installed Piezometer
DRILLING METHOD: 3-1/4" HSA, NQ
LOGGED BY: M.S. Ansari
LATITUDE: 39.386850 **LONGITUDE:** -82.177165
SAMPLING METHOD: UD, SS, RC
PROJECT COORDINATE SYSTEM - NAD 1983 StatePlane Ohio South FIPS 3402 Feet

DEPTH (feet)	NOTES	Origin/Identifier	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	ELEVATION
	PPV = 0.7-1.5			S-43 (18 in)	FILL: LEAN CLAY (CL), trace fine to coarse sand, trace fine to coarse gravel, firm to stiff, brown, moist.	0-4-6 N = 10	
	98.5			S-44 (18 in)	SHALE, gray, highly weathered, highly fractured.	14-34-30 N = 64	
100	Slight seepage at 101.5'			S-45 (5 in)		50/5" N = 50/5"	666
	103.5			S-46 REC-84% RQD-75%	SHALE, gray, slightly to highly weathered, strong to weak, moderately hard to low hardness, fine grained, thinly bedded, slightly to highly fractured, smooth.		
105							661
110				S-47 REC-100% RQD-73%			656
115				S-48 REC-100% RQD-93%			651
120				S-49 REC-100% RQD-100%			646
	123.5				Borehole terminated at 123.5 feet		
125							641



GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽	08/19/2025		Dry during drilling; slight seepage encountered at 13.0' and 44.8'.
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AFTER DRILLING	▼	08/21/2025	22.1	Prior to auger removal; after rock core.
AFTER DRILLING	▼			

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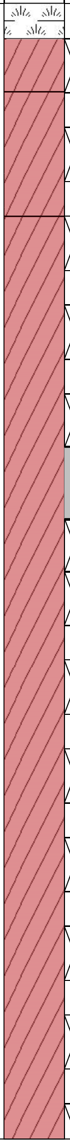
PROJECT:	Poston Plant Legacy CCR Impoundment York Township - Athens County, Ohio S&ME Project No. 25170078	**BORING LOG: B-02** *Sheet 1 of 3*

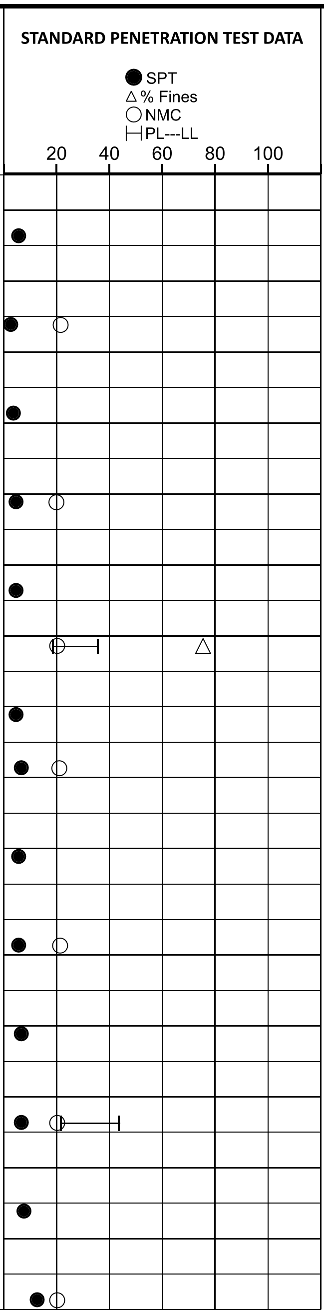
DATE DRILLED: 08/20/2025	**ELEVATION:** 767 ft	**NOTES:** Elevation estimated from Google Earth
DRILL RIG: B-57 (Track), Geoprobe 3100GT	**DATUM:** NAVD88	
DRILLER: A. Unverzagt, A. Archer	**BORING DEPTH:** 93.5 ft	
HAMMER TYPE: Auto Hammer (140 lb)	**CLOSURE:** Installed Piezometer	
DRILLING METHOD: 3-1/4" HSA, NQ	**LOGGED BY:** W. Babiy	**LATITUDE:** 39.386496 **LONGITUDE:** -82.176957
SAMPLING METHOD: UD, SS, RC	**PROJECT COORDINATE SYSTEM -** NAD 1983 StatePlane Ohio South FIPS 3402 Feet	

DEPTH (feet)	ELEVATION
0	767
5	762
10	757
15	752
20	747
25	742
30	737

NOTES	Origin/Identifier	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)
			WOOD CHIPS/TOPSOIL/ROOTMAT - 12 INCHES	
1.0 PPV = 1.0-2.5		S-01 (18 in)	FILL: SANDY LEAN CLAY (CL), firm, yellowish brown, damp.	3-2-4 N = 6
2.5 PPV = 1.0-2.0		S-02 (18 in)	FILL: LEAN CLAY (CL), trace fine to coarse sand, trace coal fragments, soft, orange brown and gray, damp.	1-1-2 N = 3
6.0 PPV = 0.5-1.0		S-03 (14 in)	FILL: LEAN CLAY WITH SAND (CL), trace fine to coarse gravel, firm to stiff, light brown with gray, moist to damp.	0-2-2 N = 4
PPV = 1.0 Seepage at 10.0'		S-04 (18 in)		0-2-3 N = 5
PPV = 1.0-2.0		S-05 (18 in)		1-2-3 N = 5
500 psi PPV = 1.0-2.0		S-06 REC-80%		
PPV = 0.5-2.0		S-07 (18 in)		1-2-3 N = 5
PPV = 1.0-1.5		S-08 (18 in)		1-3-4 N = 7
PPV = 1.0-2.0		S-09 (18 in)		1-2-4 N = 6
PPV = 0.5-1.5		S-10 (18 in)		1-2-4 N = 6
PPV = 1.0-2.0		S-11 (18 in)		2-2-5 N = 7
PPV = 1.0-2.5		S-12 (18 in)		1-3-4 N = 7
PPV = 2.5-3.5		S-13 (18 in)		2-3-5 N = 8
PPV = 2.5-3.5				

GRAPHIC





GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽	08/25/2025	87.0	During drilling; seepage encountered at 10.0' and 57.0'.
END OF DRILLING	▼	08/25/2025	32.0	Prior to auger removal; after rock core.
AFTER DRILLING	▼			
AFTER DRILLING	▼			

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf),
AR = Auger Refusal, IGM = Intermediate Geomaterial

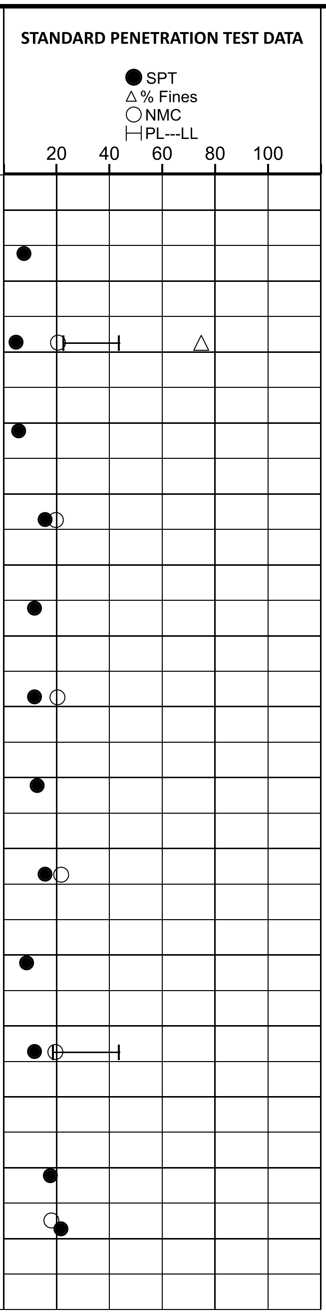
PROJECT: Poston Plant Legacy CCR Impoundment
York Township - Athens County, Ohio
S&ME Project No. 25170078

BORING LOG: B-02

Sheet 2 of 3

DATE DRILLED: 08/20/2025
ELEVATION: 767 ft
NOTES: Elevation estimated from Google Earth
DRILL RIG: B-57 (Track), Geoprobe 3100GT
DATUM: NAVD88
DRILLER: A. Unverzagt, A. Archer
BORING DEPTH: 93.5 ft
HAMMER TYPE: Auto Hammer (140 lb)
CLOSURE: Installed Piezometer
DRILLING METHOD: 3-1/4" HSA, NQ
LOGGED BY: W. Babiy
LATITUDE: 39.386496 **LONGITUDE:** -82.176957
SAMPLING METHOD: UD, SS, RC
PROJECT COORDINATE SYSTEM - NAD 1983 StatePlane Ohio South FIPS 3402 Feet

DEPTH (feet)	NOTES	Origin/Identifier	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	ELEVATION
				S-14 (18 in)	FILL: LEAN CLAY WITH SAND (CL), trace fine to coarse gravel, firm to stiff, light brown with gray, moist to damp.	1-5-8 N = 13	
35	PPV = 1.0-2.0			S-15 (18 in)		1-3-5 N = 8	732
	PPV = 0.5-0.7			S-16 (18 in)		1-2-3 N = 5	
40	PPV = 1.0-1.5			S-17 (18 in)		2-2-4 N = 6	727
	41.0 PPV = 3.5-4.5			S-18 (18 in)	FILL: SANDY LEAN CLAY WITH GRAVEL (CL), stiff to very stiff, light brown with gray, damp.	3-7-9 N = 16	
45	PPV = 1.0-3.0			S-19 (18 in)		4-5-7 N = 12	722
	PPV = 1.5-2.5			S-20 (18 in)		3-4-8 N = 12	
50	PPV = 2.5-3.5			S-21 (18 in)		4-5-8 N = 13	717
	PPV = 2.5-3.5			S-22 (18 in)		4-7-9 N = 16	
55	PPV = 0.5-2.0			S-23 (18 in)		3-3-6 N = 9	712
	56.0 PPV = 1.5 wet sand pocket at 57.0'			S-24 (18 in)	FILL: LEAN CLAY (CL), trace fine to coarse sand, trace fine to coarse gravel, stiff to very stiff, light brown with gray, damp.	1-5-7 N = 12	
	750 psi			S-25 REC-80%			
60	PPV = 3.0-4.0			S-26 (18 in)		3-8-10 N = 18	707
	PPV = 2.0-4.0 63.5			S-27 (12 in)	FILL: LEAN CLAY WITH SAND (CL), trace fine to coarse gravel, very stiff, brown, damp.	4-8-14 N = 22	



GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽	08/25/2025	87.0	During drilling; seepage encountered at 10.0' and 57.0'.
END OF DRILLING	▼	08/25/2025	32.0	Prior to auger removal; after rock core.
AFTER DRILLING	▼			
AFTER DRILLING	▼			

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf),
AR = Auger Refusal, IGM = Intermediate Geomaterial

PROJECT: Poston Plant Legacy CCR Impoundment
York Township - Athens County, Ohio
S&ME Project No. 25170078

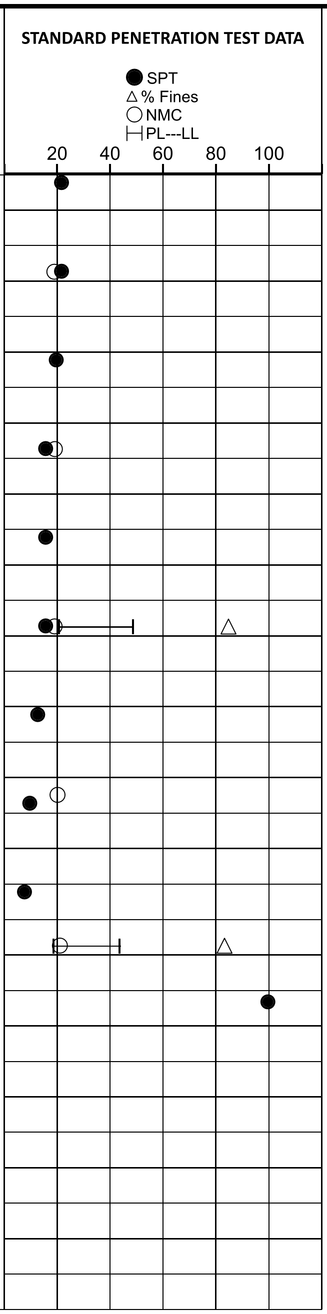
BORING LOG: B-02

Sheet 3 of 3

DATE DRILLED: 08/20/2025
ELEVATION: 767 ft
DRILL RIG: B-57 (Track), Geoprobe 3100GT
DATUM: NAVD88
DRILLER: A. Unverzagt, A. Archer
BORING DEPTH: 93.5 ft
HAMMER TYPE: Auto Hammer (140 lb)
CLOSURE: Installed Piezometer
DRILLING METHOD: 3-1/4" HSA, NQ
LOGGED BY: W. Babiy
SAMPLING METHOD: UD, SS, RC
NOTES: Elevation estimated from Google Earth
LATITUDE: 39.386496 **LONGITUDE:** -82.176957
PROJECT COORDINATE SYSTEM - NAD 1983 StatePlane Ohio South FIPS 3402 Feet

DEPTH (feet)	NOTES		Origin/Identifier	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	ELEVATION
65	PPV = 2.5-4.0				S-28 (18 in)	FILL: LEAN CLAY WITH SAND (CL), trace fine to coarse gravel, very stiff, brown, damp.	4-10-12 N = 22	702
	PPV = 3.0-4.5				S-29 (18 in)		4-8-14 N = 22	
70	PPV = 2.5-3.5 B-57 starts at 70.0'	71.0			S-30 (12 in)		4-8-12 N = 20	697
	PPV = 2.0-3.5	73.5			S-31 (18 in)	FILL: LEAN CLAY (CL), trace fine to coarse sand, trace fine to coarse gravel, very stiff, trace coal, trace organics, brown with gray, damp to moist.	4-8-8 N = 16	
75	PPV = 2.0-3.5				S-32 (18 in)	FILL: LEAN CLAY WITH SAND (CL), trace fine gravel, stiff to very stiff, orange brown, damp to moist.	4-7-9 N = 16	692
	PPV = 2.0-2.5				S-33 (18 in)		4-7-9 N = 16	
80	PPV = 1.0-2.0				S-34 (18 in)		4-6-7 N = 13	687
	PPV = 1.5-2.5				S-35 (12 in)		4-4-6 N = 10	
85	PPV = 0.5-1.0 Seepage at 85.0'				S-36 (18 in)		2-4-4 N = 8	682
	800 psi				S-37 REC-75%			
	PPV = 4.5	87.0 ▽ 87.7			S-38 (8 in)	WELL GRADED SAND WITH CLAY (SW-SC), decomposed shale, very dense, damp.	32-50/2" N = 50/2"	
90		93.5			S-39 REC-94% RQD-74%	SHALE, gray, very fine grained, thinly bedded to laminated, moderately fractured, slightly rough, moderately weathered, weak to medium strong, soft to low hardness.		677
95						Borehole terminated at 93.5 feet		672

STANDARD PENETRATION TEST DATA



GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽	08/25/2025	87.0	During drilling; seepage encountered at 10.0' and 57.0'.
END OF DRILLING	▼	08/25/2025	32.0	Prior to auger removal; after rock core.
AFTER DRILLING	▼			
AFTER DRILLING	▼			

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
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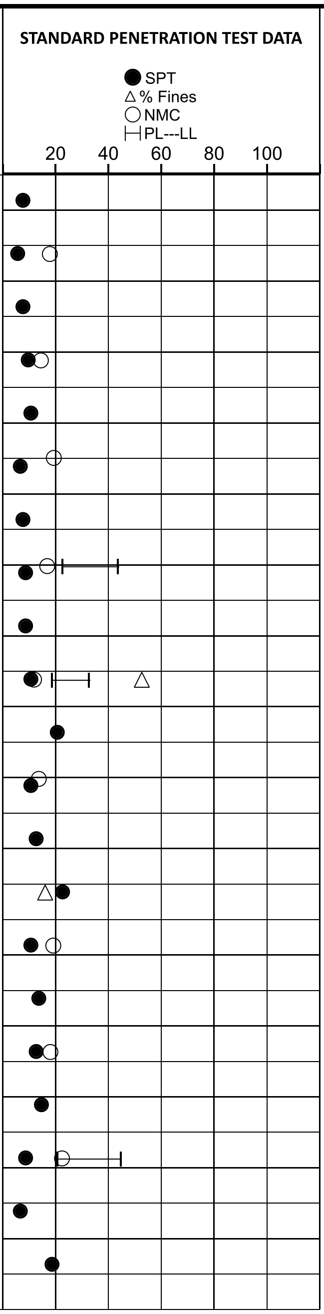
PROJECT: Poston Plant Legacy CCR Impoundment
York Township - Athens County, Ohio
S&ME Project No. 25170078

BORING LOG: B-03

Sheet 1 of 2

DATE DRILLED: 08/28/2025	**ELEVATION:** 700 ft	**NOTES:** Elevation estimated from Google Earth. Boring location offset 5.0ft east of staked location and 2.0ft bench cut from original slope	
DRILL RIG: B-57 (Track)	**DATUM:** NAVD88		
DRILLER: A. Unverzagt	**BORING DEPTH:** 45.3 ft		
HAMMER TYPE: Auto Hammer (140 lb)	**CLOSURE:** Installed Piezometer		
DRILLING METHOD: 3-1/4" HSA	**LOGGED BY:** M.S. Ansari	**LATITUDE:** 39.387047	**LONGITUDE:** -82.176517
SAMPLING METHOD: SS, RC	**PROJECT COORDINATE SYSTEM -** NAD 1983 StatePlane Ohio South FIPS 3402 Feet		

DEPTH (feet)	NOTES	Origin/Identifier	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	ELEVATION
0	PPV = 2.0-2.2		S-01 (18 in)	FILL: LEAN CLAY (CL), trace fine to coarse sand, trace fine gravel, iron staining, firm to stiff, brown and gray, damp to moist	3-4-4 N = 8	700
	PPV = 1.7-2.0		S-02 (18 in)		3-3-3 N = 6	
	PPV = 2.2-2.5		S-03 (18 in)		3-4-4 N = 8	
5	PPV = 2.0-2.2		S-04 (18 in)		3-5-5 N = 10	695
			S-05 (18 in)		3-5-6 N = 11	
			S-06 (12 in)		3-3-4 N = 7	
10	PPV = 0.7-1.2		S-07 (18 in)		2-4-4 N = 8	690
	PPV = 1.0-1.2		S-08 (13 in)		3-4-5 N = 9	
	PPV = 2.2	12.0	S-09 (18 in)	FILL: GRAVELLY LEAN CLAY WITH SAND (CL), stiff to very stiff, grayish brown, moist	3-4-5 N = 9	
	PPV = 1.7-2.0		S-10 (18 in)		4-5-6 N = 11	
15	PPV = 1.7-2.2		S-11 (18 in)		6-10-11 N = 21	685
			S-12 (13 in)		14-7-4 N = 11	
	Seepage encountered at 19.5'		S-13 (7 in)		4-5-8 N = 13	
20		19.5	S-14/14A (18 in)	FILL: CLAYEY SAND WITH GRAVEL (SC), medium dense, brown and gray, moist to wet	9-14-9 N = 23	680
	PPV = 1.7-2.5	21.0	S-15 (18 in)	FILL: LEAN CLAY WITH SAND (CL), trace fine to coarse gravel, iron stains, stiff, brown, moist	3-5-6 N = 11	
	PPV = 3.5-4.0		S-16 (18 in)		2-6-8 N = 14	
25	PPV = 2.0-2.2		S-17 (18 in)		4-5-8 N = 13	675
	PPV = 2.0-2.2		S-18 (18 in)		6-7-8 N = 15	
	PPV = 1.7-2.0	27.0	S-19 (18 in)	LEAN CLAY (CL), trace fine to coarse sand, trace fine gravel, stiff to very stiff, brown mottled with gray, moist	2-4-5 N = 9	
	PPV = 1.0-1.2		S-20 (18 in)		2-3-4 N = 7	
30	PPV = 2.0-2.2 PPV = 2.5-2.7	31.1	S-21A/B (18 in)	LEAN CLAY (CL), trace fine to coarse sand, trace fine gravel, stiff to very stiff, bluish gray, moist	4-9-10 N = 19	670



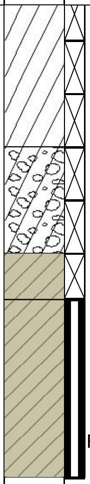
GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽	08/28/2025	21.0	Encountered groundwater
END OF DRILLING	▼	08/29/2025	40.0	Prior to rock core, inside HSA
AFTER DRILLING	▼	08/29/2025	17.0	After rcck core, prior to removing HSA
AFTER DRILLING	▼			

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf),
AR = Auger Refusal, IGM = Intermediate Geomaterial

PROJECT:	Poston Plant Legacy CCR Impoundment York Township - Athens County, Ohio **S&ME Project No. 25170078**	**BORING LOG: B-03** *Sheet 2 of 2*

DATE DRILLED: 08/28/2025	**ELEVATION:** 700 ft	**NOTES:** Elevation estimated from Google Earth. Boring location offset 5.0ft east of staked location and 2.0ft bench cut from original slope
DRILL RIG: B-57 (Track)	**DATUM:** NAVD88	
DRILLER: A. Unverzagt	**BORING DEPTH:** 45.3 ft	
HAMMER TYPE: Auto Hammer (140 lb)	**CLOSURE:** Installed Piezometer	
DRILLING METHOD: 3-1/4" HSA	**LOGGED BY:** M.S. Ansari	**LATITUDE:** 39.387047 **LONGITUDE:** -82.176517
SAMPLING METHOD: SS, RC	**PROJECT COORDINATE SYSTEM -** NAD 1983 StatePlane Ohio South FIPS 3402 Feet	

DEPTH (feet)	NOTES	Origin/Identifier	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	ELEVATION
	PPV = 1.2-1.7		S-22 (18 in)	LEAN CLAY (CL), trace fine to coarse sand, trace fine gravel, stiff to very stiff, bluish gray, moist	3-4-5 N = 9	
	PPV = 1.2-1.7		S-23 (18 in)		3-6-6 N = 12	
35			S-24 (18 in)		7-7-6 N = 13	665
36.0			S-25 (18 in)	CLAYEY GRAVEL (GC), trace fine to coarse sand, dense, brown, moist, (completely weathered shale).	3-5-11 N = 16	
	Sampler refusal at 40.3 feet		S-26 (6 in)		5-9-17 N = 26	
39.0			S-27 (6 in)	SHALE, gray, highly weathered, highly fractured	5-25-50/3" N = 50/3"	
40						660
40.3			S-28 REC-68% RQD-50%	SHALE, gray, moderately to highly weathered, medium strong to weak, moderately hard to soft, thinly bedded, moderately to high fractured		
45						655
45.3				Borehole terminated at 45.3 feet		
50						650
55						645
60						640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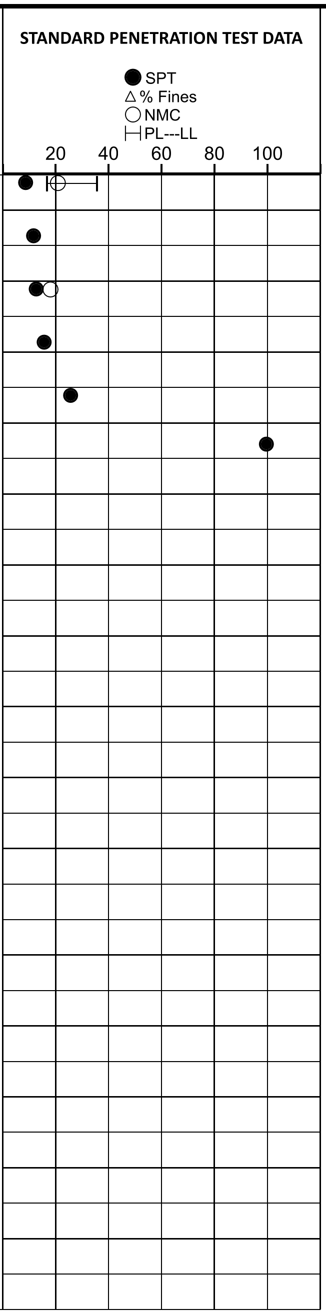


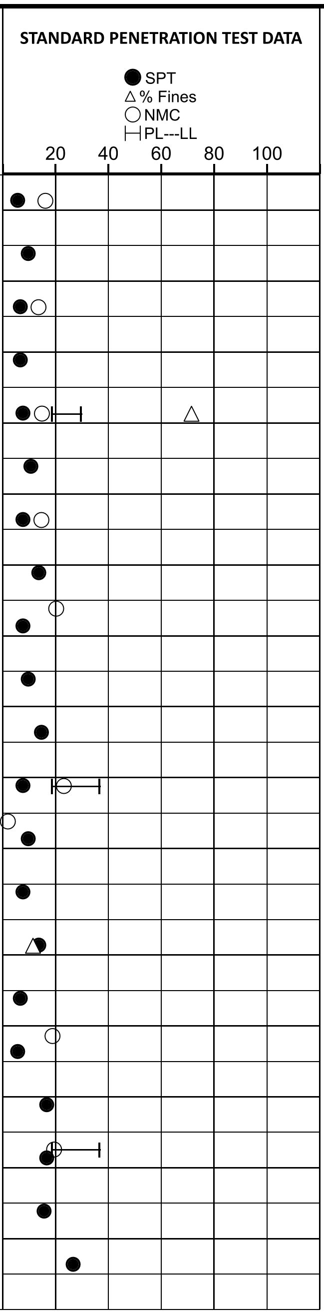
GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽	08/28/2025	21.0	Encountered groundwater
END OF DRILLING	▼	08/29/2025	40.0	Prior to rock core, inside HSA
AFTER DRILLING	▼	08/29/2025	17.0	After rcck core, prior to removing HSA
AFTER DRILLING	▼			

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf),
AR = Auger Refusal, IGM = Intermediate Geomaterial

PROJECT:	Poston Plant Legacy CCR Impoundment York Township - Athens County, Ohio **S&ME Project No. 25170078**	**BORING LOG: B-04** *Sheet 1 of 2*

DATE DRILLED: 08/27/2025	**ELEVATION:** 700 ft	**NOTES:** Elevation estimated from Google Earth Boring location offset 6.3 ft east of staked location. and 2.0 ft bench cut from original slope.
DRILL RIG: B-57 (Track)	**DATUM:** NAVD88	
DRILLER: A. Unverzagt	**BORING DEPTH:** 41.1 ft	
HAMMER TYPE: Auto Hammer (140 lb)	**CLOSURE:** Installed Piezometer	
DRILLING METHOD: 3-1/4" HSA	**LOGGED BY:** M.S. Ansari	**LATITUDE:** 39.386908 **LONGITUDE:** -82.176428
SAMPLING METHOD: SS, RC	**PROJECT COORDINATE SYSTEM -** NAD 1983 StatePlane Ohio South FIPS 3402 Feet	

DEPTH (feet)	NOTES		Origin/Identifier	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	ELEVATION
0	PPV = 1.7			S-01 (18 in)	FILL: LEAN CLAY WITH SAND (CL), trace fine to coarse gravel, firm, grayish brown, damp	3-3-3 N = 6	700
		1.5		S-02 (18 in)	FILL: LEAN CLAY WITH SAND (CL), trace fine gravel, iron stains, firm to stiff, gray and brown, damp	3-4-6 N = 10	
				S-03 (18 in)		3-4-3 N = 7	
5				S-04 (18 in)		3-4-3 N = 7	695
	PPV = 1.0-1.2			S-05 (18 in)		2-4-4 N = 8	
	PPV = 1.5-1.7			S-06 (18 in)		3-5-6 N = 11	
10	PPV = 1.2-2.0			S-07 (18 in)		12-5-3 N = 8	690
				S-08 (18 in)		5-7-7 N = 14	
	PPV = 2.2-2.5	12.0		S-09 (6 in)	FILL: LEAN CLAY WITH SAND (CL), trace fine to coarse gravel, firm, gray, few organic decayed wood chips, moist	2-4-4 N = 8	
	PPV = 2.2-2.5	13.5		S-10 (18 in)	FILL: LEAN CLAY (CL), trace fine to coarse sand, trace fine to coarse gravel, stiff, brown, moist	3-3-7 N = 10	
15		15.0		S-11 (12 in)	FILL: LEAN CLAY (CL), trace fine to coarse sand, trace fine gravel, stiff, brown, moist	8-7-8 N = 15	685
	PPV = 0.7-1.2			S-12 (18 in)		3-4-4 N = 8	
		18.0		S-13 (6 in)	FILL: GRAVELLY LEAN CLAY (CL), trace fine to coarse sand, stiff, brown, moist to damp	3-4-6 N = 10	
20				S-14 (6 in)		4-5-3 N = 8	680
		21.0 ▽		S-15\15A (18 in)	FILL: WELL GRADED SAND WITH CLAY AND GRAVEL (SW-SC), loose to medium dense, brown, wet	6-5-9 N = 14	
				S-16 (14 in)		5-4-3 N = 7	
25	PPV = 2.0-2.2	24.0		S-17 (7 in)	FILL: LEAN CLAY (CL), trace fine to coarse sand, trace fine gravel, stiff to very stiff, brown, moist	3-3-3 N = 6	675
	PPV = 4.5			S-18 (8 in)		5-8-9 N = 17	
	PPV = 3.2-3.5	27.0		S-19 (12 in)	LEAN CLAY (CL), trace fine to coarse sand, trace fine gravel, very stiff to hard, brown mottled with gray, moist	4-8-9 N = 17	
	PPV = 2.0-3.2			S-20 (18 in)		4-7-9 N = 16	
30		30.0		S-21 (18 in)	SHALE, gray and brown, iron staining, highly weathered, similar to soil	6-10-17 N = 27	670

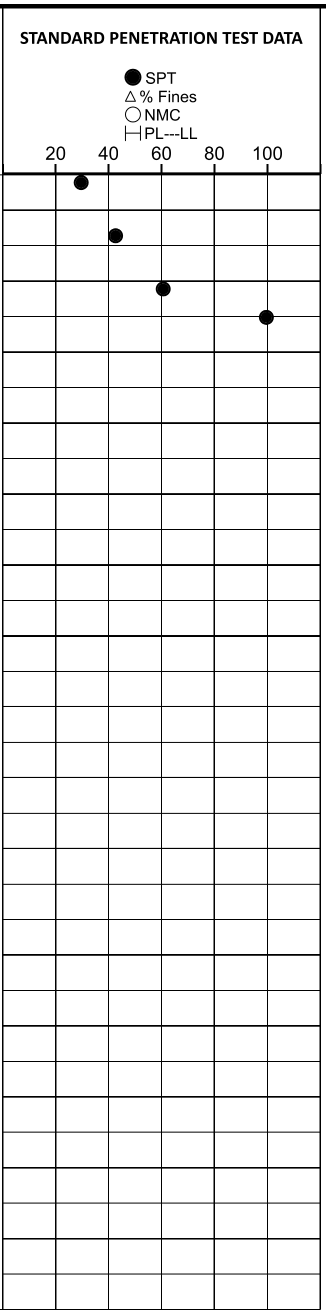


GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽	08/27/2025	21.0	Groundwater encountered
END OF DRILLING	▼	08/28/2025	21.2	Prior to rock core, inside HSA
AFTER DRILLING	▼			
AFTER DRILLING	▼			

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf),
AR = Auger Refusal, IGM = Intermediate Geomaterial

PROJECT:	Poston Plant Legacy CCR Impoundment York Township - Athens County, Ohio **S&ME Project No. 25170078**	**BORING LOG: B-04** *Sheet 2 of 2*	
DATE DRILLED: 08/27/2025	**ELEVATION:** 700 ft	**NOTES:** Elevation estimated from Google Earth Boring location offset 6.3 ft east of staked location. and 2.0 ft bench cut from original slope.	
DRILL RIG: B-57 (Track)	**DATUM:** NAVD88		
DRILLER: A. Unverzagt	**BORING DEPTH:** 41.1 ft		
HAMMER TYPE: Auto Hammer (140 lb)	**CLOSURE:** Installed Piezometer		
DRILLING METHOD: 3-1/4" HSA	**LOGGED BY:** M.S. Ansari	**LATITUDE:** 39.386908	**LONGITUDE:** -82.176428
SAMPLING METHOD: SS, RC	**PROJECT COORDINATE SYSTEM -** NAD 1983 StatePlane Ohio South FIPS 3402 Feet		

DEPTH (feet)	NOTES	Origin/Identifier	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	ELEVATION
				S-22 (18 in)	SHALE, gray and brown, iron staining, highly weathered, similar to soil	10-14-16 N = 30	
				S-23 (18 in)		5-13-30 N = 43	
35	Sampler refusal at 36.1 feet			S-24 (18 in)		13-23-38 N = 61	665
	36.1			(0 in)	SHALE, gray, fresh to highly weathered, strong to medium strong, moderately hard, thinly bedded, moderately to highly fractured, slightly rough to smooth	50/1" N = 50/1"	
40				S-25 REC-86% RQD-58%			660
	41.1				Borehole terminated at 41.1 feet		
45							655
50							650
55							645
60							640



GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽	08/27/2025	21.0	Groundwater encountered
END OF DRILLING	▼	08/28/2025	21.2	Prior to rock core, inside HSA
AFTER DRILLING	▼			
AFTER DRILLING	▼			

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf),
AR = Auger Refusal, IGM = Intermediate Geomaterial

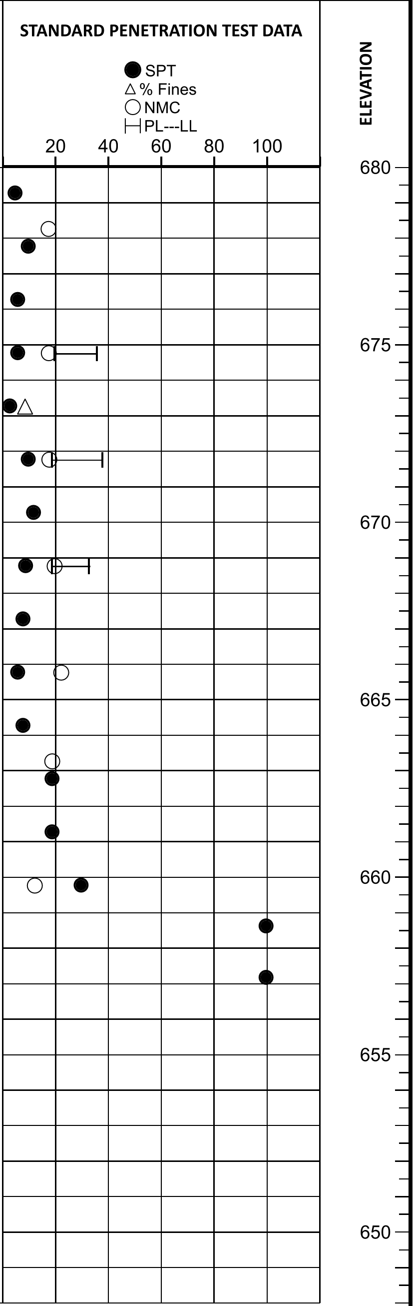
PROJECT: Poston Plant Legacy CCR Impoundment
York Township - Athens County, Ohio
S&ME Project No. 25170078

BORING LOG: B-05

Sheet 1 of 1

DATE DRILLED: 08/26/2025
ELEVATION: 680 ft
NOTES: Elevation estimated from Google Earth
DRILL RIG: B-57 (Track)
DATUM: NAVD88
DRILLER: A. Unverzagt
BORING DEPTH: 28.5 ft
HAMMER TYPE: Auto Hammer (140 lb)
CLOSURE: Cement-Bentonite Grout
DRILLING METHOD: 3-1/4" HSA
LOGGED BY: W. Babiy
LATITUDE: 39.387103 **LONGITUDE:** -82.176328
SAMPLING METHOD: SS, RC
PROJECT COORDINATE SYSTEM - NAD 1983 StatePlane Ohio South FIPS 3402 Feet

DEPTH (feet)	NOTES		SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)
0	PPV = 3.0-3.5	0.2	S-01 (18 in)	ROOTMAT - 3 INCHES FILL: LEAN CLAY (CL), trace fine to coarse sand, trace fine gravel, firm to stiff, brown, damp to wet	4-3-2 N = 5
	PPV = 1.5-3.0 Seepage at 3.3'		S-02/02A (18 in)		3-6-4 N = 10
	PPV = 1.5-3.5		S-03 (18 in)		3-3-3 N = 6
5	PPV = 0.2-1.0		S-04 (18 in)		2-1-5 N = 6
		6.0 ▽	S-05/05A (18 in)	FILL: WELL GRADED SAND WITH SILT AND GRAVEL (SW-SM), very loose, gray and light brown, wet	3-2-1 N = 3
	PPV = 3.5-4.5	7.5	S-06 (18 in)	FILL: LEAN CLAY (CL), trace fine to coarse sand, trace fine gravel, very stiff to hard, light brown with gray, moist	3-4-6 N = 10
10	PPV = 3.5-4.5	9.0	S-07 (6 in)	FILL: LEAN CLAY (CL), trace fine to coarse sand, trace fine gravel, stiff, brown mottled with black, moist.	4-6-6 N = 12
	PPV = 1.0-1.5		S-08 (18 in)		6-5-4 N = 9
	PPV = 1.5-2.5		S-09 (18 in)		8-4-4 N = 8
	PPV = 0.2-0.5	13.5	S-10 (18 in)	LEAN CLAY, firm, light brown mottled with gray	3-2-4 N = 6
15	PPV = 1.0-2.0	15.0	S-11 (18 in)	GRAVELY LEAN CLAY WITH SAND, firm to very stiff, light brown to gray, moist, (completely weathered shale).	2-3-5 N = 8
			S-12 (6 in)		17-13-6 N = 19
			S-13 (18 in)		5-7-12 N = 19
20			S-14 (18 in)		7-16-14 N = 30
	Sampler refusal at 23.5 feet		S-15 (10 in)		12-50/4" N = 50/4"
		23.1	S-16 (6 in)	SHALE, gray, moderately to highly fractured, highly weathered, very weak, friable, thinly bedded to thinly laminated, slightly rough	2-50/2" N = 50/2"
25			S-17 REC-36% RQD-0%		
		28.5		Borehole terminated at 28.5 feet	
30					



GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽	08/26/2025	6.0	Groundwater encoutered
END OF DRILLING	▼	08/26/2025	6.0	Prior to rock core, inside HSA
AFTER DRILLING	▼			
AFTER DRILLING	▼			

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf),
AR = Auger Refusal, IGM = Intermediate Geomaterial

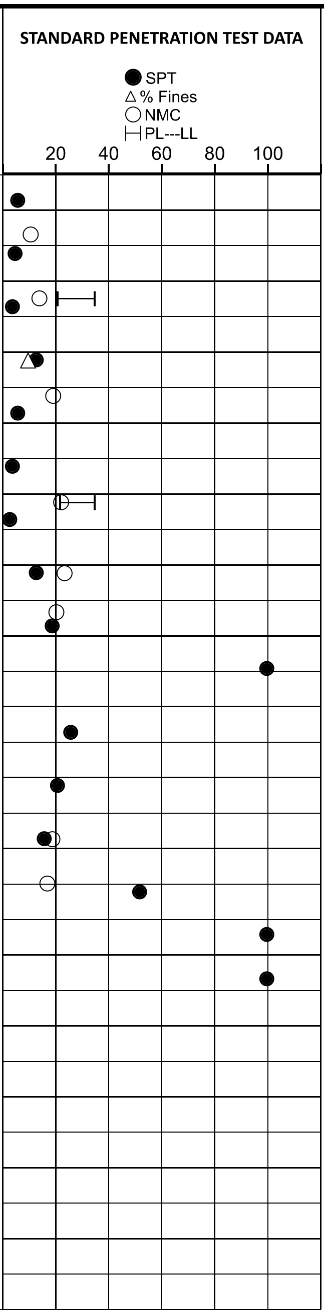
PROJECT: Poston Plant Legacy CCR Impoundment
York Township - Athens County, Ohio
S&ME Project No. 25170078

BORING LOG: B-06

Sheet 1 of 1

DATE DRILLED: 08/27/2025
ELEVATION: 681 ft
NOTES: Elevation estimated from Google Earth
DRILL RIG: B-57 (Track)
DATUM: NAVD88
DRILLER: A. Unverzagt
BORING DEPTH: 29.0 ft
HAMMER TYPE: Auto Hammer (140 lb)
CLOSURE: Cement-Bentonite Grout
DRILLING METHOD: 3-1/4" HSA
LOGGED BY: M.S. Ansari
LATITUDE: 39.386967 **LONGITUDE:** -82.176253
SAMPLING METHOD: SS, RC
PROJECT COORDINATE SYSTEM - NAD 1983 StatePlane Ohio South FIPS 3402 Feet

DEPTH (feet)	NOTES	Origin/Identifier	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)
0.4				ROOTMAT - 5 INCHES	
4.9			S-01 (18 in) S-02 (5 in) S-03 (12 in)	FILL: LEAN CLAY (CL), trace fine to coarse sand, trace fine gravel, soft to firm, light brown, few roots, moist	2-4-2 N = 6 3-2-3 N = 5 2-2-2 N = 4
6.2			S-4A/4B/5 (18 in)	FILL: WELL GRADED SAND WITH SILT (SW-SM), trace fine to coarse gravel, medium dense, light brown, wet	3-8-5 N = 13
10.5	PPV = 3.0-3.2 PPV = 0.7-1.0 PPV = 0.7-1.0		S-06 (6 in) S-07 (6 in) S-08 (6 in)	FILL: LEAN CLAY (CL), trace fine to coarse sand, trace fine gravel, soft, light brown, moist	1-3-3 N = 6 2-2-2 N = 4 2-1-2 N = 3
12.0	PPV = 0.7-1.2		S-09 (18 in)	LEAN CLAY WITH SAND (CL), trace to little fine to coarse gravel, firm to stiff, light brown mottled with gray, moist, few shale fragments	8-7-6 N = 13
14.4	PPV = 4.0-4.2		S-10 (8 in) S-11 (6 in)	SANDY LEAN CLAY (CL), little fine to coarse gravel, iron staining, very stiff to hard, brown mottled with gray, moist, few sandstone fragments	4-6-13 N = 19 11-50/5" N = 50/5"
16.5			S-12 (13 in)	POORLY GRADED SAND WITH CLAY AND GRAVEL (SP-SC), medium dense, brown, wet	10-16-10 N = 26
18.0			S-13 (14 in)	GRAVELLY LEAN CLAY (CL), some fine to coarse sand, iron staining, very stiff, brown mottled with black and gray, moist to wet	7-12-9 N = 21
19.5	PPV = 3.2-3.5		S-14 (18 in)	LEAN CLAY (CL), trace fine to coarse sand, trace fine to coarse gravel, very stiff, light gray mottled with brown, moist	8-10-6 N = 16
24.0	Sampler refusal at 24.0 feet		S-15 (18 in) S-16 (180 in) (0 in)	SHALE, light gray, highly weathered, highly cemented	10-22-30 N = 52 21-50/5" N = 50/5" 50/5" N = 50/5"
29.0			S-17 REC-90% RQD-53%	SHALE, gray, fresh to moderately weathered, strong to medium strong, moderately hard, thinly laminated, slightly fractured to highly fractured, slightly rough to smooth	
				Borehole terminated at 29.0 feet	



GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽	08/27/2025	6.0	Groundwater encountered
END OF DRILLING	▼	08/27/2025	5.4	Prior to rock core, inside HSA
AFTER DRILLING	▼	08/27/2025	9.7	After rock core, prior to auger removal
AFTER DRILLING	▼			

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf),
AR = Auger Refusal, IGM = Intermediate Geomaterial

PROJECT:	Poston Plant Legacy CCR Impoundment York Township - Athens County, Ohio **S&ME Project No. 25170078**	**BORING LOG: B-07** *Sheet 1 of 2*

DATE DRILLED: 08/19/2025	**ELEVATION:** 768 ft	**NOTES:** Elevation estimated from Google Earth
DRILL RIG: Geoprobe 3100GT	**DATUM:** NAVD88	
DRILLER: A. Archer	**BORING DEPTH:** 39.5 ft	
HAMMER TYPE: Auto Hammer (140 lb)	**CLOSURE:** Cement-Bentonite Grout	
DRILLING METHOD: 3-1/4" HSA	**LOGGED BY:** W. Babiy	**LATITUDE:** 39.384383 **LONGITUDE:** -82.176848
SAMPLING METHOD: UD, SS, RC	**PROJECT COORDINATE SYSTEM -** NAD 1983 StatePlane Ohio South FIPS 3402 Feet	

DEPTH (feet)	MATERIAL DESCRIPTION
0.3	TOPSOIL/ROOTMAT - 4 INCHES
1.0	FILL: WELL GRADED GRAVEL WITH SAND (GW), trace silt, gray, medium dense, dry.
3.0	FILL: GRAVELLY LEAN CLAY WITH SAND (CL), brown, very stiff, damp.
	FILL: FAT CLAY WITH SAND (CH), trace fine gravel, brown to gray, firm, damp.
6.0	FILL: LEAN CLAY WITH SAND (CL), trace fine gravel, brown to gray, firm, damp.
9.5	FILL: LEAN CLAY (CL), little fine to coarse sand, trace fine gravel, firm to stiff, yellowish brown, moist.
12.5	LEAN CLAY (CL), trace fine to coarse sand, trace fine gravel, very stiff to hard, yellowish brown mottled with gray, few iron oxide stains, damp, (completely weathered shale).
17.0	SHALE, decomposed, yellowish brown
19.3	SHALE, light brown to gray, very fine grained, thinly laminated, moderately to highly fractured, slightly rough, highly weathered, weak rock, soft to low hardness, some sand seams.
26.5	MICACEOUS SHALE, very fine grained, thinly laminated, moderately fractured, smooth, fresh, strong, moderately hard.

SAMPLE NO. (RECOVERY)	BLOW COUNT DATA (SPT N-value)
S-01 (12 in)	10-18-10 N = 28
S-02 (12 in)	8-5-4 N = 9
S-03 (13 in)	2-3-4 N = 7
S-04 (11 in)	2-2-3 N = 5
S-05/05A REC-95%	
S-06 (13 in)	1-2-3 N = 5
S-07 (18 in)	2-3-4 N = 7
S-08 (18 in)	2-3-8 N = 11
S-09 (18 in)	4-9-16 N = 25
S-10 (180 in)	8-14-20 N = 34
S-11 (18 in)	10-14-18 N = 32
S-12 (12 in)	15-50/5" N = 50/5"
S-13 (10 in)	25-50/4" N = 50/4"
S-14 REC-64% RQD-44%	
S-15 REC-100% RQD-46%	

NOTES

PPV = 3.0-4.0

PPV = 1.5-2.0

PPV = 0.5-0.7

500 psi

PPV = 1.5-2.5

PPV = 0.5-1.5

PPV = 1.0-1.5

Seepage at 12.0'

PPV = 0.5-1.5

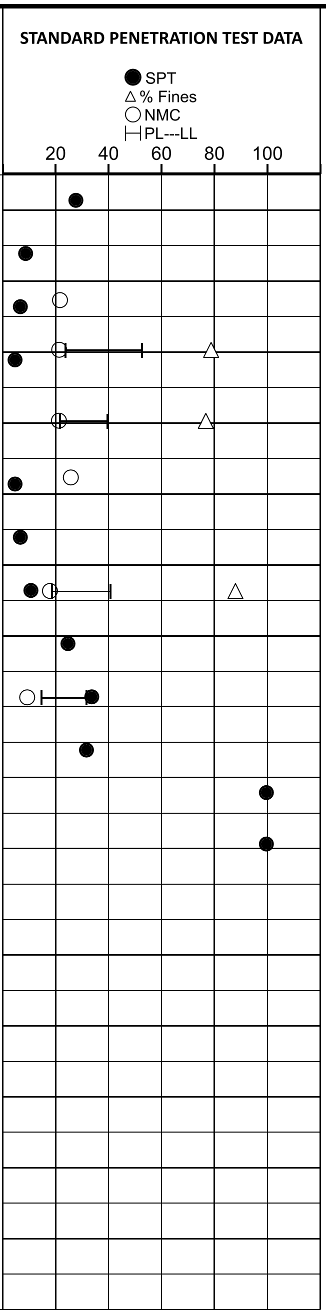
PPV = 4.5

PPV = 4.5

PPV = 4.5

Sampler refusal at 19.5 feet

DEPTH (feet)	ELEVATION
0	768
5	763
10	758
15	753
20	748
25	743
30	738



GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽	08/19/2025		Dry during drilling; seepage encountered at 12.0'.
END OF DRILLING	▼			
AFTER DRILLING	▼	08/20/2025	13.0	Prior to auger removal; after rock core.
AFTER DRILLING	▼			

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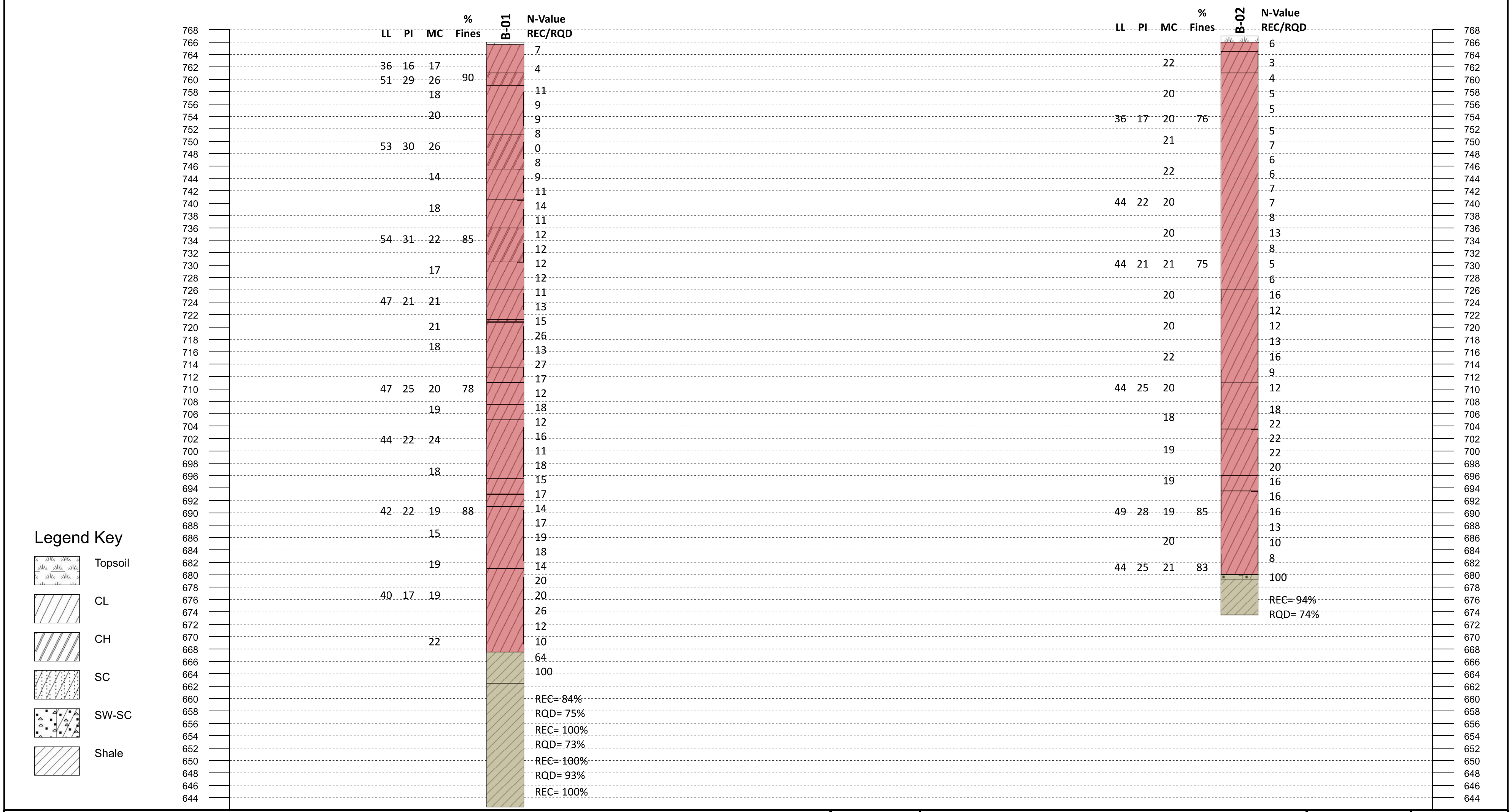
PROJECT:	Poston Plant Legacy CCR Impoundment York Township - Athens County, Ohio **S&ME Project No. 25170078**	**BORING LOG: B-07** *Sheet 2 of 2*

DATE DRILLED: 08/19/2025	**ELEVATION:** 768 ft	**NOTES:** Elevation estimated from Google Earth
DRILL RIG: Geoprobe 3100GT	**DATUM:** NAVD88	
DRILLER: A. Archer	**BORING DEPTH:** 39.5 ft	
HAMMER TYPE: Auto Hammer (140 lb)	**CLOSURE:** Cement-Bentonite Grout	
DRILLING METHOD: 3-1/4" HSA	**LOGGED BY:** W. Babiy	**LATITUDE:** 39.384383 **LONGITUDE:** -82.176848
SAMPLING METHOD: UD, SS, RC	**PROJECT COORDINATE SYSTEM -** NAD 1983 StatePlane Ohio South FIPS 3402 Feet	

DEPTH (feet)	NOTES	Origin/Identifier	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	STANDARD PENETRATION TEST DATA ● SPT △ % Fines ○ NMC ├┤ PL---LL 20 40 60 80 100	ELEVATION
			▨	S-16 REC-92% RQD-88%	MICACEOUS SHALE, very fine grained, thinly laminated, moderately fractured, smooth, fresh, strong, moderately hard.			
35			▨					733
			▨	S-17 REC-100% RQD-80%				
	39.5				Borehole terminated at 39.5 feet			
40								728
45								723
50								718
55								713
60								708

GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽	08/19/2025		Dry during drilling; seepage encountered at 12.0'.
END OF DRILLING	▼			
AFTER DRILLING	▼	08/20/2025	13.0	Prior to auger removal; after rock core.
AFTER DRILLING	▼			

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf),
AR = Auger Refusal, IGM = Intermediate Geomaterial

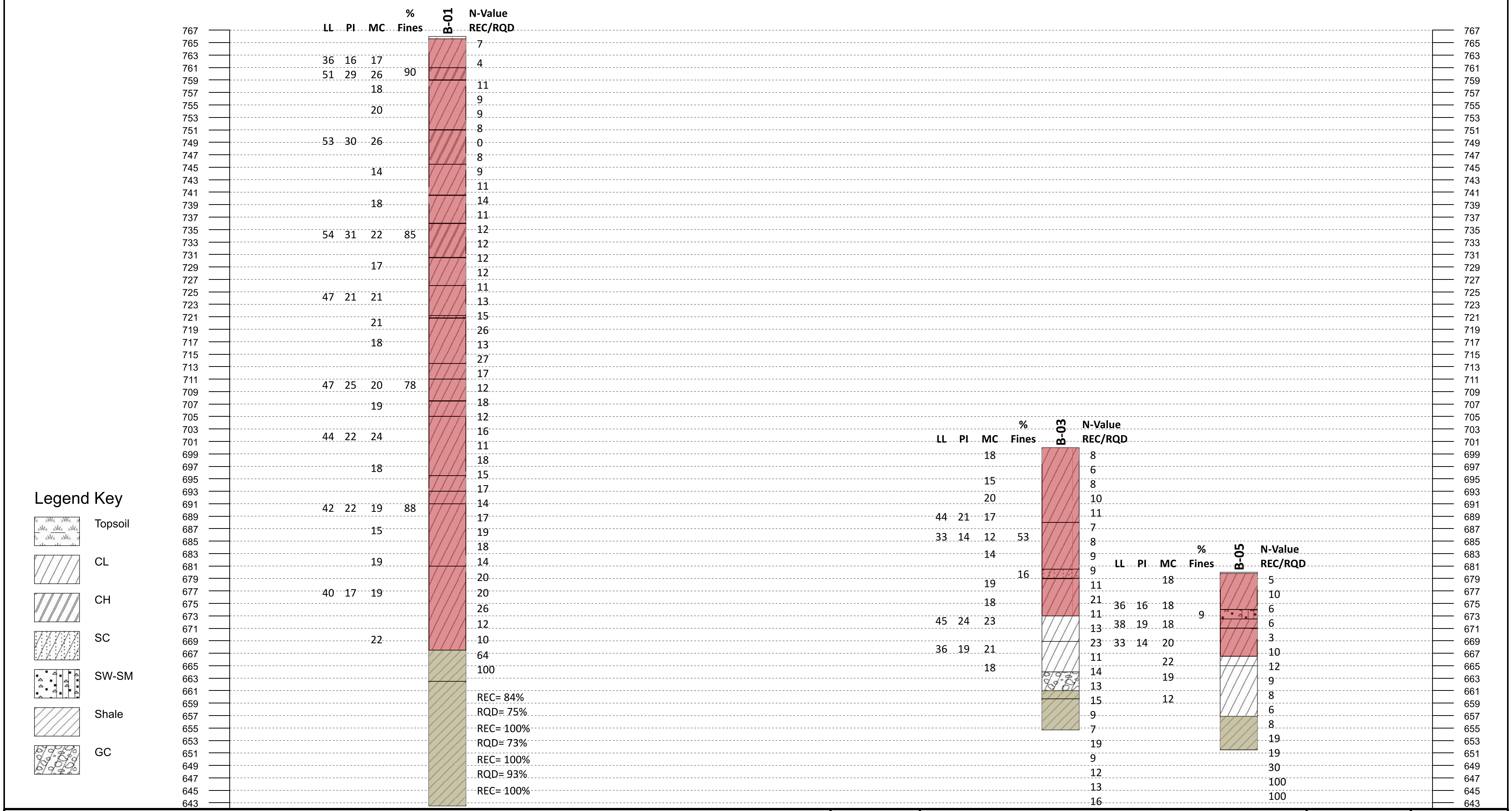


Subsurface Profile - East Embankment Alignment

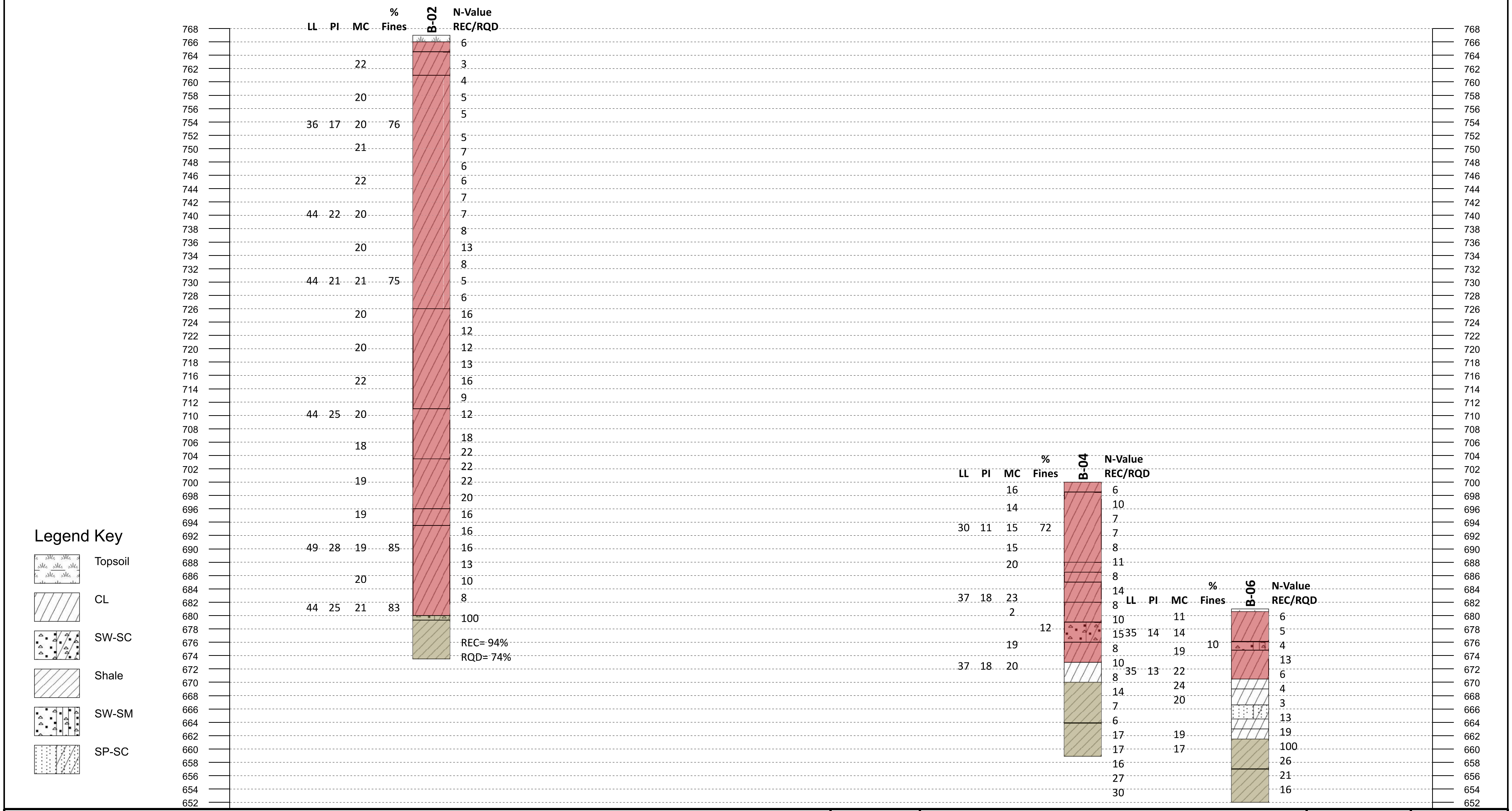
Poston Plant Legacy CCR Impoundment
York Township - Athens County, Ohio

SCALE:
1:219
DATE:
Jan 19, 2026
PROJECT NUMBER:
25170078

FIGURE NO.
1



	East Embankment Cross section 1 (B-01, B-03, B-05)	SCALE: 1:364 DATE: Jan 19, 2026 PROJECT NUMBER: 25170078	FIGURE NO. 2
	Poston Plant Legacy CCR Impoundment York Township - Athens County, Ohio		



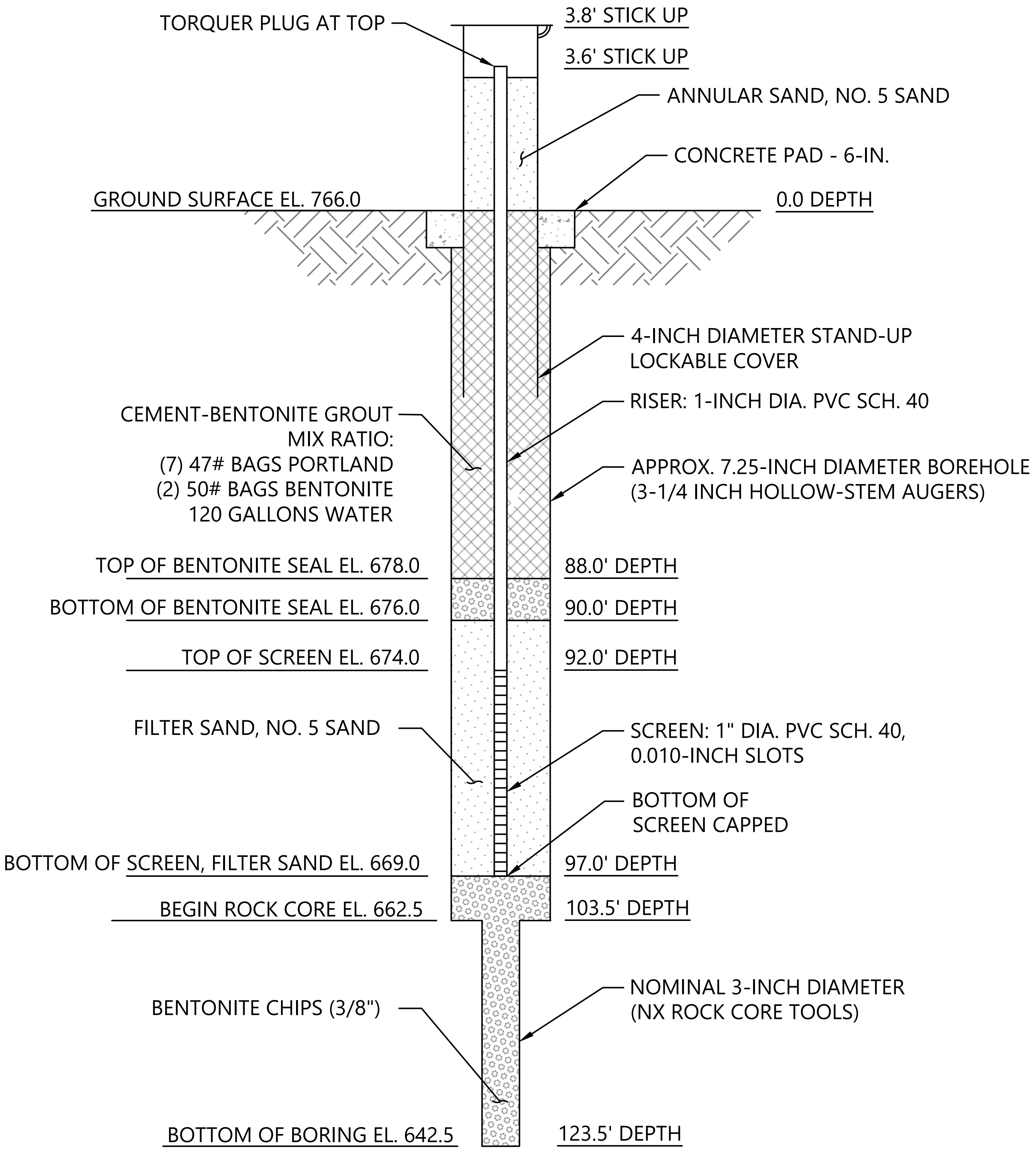
East Embankment Cross Section 2 (B-02, B-04, B-06)

Poston Plant Legacy CCR Impoundment
York Township - Athens County, Ohio

SCALE:	1:369
DATE:	Jan 19, 2026
PROJECT NUMBER:	25170078
FIGURE NO.	3

INSTALL DATE: 08/21/2025
INSTALLER: A. UNVERZAGT
FIELD ENGINEER: M.S. ANSARI
B-01 PIEZOMETER

10' RISER (1-INCH PVC) INSTALLED
IN CONCRETE WITH 9.2' STICK UP
ABOVE GROUND SURFACE



Drawing Path: T:\Columbus-1170\Projects\2025\25170078_AEP_Poston Legacy CCR Impoundment Eval\Civil\CAD\DWG\PIEZO.dwg

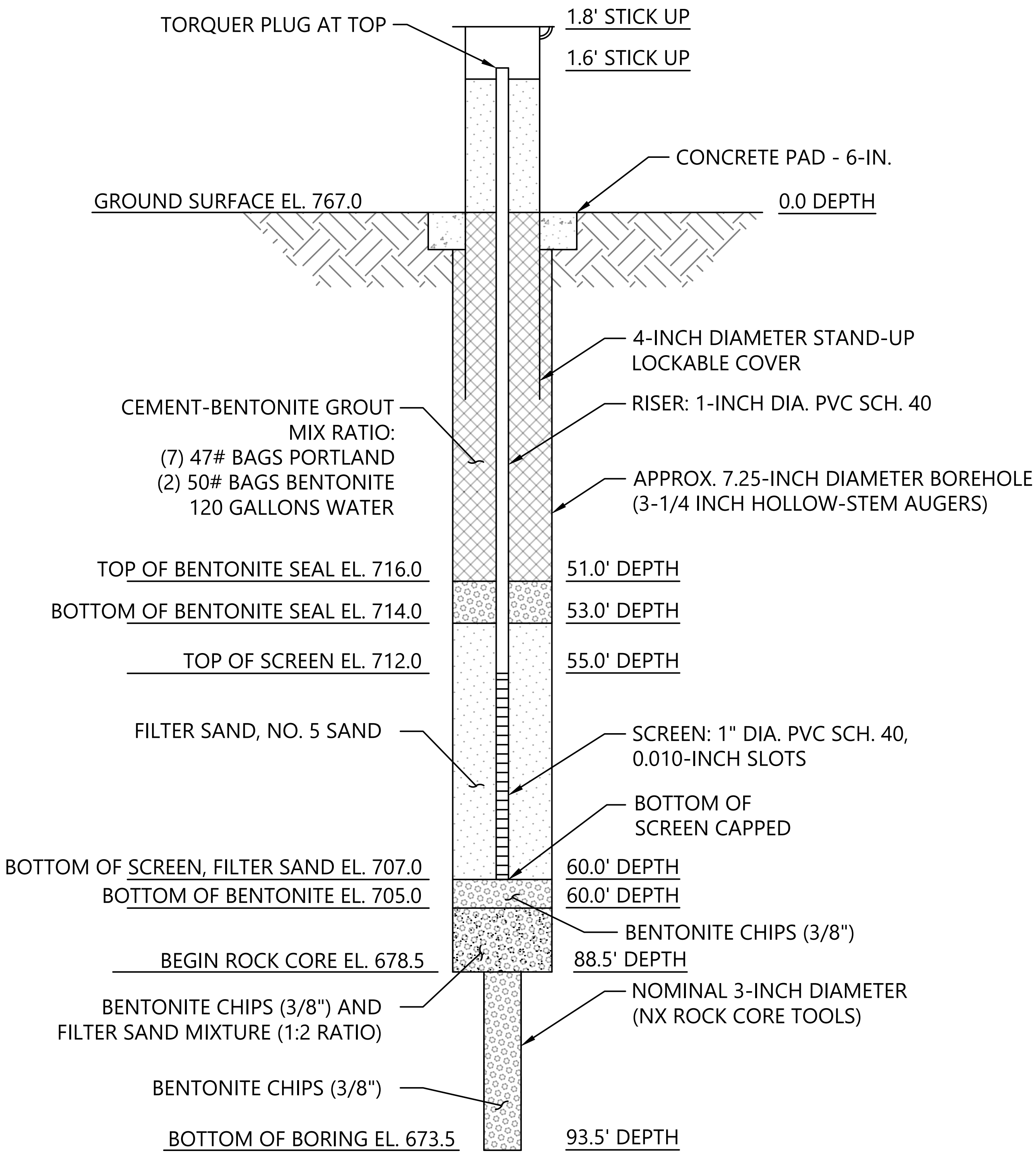
PIEZOMETER B-1

GEOTECHNICAL DATA REPORT
POSTON PLANT LEGACY CCR IMPOUNDMENT
YORK TOWNSHIP - ATHENS COUNTY, OHIO

SCALE:	FIGURE NO.
NTS	1
DATE:	
09/23/2025	
PROJECT NUMBER	
25170078	

INSTALL DATE: 08/25/2025
INSTALLER: A. UNVERZAGT
FIELD ENGINEER: W. BABIY
B-02 PIEZOMETER

10' RISER (1-INCH PVC) INSTALLED
IN CONCRETE WITH 9.2' STICK UP
ABOVE GROUND SURFACE



PIEZOMETER B-2

GEOTECHNICAL DATA REPORT
POSTON PLANT LEGACY CCR IMPOUNDMENT
YORK TOWNSHIP - ATHENS COUNTY, OHIO

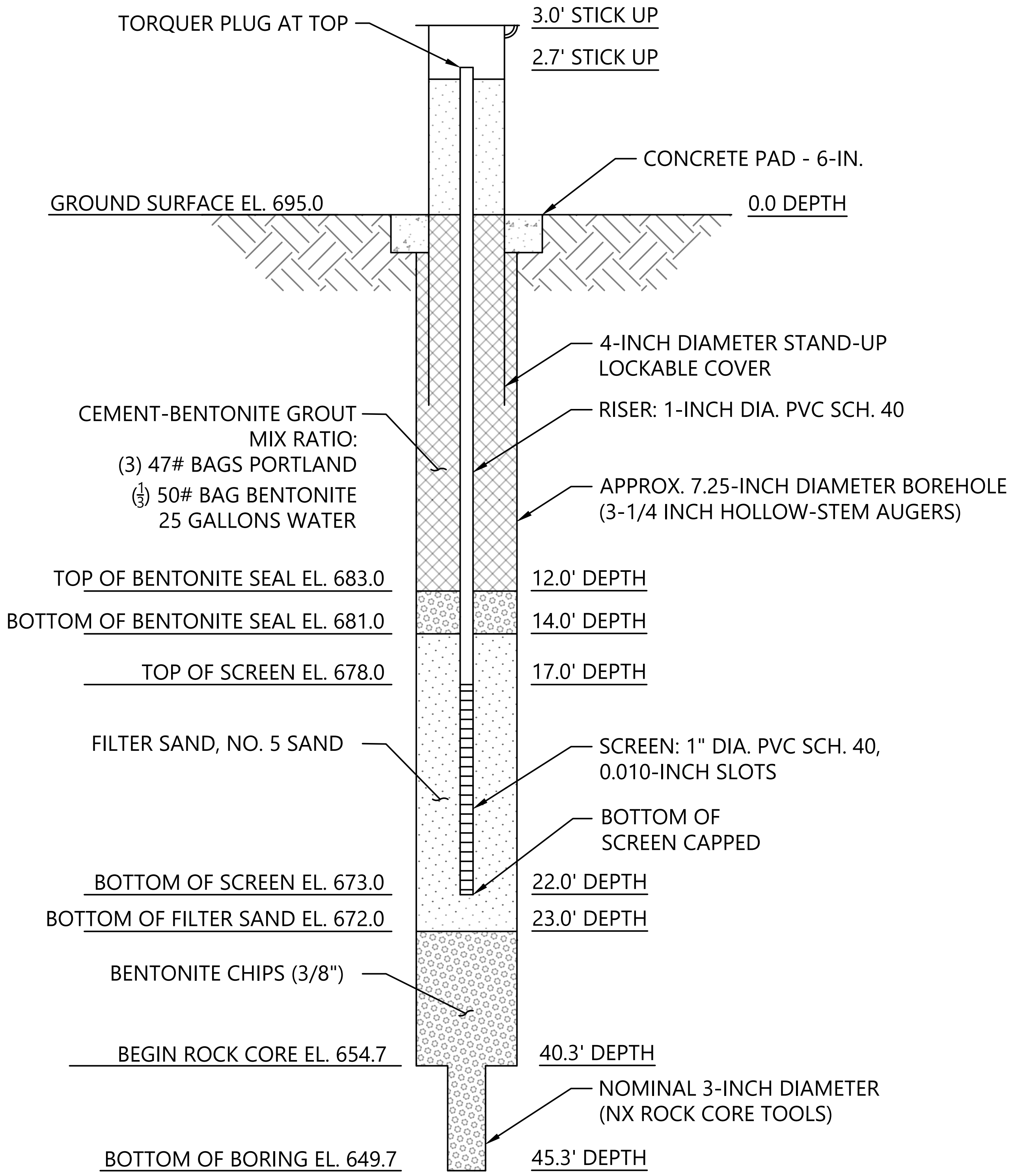
SCALE:
NTS
DATE:
09/23/2025
PROJECT NUMBER
25170078

FIGURE NO.
2

Drawing Path: T:\Columbus-1170\Projects\2025\25170078_AEP_Poston Legacy CCR Impoundment Eval\Civil\CAD\DWG\PIEZO.dwg

INSTALL DATE: 08/29/2025
INSTALLER: A. UNVERZAGT
FIELD ENGINEER: M.S. ANSARI
B-03 PIEZOMETER

10' RISER (1-INCH PVC) INSTALLED
IN CONCRETE WITH 7.0' STICK UP
ABOVE GROUND SURFACE



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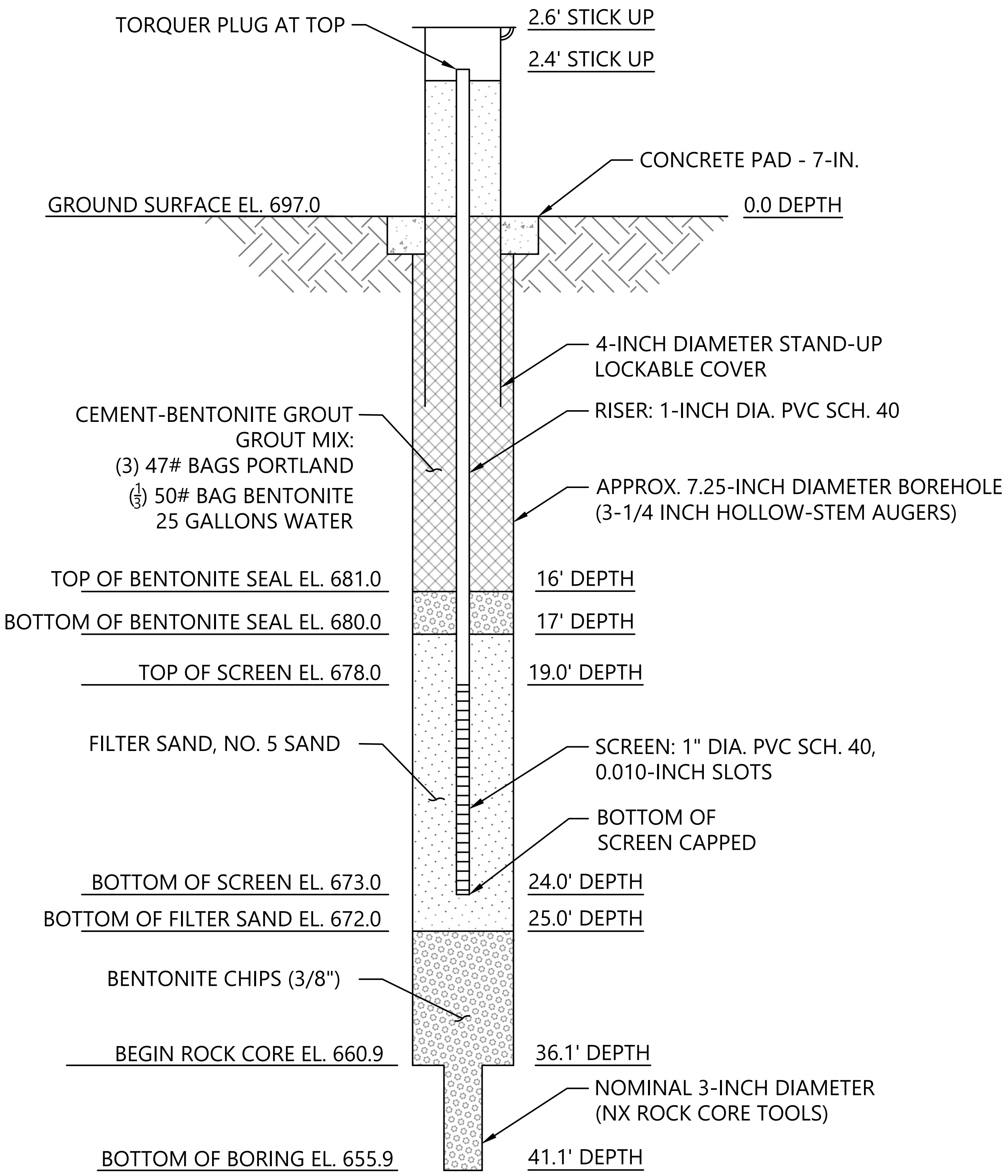
PIEZOMETER B-3

GEOTECHNICAL DATA REPORT
POSTON PLANT LEGACY CCR IMPOUNDMENT
YORK TOWNSHIP - ATHENS COUNTY, OHIO

SCALE: NTS
DATE: 09/23/2025
PROJECT NUMBER: 25170078
FIGURE NO. 3

INSTALL DATE: 08/29/2025
INSTALLER: A. UNVERZAGT
FIELD ENGINEER: M.S. ANSARI
B-04 PIEZOMETER

10' RISER (1-INCH PVC) INSTALLED
IN CONCRETE WITH 9.0' STICK UP
ABOVE GROUND SURFACE

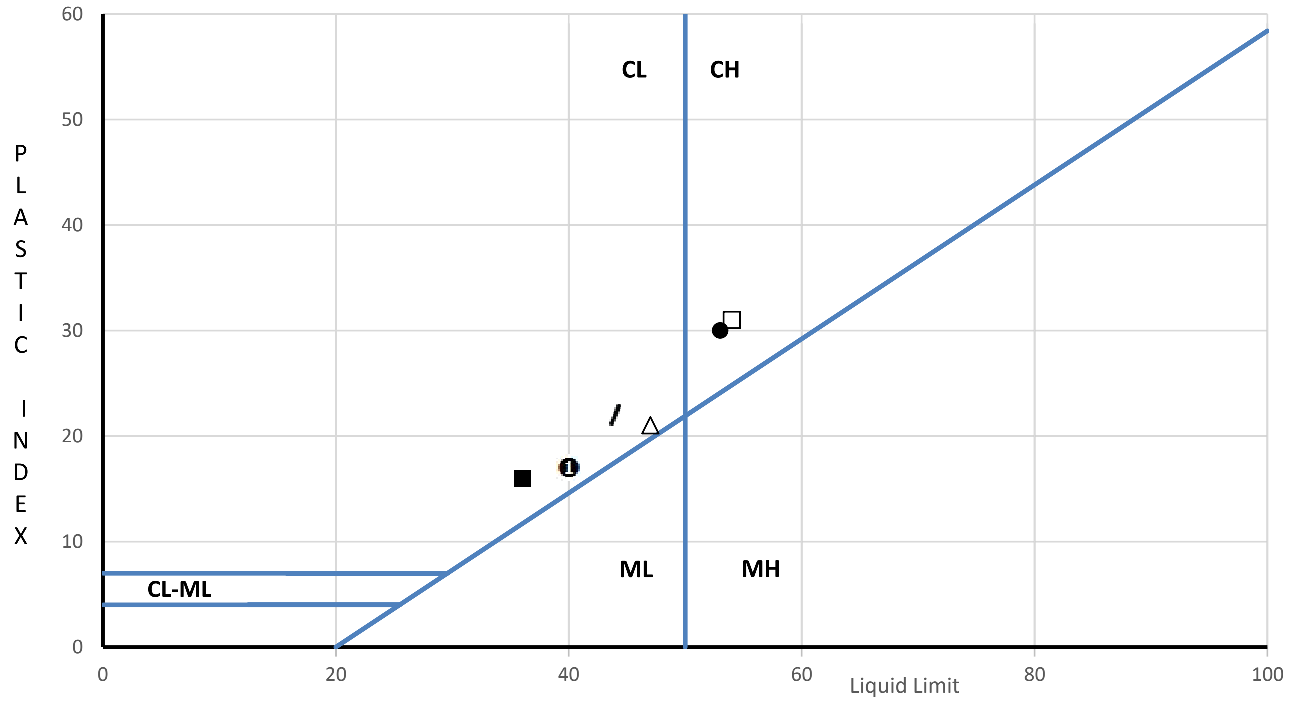


Drawing Path: T:\Columbus-1170\Projects\2025\25170078_AEP_Poston Legacy CCR Impoundment Eval\Civil\CAD\DWG\PIEZO.dwg

PIEZOMETER B-4

GEOTECHNICAL DATA REPORT
POSTON PLANT LEGACY CCR IMPOUNDMENT
YORK TOWNSHIP - ATHENS COUNTY, OHIO

SCALE: NTS
DATE: 09/23/2025
PROJECT NUMBER: 25170078
FIGURE NO. 4



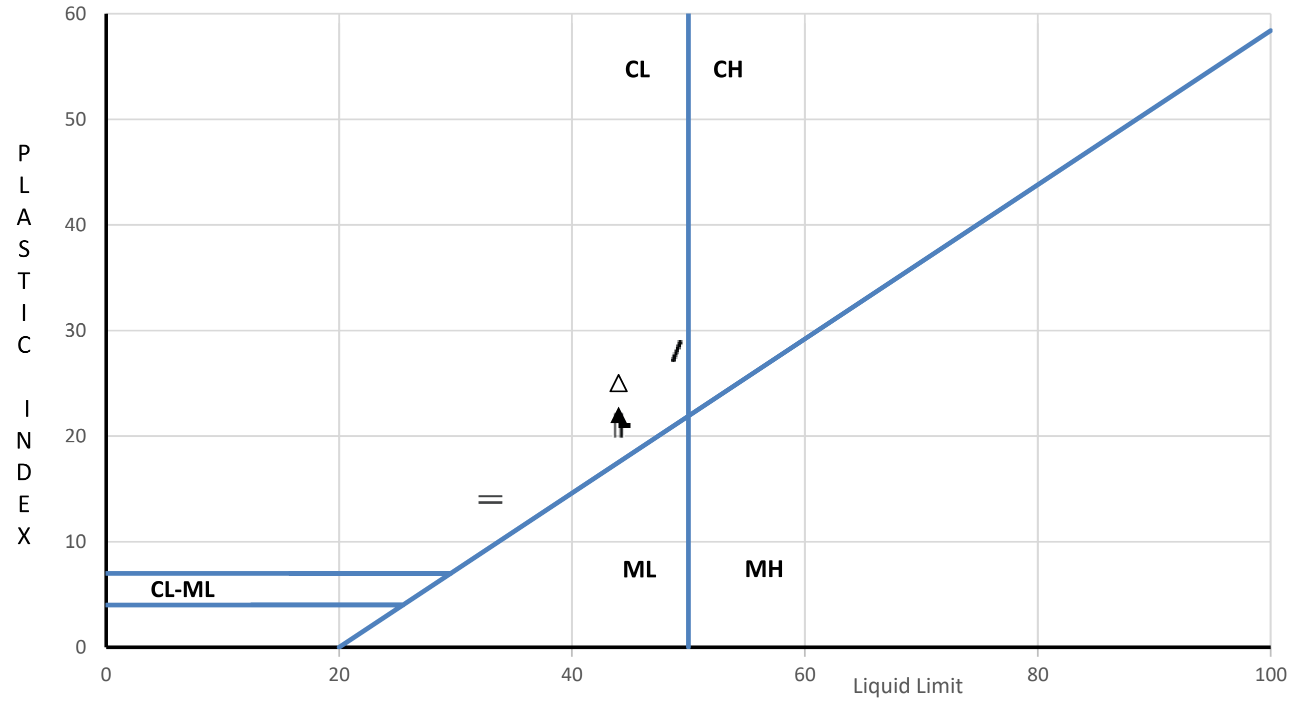
Specimen Identification				MC	LL	PL	PI	Fines	Classification (symbol is based on minus 40 material only when no grain size information is present.)	
	ID	No.	Top Depth						Symbol	Name
■	B-01	S-02	3.5	16.9	36	20	16		CL	
	B-01	S-04	7	17.5						
	B-01	S-06	11	19.9						
●	B-01	S-08	16	26.0	53	23	30		CH	
	B-01	S-10	21	14.1						
	B-01	S-12	26	17.9						
□	B-01	S-14	31	21.8	54	23	31	84.8	CH	FAT CLAY WITH SAND
	B-01	S-16	36	16.8						
△	B-01	S-18	41	20.7	47	26	21		CL	
	B-01	S-20B	45.2	21.2						
	B-01	S-22	48.5	18.3						
	B-01	S-27	58.5	19.2						
/	B-01	S-29	63.5	23.7	44	22	22		CL	
	B-01	S-31	68.5	18.5						
	B-01	S-36	78.5	15.2						
	B-01	S-38	83.5	18.6						
❶	B-01	S-40	88.5	19.0	40	23	17		CL	
	B-01	S-43	96	21.6						
	B-02	S-02	3.5	21.7						
	B-02	S-04	8.5	20.1						

INDEX TEST RESULTS

Project Name	Poston Plant Legacy CCR Impoundment
Project Number	25170078

Approved by	Date
Paula J. Manning	10/23/2025

Report Date 12/10/2025



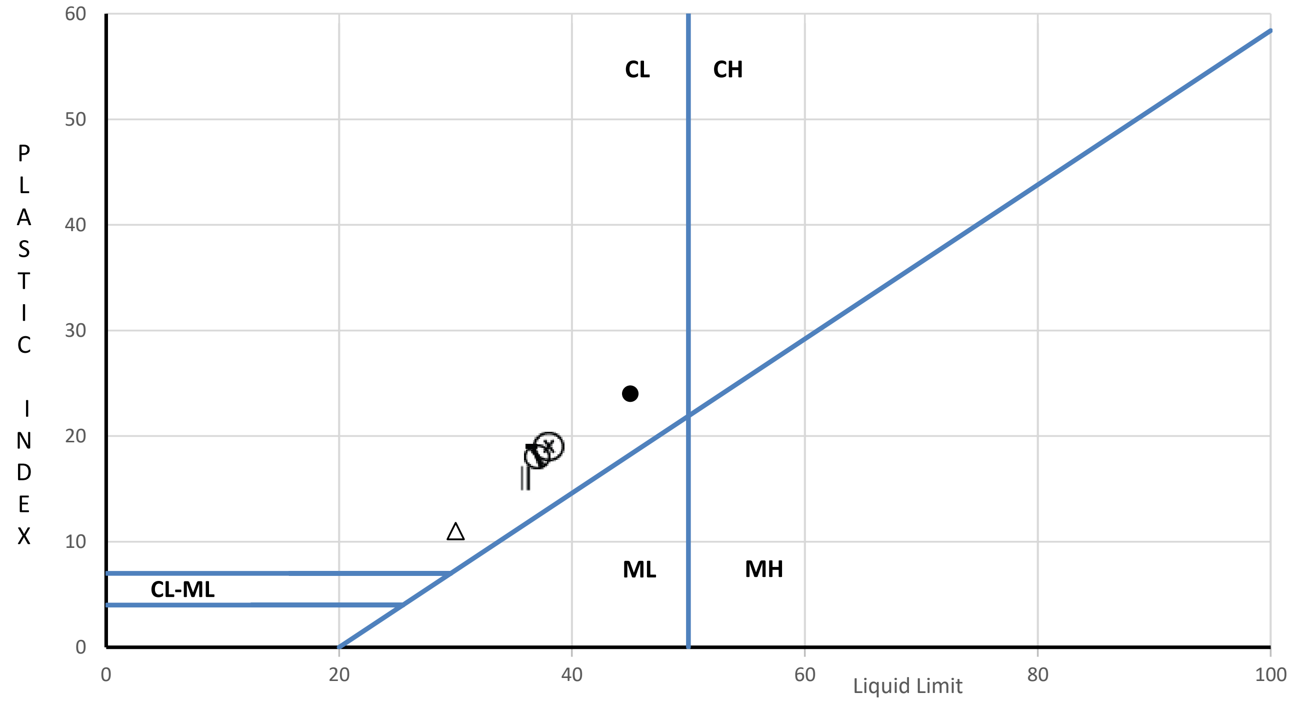
Specimen Identification				MC	LL	PL	PI	Fines	Classification (symbol is based on minus 40 material only when no grain size information is present.)	
	ID	No.	Top Depth						Symbol	Name
	B-02	**S-08**	**16**	**21.2**						
	B-02	**S-10**	**21**	**21.5**						
▲	**B-02**	**S-12**	**26**	**20.4**	**44**	**22**	**22**		**CL**	
	B-02	**S-14**	**31**	**20.4**						
▬	**B-02**	**S-16**	**36**	**20.7**	**44**	**23**	**21**	**74.9**	**CL**	**LEAN CLAY WITH SAND**
	B-02	**S-18**	**41**	**19.9**						
	B-02	**S-20**	**46**	**20.5**						
	B-02	**S-22**	**51**	**21.9**						
△	**B-02**	**S-24**	**56**	**19.7**	**44**	**19**	**25**		**CL**	
	B-02	**S-27**	**61**	**18.2**						
	B-02	**S-29**	**66**	**19.1**						
	B-02	**S-31**	**71**	**19.3**						
/	**B-02**	**S-33**	**76**	**19.2**	**49**	**21**	**28**	**84.9**	**CL**	**LEAN CLAY WITH SAND**
	B-02	**S-35**	**81**	**20.3**						
	B-03	**S-02**	**1.5**	**18.0**						
	B-03	**S-04**	**4.5**	**14.6**						
	B-03	**S-06**	**7.5**	**19.5**						
‖	**B-03**	**S-08**	**10.5**	**17.0**	**44**	**23**	**21**		**CL**	
=	**B-03**	**S-10**	**13.5**	**12.0**	**33**	**19**	**14**	**52.8**	**CL**	**GRAVELLY LEAN CLAY WITH SAND**
	B-03	**S-12**	**16.5**	**13.8**						

INDEX TEST RESULTS

Project Name	Poston Plant Legacy CCR Impoundment
Project Number	25170078

Approved by	Date
Paula J. Manning	12/9/2025

Report Date 12/10/2025



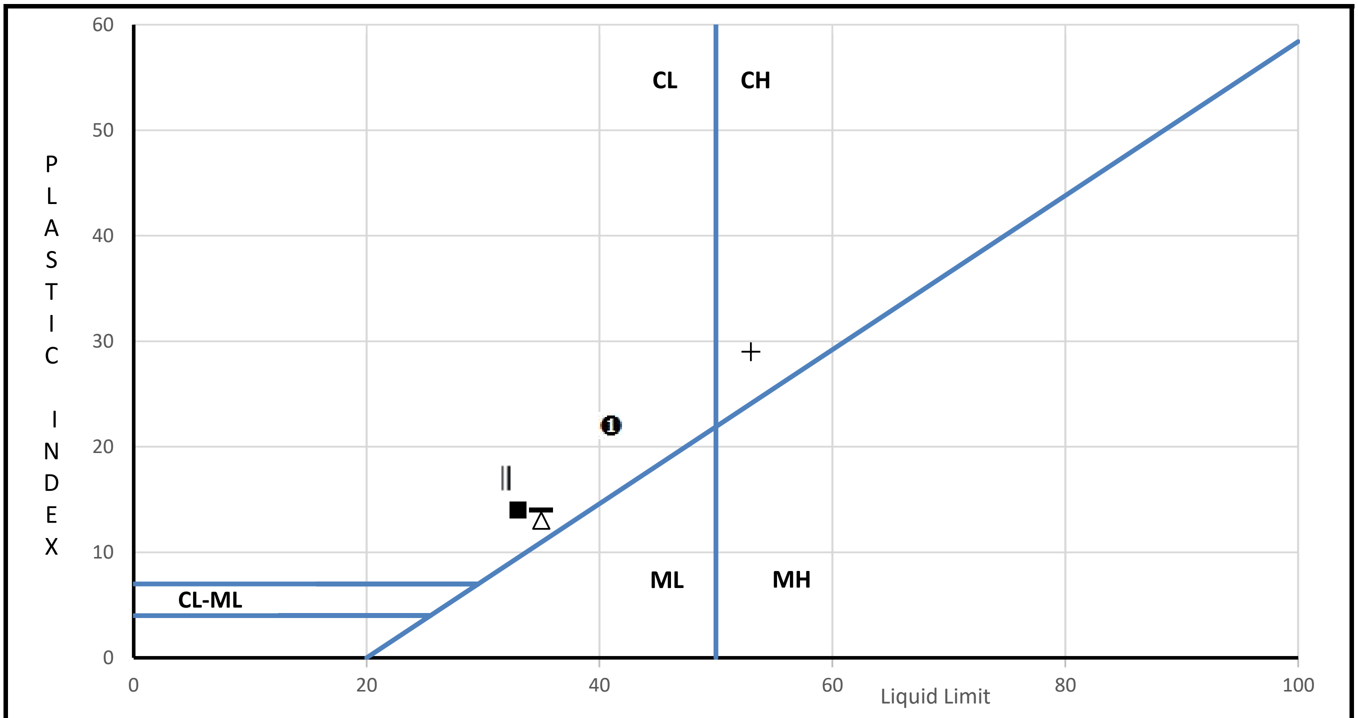
Specimen Identification				MC	LL	PL	PI	Fines	Classification (symbol is based on minus 40 material only when no grain size information is present.)	
	ID	No.	Top Depth						Symbol	Name
	B-03	S-14A	19.5					16.2		
	B-03	S-15	21	19.3						
	B-03	S-17	24	18.2						
●	B-03	S-19	27	22.6	45	21	24		CL	
▬	B-03	S-22	31.5	21.0	36	17	19		CL	
	B-03	S-24	34.5	18.2						
	B-04	S-01	0	16.3						
	B-04	S-03	3	13.7						
△	B-04	S-05	6	15.0	30	19	11	71.6	CL	LEAN CLAY WITH SAND
	B-04	S-07	9	14.8						
	B-04	S-09	12	20.4						
\	B-04	S-12	16.5	23.3	37	19	18		CL	
	B-04	S-13	18	2.1						
	B-04	S-15A	21					11.6		
	B-04	S-17	24	19.0						
⃠	B-04	S-19	27	19.6	37	19	18		CL	
	B-05	S-02	1.5	17.5						
‖	B-05	S-04	4.5	17.6	36	20	16		CL	
	B-05	S-05A	6					8.6		
⊗	B-05	S-06	7.5	17.8	38	19	19		CL	

INDEX TEST RESULTS

Project Name	Poston Plant Legacy CCR Impoundment
Project Number	25170078

Approved by	Date
Paula J. Manning	12/10/2025

Report Date 12/10/2025



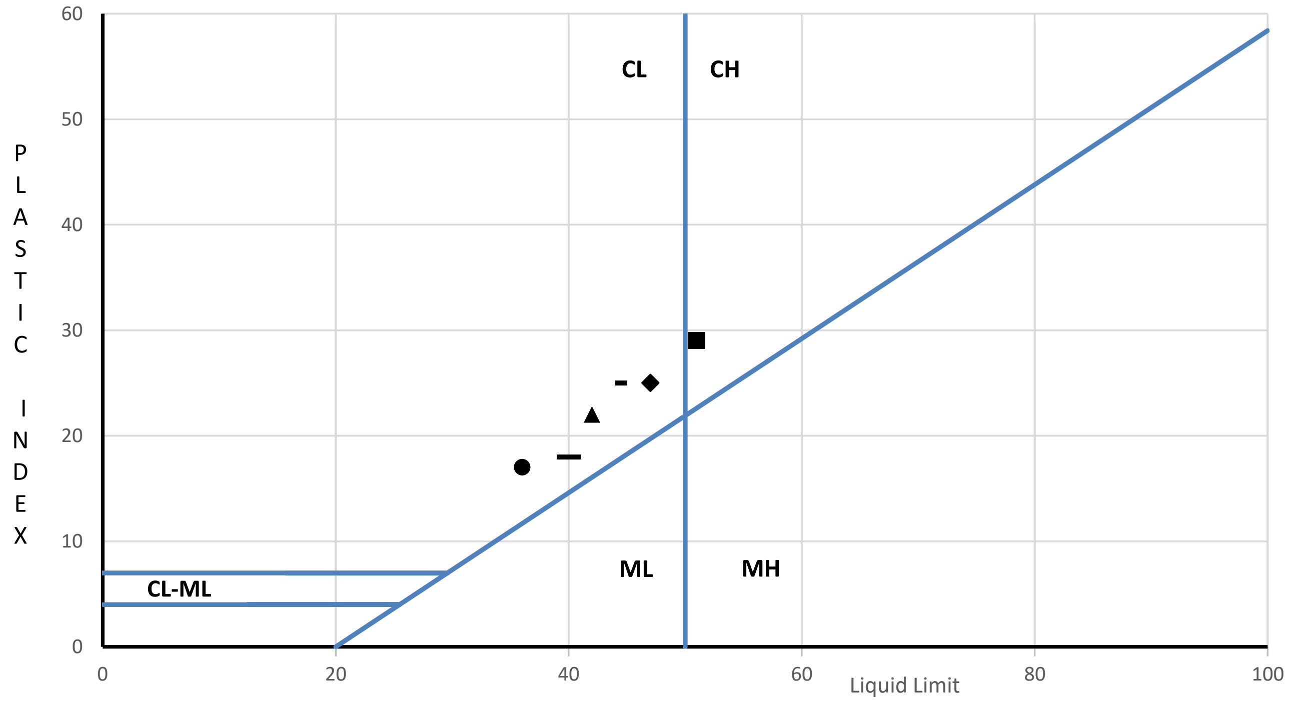
Specimen Identification				MC	LL	PL	PI	Fines	Classification (symbol is based on minus 40 material only when no grain size information is present.)	
	ID	No.	Top Depth						Symbol	Name
■	B-05	S-08	10.5	19.8	33	19	14		CL	
	B-05	S-10	13.5	22.3						
	B-05	S-12	16.5	18.9						
	B-05	S-14	19.5	12.3						
	B-06	S-02	1.5	10.7						
▬	B-06	S-03	3	14.0	35	21	14		CL	
	B-06	S-05	4.5					9.7		
	B-06	S-06	6	19.2						
△	B-06	S-08	9	22.2	35	22	13		CL	
	B-06	S-09	10.5	23.5						
	B-06	S-10	12	20.4						
	B-06	S-14	18	18.9						
	B-06	S-15	19.5	17.0						
	B-07	S-03	3	21.8						
+	B-07	S-04	4.5	21.5	53	24	29	78.9	CH	FAT CLAY WITH SAND
	B-07	S-06	8	25.9						
❶	B-07	S-08	11	18.0	41	19	22	88.1	CL	LEAN CLAY
‖	B-07	S-10	14	9.4	32	15	17		CL	

INDEX TEST RESULTS

Project Name	Poston Plant Legacy CCR Impoundment
Project Number	25170078

Approved by	Date
Paula J. Manning	11/6/2025

Report Date 12/10/2025



Specimen Identification				MC	LL	PL	PI	Fines	Classification (symbol is based on minus 40 material only when no grain size information is present.)	
	ID	No.	Top Depth						Symbol	Name
■	**B-01**	**S-03**	**5**	**25.8**	**51**	**22**	**29**	**90.0**	**CH**	**FAT CLAY**
◆	**B-01**	**S-25**	**55**	**19.5**	**47**	**22**	**25**	**78.1**	**CL**	**LEAN CLAY WITH SAND**
▲	**B-01**	**S-34**	**75**	**18.6**	**42**	**20**	**22**	**88.4**	**CL**	**LEAN CLAY**
●	**B-02**	**S-06**	**12.5**	**20.4**	**36**	**19**	**17**	**75.6**	**CL**	**LEAN CLAY WITH SAND**
–	**B-02**	**S-37**	**85**	**21.2**	**44**	**19**	**25**	**83.4**	**CL**	**LEAN CLAY WITH SAND**
—	**B-07**	**S-05**	**6**	**21.4**	**40**	**22**	**18**	**76.9**	**CL**	**LEAN CLAY WITH SAND**

INDEX TEST RESULTS

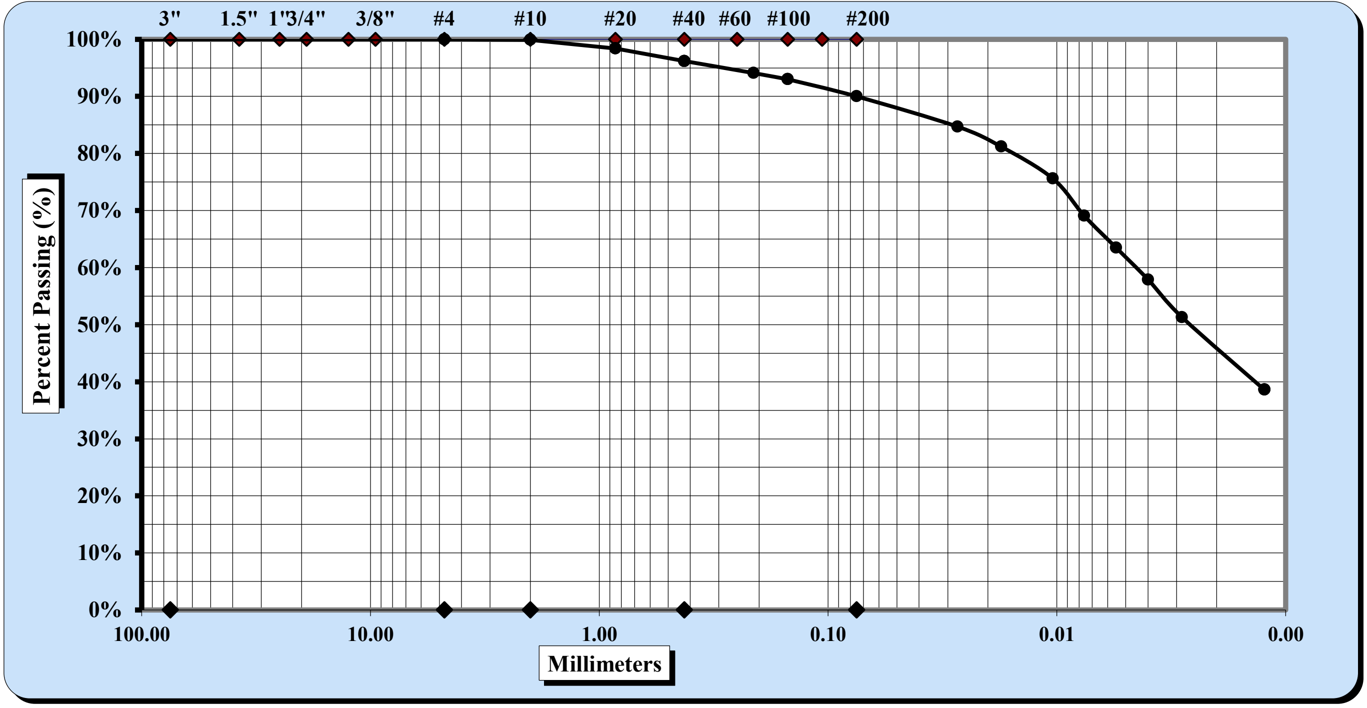
Project Name	Poston Plant Legacy CCR Impoundment
Project Number	25170078

Approved by	Date
Paula J. Manning	1/5/2026

Report Date 1/13/2026

	ASTM D422: Standard Test Methods for Particle-Size Distribution (Gradation) of Soils		
		Report Date	1/12/2026
		Test Date	12/16/2025
		Sample Date	8/19/2025

Project Number	25170078		
Project Name	Poston Plant Legacy CCR Impoundment		
Client Name	American Electric Power		
Client Address	8500 Smiths Mill Road, New Albany, Ohio 43054		
KeyLAB ID	CBUS2025093091	Sample Type	UD
Location ID	B-01	Sample Top Depth	5
Sample Reference	S-03	Sample Base Depth	6.3
Description	FAT CLAY (CH), trace fine to coarse sand	Method	ASTM D422
Classification:	FAT CLAY (CH)		



ASTM PARTICLE SIZE DEFINITIONS			
Cobbles	< 300 mm (12") and > 75 mm (3")	Medium Sand	< 2.00 mm and > 0.425 mm (#40)
Gravel	< 75 mm and > 4.75 mm (#4)	Fine Sand	< 0.425 mm and > 0.075 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Silt & Clay	< 0.075

Maximum Particle Size	**2 mm**	Coarse Sand	0.1	Fine Sand	6.2
Gravel	0.0	Medium Sand	3.7	Silt & Clay	90.0
Liquid Limit	51	Plastic Limit	22	Plastic Index	29

Description of Sand & Gravel Particles: Rounded ☒ Angular ☐

Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

Dispersion Method: Stirrer Dispersion Period: 1 min Dispersing Agent: Sodium Hexametaphosphate Solution

References / Comments / Deviations:

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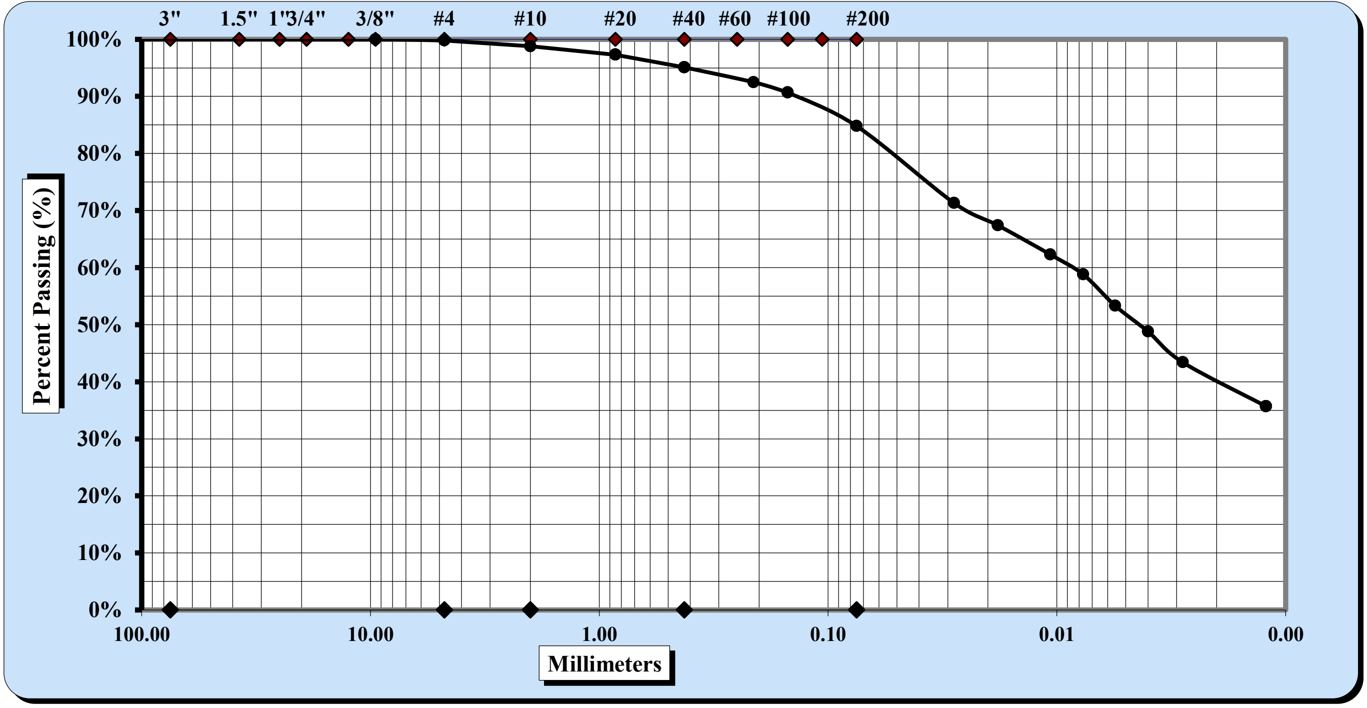
ASTM D422: Standard Test Methods for Particle-Size Distribution (Gradation) of Soils

Report Date	**12/10/2025**
Test Date	**10/14/2025**
Sample Date	**8/19/2025**

Project Number	25170078		
Project Name	Poston Plant Legacy CCR Impoundment		
Client Name	American Electric Power		
Client Address	8500 Smiths Mill Road, New Albany, Ohio 43054		
KeyLAB ID	CBUS2025093078	Sample Type	SS
Location ID	B-01	Sample Top Depth	31
Sample Reference	S-14	Sample Base Depth	32.5
Description	FAT CLAY WITH SAND (CH), trace fine gravel	Method	ASTM D422
Classification:	FAT CLAY WITH SAND (CH)		



ASTM PARTICLE SIZE DEFINITIONS

Cobbles	< 300 mm (12") and > 75 mm (3")	Medium Sand	< 2.00 mm and > 0.425 mm (#40)
Gravel	< 75 mm and > 4.75 mm (#4)	Fine Sand	< 0.425 mm and > 0.075 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Silt & Clay	< 0.075

Maximum Particle Size	**4.75 mm**	Coarse Sand	1.0	Fine Sand	10.3
Gravel	0.2	Medium Sand	3.7	Silt & Clay	84.8
Liquid Limit	54	Plastic Limit	23	Plastic Index	31

Description of Sand & Gravel Particles: Rounded ☒ Angular ☐

Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

Dispersion Method: Stirrer Dispersion Period: 1 min Dispersing Agent: Sodium Hexametaphosphate Solution

References / Comments / Deviations:

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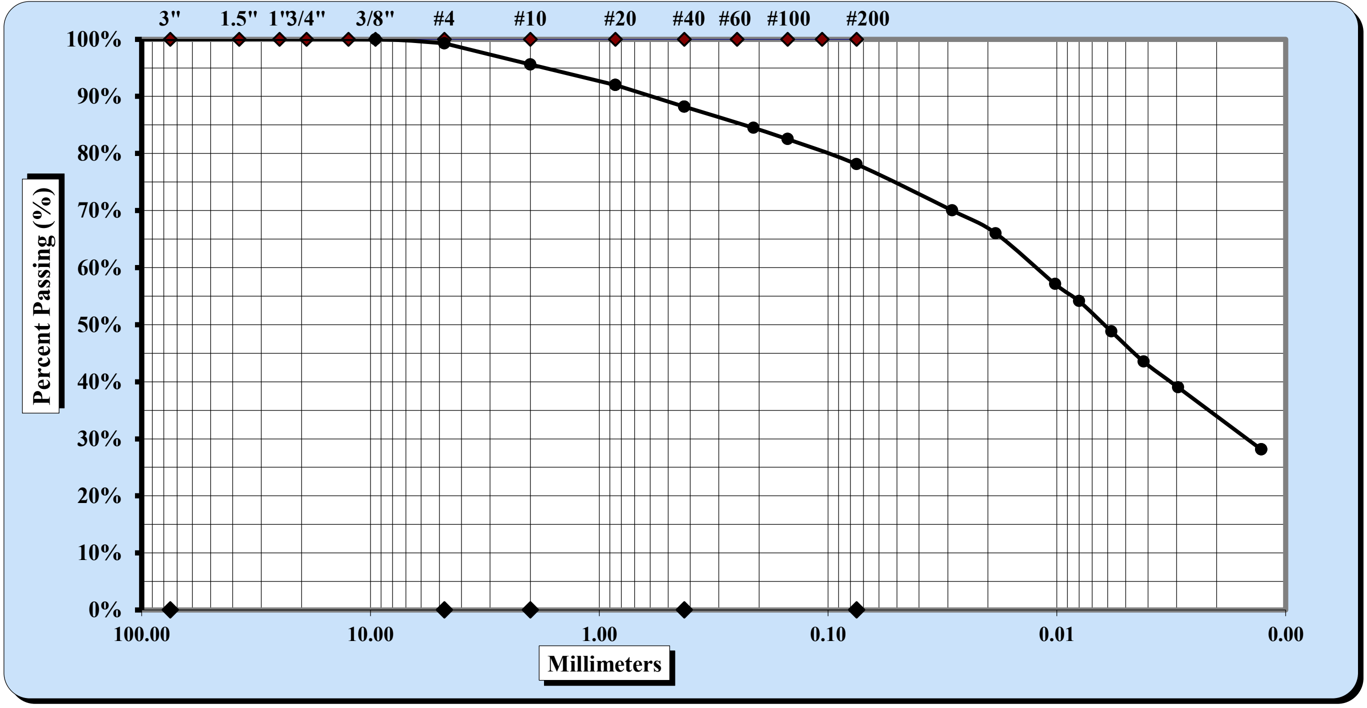
ASTM D422: Standard Test Methods for Particle-Size Distribution (Gradation) of Soils

Report Date	**1/12/2026**
Test Date	**12/30/2025**
Sample Date	**8/19/2025**

Project Number	25170078		
Project Name	Poston Plant Legacy CCR Impoundment		
Client Name	American Electric Power		
Client Address	8500 Smiths Mill Road, New Albany, Ohio 43054		
KeyLAB ID	CBUS2025093092	Sample Type	UD
Location ID	B-01	Sample Top Depth	55
Sample Reference	S-25	Sample Base Depth	56.8
Description	LEAN CLAY WITH SAND (CL), trace fine gravel	Method	ASTM D422
Classification:	LEAN CLAY WITH SAND (CL)		



ASTM PARTICLE SIZE DEFINITIONS

Cobbles	< 300 mm (12") and > 75 mm (3")	Medium Sand	< 2.00 mm and > 0.425 mm (#40)
Gravel	< 75 mm and > 4.75 mm (#4)	Fine Sand	< 0.425 mm and > 0.075 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Silt & Clay	< 0.075

Maximum Particle Size	**4.75 mm**	Coarse Sand	3.7	Fine Sand	10.1
Gravel	0.7	Medium Sand	7.4	Silt & Clay	78.1
Liquid Limit	47	Plastic Limit	22	Plastic Index	25

Description of Sand & Gravel Particles: Rounded ☒ Angular ☐

Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

Dispersion Method: Stirrer Dispersion Period: 1 min Dispersing Agent: Sodium Hexametaphosphate Solution

References / Comments / Deviations:

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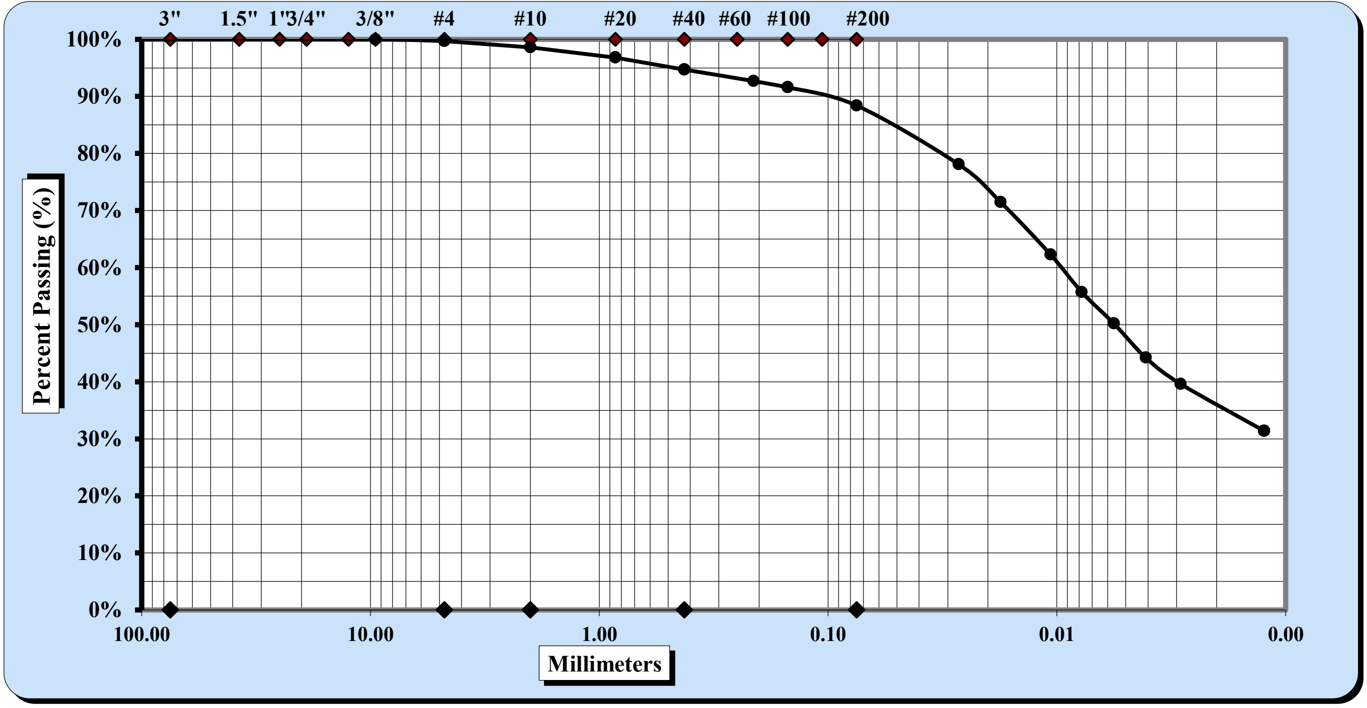
ASTM D422: Standard Test Methods for Particle-Size Distribution (Gradation) of Soils

Report Date	1/12/2026
Test Date	11/3/2025
Sample Date	8/19/2025

Project Number	25170078		
Project Name	Poston Plant Legacy CCR Impoundment		
Client Name	American Electric Power		
Client Address	8500 Smiths Mill Road, New Albany, Ohio 43054		
KeyLAB ID	CBUS2025093086	Sample Type	UD
Location ID	B-01	Sample Top Depth	75
Sample Reference	S-34	Sample Base Depth	76.3
Description	LEAN CLAY (CL), little fine to coarse sand, trace fine gravel	Method	ASTM D422
Classification:	LEAN CLAY (CL)		



ASTM PARTICLE SIZE DEFINITIONS

Cobbles	< 300 mm (12") and > 75 mm (3")	Medium Sand	< 2.00 mm and > 0.425 mm (#40)
Gravel	< 75 mm and > 4.75 mm (#4)	Fine Sand	< 0.425 mm and > 0.075 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Silt & Clay	< 0.075

Maximum Particle Size	**4.75 mm**	Coarse Sand	1.1	Fine Sand	6.3
Gravel	0.3	Medium Sand	3.9	Silt & Clay	88.4
Liquid Limit	42	Plastic Limit	20	Plastic Index	22

Description of Sand & Gravel Particles: Rounded ☒ Angular ☐

Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

Dispersion Method: Stirrer Dispersion Period: 1 min Dispersing Agent: Sodium Hexametaphosphate Solution

References / Comments / Deviations:

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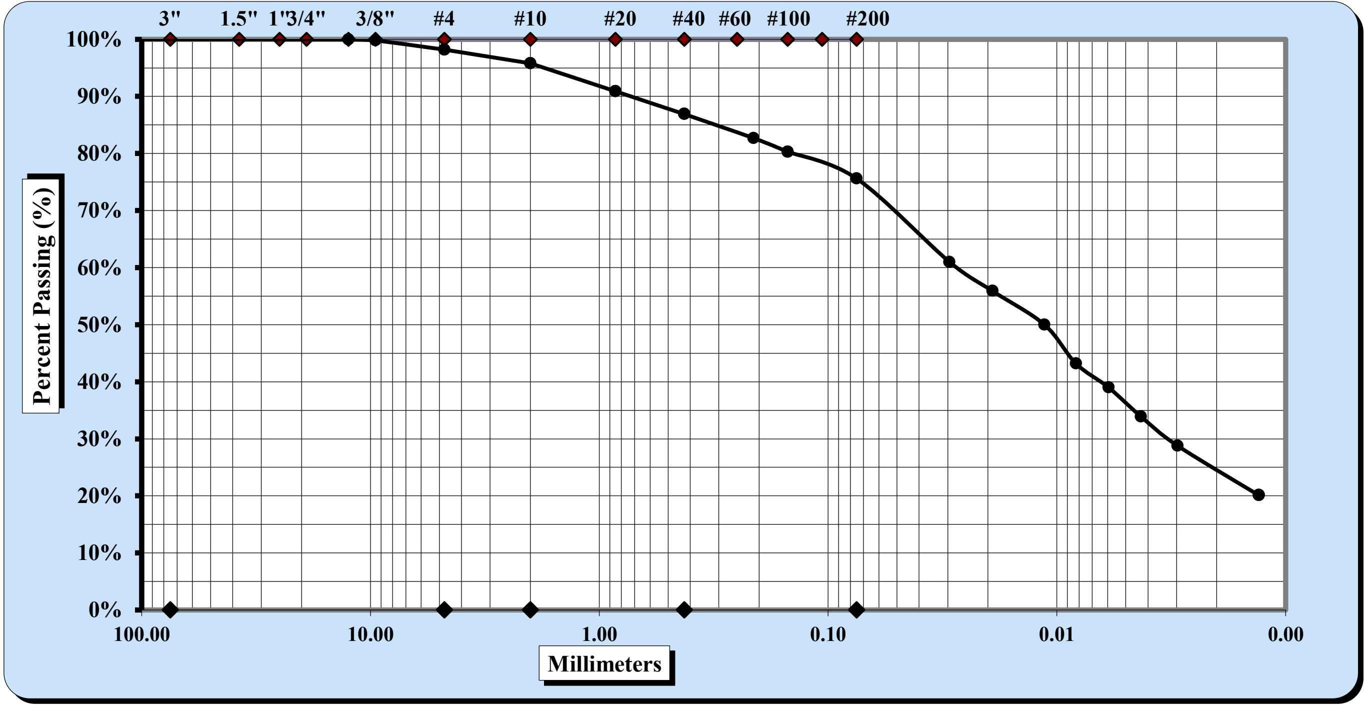
ASTM D422: Standard Test Methods for Particle-Size Distribution (Gradation) of Soils

Report Date	1/12/2026
Test Date	12/22/2025
Sample Date	8/20/2025

Project Number	25170078		
Project Name	Poston Plant Legacy CCR Impoundment		
Client Name	American Electric Power		
Client Address	8500 Smiths Mill Road, New Albany, Ohio 43054		
KeyLAB ID	CBUS20250930109	Sample Type	UD
Location ID	B-02	Sample Top Depth	12.5
Sample Reference	S-06	Sample Base Depth	14.1
Description	LEAN CLAY WITH SAND (CL), trace fine gravel	Method	ASTM D422
Classification:	LEAN CLAY WITH SAND (CL)		



ASTM PARTICLE SIZE DEFINITIONS

Cobbles	< 300 mm (12") and > 75 mm (3")	Medium Sand	< 2.00 mm and > 0.425 mm (#40)
Gravel	< 75 mm and > 4.75 mm (#4)	Fine Sand	< 0.425 mm and > 0.075 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Silt & Clay	< 0.075

Maximum Particle Size	**9.5 mm**	Coarse Sand	2.4	Fine Sand	11.3
Gravel	1.8	Medium Sand	8.9	Silt & Clay	75.6
Liquid Limit	36	Plastic Limit	19	Plastic Index	17

Description of Sand & Gravel Particles: Rounded ☒ Angular ☐

Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

Dispersion Method: Stirrer Dispersion Period: 1 min Dispersing Agent: Sodium Hexametaphosphate Solution

References / Comments / Deviations:

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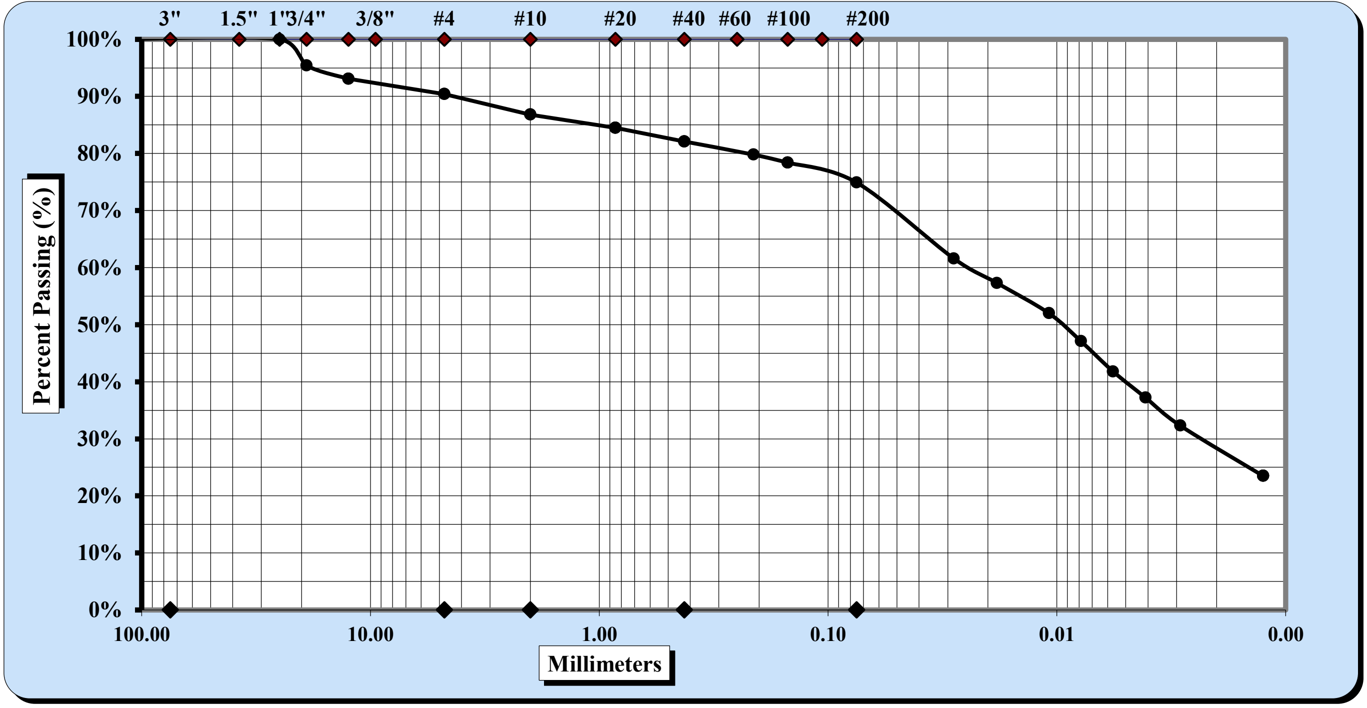
ASTM D422: Standard Test Methods for Particle-Size Distribution (Gradation) of Soils

Report Date	12/10/2025
Test Date	10/14/2025
Sample Date	8/20/2025

Project Number	25170078
Project Name	Poston Plant Legacy CCR Impoundment
Client Name	American Electric Power
Client Address	8500 Smiths Mill Road, New Albany, Ohio 43054

KeyLAB ID	CBUS2025093099	Sample Type	SS
Location ID	B-02	Sample Top Depth	36
Sample Reference	S-16	Sample Base Depth	37.5
Description	LEAN CLAY WITH SAND (CL), trace fine to coarse gravel	Method	ASTM D422
Classification:	LEAN CLAY WITH SAND (CL)		



ASTM PARTICLE SIZE DEFINITIONS

Cobbles	< 300 mm (12") and > 75 mm (3")	Medium Sand	< 2.00 mm and > 0.425 mm (#40)
Gravel	< 75 mm and > 4.75 mm (#4)	Fine Sand	< 0.425 mm and > 0.075 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Silt & Clay	< 0.075

Maximum Particle Size	**25 mm**	Coarse Sand	3.6	Fine Sand	7.2
Gravel	9.6	Medium Sand	4.7	Silt & Clay	74.9
Liquid Limit	44	Plastic Limit	23	Plastic Index	21

Description of Sand & Gravel Particles: Rounded ☒ Angular ☐

Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

Dispersion Method: Stirrer Dispersion Period: 1 min Dispersing Agent: Sodium Hexametaphosphate Solution

References / Comments / Deviations:

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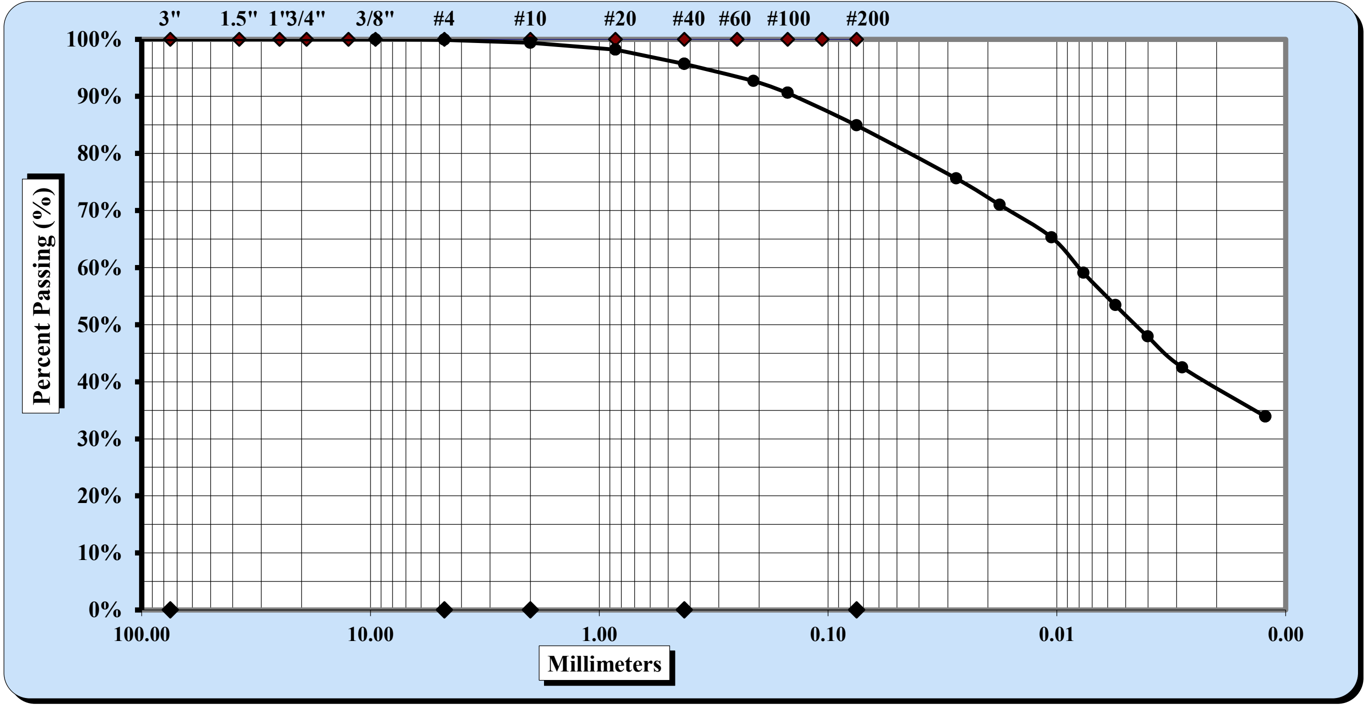
ASTM D422: Standard Test Methods for Particle-Size Distribution (Gradation) of Soils

Report Date	**12/10/2025**
Test Date	**10/14/2025**
Sample Date	**8/20/2025**

Project Number	25170078		
Project Name	Poston Plant Legacy CCR Impoundment		
Client Name	American Electric Power		
Client Address	8500 Smiths Mill Road, New Albany, Ohio 43054		
KeyLAB ID	CBUS20250930107	Sample Type	SS
Location ID	B-02	Sample Top Depth	76
Sample Reference	S-33	Sample Base Depth	77.5
Description	LEAN CLAY WITH SAND (CL), trace fine gravel	Method	ASTM D422
Classification:	LEAN CLAY WITH SAND (CL)		



ASTM PARTICLE SIZE DEFINITIONS

Cobbles	< 300 mm (12") and > 75 mm (3")	Medium Sand	< 2.00 mm and > 0.425 mm (#40)
Gravel	< 75 mm and > 4.75 mm (#4)	Fine Sand	< 0.425 mm and > 0.075 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Silt & Clay	< 0.075

Maximum Particle Size	**2 mm**	Coarse Sand	0.5	Fine Sand	10.8
Gravel	0.1	Medium Sand	3.7	Silt & Clay	84.9
Liquid Limit	49	Plastic Limit	21	Plastic Index	28

Description of Sand & Gravel Particles: Rounded ☒ Angular ☐

Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

Dispersion Method: Stirrer Dispersion Period: 1 min Dispersing Agent: Sodium Hexametaphosphate Solution

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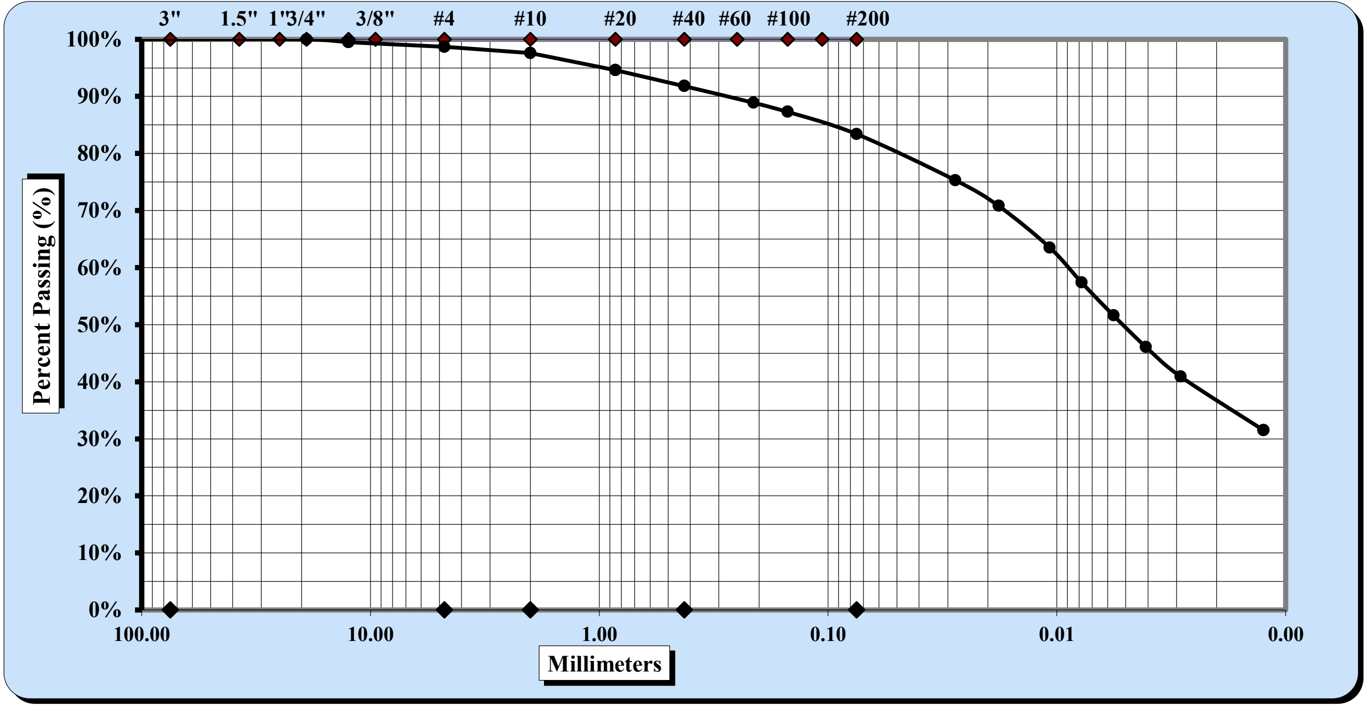
ASTM D422: Standard Test Methods for Particle-Size Distribution (Gradation) of Soils

Report Date	**1/12/2026**
Test Date	**11/3/2025**
Sample Date	**8/20/2025**

Project Number	25170078		
Project Name	Poston Plant Legacy CCR Impoundment		
Client Name	American Electric Power		
Client Address	8500 Smiths Mill Road, New Albany, Ohio 43054		
KeyLAB ID	CBUS20250930110	Sample Type	UD
Location ID	B-02	Sample Top Depth	85
Sample Reference	S-37	Sample Base Depth	86.5
Description	LEAN CLAY WITH SAND (CL), trace fine gravel	Method	ASTM D422
Classification:	LEAN CLAY WITH SAND (CL)		



ASTM PARTICLE SIZE DEFINITIONS

Cobbles	< 300 mm (12") and > 75 mm (3")	Medium Sand	< 2.00 mm and > 0.425 mm (#40)
Gravel	< 75 mm and > 4.75 mm (#4)	Fine Sand	< 0.425 mm and > 0.075 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Silt & Clay	< 0.075

Maximum Particle Size	**12.5 mm**	Coarse Sand	1.1	Fine Sand	8.4
Gravel	1.3	Medium Sand	5.8	Silt & Clay	83.4
Liquid Limit	44	Plastic Limit	19	Plastic Index	25

Description of Sand & Gravel Particles: Rounded ☒ Angular ☐

Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

Dispersion Method: Stirrer Dispersion Period: 1 min Dispersing Agent: Sodium Hexametaphosphate Solution

References / Comments / Deviations:

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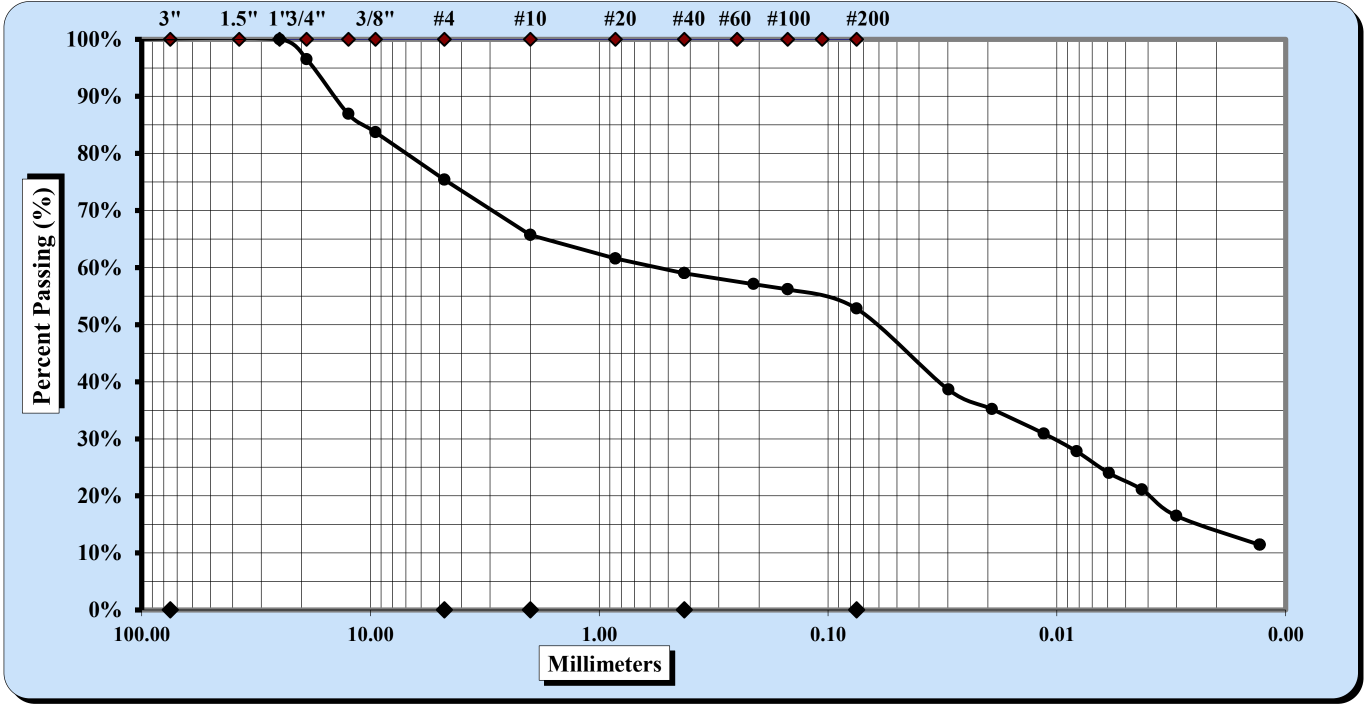
ASTM D422: Standard Test Methods for Particle-Size Distribution (Gradation) of Soils

Report Date	**12/10/2025**
Test Date	**10/14/2025**
Sample Date	**8/28/2025**

Project Number	25170078		
Project Name	Poston Plant Legacy CCR Impoundment		
Client Name	American Electric Power		
Client Address	8500 Smiths Mill Road, New Albany, Ohio 43054		
KeyLAB ID	CBUS20250930115	Sample Type	SS
Location ID	B-03	Sample Top Depth	13.5
Sample Reference	S-10	Sample Base Depth	15
Description	GRAVELLY LEAN CLAY WITH SAND (CL)	Method	ASTM D422
Classification:	GRAVELLY LEAN CLAY WITH SAND (CL)		



ASTM PARTICLE SIZE DEFINITIONS

Cobbles	< 300 mm (12") and > 75 mm (3")	Medium Sand	< 2.00 mm and > 0.425 mm (#40)
Gravel	< 75 mm and > 4.75 mm (#4)	Fine Sand	< 0.425 mm and > 0.075 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Silt & Clay	< 0.075

Maximum Particle Size	**25 mm**	Coarse Sand	9.7	Fine Sand	6.2
Gravel	24.6	Medium Sand	6.7	Silt & Clay	52.8
Liquid Limit	33	Plastic Limit	19	Plastic Index	14

Description of Sand & Gravel Particles: Rounded ☒ Angular ☐

Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

Dispersion Method: Stirrer Dispersion Period: 1 min Dispersing Agent: Sodium Hexametaphosphate Solution

References / Comments / Deviations:

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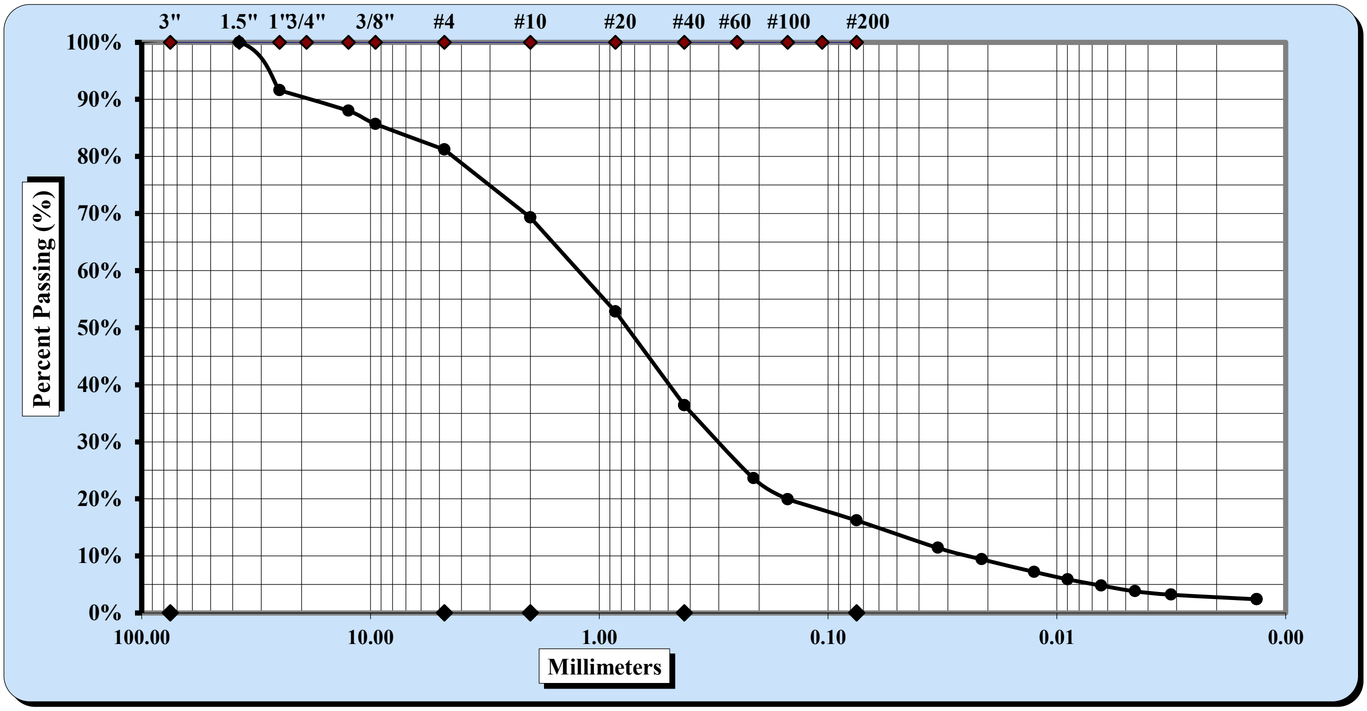
Columbus	*6190 Enterprise Court, Dublin, OH 43016-7297*	

ASTM D422: Standard Test Methods for Particle-Size Distribution (Gradation) of Soils

Report Date	**12/10/2025**
Test Date	**10/13/2025**
Sample Date	**8/28/2025**

Project Number	25170078		
Project Name	Poston Plant Legacy CCR Impoundment		
Client Name	American Electric Power		
Client Address	8500 Smiths Mill Road, New Albany, Ohio 43054		
KeyLAB ID	CBUS20250930117	Sample Type	SS
Location ID	B-03	Sample Top Depth	19.5
Sample Reference	S-14A	Sample Base Depth	21
Description	Visual: CLAYEY SAND WITH GRAVEL (SC)	Method	ASTM D422



ASTM PARTICLE SIZE DEFINITIONS			
Cobbles	< 300 mm (12") and > 75 mm (3")	Medium Sand	< 2.00 mm and > 0.425 mm (#40)
Gravel	< 75 mm and > 4.75 mm (#4)	Fine Sand	< 0.425 mm and > 0.075 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Silt & Clay	< 0.075

Maximum Particle Size	**37.5 mm**	Coarse Sand	11.9	Fine Sand	20.2
Gravel	18.8	Medium Sand	32.9	Silt & Clay	16.2
Liquid Limit	ND	Plastic Limit	ND	Plastic Index	ND

Cc = 3.00 **Cu = 50.75**

Description of Sand & Gravel Particles: Rounded ☒ Angular ☐

Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

Dispersion Method: Stirrer Dispersion Period: 1 min Dispersing Agent: Sodium Hexametaphosphate Solution

References / Comments / Deviations:

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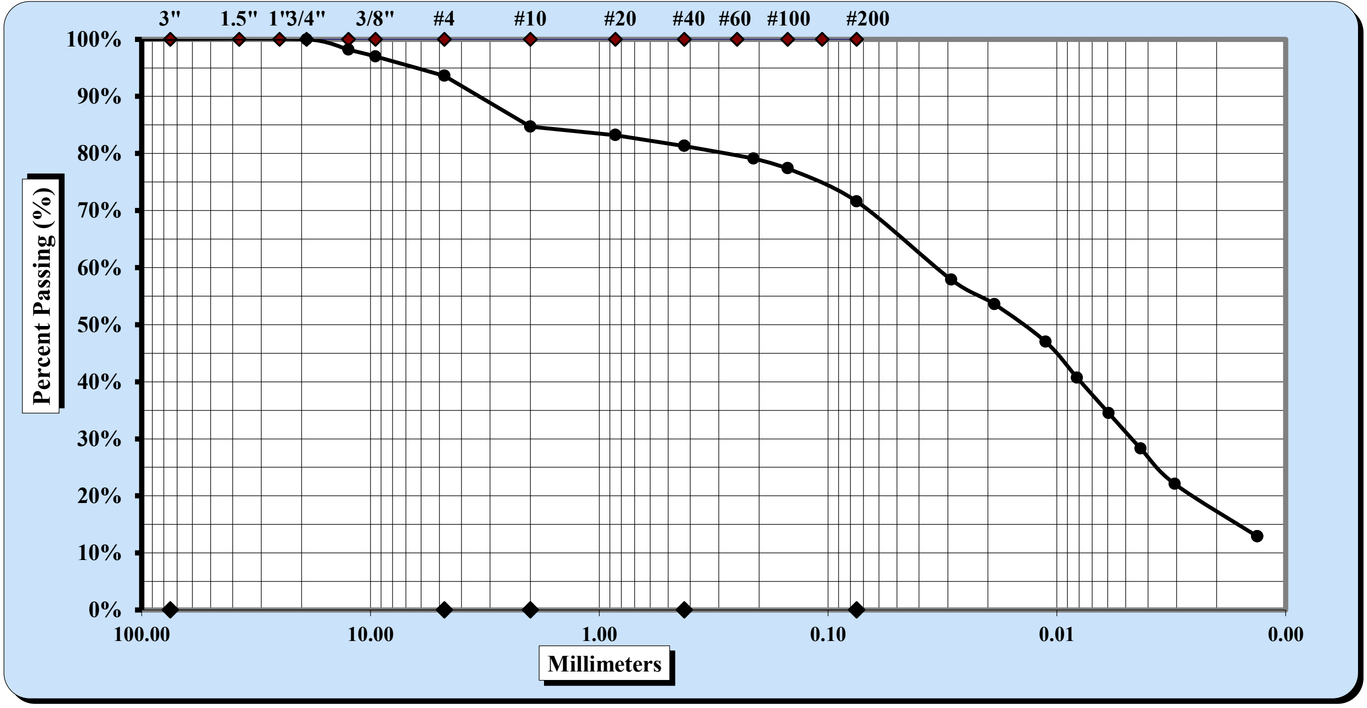
ASTM D422: Standard Test Methods for Particle-Size Distribution (Gradation) of Soils

Report Date	**12/10/2025**
Test Date	**10/30/2025**
Sample Date	**8/27/2025**

Project Number	25170078		
Project Name	Poston Plant Legacy CCR Impoundment		
Client Name	American Electric Power		
Client Address	8500 Smiths Mill Road, New Albany, Ohio 43054		
KeyLAB ID	CBUS20250930125	Sample Type	SS
Location ID	B-04	Sample Top Depth	6
Sample Reference	S-05	Sample Base Depth	7.5
Description	LEAN CLAY WITH SAND (CL), trace fine gravel	Method	ASTM D422
Classification:	LEAN CLAY WITH SAND (CL)		



ASTM PARTICLE SIZE DEFINITIONS

Cobbles	< 300 mm (12") and > 75 mm (3")	Medium Sand	< 2.00 mm and > 0.425 mm (#40)
Gravel	< 75 mm and > 4.75 mm (#4)	Fine Sand	< 0.425 mm and > 0.075 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Silt & Clay	< 0.075

Maximum Particle Size	**19 mm**	Coarse Sand	8.9	Fine Sand	9.7
Gravel	6.4	Medium Sand	3.4	Silt & Clay	71.6
Liquid Limit	30	Plastic Limit	19	Plastic Index	11

Description of Sand & Gravel Particles: Rounded ☒ Angular ☐

Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

Dispersion Method: Stirrer Dispersion Period: 1 min Dispersing Agent: Sodium Hexametaphosphate Solution

References / Comments / Deviations:

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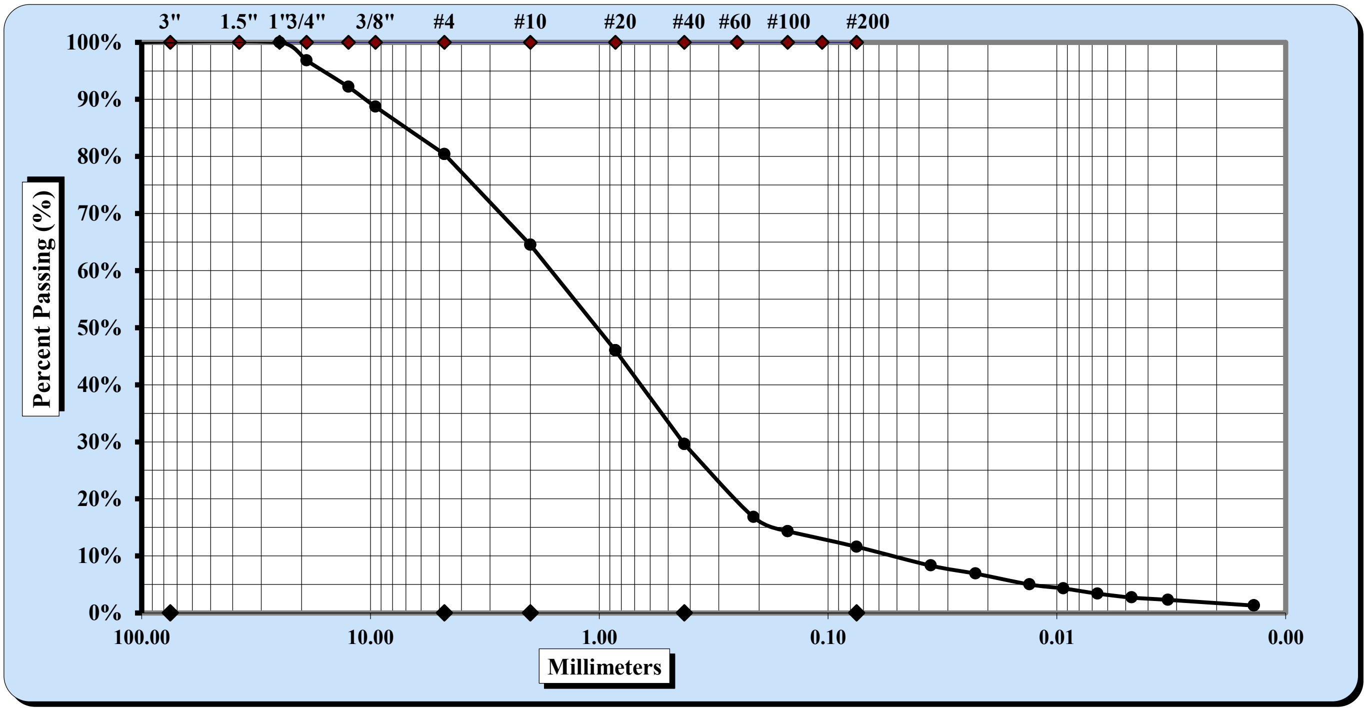
ASTM D422: Standard Test Methods for Particle-Size Distribution (Gradation) of Soils

Report Date	1/19/2026
Test Date	10/29/2025
Sample Date	8/27/2025

Project Number	25170078		
Project Name	Poston Plant Legacy CCR Impoundment		
Client Name	American Electric Power		
Client Address	8500 Smiths Mill Road, New Albany, Ohio 43054		
KeyLAB ID	CBUS20250930130	Sample Type	SS
Location ID	B-04	Sample Top Depth	21
Sample Reference	S-15A	Sample Base Depth	22.5
Description	Visual: WELL GRADED SAND WITH CLAY AND GRAVEL (SW-SC)	Method	ASTM D422



ASTM PARTICLE SIZE DEFINITIONS

Cobbles	< 300 mm (12") and > 75 mm (3")	Medium Sand	< 2.00 mm and > 0.425 mm (#40)
Gravel	< 75 mm and > 4.75 mm (#4)	Fine Sand	< 0.425 mm and > 0.075 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Silt & Clay	< 0.075

Maximum Particle Size	**25 mm**	Coarse Sand	15.9	Fine Sand	18.0
Gravel	19.6	Medium Sand	34.9	Silt & Clay	11.6
Liquid Limit	ND	Plastic Limit	ND	Plastic Index	ND

Cc = 2.20 **Cu = 31.09**

Description of Sand & Gravel Particles: Rounded ☒ Angular ☐

Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

Dispersion Method: Stirrer Dispersion Period: 1 min Dispersing Agent: Sodium Hexametaphosphate Solution

References / Comments / Deviations:

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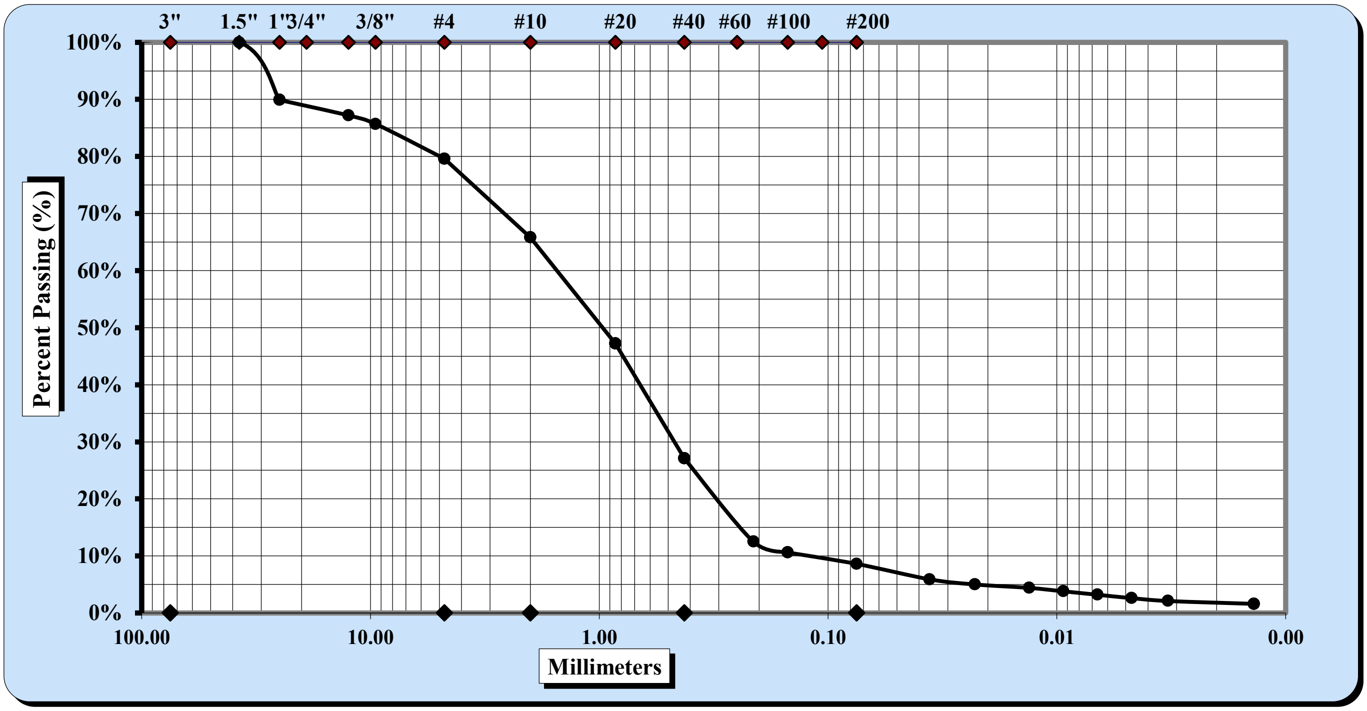
ASTM D422: Standard Test Methods for Particle-Size Distribution (Gradation) of Soils

Report Date	**12/10/2025**
Test Date	**10/29/2025**
Sample Date	**8/26/2025**

Project Number	25170078		
Project Name	Poston Plant Legacy CCR Impoundment		
Client Name	American Electric Power		
Client Address	8500 Smiths Mill Road, New Albany, Ohio 43054		
KeyLAB ID	CBUS20250930135	Sample Type	SS
Location ID	B-05	Sample Top Depth	6
Sample Reference	S-05A	Sample Base Depth	7.5
Description	Visual: WELL GRADED SAND WITH SILT AND GRAVEL (SW-SM)	Method	ASTM D422



ASTM PARTICLE SIZE DEFINITIONS

Cobbles	< 300 mm (12") and > 75 mm (3")	Medium Sand	< 2.00 mm and > 0.425 mm (#40)
Gravel	< 75 mm and > 4.75 mm (#4)	Fine Sand	< 0.425 mm and > 0.075 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Silt & Clay	< 0.075

Maximum Particle Size	**37.5 mm**	Coarse Sand	13.8	Fine Sand	18.5
Gravel	20.4	Medium Sand	38.7	Silt & Clay	8.6
Liquid Limit	ND	Plastic Limit	ND	Plastic Index	ND

Cc = **1.18** **Cu =** **12.57**

Description of Sand & Gravel Particles: Rounded ☒ Angular ☐

Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

Dispersion Method: Stirrer Dispersion Period: 1 min Dispersing Agent: Sodium Hexametaphosphate Solution

References / Comments / Deviations:

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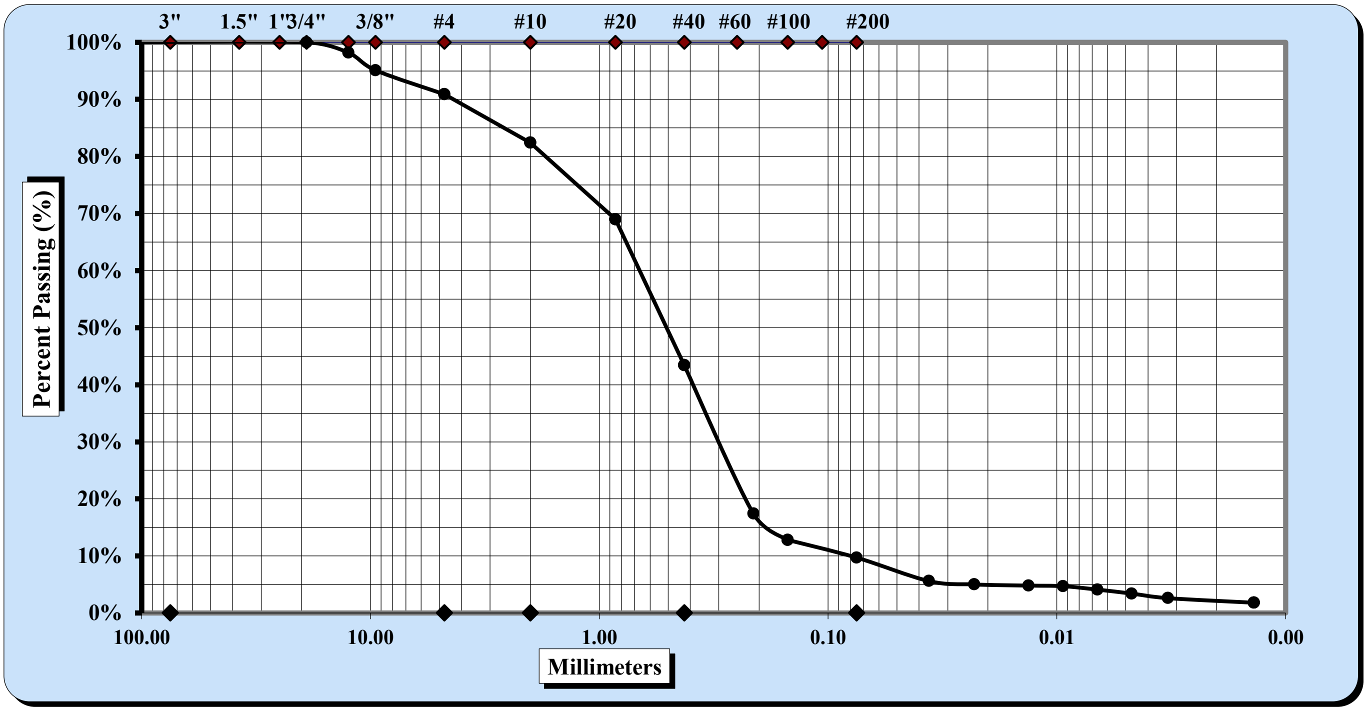
ASTM D422: Standard Test Methods for Particle-Size Distribution (Gradation) of Soils

Report Date	**12/10/2025**
Test Date	**10/29/2025**
Sample Date	**8/27/2025**

Project Number	25170078		
Project Name	Poston Plant Legacy CCR Impoundment		
Client Name	American Electric Power		
Client Address	8500 Smiths Mill Road, New Albany, Ohio 43054		
KeyLAB ID	CBUS20250930143	Sample Type	SS
Location ID	B-06	Sample Top Depth	4.5
Sample Reference	S-05	Sample Base Depth	6
Description	Visual: WELL GRADED SAND WITH SILT (SW-SM), trace fine gravel	Method	ASTM D422



ASTM PARTICLE SIZE DEFINITIONS

Cobbles	< 300 mm (12") and > 75 mm (3")	Medium Sand	< 2.00 mm and > 0.425 mm (#40)
Gravel	< 75 mm and > 4.75 mm (#4)	Fine Sand	< 0.425 mm and > 0.075 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Silt & Clay	< 0.075

Maximum Particle Size	**19 mm**	Coarse Sand	8.5	Fine Sand	33.7
Gravel	9.1	Medium Sand	39.0	Silt & Clay	9.7
Liquid Limit	ND	Plastic Limit	ND	Plastic Index	ND

Cc = 1.65 **Cu = 8.31**

Description of Sand & Gravel Particles: Rounded ☒ Angular ☐

Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

Dispersion Method: Stirrer Dispersion Period: 1 min Dispersing Agent: Sodium Hexametaphosphate Solution

References / Comments / Deviations:

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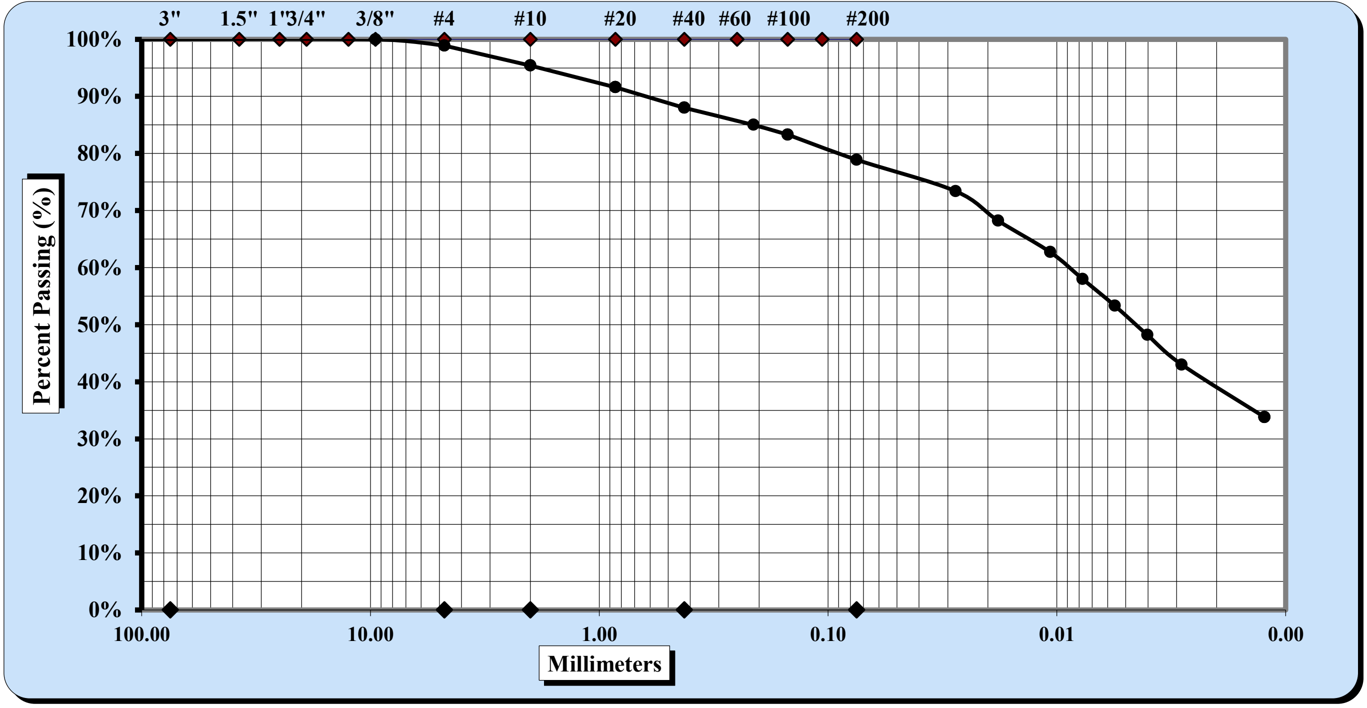
ASTM D422: Standard Test Methods for Particle-Size Distribution (Gradation) of Soils

Report Date	**12/10/2025**
Test Date	**10/29/2025**
Sample Date	**8/19/2025**

Project Number	25170078		
Project Name	Poston Plant Legacy CCR Impoundment		
Client Name	American Electric Power		
Client Address	8500 Smiths Mill Road, New Albany, Ohio 43054		
KeyLAB ID	CBUS20250930151	Sample Type	SS
Location ID	B-07	Sample Top Depth	4.5
Sample Reference	S-04	Sample Base Depth	5.4
Description	FAT CLAY WITH SAND (CH), trace fine gravel	Method	ASTM D422
Classification:	FAT CLAY WITH SAND (CH)		



ASTM PARTICLE SIZE DEFINITIONS			
Cobbles	< 300 mm (12") and > 75 mm (3")	Medium Sand	< 2.00 mm and > 0.425 mm (#40)
Gravel	< 75 mm and > 4.75 mm (#4)	Fine Sand	< 0.425 mm and > 0.075 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Silt & Clay	< 0.075

Maximum Particle Size	**9.5 mm**	Coarse Sand	3.5	Fine Sand	9.1
Gravel	1.1	Medium Sand	7.4	Silt & Clay	78.9
Liquid Limit	53	Plastic Limit	24	Plastic Index	29

Description of Sand & Gravel Particles: Rounded ☒ Angular ☐

Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

Dispersion Method: Stirrer

References / Comments / Deviations:

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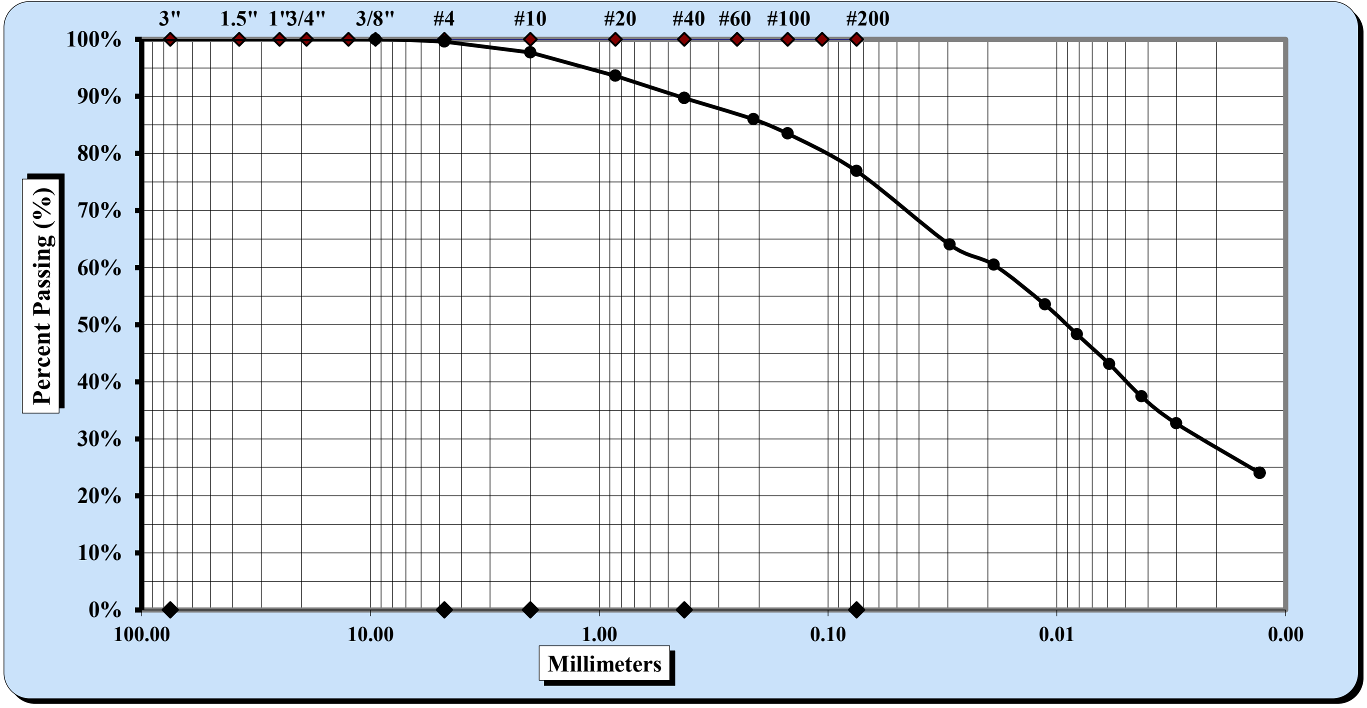
ASTM D422: Standard Test Methods for Particle-Size Distribution (Gradation) of Soils

Report Date	**1/12/2026**
Test Date	**12/1/2025**
Sample Date	**8/19/2025**

Project Number	25170078		
Project Name	Poston Plant Legacy CCR Impoundment		
Client Name	American Electric Power		
Client Address	8500 Smiths Mill Road, New Albany, Ohio 43054		
KeyLAB ID	CBUS20250930155	Sample Type	UD
Location ID	B-07	Sample Top Depth	6
Sample Reference	S-05	Sample Base Depth	7.9
Description	LEAN CLAY WITH SAND (CL), trace fine gravel	Method	ASTM D422
Classification:	LEAN CLAY WITH SAND (CL)		



ASTM PARTICLE SIZE DEFINITIONS

Cobbles	< 300 mm (12") and > 75 mm (3")	Medium Sand	< 2.00 mm and > 0.425 mm (#40)
Gravel	< 75 mm and > 4.75 mm (#4)	Fine Sand	< 0.425 mm and > 0.075 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Silt & Clay	< 0.075

Maximum Particle Size	**4.75 mm**	Coarse Sand	1.9	Fine Sand	12.8
Gravel	0.4	Medium Sand	8.0	Silt & Clay	76.9
Liquid Limit	40	Plastic Limit	22	Plastic Index	18

Description of Sand & Gravel Particles: Rounded ☒ Angular ☐

Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

Dispersion Method: Stirrer Dispersion Period: 1 min Dispersing Agent: Sodium Hexametaphosphate Solution

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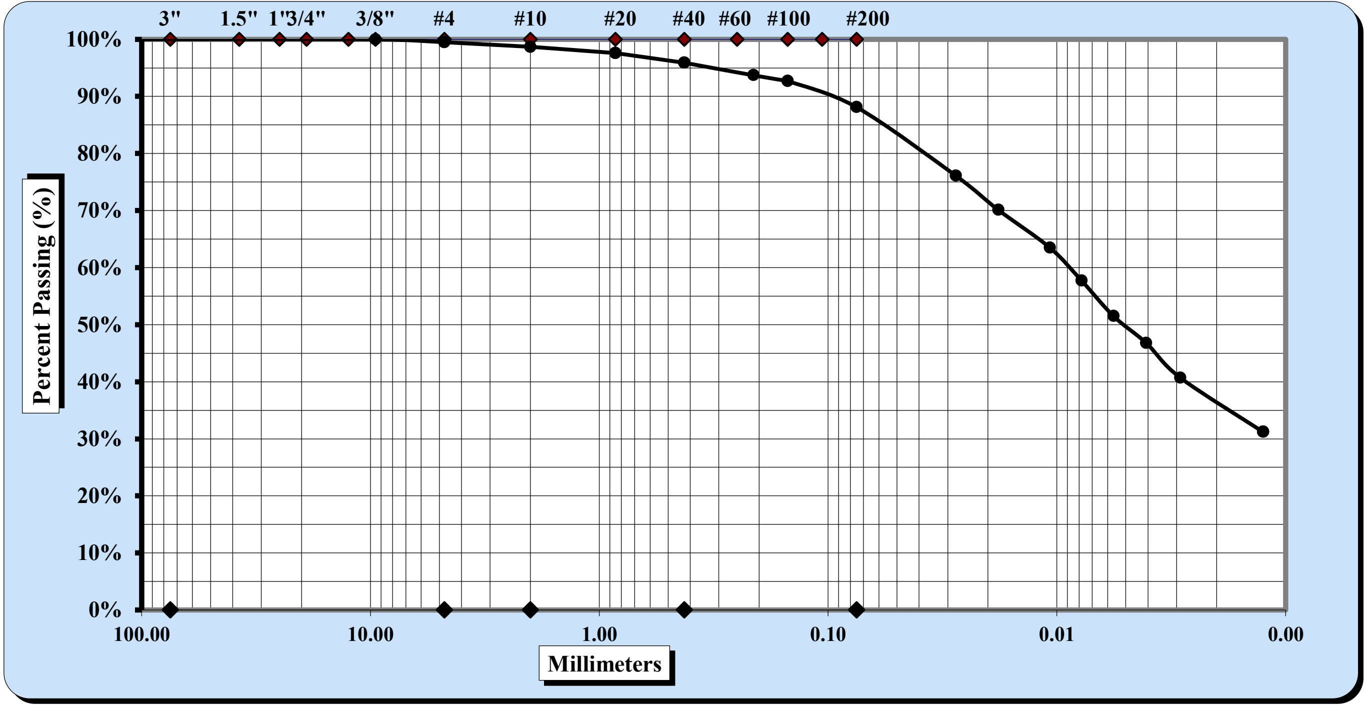
ASTM D422: Standard Test Methods for Particle-Size Distribution (Gradation) of Soils

Report Date	**12/10/2025**
Test Date	**10/29/2025**
Sample Date	**8/19/2025**

Project Number	25170078		
Project Name	Poston Plant Legacy CCR Impoundment		
Client Name	American Electric Power		
Client Address	8500 Smiths Mill Road, New Albany, Ohio 43054		
KeyLAB ID	CBUS20250930153	Sample Type	SS
Location ID	B-07	Sample Top Depth	11
Sample Reference	S-08	Sample Base Depth	12.5
Description	LEAN CLAY (CL), little fine to coarse sand, trace fine gravel	Method	ASTM D422
Classification:	LEAN CLAY (CL)		



ASTM PARTICLE SIZE DEFINITIONS

Cobbles	< 300 mm (12") and > 75 mm (3")	Medium Sand	< 2.00 mm and > 0.425 mm (#40)
Gravel	< 75 mm and > 4.75 mm (#4)	Fine Sand	< 0.425 mm and > 0.075 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Silt & Clay	< 0.075

Maximum Particle Size	**4.75 mm**	Coarse Sand	0.8	Fine Sand	7.8
Gravel	0.5	Medium Sand	2.8	Silt & Clay	88.1
Liquid Limit	41	Plastic Limit	19	Plastic Index	22

Description of Sand & Gravel Particles: Rounded ☒ Angular ☐

Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

Dispersion Method: Stirrer Dispersion Period: 1 min Dispersing Agent: Sodium Hexametaphosphate Solution

References / Comments / Deviations:

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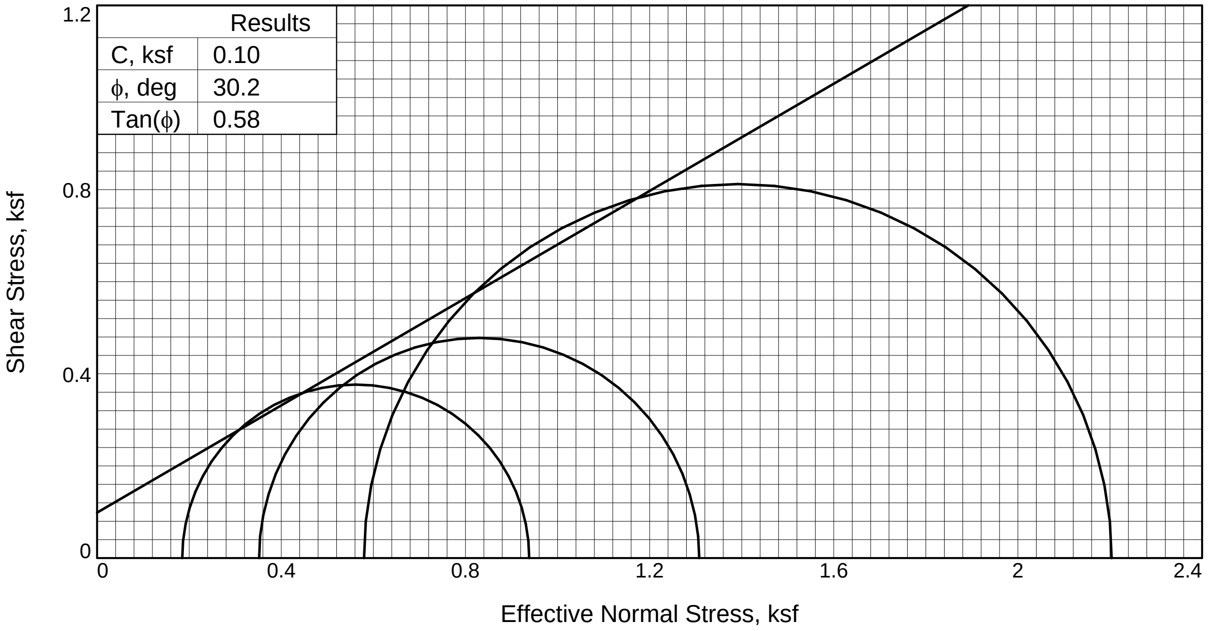
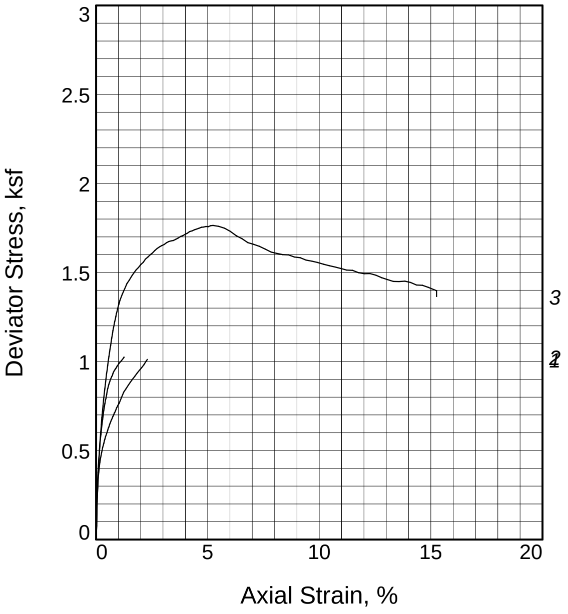


	Results
C, ksf	0.10
ϕ, deg	30.2
Tan(ϕ)	0.58



	Sample No.	1	2	3
Initial	Water Content, %	21.9	21.9	21.9
	Dry Density, pcf	92.7	92.7	92.7
	Saturation, %	72.3	72.3	72.3
	Void Ratio	0.8176	0.8176	0.8176
	Diameter, in.	2.817	2.817	2.817
	Height, in.	5.980	5.980	5.980
At Test	Water Content, %	29.9	29.6	29.2
	Dry Density, pcf	93.2	93.7	94.3
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.8085	0.7982	0.7879
	Diameter, in.	2.812	2.840	2.852
	Height, in.	5.970	5.822	5.738
	Strain rate, %/min.	0.0033	0.0033	0.0033
	Back Pressure, psi	50.00	50.00	50.00
	Cell Pressure, psi	53.26	56.09	62.00
	Fail. Stress, ksf	0.75	0.96	1.62
	Excess Pore Pr., ksf	0.28	0.53	1.15
	Ult. Stress, ksf	1.01	1.03	1.76
	Excess Pore Pr., ksf	0.32	0.51	1.20
	$\bar{\sigma}_1$ Failure, ksf	0.94	1.31	2.20
	$\bar{\sigma}_3$ Failure, ksf	0.18	0.35	0.58

Type of Test:
CU with Pore Pressures

Sample Type: Intact

Description: FAT CLAY (CH), trace fine to coarse sand

LL= 51 **PL=** 22 **PI=** 29

Assumed Specific Gravity= 2.7

Remarks: ASTM D4767 Multi Stage
Effective Stress Failure defined by Stress Ratio

Figure 1

Client: American Electric Power

Project: AEP Poston Legacy CCR Impound
Athens, Ohio

Location: B-01 Multi Stage

Sample Number: S-03 **Depth:** 5.0'-6.5'

Proj. No.: 25170078 **Date Sampled:** 8/19/2025

TRIAXIAL SHEAR TEST REPORT
S&ME, Inc.
Dublin, Ohio

Tested By: CJ

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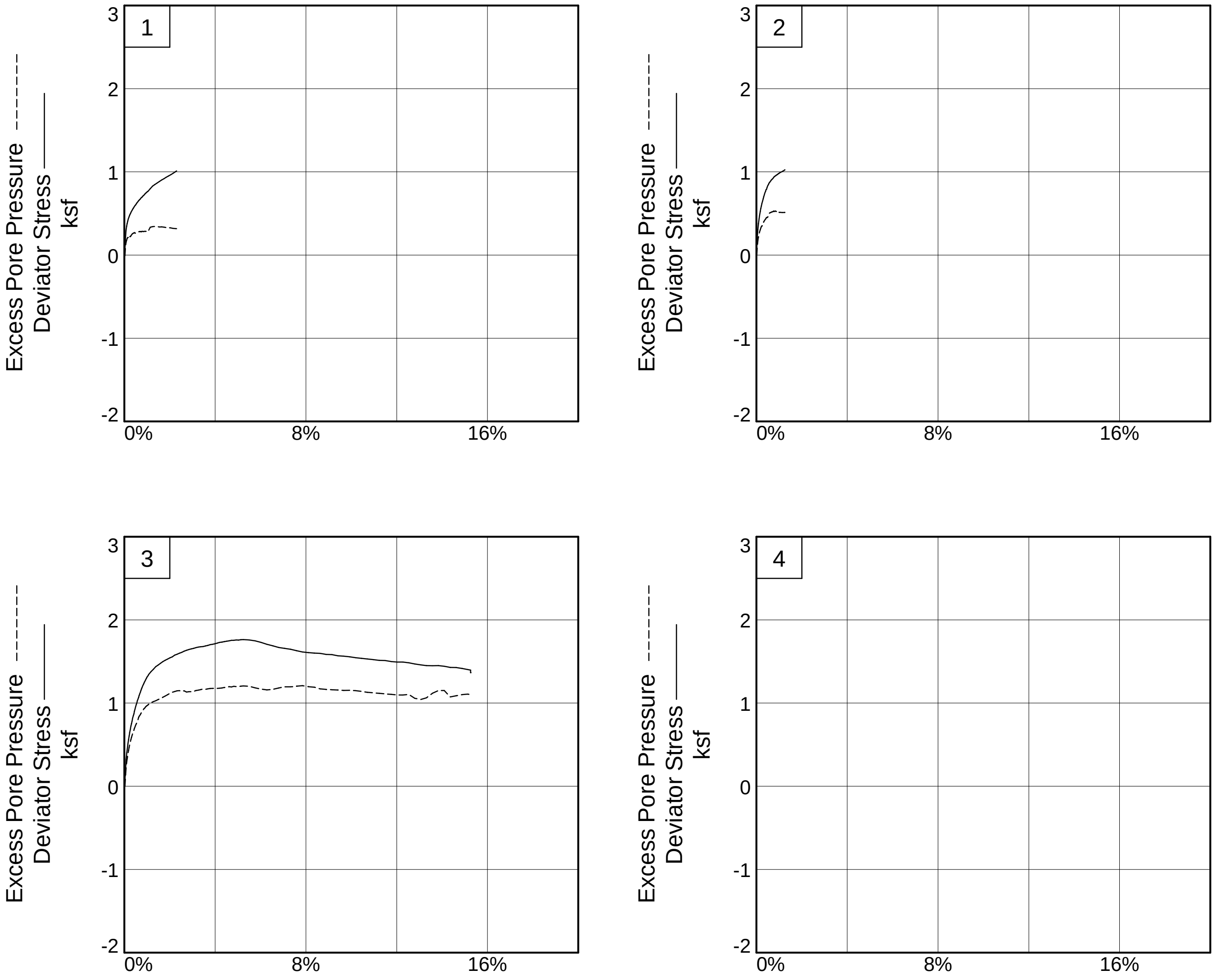

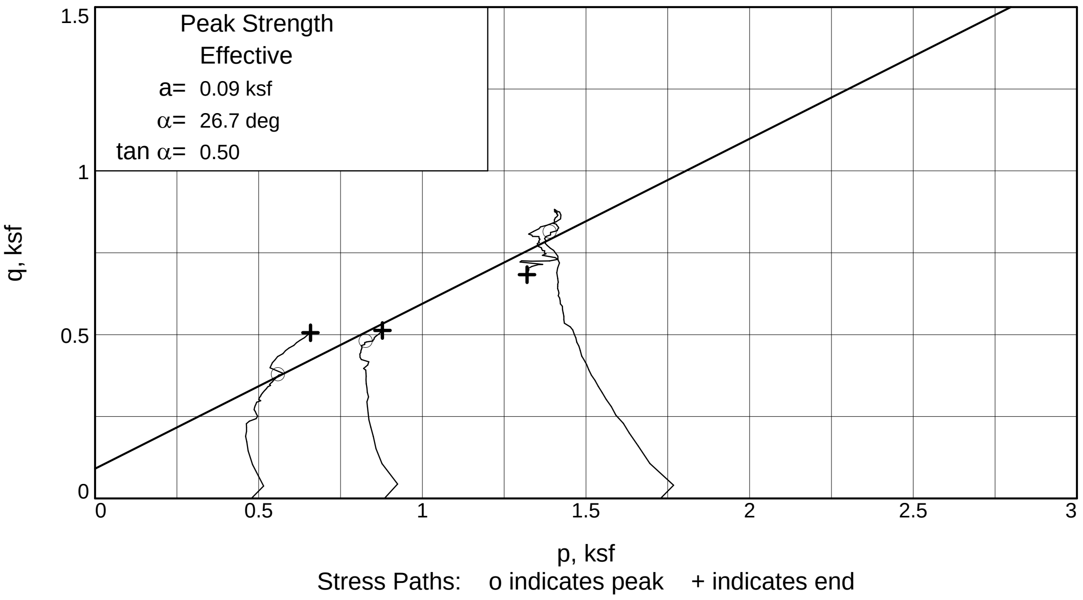

Client: American Electric Power

Project: AEP Poston Legacy CCR Impound

Location: B-01 Multi Stage **Depth:** 5.0'-6.5' **Sample Number:** S-03

Project No.: 25170078 **Figure** 2 **S&ME, Inc.**

Tested By: CJ

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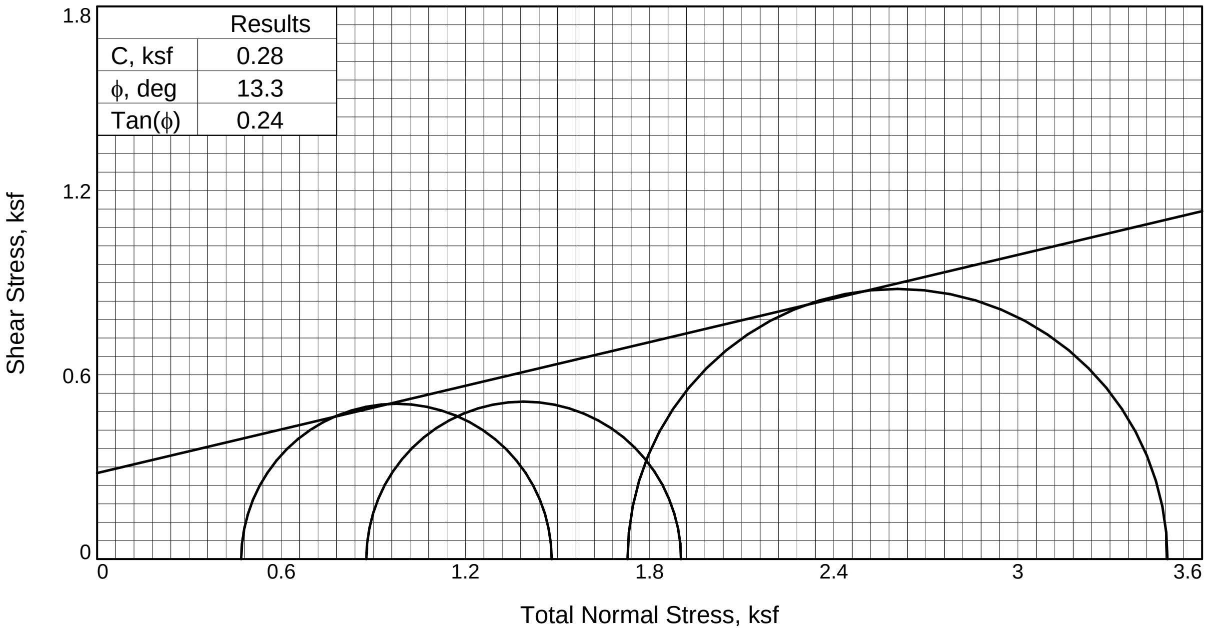
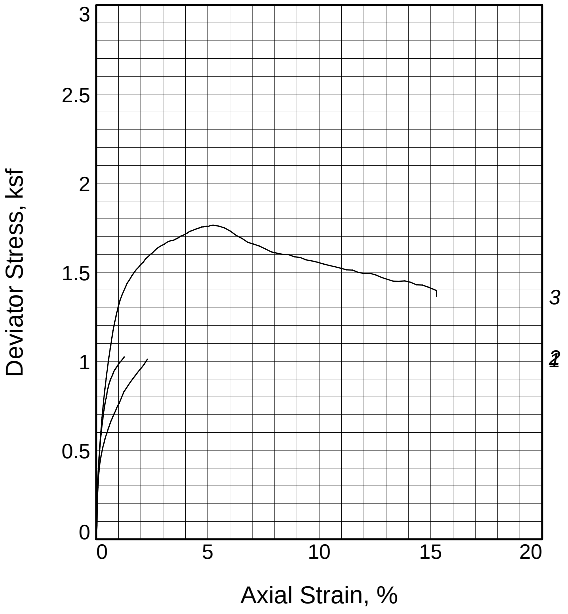


	Results
C, ksf	0.28
ϕ, deg	13.3
Tan(ϕ)	0.24



	Sample No.	1	2	3
Initial	Water Content, %	21.9	21.9	21.9
	Dry Density, pcf	92.7	92.7	92.7
	Saturation, %	72.3	72.3	72.3
	Void Ratio	0.8176	0.8176	0.8176
	Diameter, in.	2.817	2.817	2.817
	Height, in.	5.980	5.980	5.980
At Test	Water Content, %	29.9	29.6	29.2
	Dry Density, pcf	93.2	93.7	94.3
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.8085	0.7982	0.7879
	Diameter, in.	2.812	2.840	2.852
	Height, in.	5.970	5.822	5.738
	Strain rate, %/min.	0.0033	0.0033	0.0033
	Back Pressure, psi	50.00	50.00	50.00
	Cell Pressure, psi	53.26	56.09	62.00
	Fail. Stress, ksf	1.01	1.03	1.76
	Excess Pore Pr., ksf	0.32	0.51	1.20
	Ult. Stress, ksf	0.75	0.96	1.62
	Excess Pore Pr., ksf	0.28	0.53	1.15
	$\bar{\sigma}_1$ Failure, ksf	1.16	1.39	2.28
	$\bar{\sigma}_3$ Failure, ksf	0.15	0.37	0.53

Type of Test:
CU with Pore Pressures

Sample Type: Intact

Description: FAT CLAY (CH), trace fine to coarse sand

LL= 51 **PL=** 22 **PI=** 29

Assumed Specific Gravity= 2.7

Remarks: ASTM D4767 Multi Stage
Undrained Strength defined by Principal Stress Difference

Figure 1

Client: American Electric Power

Project: AEP Poston Legacy CCR Impound
Athens, Ohio

Location: B-01 Multi Stage

Sample Number: S-03 **Depth:** 5.0'-6.5'

Proj. No.: 25170078 **Date Sampled:** 8/19/2025

TRIAXIAL SHEAR TEST REPORT
S&ME, Inc.
Dublin, Ohio

Tested By: CJ

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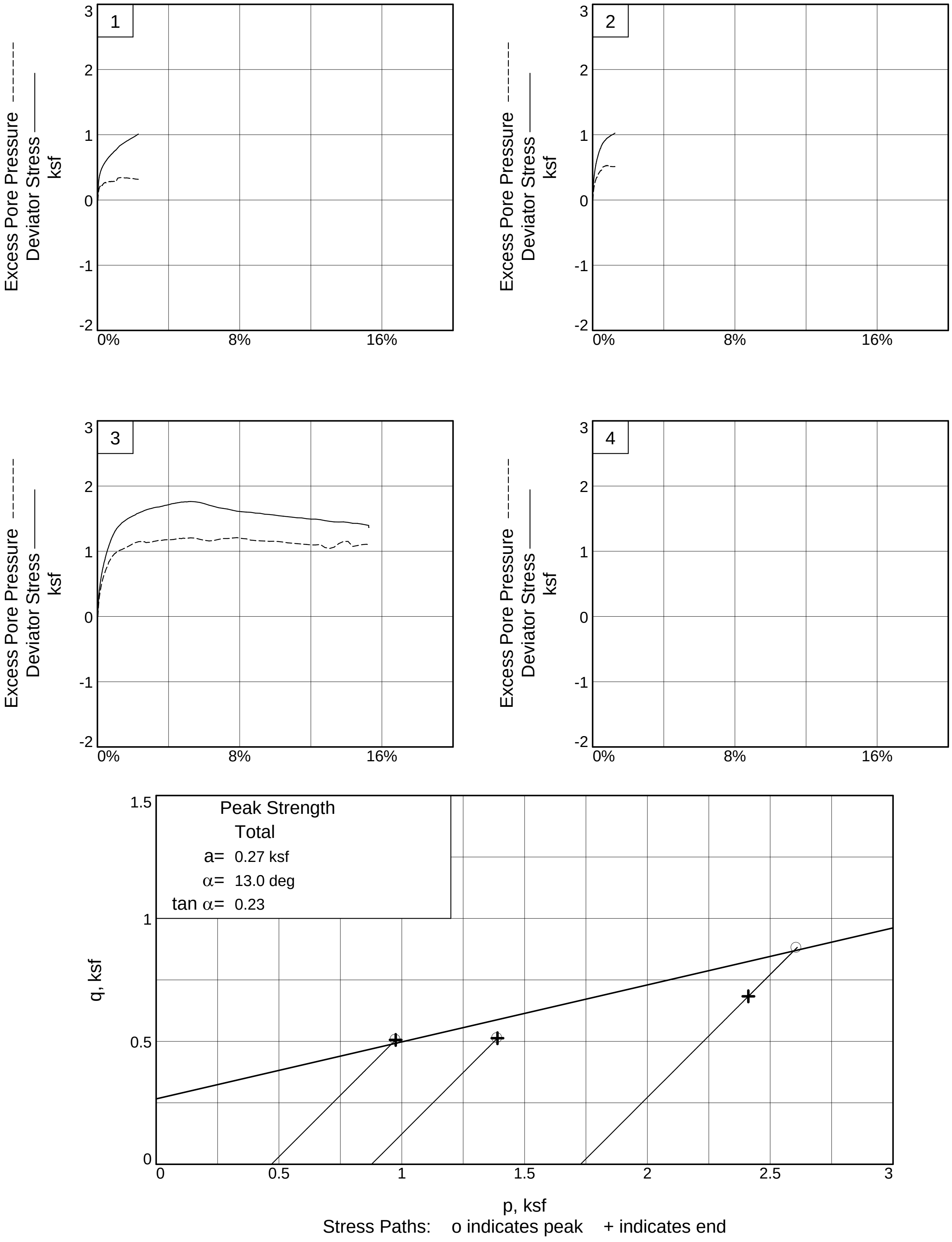


Client: American Electric Power

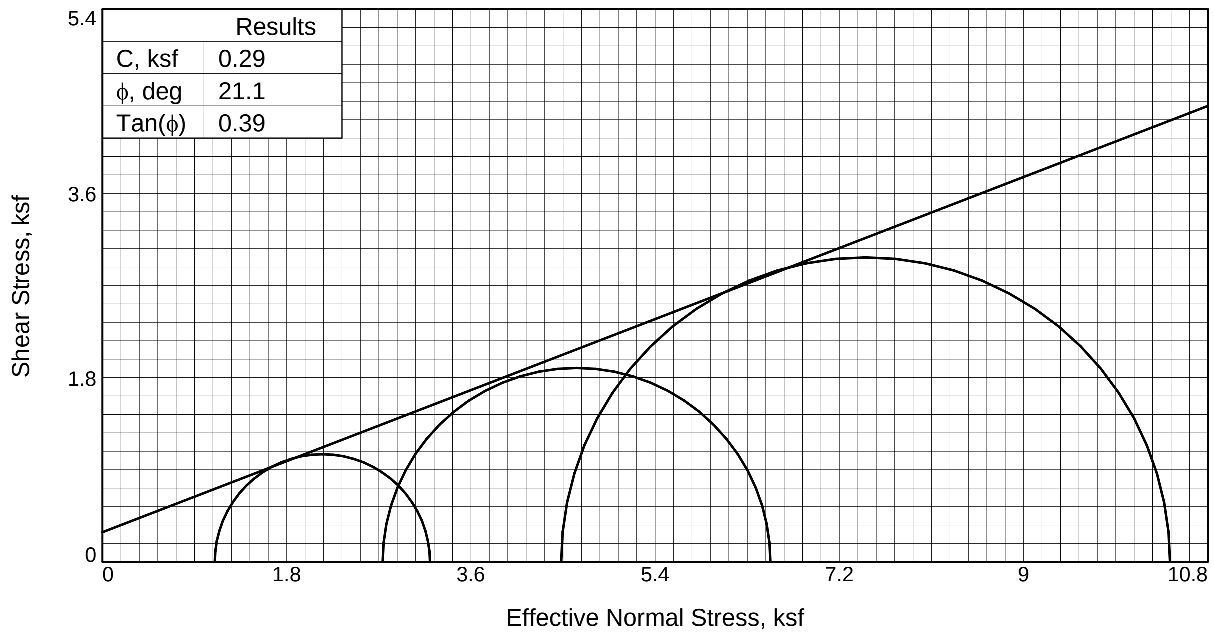
Project: AEP Poston Legacy CCR Impound

Location: B-01 Multi Stage **Depth:** 5.0'-6.5' **Sample Number:** S-03

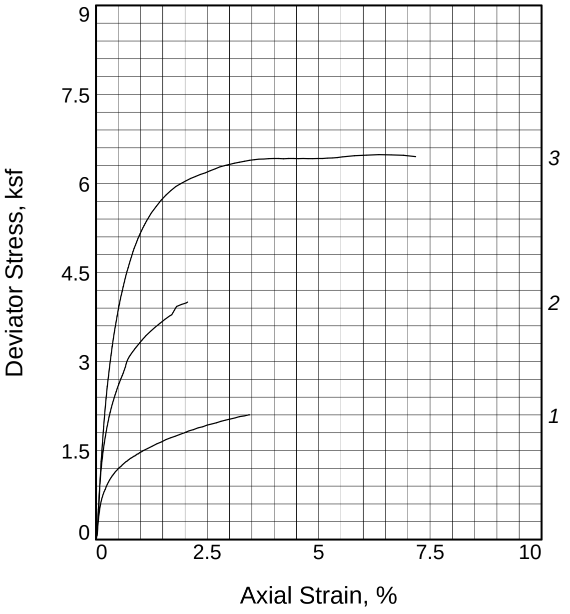
Project No.: 25170078 **Figure** 2 **S&ME, Inc.**

Tested By: CJ

C and phi are not test results but an interpretation of the test results. The designer is responsible for interpreting test data as provided by S&ME.



	Results
C, ksf	0.29
ϕ, deg	21.1
Tan(ϕ)	0.39



	Sample No.	1	2	3
Initial	Water Content, %	18.9	18.9	18.9
	Dry Density, pcf	107.1	107.1	107.1
	Saturation, %	88.9	88.9	88.9
	Void Ratio	0.5731	0.5731	0.5731
	Diameter, in.	2.846	2.846	2.846
	Height, in.	5.862	5.862	5.862
At Test	Water Content, %	16.1	15.3	14.9
	Dry Density, pcf	117.5	119.4	120.2
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.4350	0.4123	0.4020
	Diameter, in.	2.760	2.794	2.816
	Height, in.	5.687	5.462	5.336
	Strain rate, %/min.	0.0017	0.0017	0.0017
	Back Pressure, psi	50.00	50.00	50.00
	Cell Pressure, psi	70.04	89.83	117.75
	Fail. Stress, ksf	2.1	3.8	5.9
	Excess Pore Pr., ksf	1.8	3.0	5.3
	Ult. Stress, ksf	2.1	3.8	6.5
	Excess Pore Pr., ksf	1.8	3.0	6.0
	$\bar{\sigma}_1$ Failure, ksf	3.2	6.5	10.4
	$\bar{\sigma}_3$ Failure, ksf	1.1	2.7	4.5

Type of Test:
CU with Pore Pressures

Sample Type: Intact

Description: LEAN CLAY WITH SAND (CL), trace fine gravel

LL= 47 **PL=** 22 **PI=** 25

Assumed Specific Gravity= 2.7

Remarks: ASTM D4767 Multi Stage
Effective Stress Failure defined by Stress Ratio

Figure 1

Client: American Electric Power

Project: AEP Poston Legacy CCR Impound
Athens, Ohio

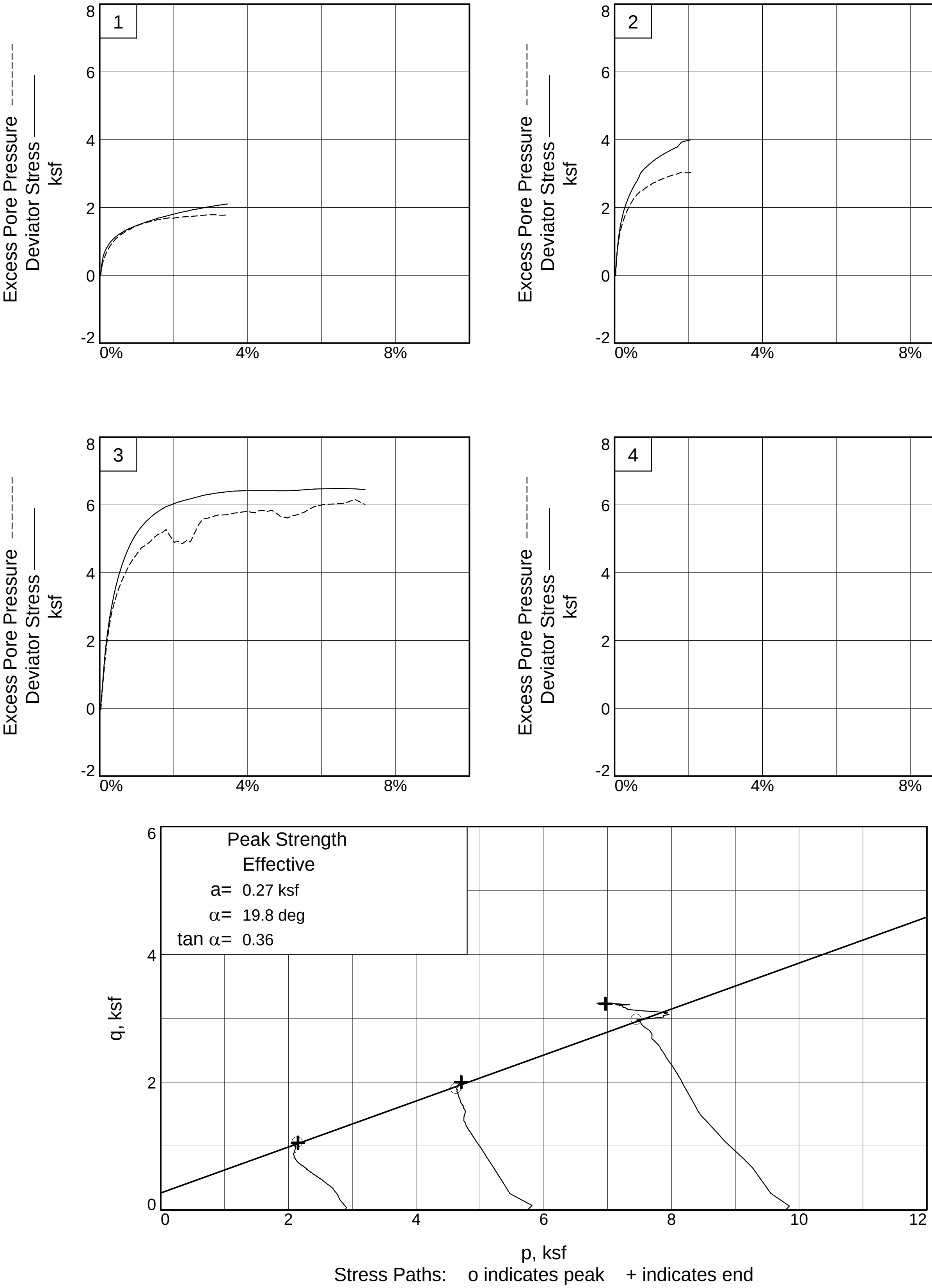
Location: B-01 Multi Stage

Sample Number: S-25 **Depth:** 55.0'-56.8'

Proj. No.: 25170078 **Date Sampled:** 8/19/2025

TRIAXIAL SHEAR TEST REPORT
S&ME, Inc.
Dublin, Ohio

Tested By: CJ



Client: American Electric Power
Project: AEP Poston Legacy CCR Impound
Location: B-01 Multi Stage **Depth:** 55.0'-56.8' **Sample Number:** S-25
Project No.: 25170078 **Figure** 2

S&ME, Inc.

Tested By: CJ

C and phi are not test results but an interpretation of the test results. The designer is responsible for interpreting test data as provided by S&ME.

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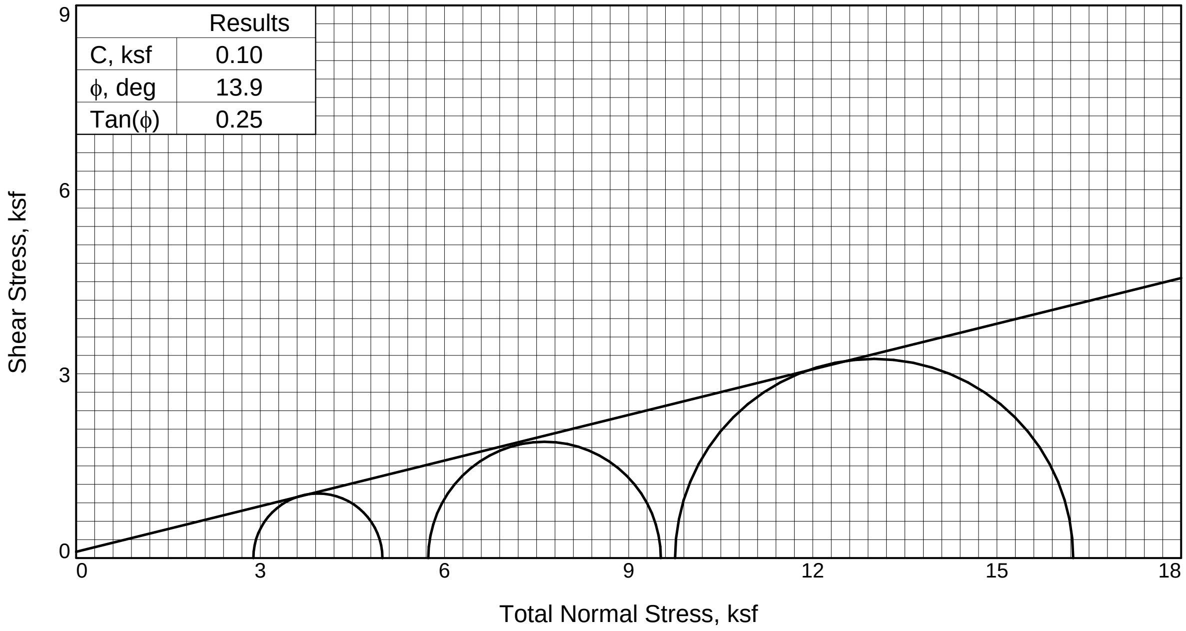
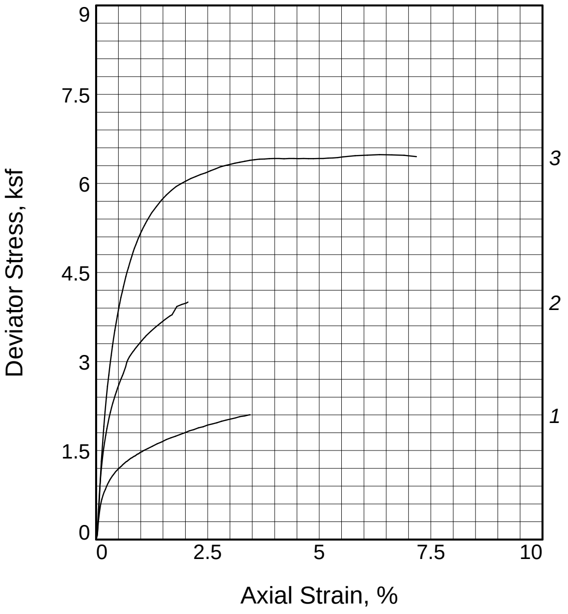


	Results
C, ksf	0.10
ϕ, deg	13.9
Tan(ϕ)	0.25



	Sample No.	1	2	3
Initial	Water Content, %	18.9	18.9	18.9
	Dry Density, pcf	107.1	107.1	107.1
	Saturation, %	88.9	88.9	88.9
	Void Ratio	0.5731	0.5731	0.5731
	Diameter, in.	2.846	2.846	2.846
	Height, in.	5.862	5.862	5.862
At Test	Water Content, %	16.1	15.3	14.9
	Dry Density, pcf	117.5	119.4	120.2
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.4350	0.4123	0.4020
	Diameter, in.	2.760	2.794	2.816
	Height, in.	5.687	5.462	5.336
	Strain rate, %/min.	0.0017	0.0017	0.0017
	Back Pressure, psi	50.00	50.00	50.00
	Cell Pressure, psi	70.04	89.83	117.75
	Fail. Stress, ksf	2.1	3.8	6.5
	Excess Pore Pr., ksf	1.8	3.0	6.0
	Ult. Stress, ksf	2.1	3.8	5.9
	Excess Pore Pr., ksf	1.8	3.0	5.3
	$\bar{\sigma}_1$ Failure, ksf	3.2	6.5	10.2
	$\bar{\sigma}_3$ Failure, ksf	1.1	2.7	3.7

Type of Test:
CU with Pore Pressures

Sample Type: Intact

Description: LEAN CLAY WITH SAND (CL), trace fine gravel

LL= 47 **PL=** 22 **PI=** 25

Assumed Specific Gravity= 2.7

Remarks: ASTM D4767 Multi Stage
Undrained Strength defined by Principal Stress Difference

Figure 1

Client: American Electric Power

Project: AEP Poston Legacy CCR Impound
Athens, Ohio

Location: B-01 Multi Stage

Sample Number: S-25 **Depth:** 55.0'-56.8'

Proj. No.: 25170078 **Date Sampled:** 8/19/2025

TRIAXIAL SHEAR TEST REPORT
S&ME, Inc.
Dublin, Ohio

Tested By: CJ

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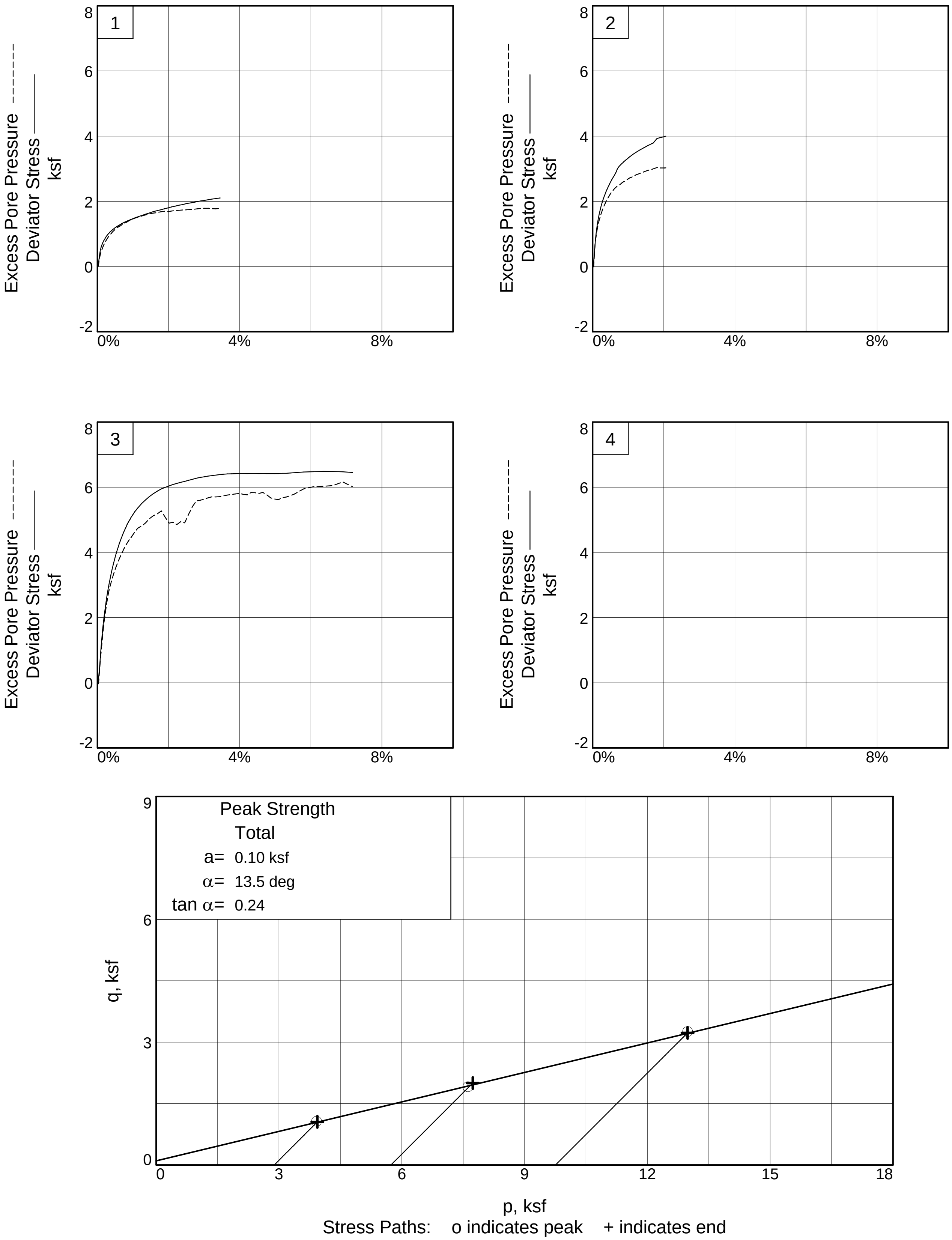


Client: American Electric Power

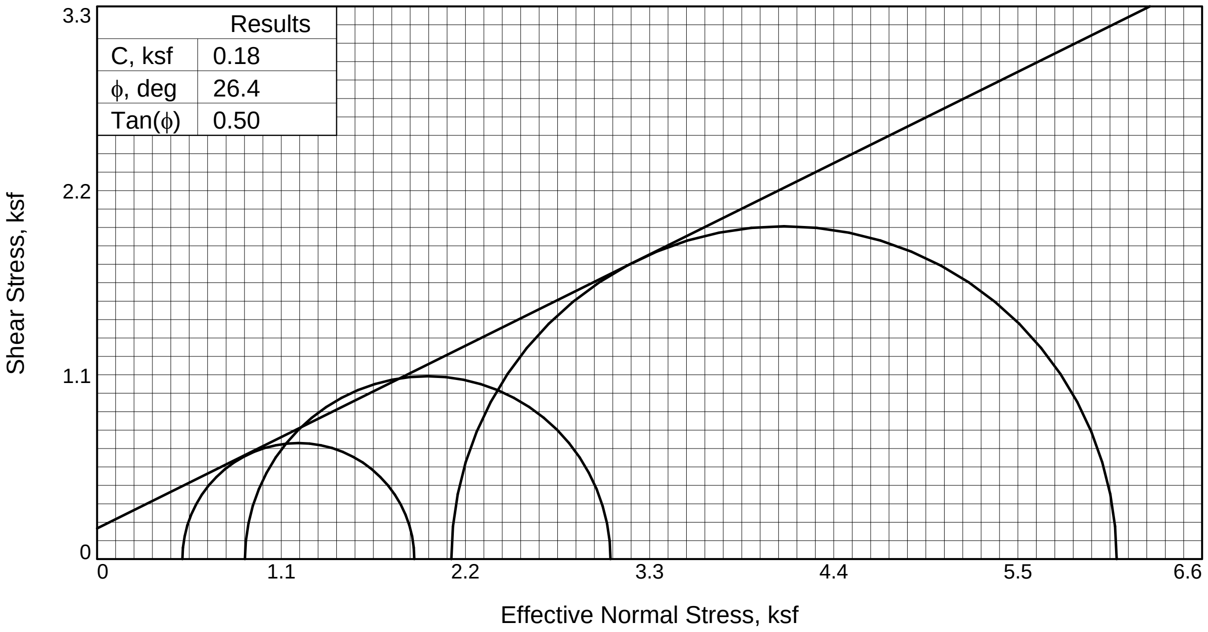
Project: AEP Poston Legacy CCR Impound

Location: B-01 Multi Stage **Depth:** 55.0'-56.8' **Sample Number:** S-25

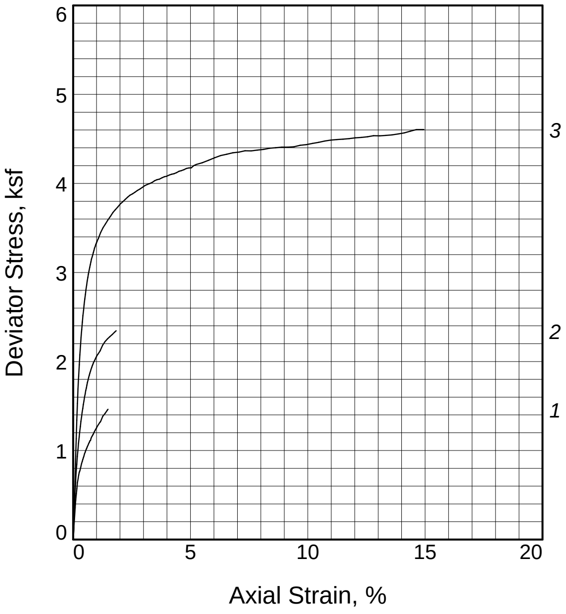
Project No.: 25170078 **Figure** 2 **S&ME, Inc.**

Tested By: CJ

C and phi are not test results but an interpretation of the test results. The designer is responsible for interpreting test data as provided by S&ME.



	Results
C, ksf	0.18
φ, deg	26.4
Tan(φ)	0.50



	Sample No.	1	2	3
Initial	Water Content, %	15.0	15.0	15.0
	Dry Density, pcf	115.0	115.0	115.0
	Saturation, %	86.8	86.8	86.8
	Void Ratio	0.4657	0.4657	0.4657
	Diameter, in.	2.870	2.870	2.870
	Height, in.	5.835	5.835	5.835
At Test	Water Content, %	16.9	16.5	16.0
	Dry Density, pcf	115.8	116.7	117.8
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.4559	0.4445	0.4314
	Diameter, in.	2.864	2.878	2.895
	Height, in.	5.822	5.721	5.599
	Strain rate, %/min.	0.0033	0.0033	0.0033
	Back Pressure, psi	50.00	50.00	50.00
	Cell Pressure, psi	55.92	62.00	74.06
	Fail. Stress, ksf	1.39	2.18	3.97
	Excess Pore Pr., ksf	0.34	0.85	1.35
	Ult. Stress, ksf	1.46	2.35	4.61
	Excess Pore Pr., ksf	0.31	0.77	0.64
	$\bar{\sigma}_1$ Failure, ksf	1.89	3.07	6.09
	$\bar{\sigma}_3$ Failure, ksf	0.51	0.88	2.12

Type of Test:
CU with Pore Pressures

Sample Type: Intact

Description: LEAN CLAY WITH SAND (CL), trace fine gravel

LL= 36 **PL=** 19 **PI=** 17

Assumed Specific Gravity= 2.7

Remarks: ASTM D4767 Multi Stage
Effective Stress Failure defined by Stress Ratio

Figure 1

Client: American Electric Power

Project: AEP Poston Legacy CCR Impound
Athens, Ohio

Location: B-02 Multi Stage

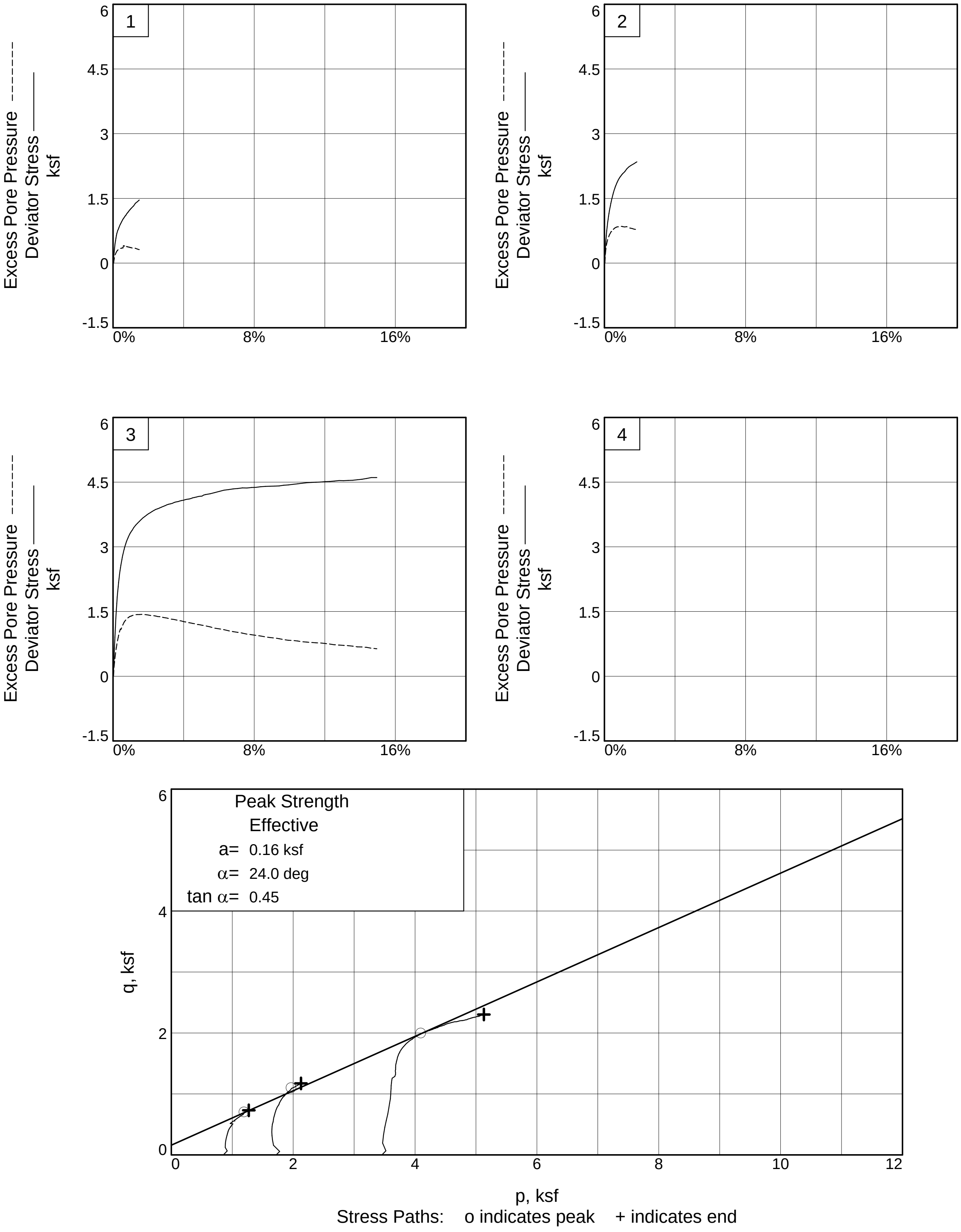
Sample Number: S-06 **Depth:** 12.5'-14.5'

Proj. No.: 25170078 **Date Sampled:** 8/20/2025

TRIAXIAL SHEAR TEST REPORT
S&ME, Inc.
Dublin, Ohio

Tested By: CJ

C and phi are not test results but an interpretation of the test results. The designer is responsible for interpreting test data as provided by S&ME.



Client: American Electric Power

Project: AEP Poston Legacy CCR Impound

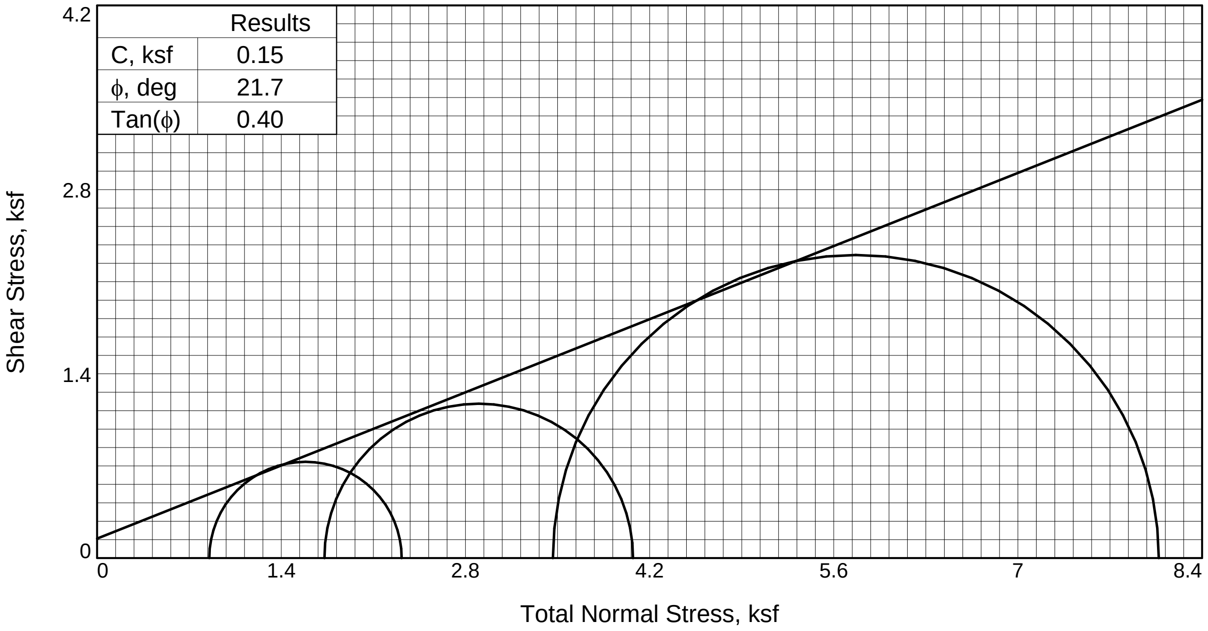
Location: B-02 Multi Stage **Depth:** 12.5'-14.5' **Sample Number:** S-06

Project No.: 25170078 **Figure** 2

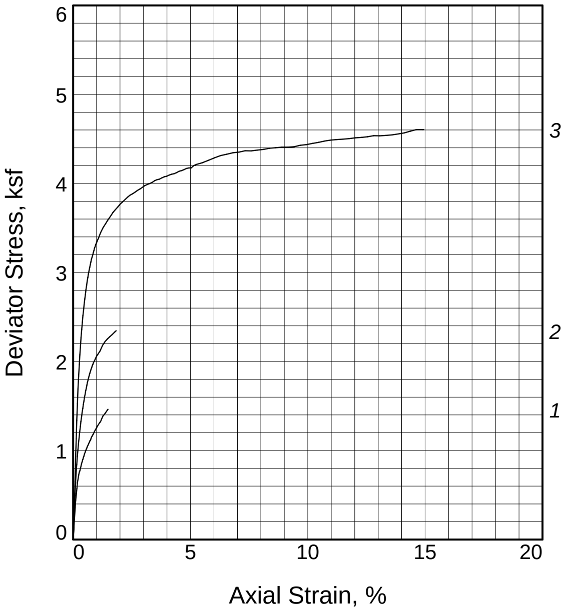
S&ME, Inc.

Tested By: CJ

C and phi are not test results but an interpretation of the test results. The designer is responsible for interpreting test data as provided by S&ME.



	Results
C, ksf	0.15
ϕ, deg	21.7
Tan(ϕ)	0.40



	Sample No.	1	2	3
Initial	Water Content, %	15.0	15.0	15.0
	Dry Density, pcf	115.0	115.0	115.0
	Saturation, %	86.8	86.8	86.8
	Void Ratio	0.4657	0.4657	0.4657
	Diameter, in.	2.870	2.870	2.870
	Height, in.	5.835	5.835	5.835
At Test	Water Content, %	16.9	16.5	16.0
	Dry Density, pcf	115.8	116.7	117.8
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.4559	0.4445	0.4314
	Diameter, in.	2.864	2.878	2.895
	Height, in.	5.822	5.721	5.599
	Strain rate, %/min.	0.0033	0.0033	0.0033
	Back Pressure, psi	50.00	50.00	50.00
	Cell Pressure, psi	55.92	62.00	74.06
	Fail. Stress, ksf	1.46	2.35	4.61
	Excess Pore Pr., ksf	0.31	0.77	0.64
	Ult. Stress, ksf	1.39	2.18	3.97
	Excess Pore Pr., ksf	0.34	0.85	1.35
	$\bar{\sigma}_1$ Failure, ksf	2.00	3.30	7.43
	$\bar{\sigma}_3$ Failure, ksf	0.54	0.95	2.83

Type of Test:
CU with Pore Pressures

Sample Type: Intact

Description: LEAN CLAY WITH SAND (CL), trace fine gravel

LL= 36 **PL=** 19 **PI=** 17

Assumed Specific Gravity= 2.7

Remarks: ASTM D4767 Multi Stage
Undrained Strength defined by Principal Stress Difference

Figure 1

Client: American Electric Power

Project: AEP Poston Legacy CCR Impound
Athens, Ohio

Location: B-02 Multi Stage

Sample Number: S-06 **Depth:** 12.5'-14.5'

Proj. No.: 25170078 **Date Sampled:** 8/20/2025

TRIAXIAL SHEAR TEST REPORT
S&ME, Inc.
Dublin, Ohio

Tested By: CJ

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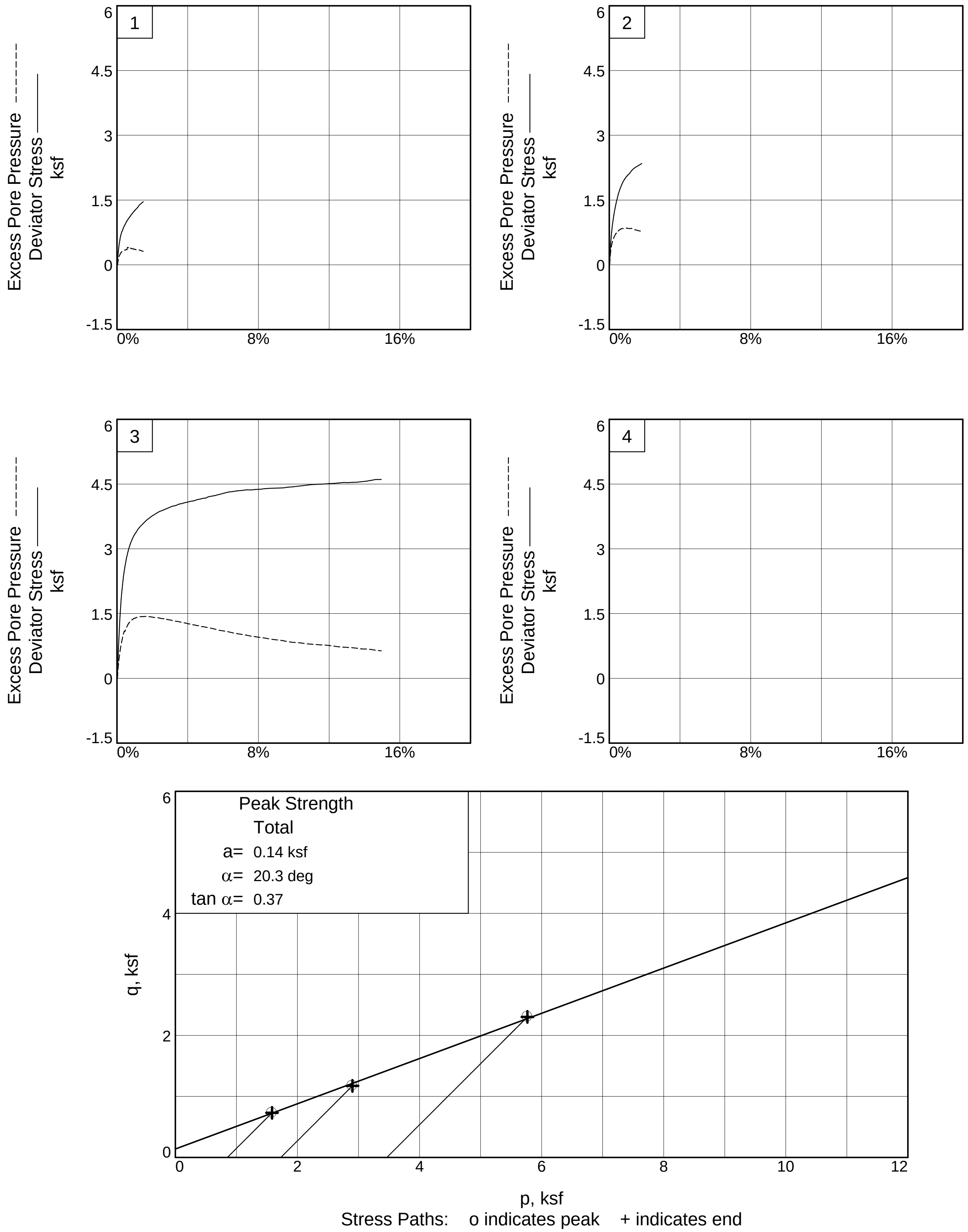


Client: American Electric Power

Project: AEP Poston Legacy CCR Impound

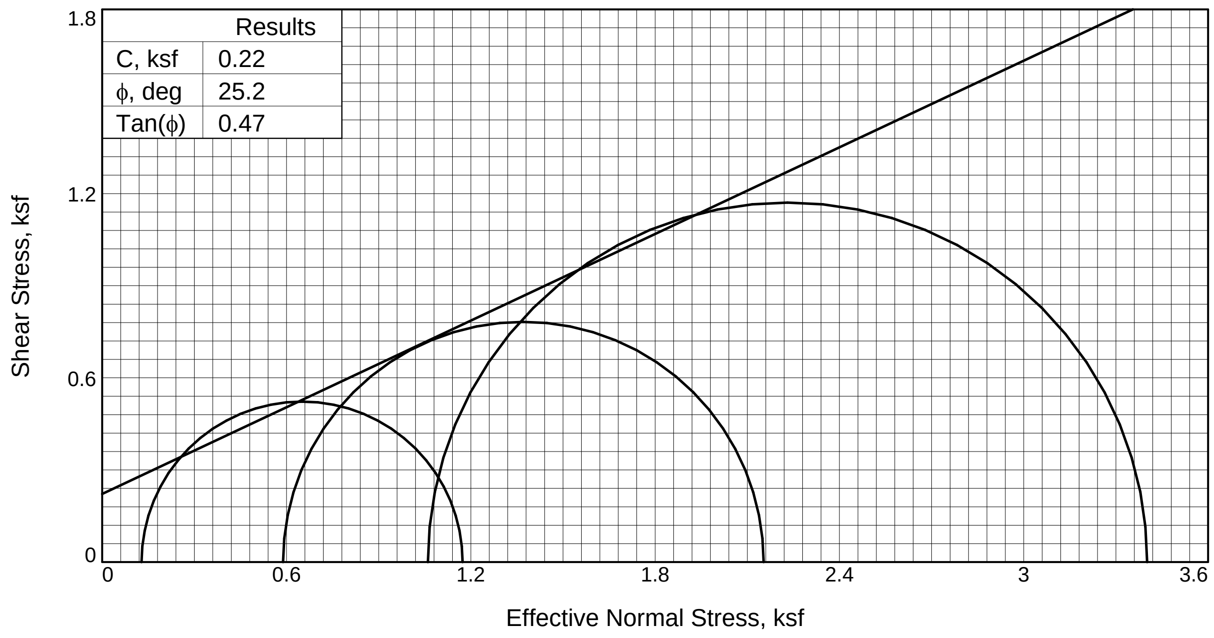
Location: B-02 Multi Stage **Depth:** 12.5'-14.5' **Sample Number:** S-06

Project No.: 25170078 **Figure** 2

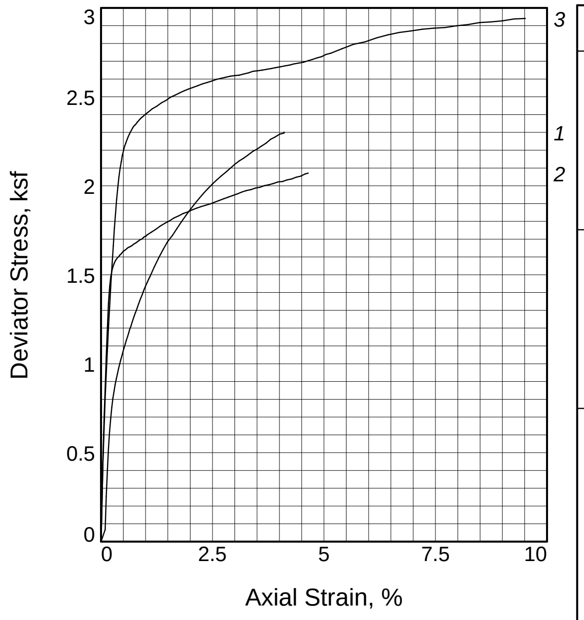
S&ME, Inc.

Tested By: CJ

C and phi are not test results but an interpretation of the test results. The designer is responsible for interpreting test data as provided by S&ME.



	Results
C, ksf	0.22
ϕ, deg	25.2
Tan(ϕ)	0.47



	Sample No.	1	2	3
Initial	Water Content, %	21.2	21.2	21.2
	Dry Density, pcf	108.4	108.4	108.4
	Saturation, %	103.2	103.2	103.2
	Void Ratio	0.5542	0.5542	0.5542
	Diameter, in.	2.879	2.879	2.879
	Height, in.	6.085	6.085	6.085
At Test	Water Content, %	20.2	18.8	17.2
	Dry Density, pcf	109.0	111.9	115.0
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.5466	0.5068	0.4657
	Diameter, in.	2.874	2.910	2.952
	Height, in.	6.075	5.776	5.457
	Strain rate, %/min.	0.02	0.02	0.02
	Back Pressure, psi	50.00	50.00	50.00
	Cell Pressure, psi	53.42	56.93	62.21
	Fail. Stress, ksf	1.05	1.56	2.34
	Excess Pore Pr., ksf	0.36	0.41	0.70
	Ult. Stress, ksf	2.30	2.07	2.94
	Excess Pore Pr., ksf	-0.09	-0.04	0.16
	$\bar{\sigma}_1$ Failure, ksf	1.17	2.15	3.40
	$\bar{\sigma}_3$ Failure, ksf	0.13	0.59	1.06

Type of Test:
CU with Pore Pressures

Sample Type: Intact

Description: LEAN CLAY WITH SAND (CL), trace fine gravel

LL= 40 **PL=** 22 **PI=** 18

Assumed Specific Gravity= 2.7

Remarks: ASTM D4767 Multi Stage
Effective Stress Failure defined by Shear Stress Ratio

Figure 1

Client: American Electric Power

Project: AEP Poston Legacy CCR Impound
Athens, Ohio

Location: B-07 Multi Stage

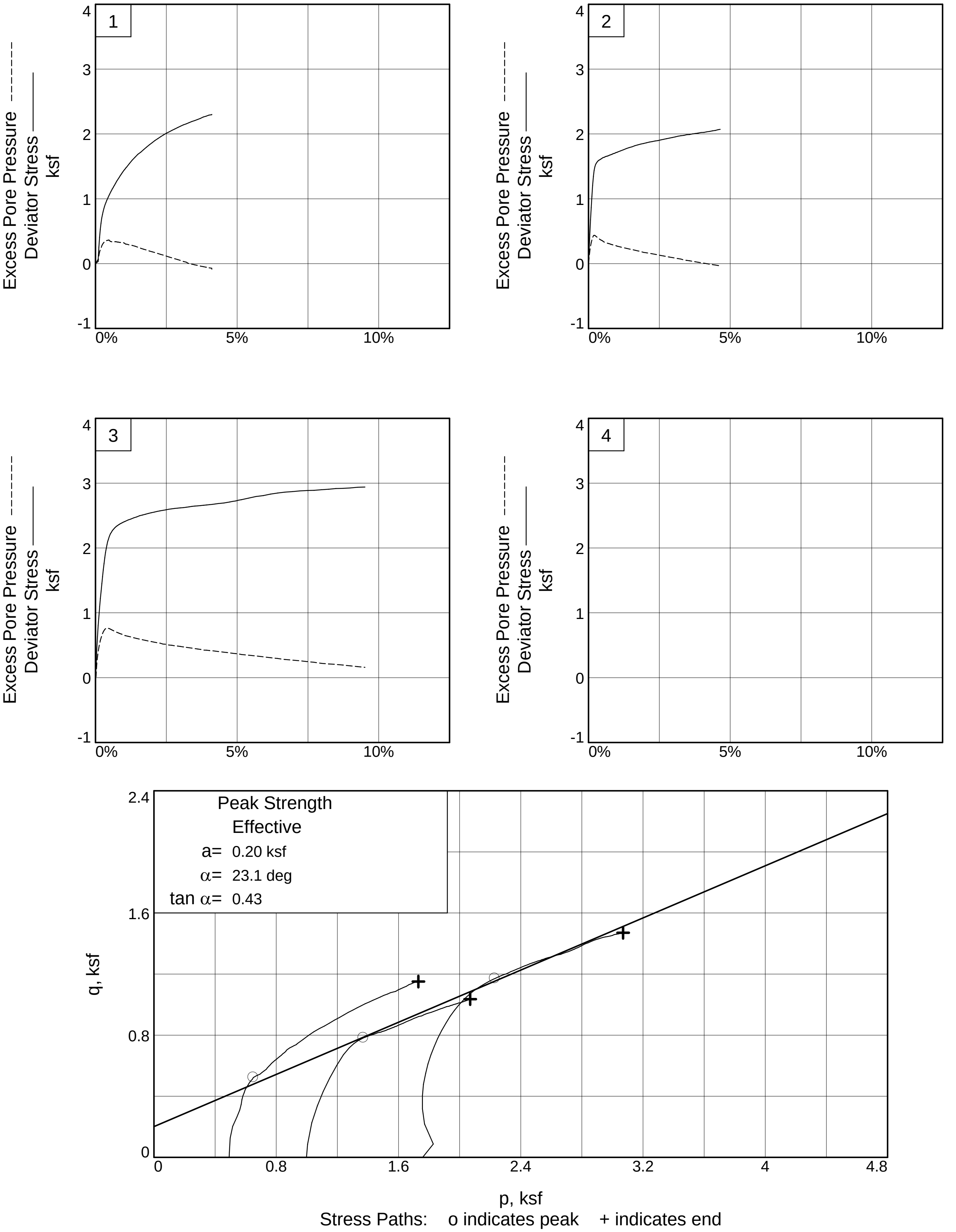
Sample Number: S-5 II **Depth:** 6.0'-8.0'

Proj. No.: 25170078 **Date Sampled:**

TRIAXIAL SHEAR TEST REPORT
S&ME, Inc.
Dublin, Ohio

Tested By: PJM

C and phi are not test results but an interpretation of the test results. The designer is responsible for interpreting test data as provided by S&ME.



Client: American Electric Power

Project: AEP Poston Legacy CCR Impound

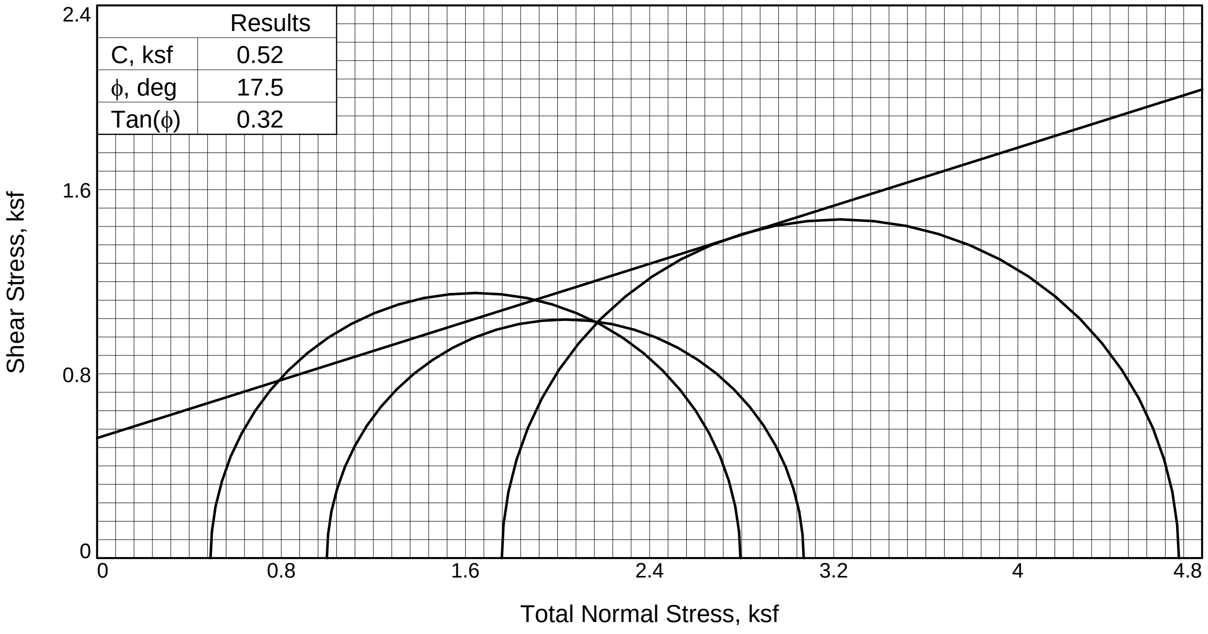
Location: B-07 Multi Stage **Depth:** 6.0'-8.0' **Sample Number:** S-5 II

Project No.: 25170078 **Figure** 2

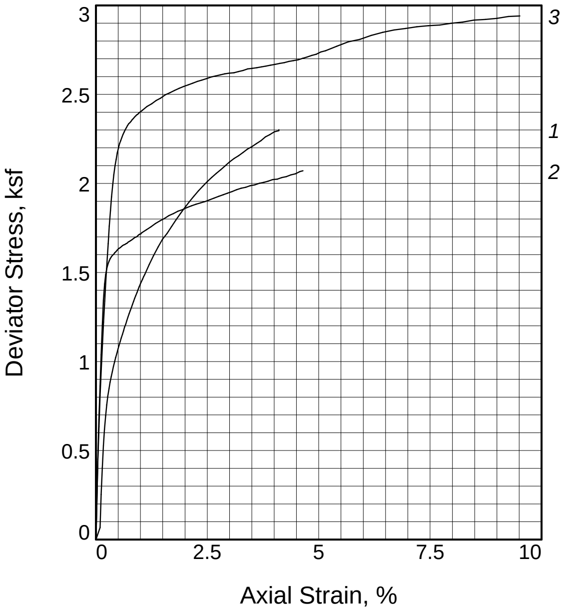
S&ME, Inc.

Tested By: PJM

C and phi are not test results but an interpretation of the test results. The designer is responsible for interpreting test data as provided by S&ME.



	Results
C, ksf	0.52
ϕ, deg	17.5
Tan(ϕ)	0.32



	Sample No.	1	2	3
Initial	Water Content, %	21.2	21.2	21.2
	Dry Density, pcf	108.4	108.4	108.4
	Saturation, %	103.2	103.2	103.2
	Void Ratio	0.5542	0.5542	0.5542
	Diameter, in.	2.879	2.879	2.879
	Height, in.	6.085	6.085	6.085
At Test	Water Content, %	20.2	18.8	17.2
	Dry Density, pcf	109.0	111.9	115.0
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.5466	0.5068	0.4657
	Diameter, in.	2.874	2.910	2.952
	Height, in.	6.075	5.776	5.457
	Strain rate, %/min.	0.02	0.02	0.02
	Back Pressure, psi	50.00	50.00	50.00
	Cell Pressure, psi	53.42	56.93	62.21
	Fail. Stress, ksf	2.30	2.07	2.94
	Excess Pore Pr., ksf	-0.09	-0.04	0.16
	Ult. Stress, ksf	1.05	1.56	2.34
	Excess Pore Pr., ksf	0.36	0.41	0.70
	$\bar{\sigma}_1$ Failure, ksf	2.88	3.10	4.54
	$\bar{\sigma}_3$ Failure, ksf	0.58	1.03	1.60

Type of Test:
CU with Pore Pressures

Sample Type: Intact

Description: LEAN CLAY WITH SAND (CL), trace fine gravel

LL= 40 **PL=** 22 **PI=** 18

Assumed Specific Gravity= 2.7

Remarks: ASTM D4767 Multi Stage
Undrained Failure defined by Principal Stress Difference

Figure 1

Client: American Electric Power

Project: AEP Poston Legacy CCR Impound
Athens, Ohio

Location: B-07 Multi Stage

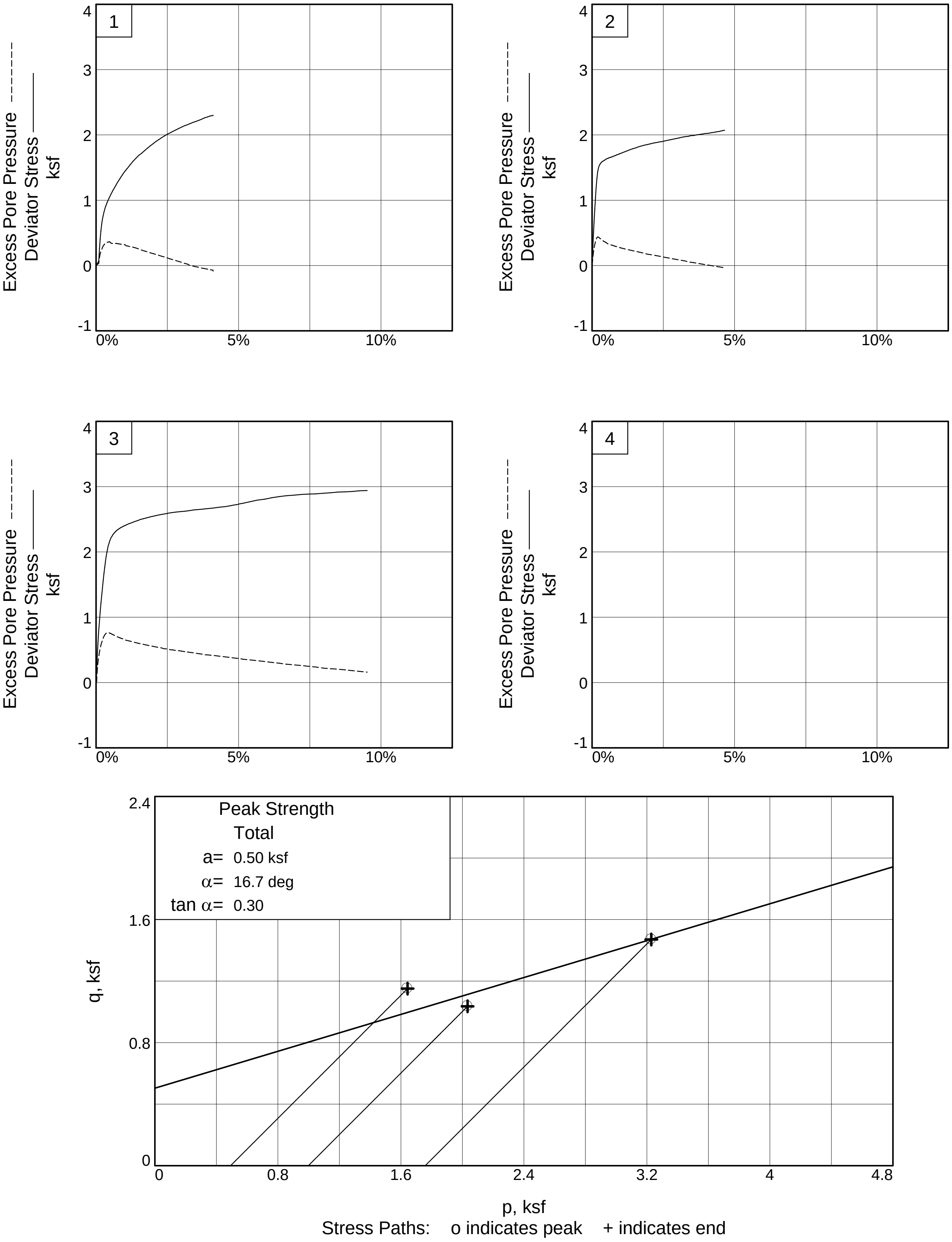
Sample Number: S-5 II **Depth:** 6.0'-8.0'

Proj. No.: 25170078 **Date Sampled:**

TRIAXIAL SHEAR TEST REPORT
S&ME, Inc.
Dublin, Ohio

Tested By: PJM

C and phi are not test results but an interpretation of the test results. The designer is responsible for interpreting test data as provided by S&ME.



Client: American Electric Power

Project: AEP Poston Legacy CCR Impound

Location: B-07 Multi Stage **Depth:** 6.0'-8.0' **Sample Number:** S-5 II

Project No.: 25170078 **Figure** 2 **S&ME, Inc.**

Tested By: PJM

Form No. WS-D5084-1
Revision No. : 0
Revision Date: 03/11/15

ASTM D5084 Flex Wall Perm Method C

Test Data

S&ME, Inc. Columbus Branch, 6190 Enterprise Ct., Dublin, Ohio 43016

Project No:	25170078	Report Date:	1/9/2026
Project Name:	AEP Poston Legacy CCR Impound	Test Date:	10/27/2025
Client Name:	American Electric Power	Sample Date:	8/19/2025
Client Address:	8500 Smiths Mill Rd., New Albany, OH 43054	Log No:	17-67-25
Sample ID:	B-01 ST-34 75.0'-76.3' I	Sample Type:	Intact
Description:	LEAN CLAY (CL), little fine to coarse sand, trace fine gravel		

Sample Info:	Assumed SG:	2.70	Percentage Passing 200:	88.4	Maximum Particle Size:	**4.75 mm**
	Liquid Limit:	42	Plastic Limit:	20	Plastic Index:	22

				Final Specimen Conditions			
Length (cm):	**14.91**	Wet Density (PCF):	**133.3**	Length (cm):	**14.88**	Wet Density (PCF):	**134.2**
Diameter (cm):	**7.23**	Dry Density (PCF):	**113.5**	Diameter (cm):	**7.25**	Dry Density (PCF):	**113.3**
Area (cm^2)	**41.11**	Percent Saturation:	**97.3%**	Area (cm^2)	**41.28**	Percent Saturation:	**100.0%**
Volume (cm^3)	**613.03**			Volume (cm^3)	**614.22**	B-Parameter:	**0.95**
Wet weight (grams)	**1309.5**	Void Ratio:	**0.485**	Wet weight (grams)	**1321.1**	Void Ratio:	**0.487**
Dry Weight (grams)	**1114.9**	Porosity:	**0.326**	Dry Weight (grams)	**1114.9**	Porosity:	**0.328**
Percent Moisture:	**17.5%**			Percent Moisture:	**18.5%**		
Test Parameters:	Effective Consolidation Stress (psi):		**40.0**	Permeant Liquid Used:		Deaired Water	
Burette Area (cm^2):	**0.874**	Cell Pressure (psi):	**90.0**	Influent Pressure (psi):	**65.0**	Effluent Pressure (psi):	**50.0**

Time (24-hr)			**Temperature (^{o}C)**				**Measurements**						**Initial Gradient**	**Final Gradient**	**K-Value (cm/sec)**	
Start	**End**	**Time (sec)**	**Initial**	**Final**	**Avg.**	**Factor**	**$h_{out}1$**	**$h_{in}1$**	**$h_{out}2$**	**$h_{in}2$**	**h1**	**h2**			**Uncorrected K-Value**	**Corrected K-Value**
9:22:00	12:26:00	11040	19.8	20.6	20.2	0.9954	49.40	2.00	49.30	2.10	1108.5	1108.3	74.51	74.49	2.93E-09	2.92E-09
12:26:00	15:01:00	9300	20.6	21.6	21.1	0.9740	49.30	2.10	49.22	2.20	1108.3	1108.1	74.49	74.48	3.14E-09	3.05E-09
15:01:00	17:42:00	9660	21.6	22.4	22.0	0.9533	49.22	2.20	49.10	2.30	1108.1	1107.9	74.48	74.46	3.69E-09	3.52E-09
17:42:00	9:39:00	57420	22.4	19.9	21.2	0.9728	49.10	2.30	48.60	2.80	1107.9	1106.7	74.46	74.38	2.82E-09	2.75E-09
Notes:												***Averages:***	***74.48***	***74.45***	***3.15E-09***	***3.1E-09***

Technician: Paula J. Manning

Technical Responsibility: Erica Goodyear

Erica Goodyear
signature

Position: T3

Form No. WS-D5084-1
Revision No. : 0
Revision Date: 03/11/15

ASTM D5084 Flex Wall Perm Method C

Test Data

S&ME, Inc. Columbus Branch, 6190 Enterprise Ct., Dublin, Ohio 43016

Project No:	25170078	Report Date:	1/9/2026
Project Name:	AEP Poston Legacy CCR Impound	Test Date:	10/27/2025
Client Name:	American Electric Power	Sample Date:	8/20/2025
Client Address:	8500 Smiths Mill Rd., New Albany, OH 43054	Log No:	17-67-25
Sample ID:	B-02 ST-37 85.0'-87.0' II	Sample Type:	Intact
Description:	LEAN CLAY WITH SAND (CL), trace fine gravel		

Sample Info:	Assumed SG:	2.70	Percentage Passing 200:	83.4	Maximum Particle Size:	**12.5 mm**
	Liquid Limit:	44	Plastic Limit:	19	Plastic Index:	25

				Final Specimen Conditions			
Length (cm):	**14.56**	Wet Density (PCF):	**125.8**	Length (cm):	**14.19**	Wet Density (PCF):	**128.9**
Diameter (cm):	**7.22**	Dry Density (PCF):	**98.3**	Diameter (cm):	**7.01**	Dry Density (PCF):	**106.9**
Area (cm^2)	**40.92**	Percent Saturation:	**100.0%**	Area (cm^2)	**38.60**	Percent Saturation:	**96.3%**
Volume (cm^3)	**595.55**			Volume (cm^3)	**547.82**	B-Parameter:	**0.99**
Wet weight (grams)	**1200.6**	Void Ratio:	**0.714**	Wet weight (grams)	**1131.2**	Void Ratio:	**0.576**
Dry Weight (grams)	**938.3**	Porosity:	**0.416**	Dry Weight (grams)	**938.3**	Porosity:	**0.366**
Percent Moisture:	**27.9%**			Percent Moisture:	**20.6%**		
Test Parameters:	Effective Consolidation Stress (psi):		**50.0**	Permeant Liquid Used:		Deaired Water	
Burette Area (cm^2):	**0.874**	Cell Pressure (psi):	**100.0**	Influent Pressure (psi):	**70.0**	Effluent Pressure (psi):	**50.0**

Time (24-hr)			**Temperature (^oC)**				**Measurements**						**Initial Gradient**	**Final Gradient**	**K-Value (cm/sec)**	
Start	**End**	**Time (sec)**	**Initial**	**Final**	**Avg.**	**Factor**	**$h_{out}1$**	**$h_{in}1$**	**$h_{out}2$**	**$h_{in}2$**	**h1**	**h2**			**Uncorrected K-Value**	**Corrected K-Value**
9:24:15	12:27:15	10980	19.8	20.6	20.2	0.9954	49.70	1.40	49.45	1.70	1461.1	1460.4	102.94	102.90	6.28E-09	6.25E-09
12:27:15	15:04:15	9420	20.6	21.6	21.1	0.9740	49.45	1.70	49.20	1.90	1460.4	1459.9	102.90	102.86	5.99E-09	5.84E-09
15:04:15	17:43:15	9540	21.6	22.4	22.0	0.9533	49.20	1.90	48.90	2.15	1459.9	1459.3	102.86	102.82	7.24E-09	6.90E-09
17:43:15	9:39:15	57360	22.4	19.9	21.2	0.9728	48.90	2.15	47.50	3.50	1459.3	1456.2	102.82	102.60	6.02E-09	5.86E-09
Notes:												***Averages:***	***102.88***	***102.80***	***6.38E-09***	***6.2E-09***

Technician: Paula J. Manning
Technical Responsibility: Erica Goodyear   Erica Goodyear
signature
Position: T3

Appendix IV – Parameter Justification

JOB NUMBER : 25-17-0078
PROJECT NAME : POSTON LEGACY CCR
PROJECT LOCATION : YORK TOWNSHIP, ATHENS COUNTY, OHIO
SUBJECT: STRENGTH AND PERMEABILITY PARAMETERS JUSTIFICATION
CALCULATED BY - DATE: WB - 01/27/2026
CHECKED BY - DATE: DJT - 02/02/2026

Methods for determining drained strength parameters for granular soils.

- Cohesion taken to be 0psf for all granular soils.
- Granular soils include Sand Drain and CCR Material.
- Effective friction angle estimated using multiple blow count correlations and previous reports.
    1) ϕ' using $(N_1)_{60}$ correlation: Hatanaka, M. & Uchida, A. (1996)
    2) ϕ' using $(N_1)_{60}$ correlation: Terzaghi, K., Peck, R., & Mesri, G. (1996)
    3) ϕ' using N correlation: Mitchell (1981)
    4) ϕ' using N_{60} correlation: Sowers (1979)
    4) ϕ' results for the CCR material provided in the 2017 Terracon report.
- Summary of granular effective stress friction angle correlations are located in following pages.
- ϕ' chosen by comparison of correlation summaries.

Methods for determining drained strength parameters for cohesive soils.

- Cohesive soils include Natural, Embankment, and Clay Cap Soils.
- Drained strength parameters for Natural soils were estimated using correlations and our engineering experience with similar soils. Also, note the following:
    1) Secant fully softened friction angle estimated using Liquid Limit and Clay Fraction (% passing .002mm) correlation by Stark et al. (2014). A clay fraction of 10 was estimated based on visual identification and our experience with similar soils in this area.
    2) An effective cohesion value of 100 psf was chosen based on our experience with similar soils in this area.
- Drained strength parameters for Embankment soils were estimated using a comparison of the four CU Triaxial test results completed in the recent geotechnical study. A summary of CU Triaxial test results is included in the following pages.
- Drained strength parameters for Clay Cap soils were assumed to be similar to embankment soils. Based on the previous assumption and our experience with similar soils in this area, strength values of 26° and 100psf were chosen for ϕ' and c', respectively.

Methods for determining undrained strength parameters for cohesive soils.

- Undrained strength parameters were used for staged pseudo-static analysis.
- Undrained strength parameters for Embankment soils were estimated using a comparison of the four CU Triaxial test results completed in the recent geotechnical study. A summary of CU Triaxial test results is included in the following pages.
- The friction angle was taken as 0° for cohesive soils where laboratory CU testing was not completed.
- Cohesion for Natural and Clay Cap soils was estimated using multiple field results correlations and previous reports.
    1) S_u using N_{60} correlation: Terzaghi, K., Peck, R., & Mesri, G. (1996)
    2) q_u from field pocket penetrometer values.
    3) S_u results for the Clay Cap soils provided in the 2017 Terracon report.
- Summary of the undrained shear strength correlations are located in following pages.
- Cohesion was chosen by comparison of correlation summaries.

Determination of undrained strength for CCR material was based on our engineering experience with testing this material obtained from other sites.

Methods for determining wet unit weight.

- The unit weight for the granular sand drain soils was estimated based on the correlation to N values by Mitchell (1981).
- The unit weight for the granular CCR material was estimated based on the correlation to N values by Mitchell (1981) and a comparison of the results from the 2017 Terracon report.
- The unit weight for the Embankment soils was estimated using a comparison of the four CU Triaxial test results completed in the recent geotechnical study. A summary of CU Triaxial test results is included in the following pages.

- The unit weight for the cohesive Clay Cap soil was estimated from a comparison of the results from the 2017 Terracon report.
- The unit weight for the cohesive Natural soil was estimated based on our experience with similar soils in this area

Rock was assumed impenetrable as a failure surface is not likely to form in this material at this site.

Methods for determining hydraulic conductivity / permeability.

- The hydraulic conductivity for the Embankment soils was estimated using a comparison of the two flex wall permeability laboratory results completed in the recent geotechnical study. A summary of the permeability test results is included in the following pages.
- The hydraulic conductivity for the Natural, Clay CAP, and CCR soils was estimated using a correlation by Holtz & Kovacs (1981).
- The hydraulic conductivity for Rock was estimated using a correlation by Driscoll (1986), Fig 5.14.

- The hydraulic conductivity for the Sand Drain was estimated by comparing two grain size correlations.

1) k using D_{10} correlation: Hazen (1911)
2) k using gradation correlation: Kozeny-Carman Equation from Carrier (2003)

- Summary of the hydraulic conductivity correlations are located in following pages.

Effective Stress Friction Angle Correlations

Summary of SPT Results

N (b/ft)					
Material	**Count**	**Min**	**Max**	**Median**	**Mean**
Granular - CCR	51	0	29	1	5
Granular - Sand Drain	4	3	23	14	13

N_{60} (b/ft)					
Material	**Count**	**Min**	**Max**	**Median**	**Mean**
Granular - CCR	51	0	28	1	5
Granular - Sand Drain	4	4	40	21	21

$(N_1)_{60}$ (b/ft)					
Material	**Count**	**Min**	**Max**	**Median**	**Mean**
Granular - CCR	51	0	48	2	8
Granular - Sand Drain	4	7	41	26	25

Summary of Correlations Based on SPT Results

ϕ' (°)					
Material	**Count**	**Min**	**Max**	**Median**	**Mean**
Granular - CCR	51	20	47	25	27
Granular - Sand Drain	4	30	45	40	39

Hatanaka, M. & Uchida, A. (1996). Empirical correlation between penetration resistance and internal friction angle of sandy soils. Soils and Foundations, 36(4), pg. 1-9.

$$\varphi' = \sqrt{15.4N_{60}} + 20°$$

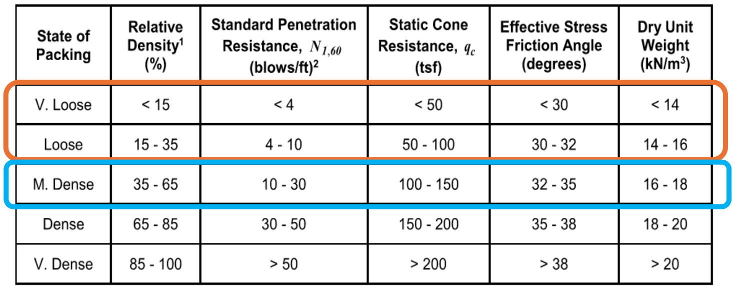
ϕ' (°)					
Material	**Count**	**Min**	**Max**	**Median**	**Mean**
Granular - CCR	51	27	42	28	30
Granular - Sand Drain	4	30	40	37	36

Terzaghi, K., Peck, R., & Mesri, G. (1996). Soil Mechanics in Engineering Practice, Third Edition. John Wiley & Sons, Inc., New York, NY. Pg. 151, Fig. 19.6.

Terracon (2017) Results Summary for CCR Material			
Boring	**Depth**	**γ_{wet} (pcf)**	**ϕ' (°)**
P16033004 B-2	4.5-7.5	125	34
P16033004 B-2	7.5-10.5	115	30
P16033004 B-2	10.5-53.5	110	28
P16022005 B-1	4.5-7.5	123	33
P16022005 B-1	7.5-25.0	115	30
Mean		**118**	**31**

Effective Stress Friction Angle Correlations

Table 8-4 Relationship between SPT N Value, Relative Density, and Angle of Internal Resistance (after Mitchell 1981)



State of Packing	Relative Density[1] (%)	Standard Penetration Resistance, $N_{1,60}$ (blows/ft)[2]	Static Cone Resistance, q_c (tsf)	Effective Stress Friction Angle (degrees)	Dry Unit Weight (kN/m^3)
V. Loose	< 15	< 4	< 50	< 30	< 14
Loose	15 - 35	4 - 10	50 - 100	30 - 32	14 - 16
M. Dense	35 - 65	10 - 30	100 - 150	32 - 35	16 - 18
Dense	65 - 85	30 - 50	150 - 200	35 - 38	18 - 20
V. Dense	85 - 100	> 50	> 200	> 38	> 20

[1] Freshly deposited, normally consolidated sand

[2] Corrected to an effective vertical overburden pressure of 1 atm.

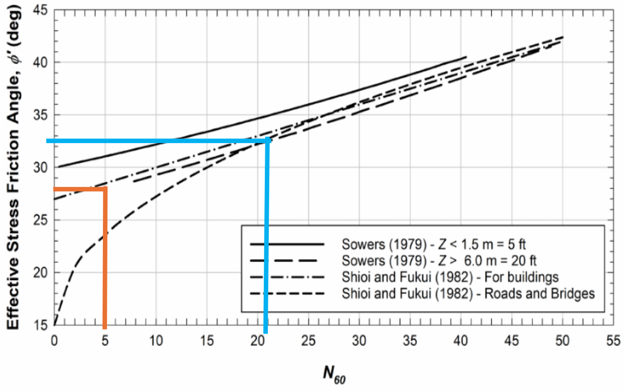


Figure 8-2 Relationship between Effective Stress Friction Angle of Coarse-Grained Soils and SPT N_{60} Value

🟧 Granular - CCR

🟦 Granular - Sand Drain

Effective Stress Friction Angles to Use for Model, ϕ' (°)

Granular - CCR = 28 °

Granular - Sand Drain = 34 °

Undrained Shear Strength Correlations

Summary of SPT Results

N (b/ft)					
Material	**Count**	**Min**	**Max**	**Median**	**Mean**
Cohesive - Natural	23	6	34	16	17
Cohesive - Clay Cap	23	5	33	12	14

N_{60} (b/ft)					
Material	**Count**	**Min**	**Max**	**Median**	**Mean**
Cohesive - Natural	23	8	51	21	24
Cohesive - Clay Cap	23	5	33	12	14

Summary of Correlations Based on SPT Results

S_u (psf)					
Material	**Count**	**Min**	**Max**	**Median**	**Mean**
Cohesive - Natural	23	1005	6382	2680	3008
Cohesive - Clay Cap	23	625	4125	1500	1696

Terzaghi, K., Peck, R., & Mesri, G. (1996). Soil Mechanics in Engineering Practice, Third Edition. John Wiley & Sons, Inc., New York, NY. Pg. 191, Fig. 20.41

Summary of Pocket Penetrometer Results

Soil Pocket Penetrometer (tsf)					
Material	**Count**	**Min**	**Max**	**Median**	**Mean**
Cohesive - Natural	12	0.2	4.2	1.9	2.0
Cohesive - Clay Cap	6	2.0	4.0	2.4	2.6

Soil pocket penetrometer values that were measured higher than the capabilities of the instrument, 4.5+ tsf, were removed from the correlation.

Summary of Pocket Historical Info

Terracon (2017) Results Summary for Clay Cap Material			
Boring	**Depth**	**γ_{wet} (pcf)**	**S_u (ksf)**
P16033004 B-2	0-3	124	0.75
P16033004 B-2	3-4.5	130	3.0
P16022005 B-1	0-4.5	125	1.0
Mean		**126**	**1.6**

Undrained Shear Strength to Use for Model, c (psf)

Cohesive - Natural = 2000

Cohesive - Clay Cap = 1000

DRAINED SHEAR STRENGTH PARAMETER CORRELATION

Project No: 25170078
Project: Poston CCR Legacy

Reference:
Fully Softened Shear Strength at Low Stresses for Levee and Embankment Design. Joseph A. Gamez and Timothy D. Stark; Journal of Geotechnical and Geoenvironmental Engineering, Sept 2014. pp 06014010-1 through 06014010-6

Purpose:
Estimate effective stress, or drained, shear strength parameters of cohesive soils through emperical correlations using laboratory index testing and the effective normal stress. Secant residual and secant fully softened friction angles can be estimated from charts developed by Stark et al.

Laboratory Data

Soil Layer: Cohesive - Natural

Statistical Results from 2 Borings

	MC	LL	PL	PI	% Passing #200 Sieve (.075 mm)	Clay Sized Fraction (.002 mm)
Number in Statistical Sample	2	2	2	2	0	0
Minimum	9	32	15	17	0	0
Maximum	20	37	19	18	0	0
Mean	14.5	34.5	17.0	17.5	#DIV/0!	#DIV/0!
Median	14.5	34.5	17	17.5	#NUM!	#NUM!
Mode	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Std Dev	7.2	3.5	2.8	0.7	#DIV/0!	#DIV/0!
Design Value	-	35	-	-	-	10

Adjustment Factor for ASTM Derived Values

$$\frac{\textit{ball-milled derived LL}}{\textit{ASTM derived LL}} = .003\,(\textit{ASTM derived LL}) + 1.23$$

LL_{ASTM} = 35
LL_{BM} = 46.7

$$\frac{\textit{ball-milled derived CF}}{\textit{ASTM derived CF}} = 0.0003\,(\textit{ASTM derived CF})^2 - 0.037(\textit{ASTM derived CF}) + 2.254$$

CF_{ASTM} = 10
CF_{BM} = 19.1

where: LL = Liquid Limit
CF = Clay-sized Fraction

DRAINED SHEAR STRENGTH PARAMETER CORRELATION

Soil Layer: Cohesive - Natural

LL_{BM} = 46.7

CF_{BM} = 19.1

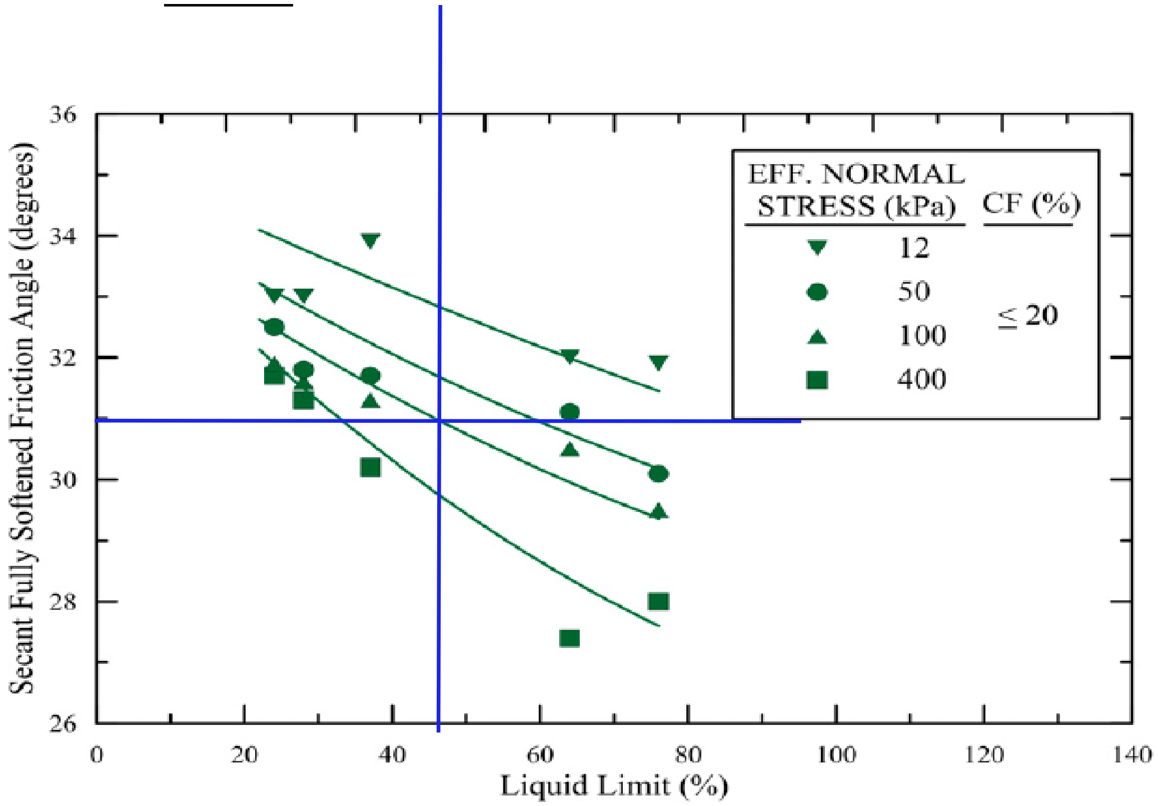


Fig. 3. Augmented drained fully softened friction angle correlation for CF ≤ 20%

Secant Fully Softened Friction Angle

Clay Sized Fraction, %		Effective Normal Stress			
		12 kPa	*50 kPa*	*100 kPa*	*400 kPa*
	≤ 20	-	-	30.9	-
	25 ≤ CF ≤ 45	-	-	-	-
	≥ 50	-	-	-	-

Design Value 30

Triaxial CU Test Summary

Sample Information					Effective Strength			Undrained Strength			Limits			Initial Unit Weight		
Strata	**Boring**	**Sample**	**Depth Top**	**Depth Bottom**	**c' (psf)**	**φ' (°)**	**tan(φ)**	**c (psf)**	**φ (°)**	**tan(φ)**	**LL**	**PL**	**PI**	**γ_{dry} (psf)**	**w (%)**	**γ_w(psf)**
Embankment	B-01	S-03	5	6.5	100	30.2	0.58	280	13.3	0.24	51	22	29	92.7	21.9	113.0
Embankment	B-01	S-25	55	56.8	290	21.1	0.39	100	13.9	0.25	47	22	25	107.1	18.9	127.3
Embankment	B-02	S-06	12.5	14.5	180	26.4	0.5	150	21.7	0.40	36	19	17	115.0	15.0	132.3
Embankment	B-07	S-05	6	8	220	25.2	0.47	520	17.5	0.32	40	22	18	108.3	21.2	131.3

Max	290	30.2	0.6	520	21.7	0.40	51	22	29	115.00	21.9	132.3
Min	100	21.1	0.4	100	13.3	0.24	36	19	17	92.7	15.0	113.0
Median	200	25.8	0.5	215	15.7	0.29	44	22	22	107.7	20.1	129.3
Mean	198	25.7	0.5	263	16.6	0.30	44	21	22	105.78	19.3	126.0

	c' (psf)	**φ' (°)**		**c (psf)**	**φ (°)**		**γ_w(psf)**
Use	**150**	**26**		**250**	**16**		**115**

Proj. Name: Poston Legacy CCR Sheet: 1 of 1
Proj. No.: 25170078
Subject: Hydraulic Conductivity Test Results

Material: Cohesive - Embankment

The embankment predominantly consists of Lean Clay (CL) with varying amounts of sand and gravel size particles, seemingly quite homogenous throughout.

Laboratory Test Results:

Boring	Sample	Depth (ft)	USCS	Confining Stress (psi)	As-Tested Void Ratio	Vert. Hydr. Cond. (cm/s)	(ft/s)
B-01	ST-34	75.0-76.3	CL	40	0.487	3.10E-09	1.02E-10
B-02	ST-37	85.0-87.0	CL	50	0.576	6.20E-09	2.03E-10
					Average	4.65E-09	1.53E-10
					Median	4.65E-09	1.53E-10
					Use	**5.00E-09**	**1.64E-10**

Estimate of horizontal to vertical ratio: 2

*developed based on seepage model

Proj. Name: Poston Legacy CCR Sheet: 1 of 1
Proj. No.: 25170078
Subject: Hydraulic Conductivity Parameter Correlations - Cohesive - Natural Soils

Material: **Cohesive - Natural**

The natural soils beneath the embankment consist of Lean Clay (CL) with trace amounts of sand and gravel size particles, Lean Clay with Sand (CL) with trace amounts of gravel, and Gravelly Lean Clay with Sand (CL). One split-spoon sample encountered Poorly Graded Sand with Clay and Gravel (SP-SC) near the toe of the embankment.

Estimate vertical hydraulic conductivity based on Holtz & Kovacs (1981), Fig. 7.6:

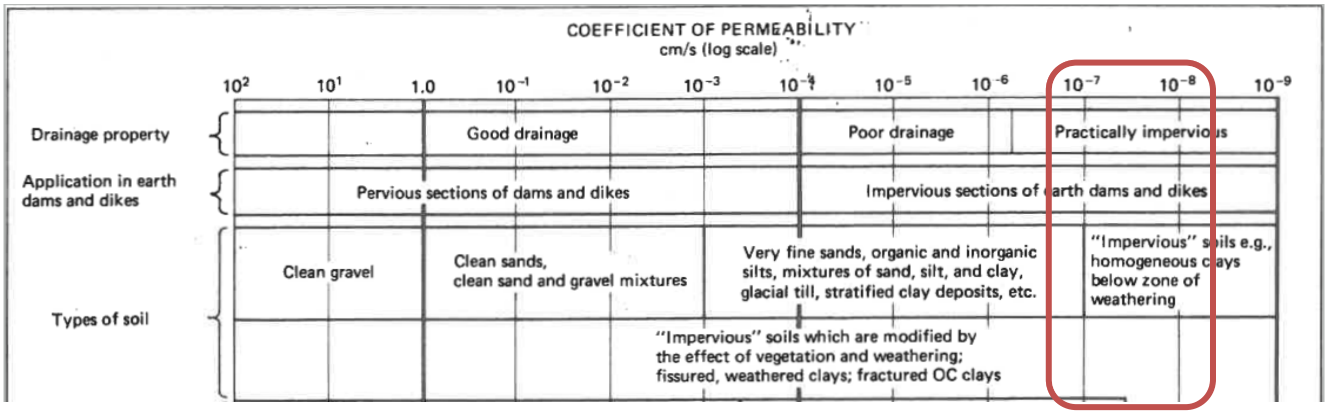


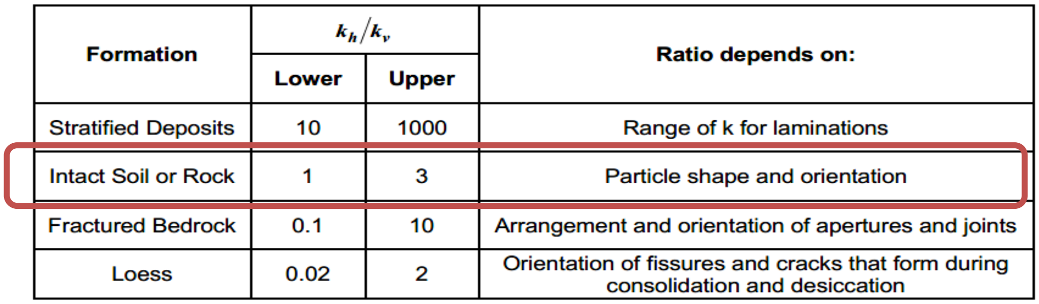
Fig. 7.6: Permeability, drainage, soil type, and methods to determine the coefficient of permeability (after A. Casagrande, 1938, with minor additions)

Holtz, R.D. and W. D. Kovacs (1981), *An Introduction to Geotechnical Engineering* , Prentice-Hall, 733 pp.

Estimate of hydraulic conductivity: 5.00E-08 cm/s = 1.64E-09 ft/s

Estimate horizontal to vertical ratio based on USBR (2014):

Table 6-6 Typical Values of Anisotropy in Natural Soils (after USBR 2014)



Formation	k_h/k_v		Ratio depends on:
	Lower	Upper	
Stratified Deposits	10	1000	Range of k for laminations
Intact Soil or Rock	1	3	Particle shape and orientation
Fractured Bedrock	0.1	10	Arrangement and orientation of apertures and joints
Loess	0.02	2	Orientation of fissures and cracks that form during consolidation and desiccation

UFC (2022), *Soil Mechanics (DM 7.1)* , Unified Facilities Criteria, U. S. Department of Defence, Publication No. UFC 3-220-10, pp. 546.

Estimate of horizontal to vertical ratio: 2

Proj. Name: Poston Legacy CCR Sheet: 1 of 1
Proj. No.: 25170078
Subject: Hydraulic Conductivity Parameter Correlations - Cohesive - Clay Cap Soils

Material: **Cohesive - Clay Cap**

The clay cap soils over the CCR material consist of Sandy Lean Clay (CL) with trace amounts of gravel, Lean Clay with Sand (CL) with trace amounts of gravel, and Sandy Silty Clay (CL-ML) with trace amounts of gravel.

Estimate vertical hydraulic conductivity based on Holtz & Kovacs (1981), Fig. 7.6:

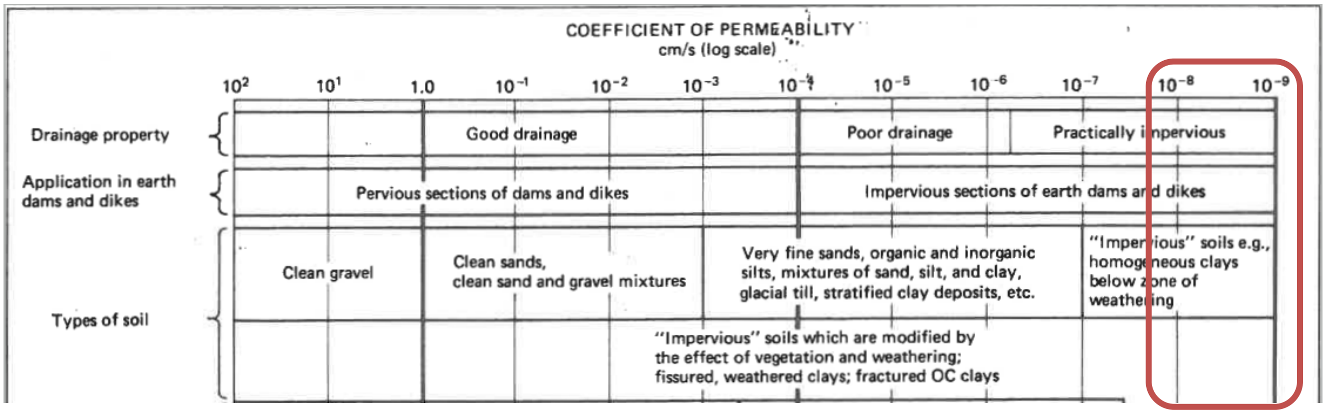


Fig. 7.6: Permeability, drainage, soil type, and methods to determine the coefficient of permeability (after A. Casagrande, 1938, with minor additions)
Holtz, R.D. and W. D. Kovacs (1981), *An Introduction to Geotechnical Engineering* , Prentice-Hall, 733 pp.

Estimate of hydraulic conductivity: 5.00E-09 cm/s = 1.64E-10 ft/s

* Assumed to be similar to Embankment material

Estimate of horizontal to vertical ratio: 2

*developed based on seepage model

Proj. Name: Poston Legacy CCR Sheet: 1 of 1
Proj. No.: 25170078
Subject: Hydraulic Conductivity Parameter Correlations - Granular - CCR Soils

Material: **Granular - CCR**

The CCR material beneath the clay cap consist of Silt (ML) with varying amounts of sand and gravel, and Silty Sand with Gravel (SM).

Estimate vertical hydraulic conductivity based on Holtz & Kovacs (1981), Fig. 7.6:

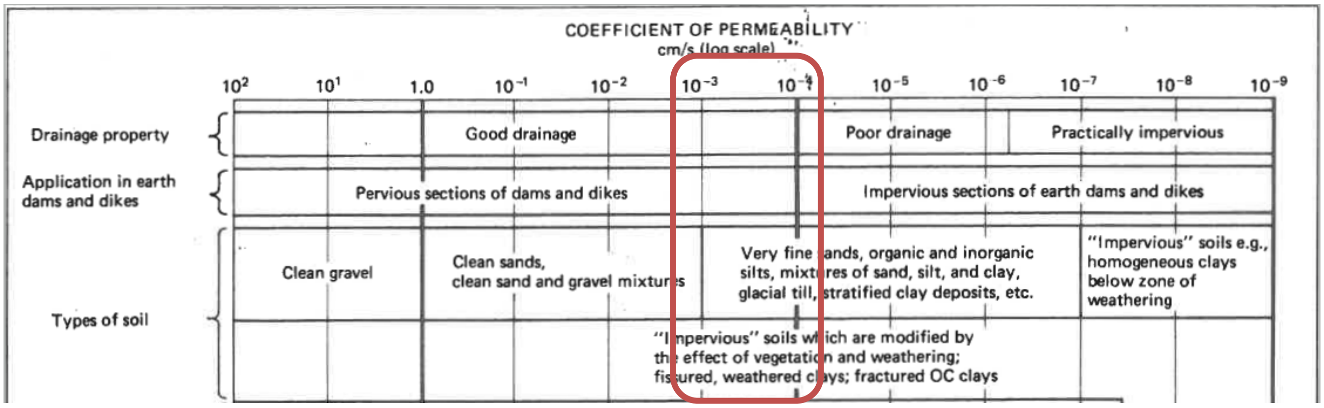


Fig. 7.6: Permeability, drainage, soil type, and methods to determine the coefficient of permeability (after A. Casagrande, 1938, with minor additions)

Holtz, R.D. and W. D. Kovacs (1981), *An Introduction to Geotechnical Engineering* , Prentice-Hall, 733 pp.

Estimate of hydraulic conductivity: 5.00E-04 cm/s = 1.64E-05 ft/s

Estimate of horizontal to vertical ratio: 1

*developed based on seepage model

Proj. Name: Poston Legacy CCR Sheet: 1 of 1
Proj. No.: 25170078
Subject: Hydraulic Conductivity Parameter Correlations - Rock

Material: **Rock**

Rock beneath the embankment and natural soils consist of Shale that is slightly to highly weatherd, strong to weak, and slightly to highly fractured.

Estimate vertical hydraulic conductivity based on Driscoll, F.G. (1986), Fig 5.14:

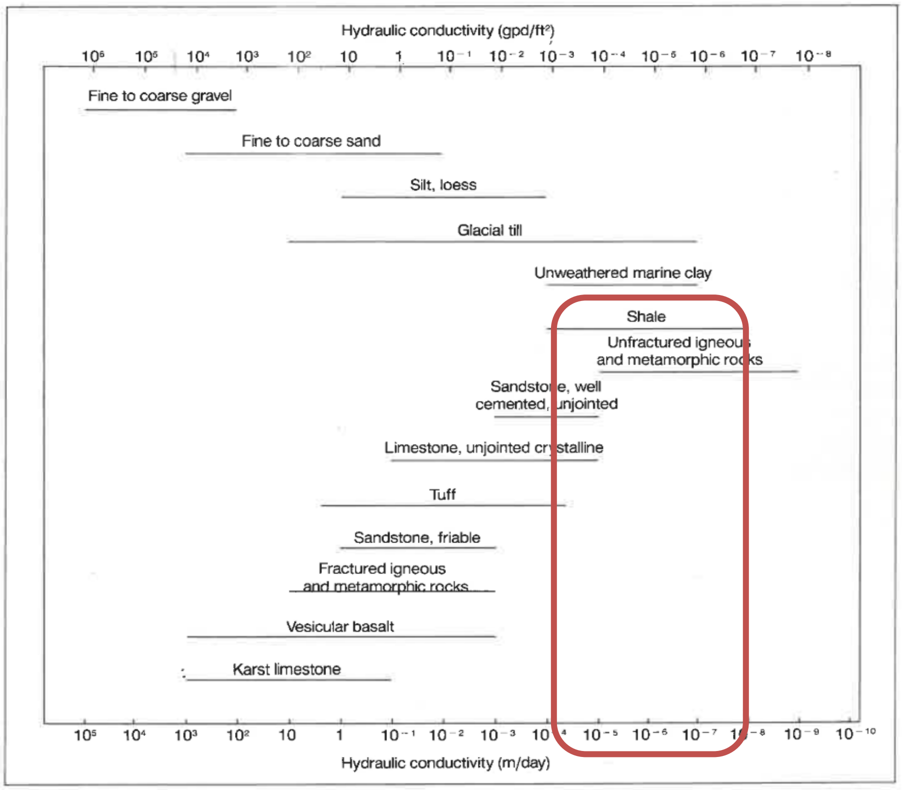


Figure 5.14. Typical *K* values for consolidated and unconsolidated aquifers. *(After Davis, 1969; Dunn and Leopold, 1978; Freeze and Cherry, 1979).*

Driscoll, F.G. (1986) Groundwater and Wells, Second Edition, Second Printing. Johnson Division, St. Paul, MN. 1089 pp., Fig 5.14

Estimate of hydraulic conductivity: 5.00E-07 m/d = 1.90E-11 ft/s

Estimate horizontal to vertical ratio based on USBR (2014):

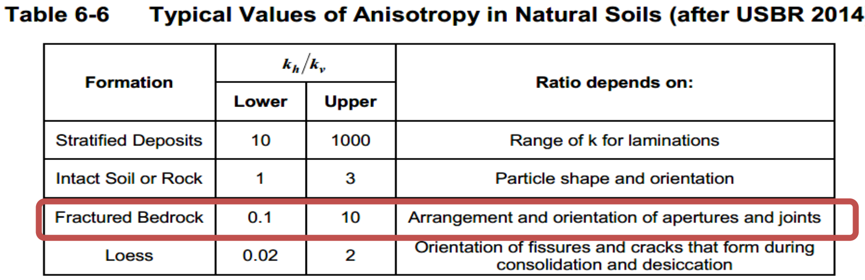


Table 6-6 Typical Values of Anisotropy in Natural Soils (after USBR 2014)

Formation	k_h/k_v		Ratio depends on:
	Lower	Upper	
Stratified Deposits	10	1000	Range of k for laminations
Intact Soil or Rock	1	3	Particle shape and orientation
Fractured Bedrock	0.1	10	Arrangement and orientation of apertures and joints
Loess	0.02	2	Orientation of fissures and cracks that form during consolidation and desiccation

UFC (2022), *Soil Mechanics (DM 7.1)* , Unified Facilities Criteria, U. S. Department of Defence, Publication No. UFC 3-220-10, pp. 546.

Estimate of horizontal to vertical ratio: 5

Proj Name:	Poston Legacy CCR	Calc. By:	WB	Date:	12/30/2025
Proj No.:	25170078				
Subject:	Hydraulic Conductivity Estimation - Hazen (1911)			Sheet:	1 of 1

Material: **Granular - Sand Drain**

The sand drain soils within the toe of the embankment constist of Clayey Sand with Gravel (SC), Well Graded Sand with Clay and Gravel (SW-SC), and Well Graded Sand with Silt and Gravel (SW-SM).

Hazen equation (1911):

$$k = C_H D_{10}^2$$

where: C_H is commonly taken as 100 when D_{10} is in units of cm
D_{10} is particle size for which 10% of the soil is finer

Boring	Sample	Depth (ft)	D_{10} (mm)	k (cm/s)
B-03	S-14A	19.5-21.0	0.022	5E-04
B-04	S-15A	21.0-22.5	0.052	3E-03
B-05	S-05A	6.0-7.5	0.122	1E-02
B-06	S-05	4.5-6.0	0.080	6E-03

Min	5E-04
Max	1E-02
Median	5E-03
Mean	6E-03
Mode	#N/A

Use	**5.00E-03**	**cm/s**
Use	**1.64E-04**	**ft/s**

Estimate of horizontal to vertical ratio:	**1**

*developed based on seepage model

Proj Name: Poston Legacy CCR Calc. By: WB Date: 12/30/2025
Proj No.: 25170078
Subject: k Estimation Summary - Kozeny-Carman Equation Sheet: 1 of 5

Material: **Granular - Sand Drain**

The sand drain soils within the toe of the embankment constist of Clayey Sand with Gravel (SC), Well Graded Sand with Clay and Gravel (SW-SC), and Well Graded Sand with Silt and Gravel (SW-SM).

Kozeny-Carman Equation from Carrier (2003), refer to following calculation sheets.

Boring	Sample	Depth (ft)	k (cm/s)
B-03	S-14A	19.5-21.0	3E-03
B-04	S-15A	21.0-22.5	3E-03
B-05	S-05A	6.0-7.5	7E-03
B-06	S-05	4.5-6.0	4E-03

Min	3E-03
Max	7E-03
Median	4E-03
Mean	4E-03
Mode	#N/A

Use	**5.00E-03**	**cm/s**
Use	**1.64E-04**	**ft/s**

Estimate of horizontal to vertical ratio:	**1**

*developed based on seepage model

Permeability Estimate using the Kozeny-Carman Equation

Project: **Poston Legacy CCR** **Proj. No.:** **25170078**
Boring: **B-03** **Sample:** **S-14A** **19.5-21.0 ft**
Material: **Granular - Sand Drain**

$k = 1.99\text{x}10^4\ (100\% / \Sigma[f_i/(D_{li}^{0.404} * D_{si}^{0.595})])^2\ (1/SF)^2\ [e^3/(1+e)]$

Carrier (2003) version of the Kozeny-Carman Equation (in J. Rice paper)

Already includes unit wt and viscosity of water at 20 deg C,

and a $C_{K\text{-}C}$ value of 5.

2.70	G
6	SF
62.4	γ_w (pcf)
110	γ_d (pcf)
0.532	Calc'd value of e

Calculated value of k	
2.5E-03	**cm/s**
7.18	**ft/day**

f_i = fraction of particles between two adjacent sieves

D_{li} = particle size diam. represented by larger sieve, cm

D_{si} = particle size diam. represented by smaller sieve, cm

SF = shape factor (6 for spherical grains and 8.5 for angular grains)

e = void ratio = $G\gamma_w/\gamma_d$ - 1 (assumes fully saturated soil)

G = specific gravity of soil

γ_w = unit weight of water

γ_d = dry unit weight of soil

Spreadsheet instructions: Enter yellow-highlighted fields as needed.

		Calculated value of k	
γ_d (pcf)	e	**cm/s**	**ft/day**
105	0.605	**3.6E-03**	**10.08**
110	0.532	**2.5E-03**	**7.18**
115	0.465	**1.8E-03**	**5.02**
120	0.404	**1.2E-03**	**3.44**
125	0.348	**8.1E-04**	**2.28**

Sieve no./size	Opening/ particle size (mm)	% Passing/ Finer	$f_i/(D_{li}^{0.404} * D_{si}^{0.595})$
1 1/2 in	37.5	100	0.000
1 in	25	91.6	2.855
1/2 in	12.5	88	2.177
3/8 in	9.5	85.7	2.167
4	4.75	81.2	7.155
10	2	69.3	41.884
20	0.85	52.8	137.045
40	0.425	36.4	290.715
70	0.212	23.6	454.120
100	0.15	19.9	213.593
200	0.075	16.2	371.022
0.033106	0.033106	11.4	1036.029
0.0213217	0.021	9.4	780.439
0.0125573	0.020	7.2	1065.286
0.0089786	0.009	5.9	1040.323
0.00640	0.006	4.8	1488.069
0.00456	0.005	3.8	1897.386
0.00317	0.003	3.2	1621.396
0.00134	0.001	2.4	4182.415
		Σ =	14634.076

Note the following limitations:
1 - The K-C formula is appropriate for coarse sands down to nonplastic silts, but not for clayey soils.
2 - The K-C formula assumes soil particles are relatively compact, i.e. no platy particles such as mica.
3 - The K-C formula assumes measured specific surface area (SSA) is equal to the calculated SSA.
4 - The K-C formula is not appropriate if particle size distribution has long, flat tail in the fine fraction. It works best if D_0 (smallest particle size) is known.
5 - The K-C formula permeability is approximately equal to the VERTICAL PERMEABILITY of a soil.

Permeability Estimate using the Kozeny-Carman Equation

Project: **Poston Legacy CCR** **Proj. No.:** **25170078**

Boring: **B-04** **Sample:** **S-15A** **21.0-22.5 ft**

Material: **Granular - Sand Drain**

$k = 1.99\text{x}10^4 \ (100\% / \Sigma[f_i/(D_{li}^{0.404} * D_{si}^{0.595})])^2 \ (1/SF)^2 \ [e^3/(1+e)]$

Carrier (2003) version of the Kozeny-Carman Equation (in J. Rice paper)

Already includes unit wt and viscosity of water at 20 deg C,

and a $C_{K\text{-}C}$ value of 5.

2.70	G
6	SF
62.4	γ_w (pcf)
110	γ_d (pcf)
0.532	Calc'd value of e

f_i = fraction of particles between two adjacent sieves

D_{li} = particle size diam. represented by larger sieve, cm

D_{si} = particle size diam. represented by smaller sieve, cm

SF = shape factor (6 for spherical grains and 8.5 for angular grains)

e = void ratio = $G\gamma_w/\gamma_d$ - 1 (assumes fully saturated soil)

G = specific gravity of soil

γ_w = unit weight of water

γ_d = dry unit weight of soil

Spreadsheet instructions: Enter yellow-highlighted fields as needed.

Calculated value of k	
3.2E-03	**cm/s**
9.01	**ft/day**

		Calculated value of k	
γ_d (pcf)	e	**cm/s**	**ft/day**
105	0.605	**4.5E-03**	**12.65**
110	0.532	**3.2E-03**	**9.01**
115	0.465	**2.2E-03**	**6.31**
120	0.404	**1.5E-03**	**4.31**
125	0.348	**1.0E-03**	**2.87**

Sieve no./size	Opening/ particle size (mm)	% Passing/ Finer	$f_i/(D_{li}^{0.404} * D_{si}^{0.595})$
1 1/2 in	37.5	100	
1 in	25	100	0.000
3/4 in	19	96.8	1.508
1/2 in	12.5	92.2	3.108
3/8 in	9.5	88.7	3.297
4	4.75	80.4	13.196
10	2	64.5	55.963
20	0.85	46.0	153.657
40	0.425	29.6	290.715
70	0.212	16.8	454.120
100	0.15	14.3	144.320
200	0.075	11.6	270.746
0.0355842	0.036	8.3	682.325
0.0226593	0.020	6.9	551.198
0.0131914	0.013	5.0	1209.386
0.00936	0.009	4.3	646.591
0.00665	0.007	3.4	1170.646
0.00471	0.005	2.7	1283.350
0.00327	0.003	2.3	1047.939
0.00138	0.001	1.3	5080.252
		Σ =	13062.316

Note the following limitations:

1 - The K-C formula is appropriate for coarse sands down to nonplastic silts, but not for clayey soils.

2 - The K-C formula assumes soil particles are relatively compact, i.e. no platy particles such as mica.

3 - The K-C formula assumes measured specific surface area (SSA) is equal to the calculated SSA.

4 - The K-C formula is not appropriate if particle size distribution has long, flat tail in the fine fraction. It works best if D_0 (smallest particle size) is known.

5 - The K-C formula permeability is approximately equal to the VERTICAL PERMEABILITY of a soil.

Permeability Estimate using the Kozeny-Carman Equation

Sheet: 4 of 5

Project: **Poston Legacy CCR** **Proj. No.:** **25170078**

Boring: **B-05** **Sample:** **S-05A** **6.0-7.5 ft**

Material: **Granular - Sand Drain**

$k = 1.99x10^4 (100\% / \Sigma[f_i/(D_{li}^{0.404} * D_{si}^{0.595})])^2 (1/SF)^2 [e^3/(1+e)]$

Carrier (2003) version of the Kozeny-Carman Equation (in J. Rice paper)

Already includes unit wt and viscosity of water at 20 deg C,

and a C_{K-C} value of 5.

2.70	G
6	SF
62.4	γ_w (pcf)
110	γ_d (pcf)
0.532	Calc'd value of e

f_i = fraction of particles between two adjacent sieves

D_{li} = particle size diam. represented by larger sieve, cm

D_{si} = particle size diam. represented by smaller sieve, cm

SF = shape factor (6 for spherical grains and 8.5 for angular grains)

e = void ratio = $G\gamma_w/\gamma_d$ - 1 (assumes fully saturated soil)

G = specific gravity of soil

γ_w = unit weight of water

γ_d = dry unit weight of soil

Spreadsheet instructions: Enter yellow-highlighted fields as needed.

Calculated value of k	
7.1E-03	**cm/s**
20.03	**ft/day**

		Calculated value of k	
γ_d (pcf)	e	**cm/s**	**ft/day**
105	0.605	**9.9E-03**	**28.12**
110	0.532	**7.1E-03**	**20.03**
115	0.465	**4.9E-03**	**14.02**
120	0.404	**3.4E-03**	**9.59**
125	0.348	**2.2E-03**	**6.38**

Sieve no./size	Opening/ particle size (mm)	% Passing/ Finer	$f_i/(D_{li}^{0.404} * D_{si}^{0.595})$
1 1/2 in	37.5	100	0.000
1 in	25	89.9	3.433
1/2 in	12.5	87.2	1.633
3/8 in	9.5	85.7	1.413
4	4.75	79.6	9.698
10	2	65.8	48.572
20	0.85	47.2	154.487
40	0.425	27.1	356.303
70	0.212	12.5	517.981
100	0.15	10.6	109.683
200	0.075	8.6	200.552
0.0359858	0.035986	5.9	554.550
0.0228608	0.023	5.0	325.766
0.0132351	0.020	4.4	282.466
0.0093843	0.009	3.8	467.687
0.00665	0.007	3.2	779.062
0.00471	0.005	2.6	1099.176
0.00327	0.003	2.1	1308.798
0.00138	0.001	1.6	2539.624
		Σ =	8760.885

Note the following limitations:

1 - The K-C formula is appropriate for coarse sands down to nonplastic silts, but not for clayey soils.

2 - The K-C formula assumes soil particles are relatively compact, i.e. no platy particles such as mica.

3 - The K-C formula assumes measured specific surface area (SSA) is equal to the calculated SSA.

4 - The K-C formula is not appropriate if particle size distribution has long, flat tail in the fine fraction. It works best if D_0 (smallest particle size) is known.

5 - The K-C formula permeability is approximately equal to the VERTICAL PERMEABILITY of a soil.

Permeability Estimate using the Kozeny-Carman Equation

Project: **Poston Legacy CCR** **Proj. No.:** **25170078**
Boring: **B-06** **Sample:** **S-05** **4.5-6.0 ft**
Material: **Granular - Sand Drain**

$k = 1.99 \times 10^4 (100\% / \Sigma[f_i/(D_{li}^{0.404} * D_{si}^{0.595})])^2 (1/SF)^2 [e^3/(1+e)]$

Carrier (2003) version of the Kozeny-Carman Equation (in J. Rice paper)

Already includes unit wt and viscosity of water at 20 deg C,

and a $C_{K\text{-}C}$ value of 5.

2.70	G
6	SF
62.4	γ_w (pcf)
110	γ_d (pcf)
0.532	Calc'd value of e

f_i = fraction of particles between two adjacent sieves

D_{li} = particle size diam. represented by larger sieve, cm

D_{si} = particle size diam. represented by smaller sieve, cm

SF = shape factor (6 for spherical grains and 8.5 for angular grains)

e = void ratio = $G\gamma_w/\gamma_d$ - 1 (assumes fully saturated soil)

G = specific gravity of soil

γ_w = unit weight of water

γ_d = dry unit weight of soil

Calculated value of k	
4.0E-03	**cm/s**
11.40	**ft/day**

		Calculated value of k	
γ_d (pcf)	e	**cm/s**	**ft/day**
105	0.605	**5.6E-03**	**16.01**
110	0.532	**4.0E-03**	**11.40**
115	0.465	**2.8E-03**	**7.98**
120	0.404	**1.9E-03**	**5.46**
125	0.348	**1.3E-03**	**3.63**

Spreadsheet instructions: Enter yellow-highlighted fields as needed.

Sieve no./size	Opening/ particle size (mm)	% Passing/ Finer	$f_i/(D_{li}^{0.404} * D_{si}^{0.595})$
1 1/2 in	37.5	100	
1 in	25	100	0.000
3/4 in	19	100	0.000
1/2 in	12.5	98.2	1.216
3/8 in	9.5	95.1	2.921
4	4.75	90.9	6.678
10	2	82.4	29.917
20	0.85	69.0	111.297
40	0.425	43.4	453.799
70	0.212	17.4	922.432
100	0.15	12.8	265.548
200	0.075	9.7	310.856
0.0362895	0.036	5.6	837.895
0.0230019	0.020	5.0	234.362
0.0132874	0.013	4.8	126.755
0.00940	0.009	4.7	91.854
0.00665	0.007	4.1	778.512
0.00471	0.005	3.4	1282.373
0.00327	0.003	2.6	2094.077
0.00138	0.001	1.8	4060.807
		Σ =	11611.298

Note the following limitations:
1 - The K-C formula is appropriate for coarse sands down to nonplastic silts, but not for clayey soils.
2 - The K-C formula assumes soil particles are relatively compact, i.e. no platy particles such as mica.
3 - The K-C formula assumes measured specific surface area (SSA) is equal to the calculated SSA.
4 - The K-C formula is not appropriate if particle size distribution has long, flat tail in the fine fraction. It works best if D_0 (smallest particle size) is known.
5 - The K-C formula permeability is approximately equal to the VERTICAL PERMEABILITY of a soil.

Seismic Site Classification (EPA, 1995)

Project: AEP Poston Legacy CCR
Location: York Twp - Athens Co, OH
Proj. No.: 25170078
Date: 2/6/2026

Seismic Site Classification Based on N-Value (ASCE 7-10 Eqn 20.4-2)

Note: Calculation of average field N value considers soils between bottom of embankment and top of bedrock.

B-03				B-04				B-05				B-06				B-07			
z_t (ft)	z_b (ft)	N	d_i/N_i	z_t (ft)	z_b (ft)	N	d_i/N_i	z_t (ft)	z_b (ft)	N	d_i/N_i	z_t (ft)	z_b (ft)	N	d_i/N_i	z_t (ft)	z_b (ft)	N	d_i/N_i
27.0	28.5	9	*0.167*	27.0	28.5	17	*0.088*	13.5	15.0	6	*0.250*	10.5	12.0	13	*0.115*	12.5	14.0	25	*0.060*
28.5	30.0	7	*0.214*	28.5	30.0	16	*0.094*	15.0	16.5	8	*0.188*	12.0	13.5	19	*0.079*	14.0	15.5	34	*0.044*
30.0	31.5	19	*0.079*	30.0	31.5	27	*0.056*	16.5	18.0	19	*0.079*	13.5	15.0	100	*0.015*	15.5	17.0	32	*0.047*
31.5	33.0	9	*0.167*	31.5	33.0	30	*0.050*	18.0	19.5	19	*0.079*	15.0	16.5	26	*0.058*	17.0	112.5	100	*0.955*
33.0	34.5	12	*0.125*	33.0	34.5	43	*0.035*	19.5	21.0	30	*0.050*	16.5	18.0	21	*0.071*				
34.5	36.0	13	*0.115*	34.5	36.0	61	*0.025*	21.0	113.5	100	*0.925*	18.0	19.5	16	*0.094*				
36.0	37.5	16	*0.094*	36.0	127.0	100	*0.910*					19.5	21.0	52	*0.029*				
37.5	39.0	26	*0.058*									21.0	110.5	100	*0.895*				
39.0	127.0	100	*0.880*																
Avg. N =			*53*	Avg. N =			*80*	Avg. N =			*64*	Avg. N =			*74*	Avg. N =			*90*

From ASCE 7-10, Chapter 20, use Table 20.3-1 to correlate the average N value to an average shear wave velocity.

$$\bar{N} = \frac{\sum_{i=1}^{n} d_i}{\sum_{i=1}^{n} \frac{d_i}{N_i}} \qquad (20.4\text{-}2)$$

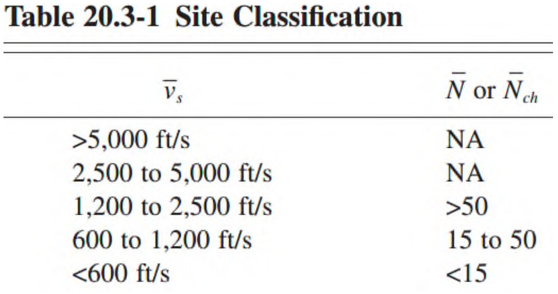
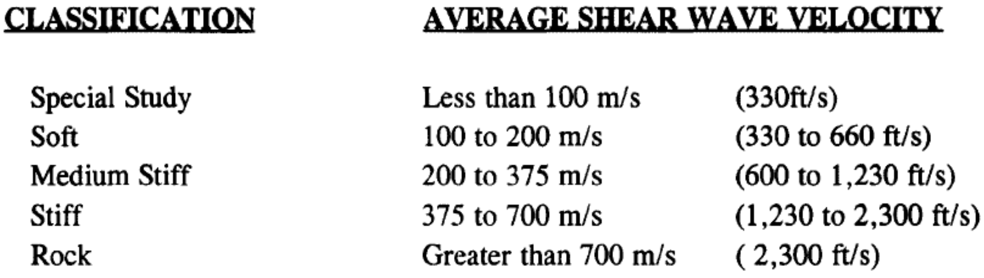


Table 20.3-1 Site Classification

$\bar{v}_s$	$\bar{N}$ or $\bar{N}_{ch}$
>5,000 ft/s	NA
2,500 to 5,000 ft/s	NA
1,200 to 2,500 ft/s	>50
600 to 1,200 ft/s	15 to 50
<600 ft/s	<15

Consider average shear wave velocity ranging from **1,200** to **2,500** ft/s.

From EPA (1995), Chapter 4, use the average shear wave velocity range to classify the soil.



CLASSIFICATION	AVERAGE SHEAR WAVE VELOCITY	
Special Study	Less than 100 m/s	(330ft/s)
Soft	100 to 200 m/s	(330 to 660 ft/s)
Medium Stiff	200 to 375 m/s	(600 to 1,230 ft/s)
Stiff	375 to 700 m/s	(1,230 to 2,300 ft/s)
Rock	Greater than 700 m/s	(2,300 ft/s)

Site classifies as "**Stiff**".

U.S. Geological Survey - Earthquake Hazards Program

Unified Hazard Tool

Please do not use this tool to obtain ground motion parameter values for the design code reference documents covered by the U.S. Seismic Design Maps web tools (e.g., the International Building Code and the ASCE 7 or 41 Standard). The values returned by the two applications are not identical.

Please also see the new USGS Earthquake Hazard Toolbox for access to the most recent NSHMs for the conterminous U.S. and Hawaii.

Input

Edition

Dynamic: Conterminous U.S. 201…

Latitude

Decimal degrees

39.385447

Longitude

Decimal degrees, negative values for western longi…

-82.177685

Site Class

760 m/s (B/C boundary)

Spectral Period

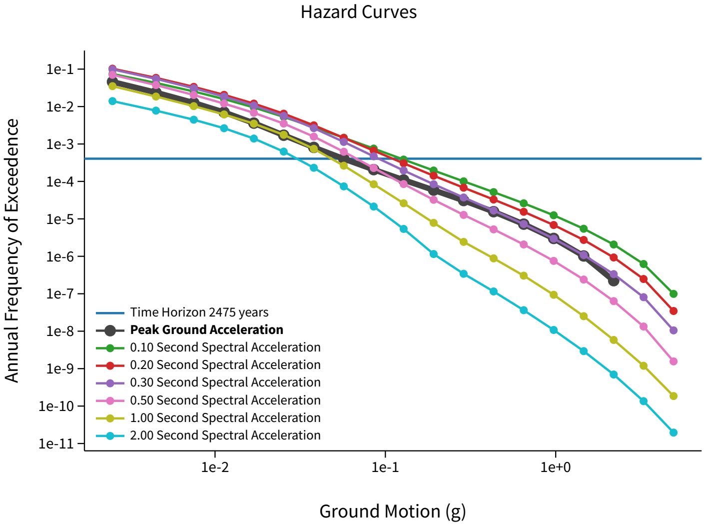
Peak Ground Acceleration

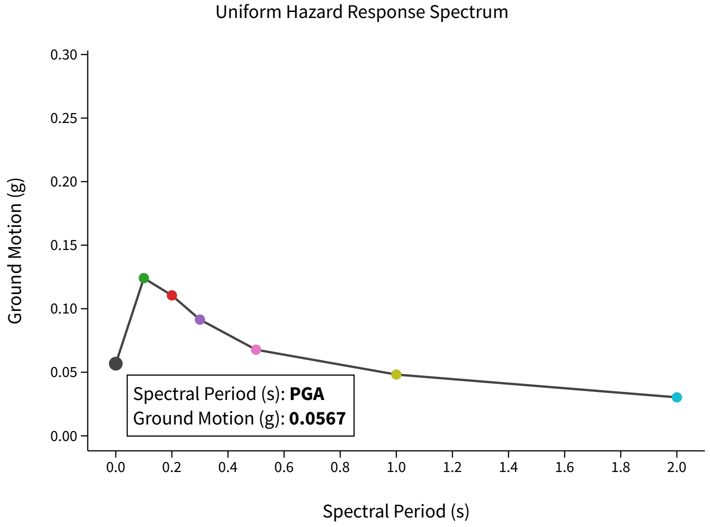
Time Horizon

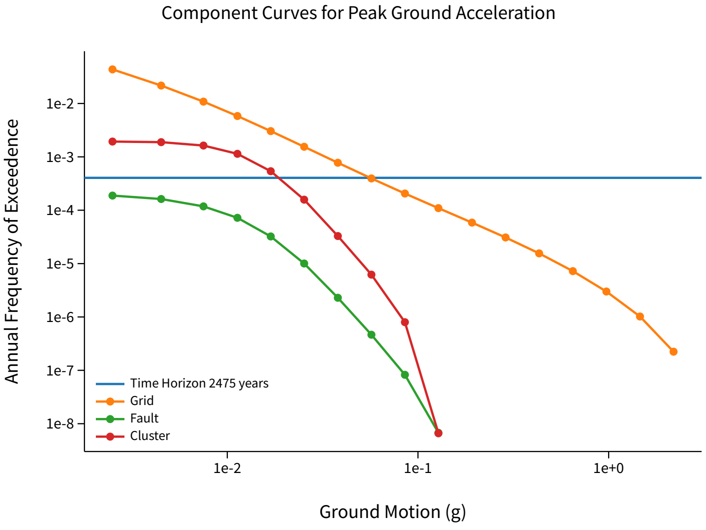
Return period in years

2475

Hazard Curve


Hazard Curves


Uniform Hazard Response Spectrum

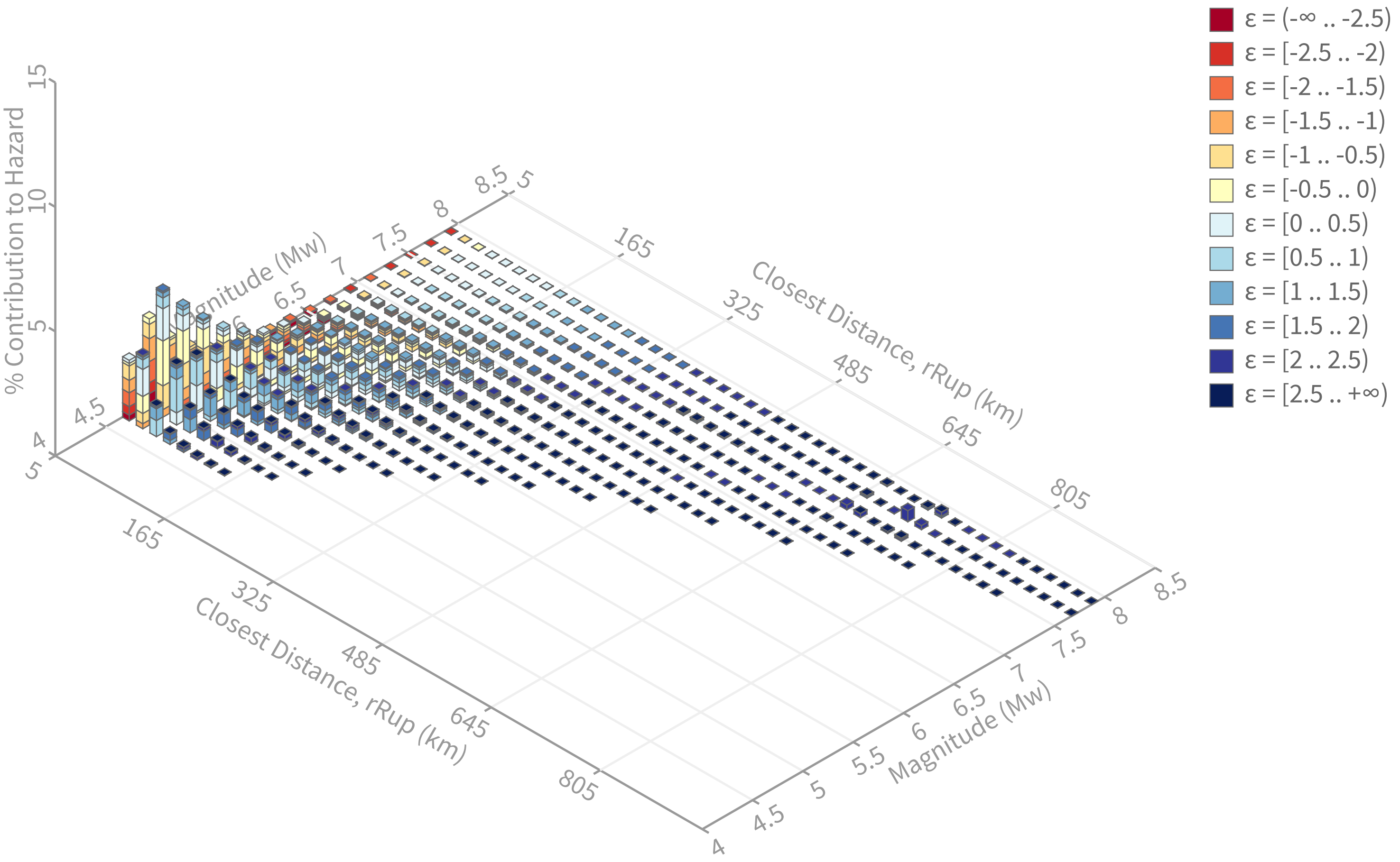

Component Curves for Peak Ground Acceleration

View Raw Data

^ Deaggregation

Component

Total



Summary statistics for, Deaggregation: Total

Deaggregation targets

Return period: 2475 yrs
Exceedance rate: 0.0004040404 yr^{-1}
PGA ground motion: 0.056740114 g

Recovered targets

Return period: 2475.7139 yrs
Exceedance rate: 0.0004039239 yr^{-1}

Totals

Binned: 100 %
Residual: 0 %
Trace: 2.21 %

Mean (over all sources)

m: 5.73
r: 99.08 km
ε_0: 0.09 σ

Mode (largest m-r bin)

m: 4.9
r: 29.59 km
ε_0: -0.12 σ
Contribution: 5.05 %

Mode (largest m-r-ε_0 bin)

m: 4.9
r: 29.26 km
ε_0: -0.23 σ
Contribution: 1.8 %

Discretization

r: min = 0.0, max = 1000.0, Δ = 20.0 km
m: min = 4.4, max = 9.4, Δ = 0.2
ε: min = -3.0, max = 3.0, Δ = 0.5 σ

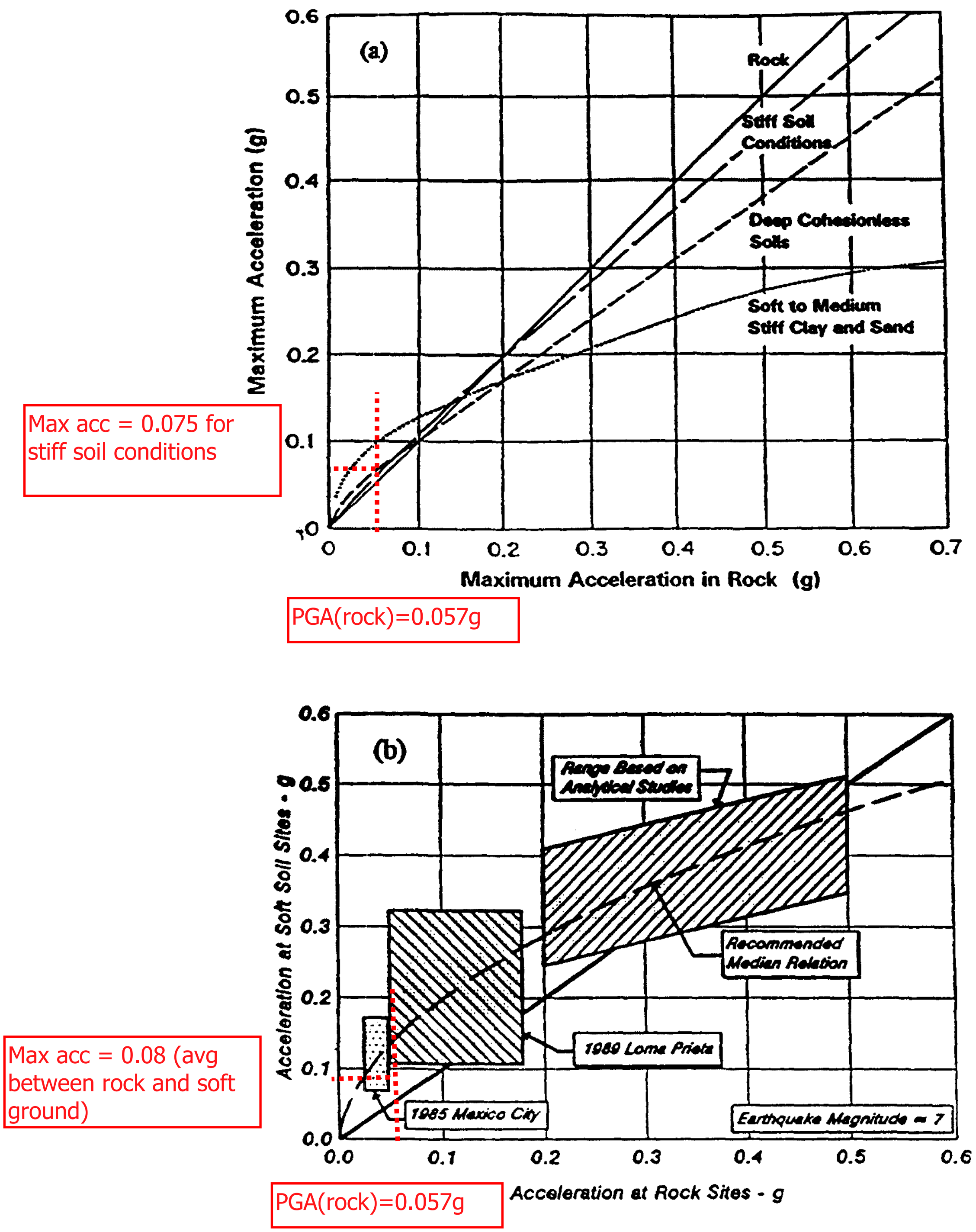
Epsilon keys

ε0: [-∞ .. -2.5)
ε1: [-2.5 .. -2.0)
ε2: [-2.0 .. -1.5)
ε3: [-1.5 .. -1.0)
ε4: [-1.0 .. -0.5)
ε5: [-0.5 .. 0.0)
ε6: [0.0 .. 0.5)
ε7: [0.5 .. 1.0)
ε8: [1.0 .. 1.5)
ε9: [1.5 .. 2.0)
ε10: [2.0 .. 2.5)
ε11: [2.5 .. +∞]

Deaggregation Contributors

Source Set ↳ Source	Type	r	m	ε_0	lon	lat	az	%
SSCn Fixed Smoothing Zone 1 (opt)	Grid							20.14
PointSourceFinite: -82.178, 39.588		22.80	5.19	-0.97	82.178°W	39.588°N	0.00	1.67
PointSourceFinite: -82.178, 39.678		32.50	5.27	-0.42	82.178°W	39.678°N	0.00	1.59
PointSourceFinite: -82.178, 39.498		13.31	5.14	-1.94	82.178°W	39.498°N	0.00	1.36
PointSourceFinite: -82.178, 39.633		27.64	5.23	-0.66	82.178°W	39.633°N	0.00	1.32
PointSourceFinite: -82.178, 39.723		37.37	5.32	-0.22	82.178°W	39.723°N	0.00	1.25
PointSourceFinite: -82.178, 39.543		18.00	5.16	-1.38	82.178°W	39.543°N	0.00	1.20
PointSourceFinite: -82.178, 39.768		42.24	5.36	-0.06	82.178°W	39.768°N	0.00	1.14
PointSourceFinite: -82.178, 39.813		47.11	5.41	0.08	82.178°W	39.813°N	0.00	1.08
USGS Fixed Smoothing Zone 1 (opt)	Grid							19.53
PointSourceFinite: -82.178, 39.588		22.80	5.19	-0.97	82.178°W	39.588°N	0.00	1.67
PointSourceFinite: -82.178, 39.678		32.50	5.27	-0.42	82.178°W	39.678°N	0.00	1.59
PointSourceFinite: -82.178, 39.498		13.31	5.14	-1.94	82.178°W	39.498°N	0.00	1.36
PointSourceFinite: -82.178, 39.633		27.64	5.23	-0.66	82.178°W	39.633°N	0.00	1.32
PointSourceFinite: -82.178, 39.723		37.37	5.32	-0.22	82.178°W	39.723°N	0.00	1.25
PointSourceFinite: -82.178, 39.543		18.00	5.16	-1.38	82.178°W	39.543°N	0.00	1.20
PointSourceFinite: -82.178, 39.768		42.24	5.36	-0.06	82.178°W	39.768°N	0.00	1.14
PointSourceFinite: -82.178, 39.813		47.11	5.41	0.08	82.178°W	39.813°N	0.00	1.08
SSCn Adaptive Smoothing Zone 1 (opt)	Grid							18.10
PointSourceFinite: -82.178, 39.588		22.80	5.19	-0.97	82.178°W	39.588°N	0.00	1.37
PointSourceFinite: -82.178, 39.678		32.50	5.27	-0.42	82.178°W	39.678°N	0.00	1.20
PointSourceFinite: -82.178, 39.723		37.37	5.32	-0.22	82.178°W	39.723°N	0.00	1.16
PointSourceFinite: -82.178, 39.498		13.31	5.14	-1.94	82.178°W	39.498°N	0.00	1.15
PointSourceFinite: -82.178, 39.633		27.64	5.23	-0.66	82.178°W	39.633°N	0.00	1.11
USGS Adaptive Smoothing Zone 1 (opt)	Grid							17.64
PointSourceFinite: -82.178, 39.588		22.80	5.19	-0.97	82.178°W	39.588°N	0.00	1.37
PointSourceFinite: -82.178, 39.678		32.50	5.27	-0.42	82.178°W	39.678°N	0.00	1.20
PointSourceFinite: -82.178, 39.723		37.37	5.32	-0.22	82.178°W	39.723°N	0.00	1.16
PointSourceFinite: -82.178, 39.498		13.31	5.14	-1.94	82.178°W	39.498°N	0.00	1.15
PointSourceFinite: -82.178, 39.633		27.64	5.23	-0.66	82.178°W	39.633°N	0.00	1.11
USGS Fixed Smoothing Zone 2 (opt)	Grid							7.15
SSCn Fixed Smoothing Zone 7 (opt)	Grid							6.23
USGS Adaptive Smoothing Zone 2 (opt)	Grid							4.72
SSCn Adaptive Smoothing Zone 7 (opt)	Grid							4.07
SSCn New Madrid	Cluster							1.01

U.S. Environmental Protection Agency. (1995). RCRA Subtitle D (258) seismic design guidance for municipal solid waste landfill facilities (EPA/600/R-95/051).



Max acc = 0.075 for stiff soil conditions

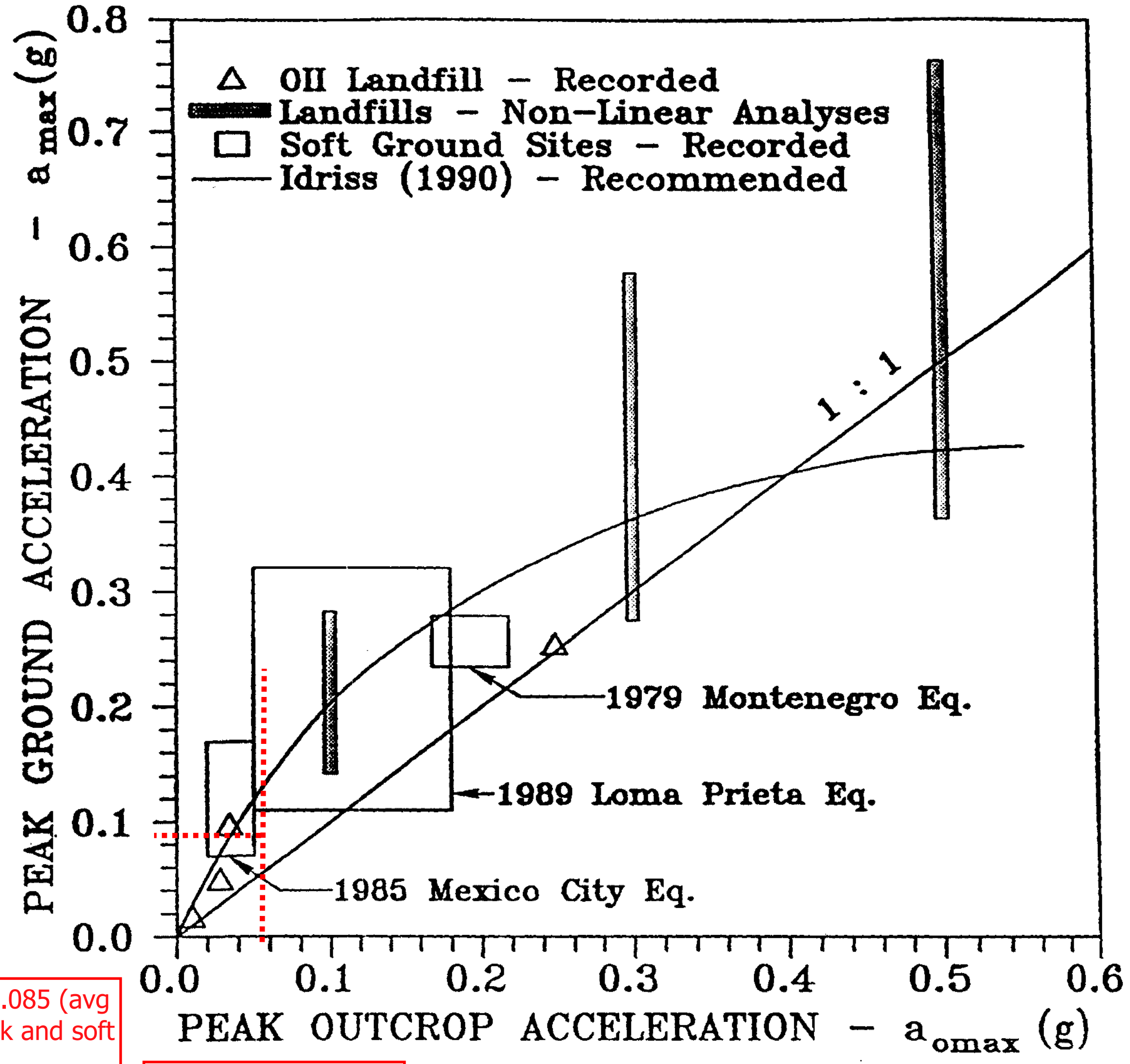
PGA(rock)=0.057g

Max acc = 0.08 (avg between rock and soft ground)

PGA(rock)=0.057g

Figure 4.4 Relationship Between Maximum Acceleration on Rock and Other Local Site Conditions: (a) Seed and Idriss (1982); (b) Idriss (1990).

U.S. Environmental Protection Agency. (1995). RCRA Subtitle D (258) seismic design guidance for municipal solid waste landfill facilities (EPA/600/R-95/051).

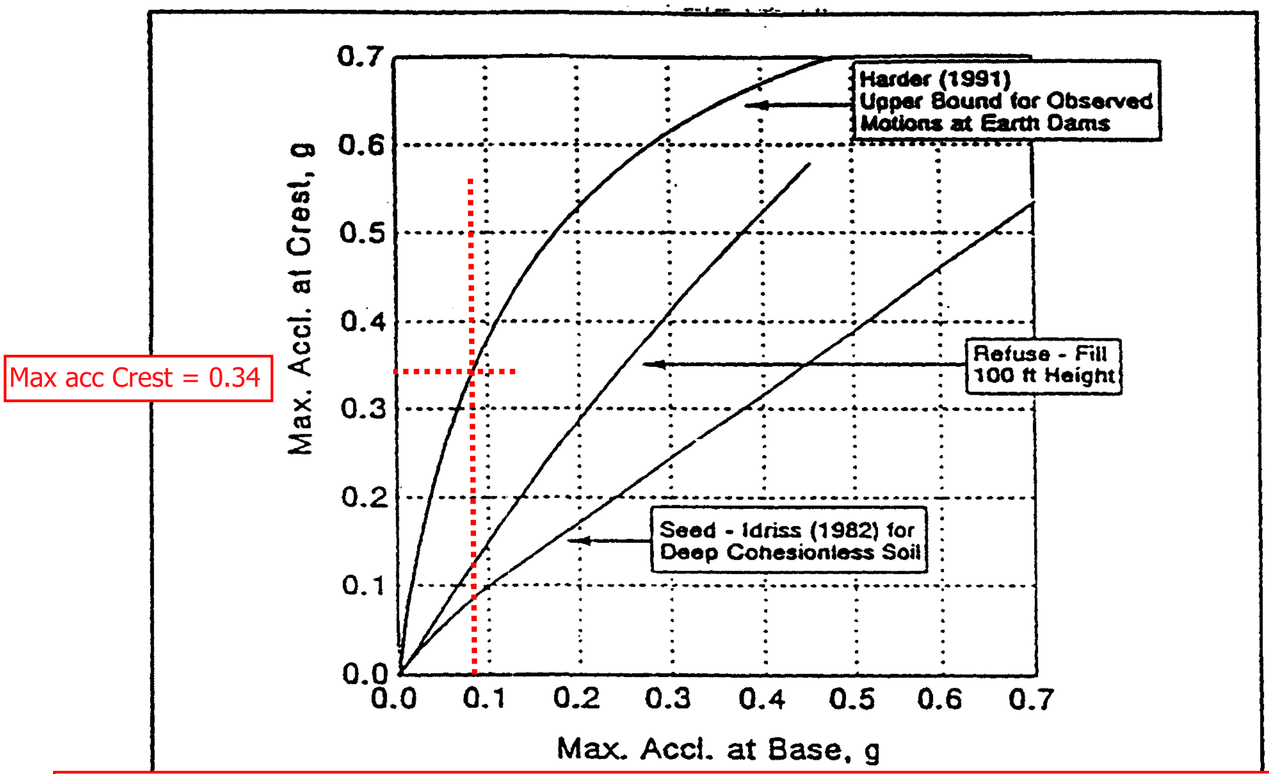


Max acc = 0.085 (avg between rock and soft soil sites)

PGA(rock)=0.057g

Figure 4.5 Observed Variations of Peak Horizontal Accelerations on Soft Soil and MSW Sites in Comparison to Rock Sites (Kavazanjian and Matasović, 1994).

U.S. Environmental Protection Agency. (1995). RCRA Subtitle D (258) seismic design guidance for municipal solid waste landfill facilities (EPA/600/R-95/051).

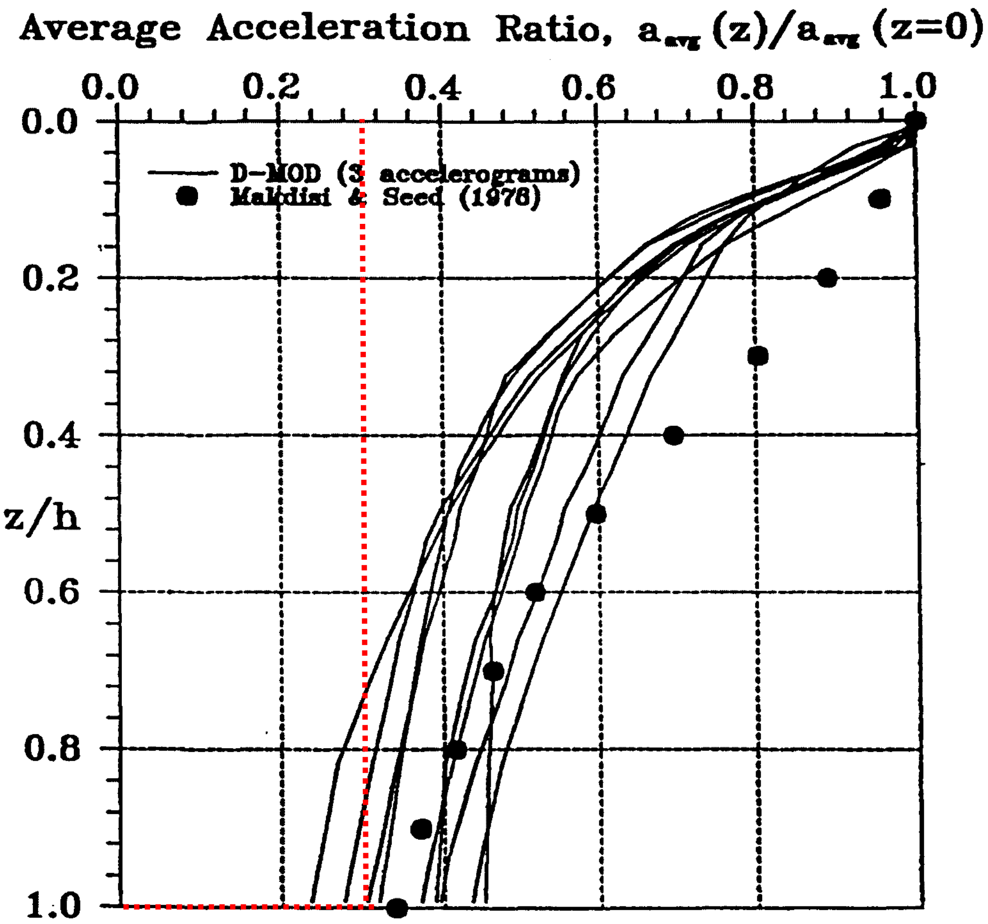


Summary of estimated acceleration at the ground surface:
From Seed and Idriss (1982), acc at base = 0.075g.
From Idriss (1990), acc at base = 0.08g.
From Kavazanjian and Matasovic (1994), acc at base = 0.085g.

Use max acc at base = 0.08g.

Figure 4.6 Approximate Relationship Between Maximum Accelerations at the Base and Crest for Various Ground Conditions (Singh and Sun, 1995)

U.S. Environmental Protection Agency. (1995). RCRA Subtitle D (258) seismic design guidance for municipal solid waste landfill facilities (EPA/600/R-95/051).



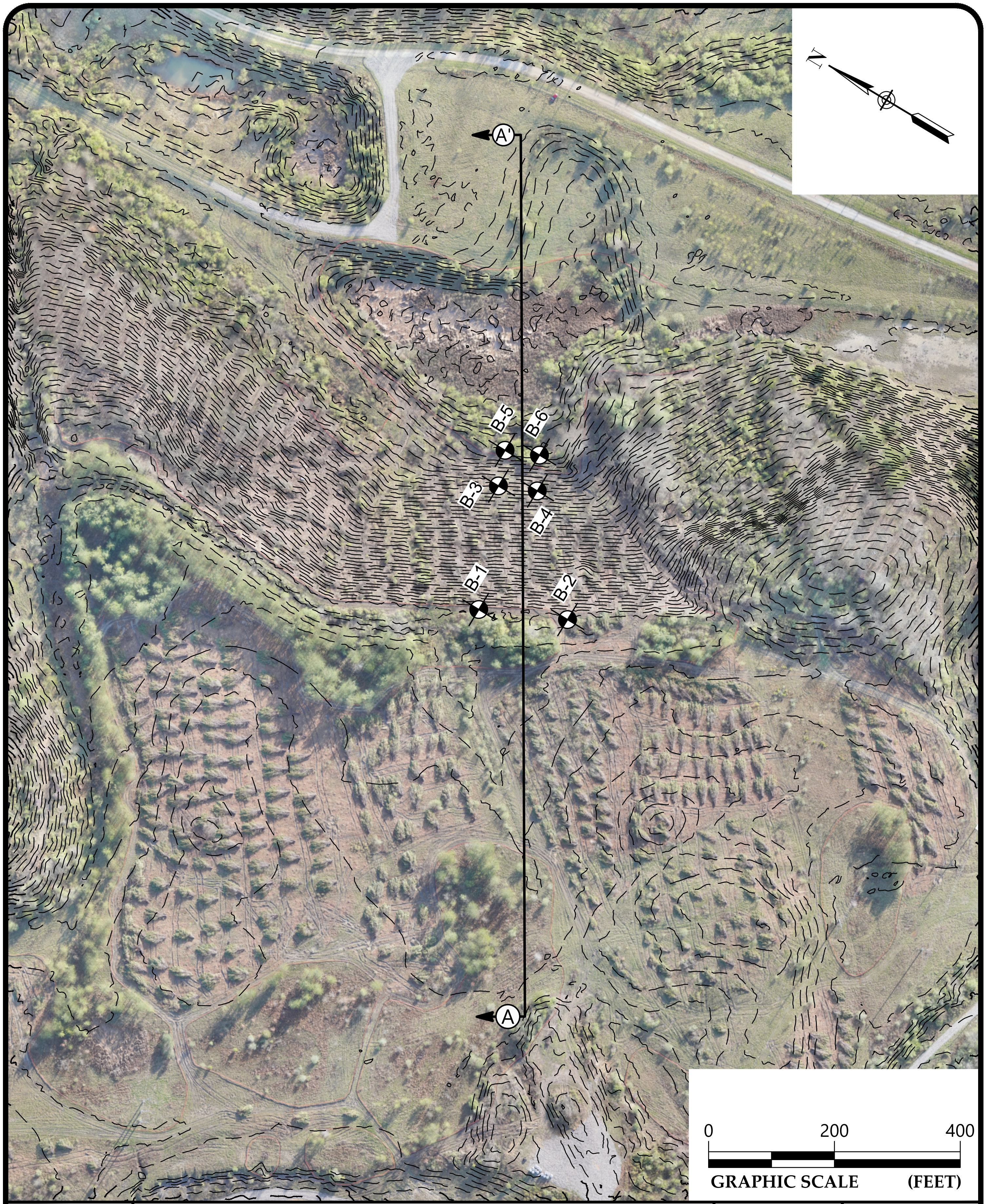
Max acc Crest = 0.34 per Singh and Sun (1995)

Considering a slip surface extending to the base of the embankment, use z/h = 1.0.
From the Kavazanjian and Matasovic chart with a z/h = 1.0, the average acceleration ratio is 0.3.

peak acceleration at base of embankment is then 0.34 x 0.30 = 0.103g.

Figure 4.7 Variation of Maximum Average Acceleration Ratio with Depth of Sliding Mass (Kavazanjian and Matasović, 1995)

Appendix V – Limit Equilibrium & Seismic Analyses



DRAWING PATH: T:\Columbus-1170\Projects\2025\25170078_AEP_Poston Legacy CCR Impoundment Eval\Civil\CAD\DWG\XREF\25170078 BASE_EXISTING.dwg **TAB:** SXS-SF **SAVE DATE:** 2026-01-21 **PAGE SIZE:** ANSI full bleed A (11.00 x 8.50 Inches)

S&ME, Inc.

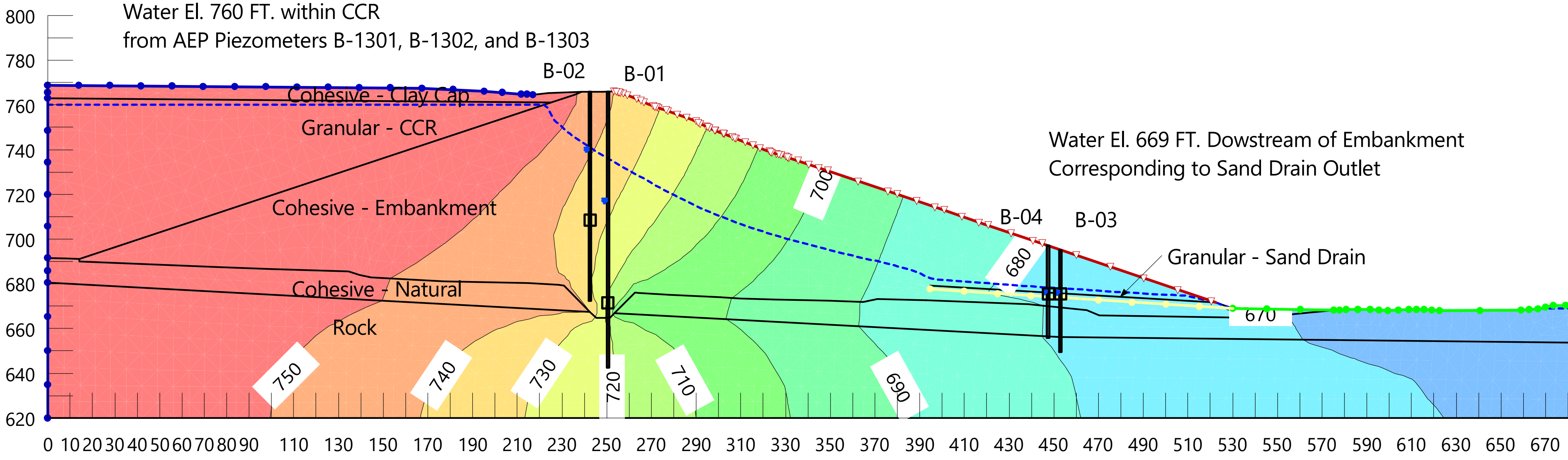
STABILITY CROSS SECTION LOCATION

POSTON LEGACY CCR IMPOUNDMENT EVAL
SAFETY FACTOR ASSESSMENT REPORT
YORK TOWNSHIP-ATHENS COUNTY, OHIO

SCALE:	1" = 200'
DATE:	01/21/2026
PROJECT NUMBER	25170078
FIGURE NO.	1

Project: Poston Legacy CCR
Project #: 25170078
Title: East Embankment
Created By: Walter Babiy
Date: 03/18/2026
Name: Steady-State Seepage
Analysis Type: Steady-State
Scale: 1:800

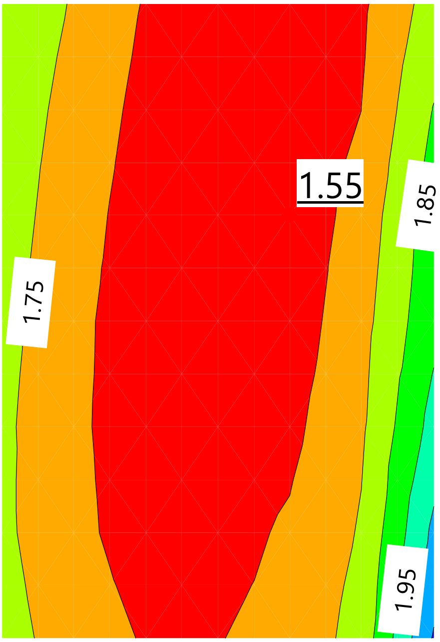
Color	Name	Hydraulic Material Model	Sat Kx (ft/sec)	Ky'/Kx' Ratio	Rotation (°)
🟪	Cohesive - Clay Cap	Saturated Only	1.64e-10	2	90
🟨	Cohesive - Embankment	Saturated Only	1.64e-10	1	90
🟦	Cohesive - Natural	Saturated Only	1.64e-09	4	90
🟪	Granular - CCR	Saturated Only	1.64e-05	1	90
🟨	Granular - Sand Drain	Saturated Only	0.000164	1	90
⬜	Rock	Saturated Only	1.9e-11	5	90

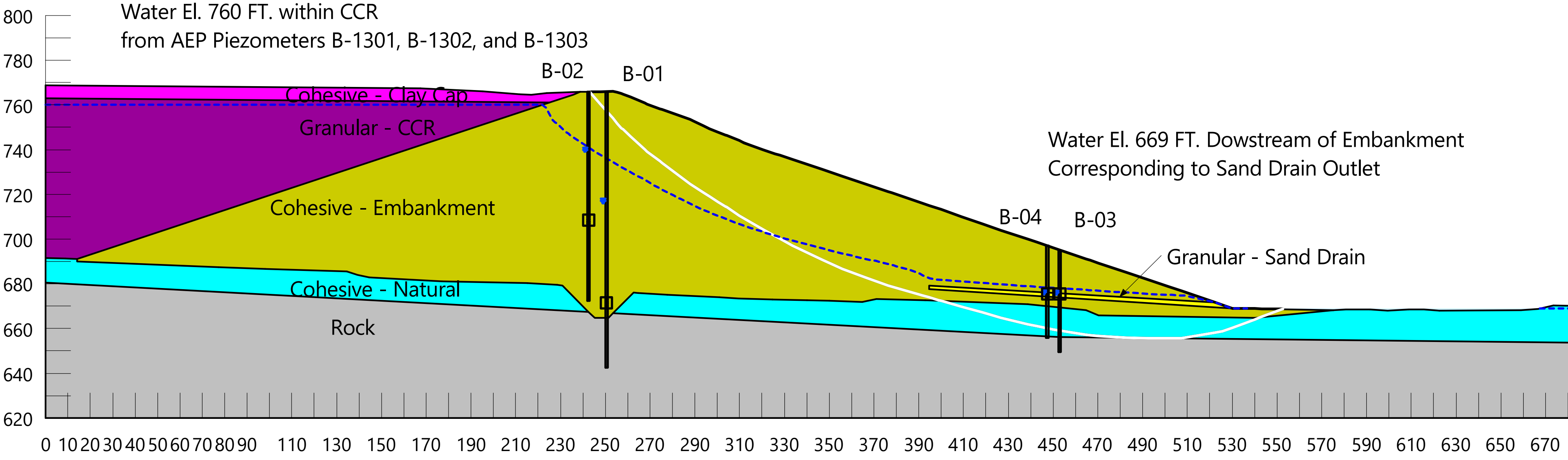

Water El. 760 FT. within CCR
from AEP Piezometers B-1301, B-1302, and B-1303

Water El. 669 FT. Dowstream of Embankment
Corresponding to Sand Drain Outlet

Project: Poston Legacy CCR
Project #: 25170078
Title: East Embankment
Created By: Walter Babiy
Date: 03/18/2026
Name: Long Term Stability
Analysis Type: Spencer
Slip Surface Option: Grid and Radius
Scale: 1:800

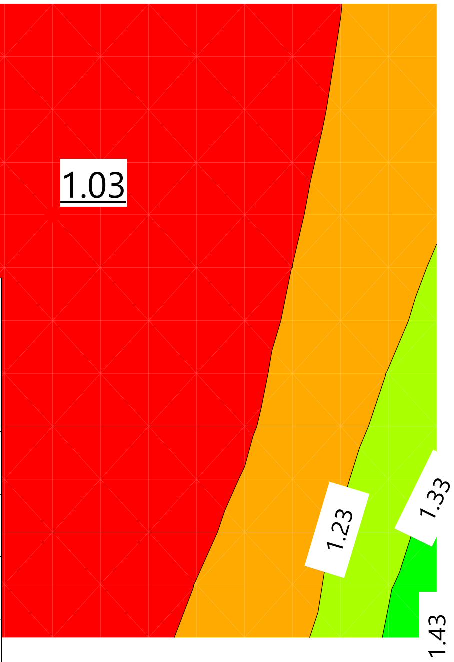
Color	**Name**	**Slope Stability Material Model**	**Unit Weight (pcf)**	**Effective Cohesion (psf)**	**Effective Friction Angle (°)**
🟪	Cohesive - Clay Cap	Mohr-Coulomb	115	100	26
🟩	Cohesive - Embankment	Mohr-Coulomb	115	150	26
🟦	Cohesive - Natural	Mohr-Coulomb	125	100	30
🟪	Granular - CCR	Mohr-Coulomb	100	0	28
🟨	Granular - Sand Drain	Mohr-Coulomb	110	0	34
⬜	Rock	Bedrock (Impenetrable)			



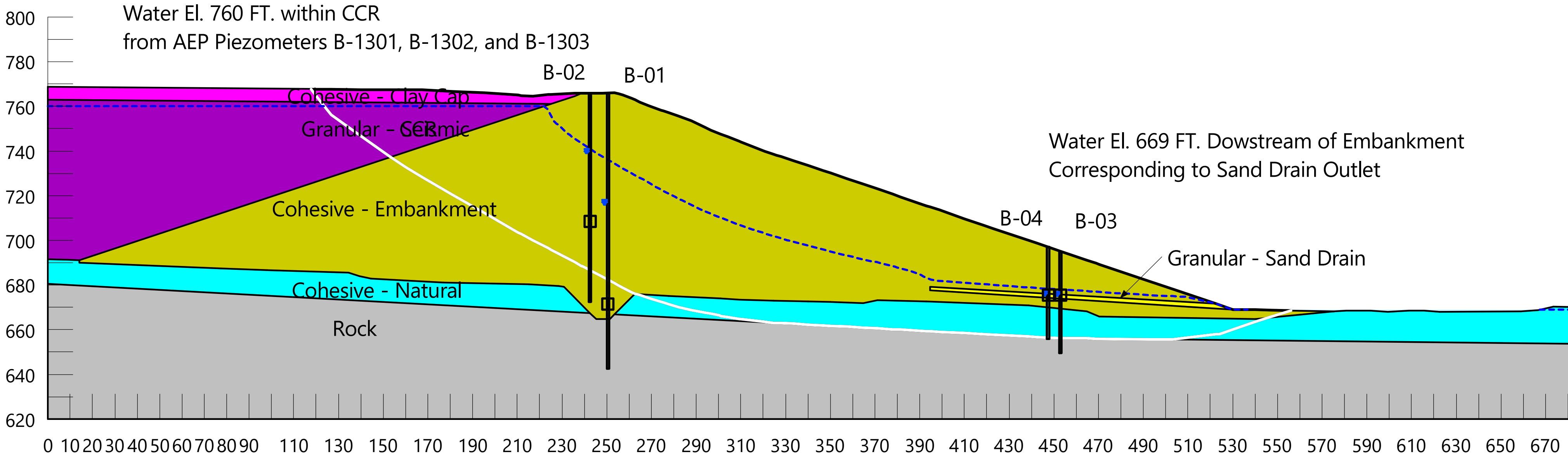

Water El. 760 FT. within CCR
from AEP Piezometers B-1301, B-1302, and B-1303

Water El. 669 FT. Dowstream of Embankment
Corresponding to Sand Drain Outlet

Project: Poston Legacy CCR
Project #: 25170078
Title: East Embankment
Created By: Walter Babiy
Date: 03/18/2026
Name: Pseudo-Static Stability
Analysis Type: Spencer
Slip Surface Option: Grid and Radius
Scale: 1:800



Color	**Name**	**Slope Stability Material Model**	**Unit Weight (pcf)**	**Effective Cohesion (psf)**	**Effective Friction Angle (°)**	**Cohesion R (psf)**	**Phi R (°)**
🟪	Cohesive - Clay Cap	Mohr-Coulomb	115	100	26	1,000	0
🟨	Cohesive - Embankment	Mohr-Coulomb	115	150	26	250	16
🟦	Cohesive - Natural	Mohr-Coulomb	125	100	30	2,000	0
🟪	Granular - CCR - Seismic	Mohr-Coulomb	100	0	28	200	20
🟨	Granular - Sand Drain	Mohr-Coulomb	110	0	34	0	34
⬜	Rock	Bedrock (Impenetrable)					



Liquefaction Susceptibility Analysis - Fine Grained Soil Screening

References: A. Boulanger & Idriss (2008)
B. Bray & Sancio (2006)

Project Information

Date:	2/5/2026
Site:	AEP Poston Legacy CCR
Location:	York Twp - Athens Co, OH
Project No.:	25170078

Boring	**Sample**	**Depth (ft)**	**USCS**	**w_c (%)**	**LL (%)**	**PL (%)**	**PI (%)**	**FC (%)**	**w_c/LL**	**Screening Criteria**			
										PI<7 [A]	**FC<50** [A]	**w_c/LL>0.85** [B]	**Susceptible?**
B-01	S-02	3.5	CL	16.9	36	20	16		0.47	No		No	No
B-01	S-03	5	CH	25.8	51	22	29	90	0.51	No	No	No	No
B-01	S-08	16	CH	26	53	23	30		0.49	No		No	No
B-01	S-14	31	CH	21.8	54	23	31	85	0.40	No	No	No	No
B-01	S-18	41	CL	20.7	47	26	21		0.44	No		No	No
B-01	S-25	55	CL	19.5	47	22	25	78	0.41	No	No	No	No
B-01	S-29	63.5	CL	23.7	44	22	22		0.54	No		No	No
B-01	S-34	75	CL	18.6	42	20	22	88	0.44	No	No	No	No
B-01	S-40	88.5	CL	19	40	23	17		0.48	No		No	No
B-02	S-06	12.5	CL	20.4	36	19	17	76	0.57	No	No	No	No
B-02	S-12	26	CL	20.4	44	22	22		0.46	No		No	No
B-02	S-16	36	CL	20.7	44	23	21	75	0.47	No	No	No	No
B-02	S-24	56	CL	19.7	44	19	25		0.45	No		No	No
B-02	S-33	76	CL	19.2	49	21	28	85	0.39	No	No	No	No
B-02	S-37	85	CL	21.2	44	19	25	83	0.48	No	No	No	No
B-03	S-08	10.5	CL	17	44	23	21		0.39	No		No	No
B-03	S-10	13.5	CL	12	33	19	14	53	0.36	No	No	No	No
B-03	S-19	27	CL	22.6	45	21	24		0.50	No		No	No
B-03	S-22	31.5	CL	21	36	17	19		0.58	No		No	No
B-04	S-05	6	CL	15	30	19	11	72	0.50	No	No	No	No
B-04	S-12	16.5	CL	23.3	37	19	18		0.63	No		No	No
B-04	S-19	27	CL	19.6	37	19	18		0.53	No		No	No
B-05	S-04	4.5	CL	17.6	36	20	16		0.49	No		No	No
B-05	S-06	7..5	CL	17.8	38	19	19		0.47	No		No	No
B-05	S-08	10.5	CL	19.8	33	19	14		0.60	No		No	No
B-06	S-03	3	CL	14	35	21	14		0.40	No		No	No
B-06	S-08	9	CL	22.2	35	22	13		0.63	No		No	No
B-07	S-04	4.5	CH	21.5	53	24	29	79	0.41	No	No	No	No
B-07	S-05	6	CL	21.4	40	22	18	77	0.54	No	No	No	No
B-07	S-08	11	CL	18	41	19	22	88	0.44	No	No	No	No

620 Wando Park Blvd.
Mt. Pleasant, SC 29464

SPT LIQUEFACTION POTENTIAL CALCULATION SHEET BASED ON YOUD ET AL. (2001) METHOD WITH KAVAZANJIAN & MATASOVIC (1995) ACCELERATION ESTIMATES

* Areas of user input are shaded in green
* Data needed for user calculation are in red

Project Information

Date: 2/5/2026
Site: AEP Poston Legacy CCR
Location: York Twp - Athens Co, OH
Project No.: 25170078

Boring: B-03
GS Elevation: 700.00 ft MSL (NAVD88)
GW Depth: 20.0 ft
GW Depth: 6.1 m

Quake Parameters

M_w: 5.73
MSF^1: 1.99 (lower bound)
MSF^2: 2.43 (upper bound)
PGA_M: 0.08 %g
PGA_{Crest}: 0.34 %g

Embankment Height: 100 ft
Crest Elevation: 766.00 ft MSL (NAVD88)

Hammer Parameters

ER 80.4 %
C_E: 1.34
C_B: 1.00
C_S: 1.2

General Parameters

γ_{soil}: 115 lb/ft^3
γ_{soil}: 18.1 kN/m^2
γ_{water}: 62.4 lb/ft^3
γ_{water}: 9.8 kN/m^2
Pa: 101.33 kPa

Liquefaction Likliehood Classification

Almost Certain to liquefy ("certain")
Very likely to liquefy ("very likely")
Liquefaction and no liquefaction are equally likely ("fifty-fifty")
Unlikely to liquefy ("unlikely")

Almost Certain that it will not liquefy ("none")

USCS	**Layer**			**z**		**N_m**	**%**	**y**	**y/h**	**k_{max}/**	**k_{max}**	**Manual Screening**	**σ_{vo}**	**σ'_{vo}**	**r_d^3**	**CSR^4**	**C_N^5**	**C_R^6**	**$(N_1)_{60}$**	**$(N_1)_{60cs}^7$**	**$CRR_{7.5}^8$**	**D_r**	**Kdr**	***f***	**K_σ**	**CRR**	**fos**	**Liq? (by**	**Liq**	**Liq**	**LPI (FS)**	**LPI (P_L)**	**ε_v**	**t**	**ΔH**
	top		bottom	(ft)	(m)		**Fines**	**(ft)**		**u_{max}**	(%g)		(kPa)	(kPa)												(corect.)		**FOS def'n)**	**$Prob^{10}$**	**Likelihood**	**0.0**	**0.0**	(%)	(ft)	(in.)
GC	36.0	-	37.5	36.8	11.20	16	15	102.8	1.03	0.30	0.10		202.5	152.4	0.88	0.08	0.81	1.00	21	24	0.278	54	1.0	0.73	0.90	0.50	6.42	no	0.00	none	0.00	0.00		1.5	0.0
GC	37.5	-	39.0	38.3	11.66	26	15	104.3	1.04	0.30	0.10		210.8	156.2	0.87	0.08	0.80	1.00	33	n/a	n/a	68	1.0	0.66	0.86	n/a	n/a	no	n/a	none	0.00	0.00		1.5	0.0
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P_G = 0.01 Σ= 0.0
Risk = very low to none

SPT LIQUEFACTION POTENTIAL CALCULATION SHEET BASED ON YOUD ET AL. (2001) METHOD
WITH KAVAZANJIAN & MATASOVIC (1995) ACCELERATION ESTIMATES

620 Wando Park Blvd.
Mt. Pleasant, SC 29464

* Areas of user input are shaded in green
* Data needed for user calculation are in red

Project Information

Date: 2/5/2026
Site: AEP Poston Legacy CCR
Location: York Twp - Athens Co, OH
Project No.: 25170078

Boring: B-04
GS Elevation: 700.00 ft MSL (NAVD88)
GW Depth: 20.0 ft
GW Depth: 6.1 m

Quake Parameters

M_w: 5.73
MSF^1: 1.99 (lower bound)
MSF^2: 2.43 (upper bound)
PGA_M: 0.08 %g
PGA_{Crest} 0.34 %g

Embankment Height: 100 ft
Crest Elevation: 766.00 ft MSL (NAVD88)

Hammer Parameters

ER 80.4 %
C_E: 1.34
C_B: 1.00
C_S: 1.2

General Parameters

γ_{soil}: 115 lb/ft^3
γ_{soil}: 18.1 kN/m^2
γ_{water}: 62.4 lb/ft^3
γ_{water}: 9.8 kN/m^2
Pa: 101.33 kPa

Liquefaction Likliehood Classification

Almost Certain to liquefy ("certain")
Very likely to liquefy ("very likely")
Liquefaction and no liquefaction are equally likely ("fifty-fifty")
Unlikely to liquefy ("unlikely")

Almost Certain that it will not liquefy ("none")

USCS	Layer			z		N_m	%	y	y/h	$k_{max}/$	k_{max}	Manual Screening	σ_{vo}	σ'_{vo}	r_d[3]	CSR[4]	C_N[5]	C_R[6]	$(N_1)_{60}$	$(N_1)_{60cs}$[7]	$CRR_{7.5}$[8]	D_r	Kdr	*f*	K_σ	CRR	fos	Liq? (by	Liq	Liq	LPI (FS)	LPI (P_L)	ε_v	t	ΔH
	top		bottom	(ft)	(m)		Fines	(ft)		u_{max}	(%g)		(kPa)	(kPa)												(corect.)		FOS def'n)	Prob[10]	Likelihood	0.0	0.0	(%)	(ft)	(in.)
SW-SC	21.0	-	22.5	21.8	6.63	14	10	87.8	0.88	0.33	0.11		119.8	114.6	0.95	0.07	0.94	0.95	20	21	0.233	54	1.0	0.73	0.97	0.45	6.24	no	0.00	none	0.00	0.00		1.5	0.0
SW-SC	22.5	-	24.0	23.3	7.09	7	10	89.3	0.89	0.32	0.11		128.1	118.4	0.95	0.07	0.92	0.95	10	11	0.122	38	1.0	0.80	0.97	0.23	3.21	no	0.00	none	0.00	0.00		1.5	0.0
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P_G = 0.01 Σ= 0.0
Risk = very low to none

620 Wando Park Blvd.
Mt. Pleasant, SC 29464

SPT LIQUEFACTION POTENTIAL CALCULATION SHEET BASED ON YOUD ET AL. (2001) METHOD WITH KAVAZANJIAN & MATASOVIC (1995) ACCELERATION ESTIMATES

* Areas of user input are shaded in green
* Data needed for user calculation are in red

Project Information
Date: 2/5/2026
Site: AEP Poston Legacy CCR
Location: York Twp - Athens Co, OH
Project No.: 25170078

Boring: B-05
GS Elevation: 680.00 ft MSL (NAVD88)
GW Depth: 6.0 ft
GW Depth: 1.8 m

Quake Parameters
M_w: 5.73
MSF[1]: 1.99 (lower bound)
MSF[2]: 2.43 (upper bound)
PGA_M: 0.08 %g
PGA_{Crest}: 0.34 %g

Embankment Height: 100 ft
Crest Elevation: 766.00 ft MSL (NAVD88)

Hammer Parameters
ER 80.4 %
C_E: 1.34
C_B: 1.00
C_S: 1.2

General Parameters
γ_{soil}: 115 lb/ft^3
γ_{soil}: 18.1 kN/m^2
γ_{water}: 62.4 lb/ft^3
γ_{water}: 9.8 kN/m^2
Pa: 101.33 kPa

Liquefaction Likliehood Classification
Almost Certain to liquefy ("certain")
Very likely to liquefy ("very likely")
Liquefaction and no liquefaction are equally likely ("fifty-fifty")
Unlikely to liquefy ("unlikely")

Almost Certain that it will not liquefy ("none")

USCS	Layer			z		N_m	%	y	y/h	k_{max}/	k_{max}	Manual Screening	σ_{vo}	σ'_{vo}	r_d[3]	CSR[4]	C_N[5]	C_R[6]	$(N_1)_{60}$	$(N_1)_{60cs}$[7]	$CRR_{7.5}$[8]	D_r	Kdr	*f*	K_σ	CRR	fos	Liq? (by	Liq	Liq	LPI (FS)	LPI (P_L)	ε_v	t	ΔH
	top		bottom	(ft)	(m)		Fines	(ft)		u_{max}	(%g)		(kPa)	(kPa)												(corect.)		FOS def'n)	Prob[10]	Likelihood	0.0	0.0	(%)	(ft)	(in.)
SW-SM	6.0	-	7.5	6.8	2.06	3	10	92.8	0.93	0.31	0.11		37.2	35.0	0.99	0.07	1.42	0.75	5	6	0.081	34	1.0	0.80	1.00	0.16	2.20	no	0.00	none	0.00	0.00		1.5	0.0
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P_G = 0.01
Σ= 0.0
Risk = very low to none

620 Wando Park Blvd.
Mt. Pleasant, SC 29464

SPT LIQUEFACTION POTENTIAL CALCULATION SHEET BASED ON YOUD ET AL. (2001) METHOD WITH KAVAZANJIAN & MATASOVIC (1995) ACCELERATION ESTIMATES

* Areas of user input are shaded in green
* Data needed for user calculation are in red

Project Information

Date: 2/5/2026
Site: AEP Poston Legacy CCR
Location: York Twp - Athens Co, OH
Project No.: 25170078

Boring: B-06
GS Elevation: 681.00 ft MSL (NAVD88)
GW Depth: 6.0 ft
GW Depth: 1.8 m

Quake Parameters

M_w: 5.73
MSF^1: 1.99 (lower bound)
MSF^2: 2.43 (upper bound)
PGA_M: 0.08 %g
PGA_{Crest}: 0.34 %g

Embankment Height: 100 ft
Crest Elevation: 766.00 ft MSL (NAVD88)

Hammer Parameters

ER 80.4 %
C_E: 1.34
C_B: 1.00
C_S: 1.2

General Parameters

γ_{soil}: 115 lb/ft^3
γ_{soil}: 18.1 kN/m^2
γ_{water}: 62.4 lb/ft^3
γ_{water}: 9.8 kN/m^2
Pa: 101.33 kPa

Liquefaction Likliehood Classification

Almost Certain to liquefy ("certain")
Very likely to liquefy ("very likely")
Liquefaction and no liquefaction are equally likely ("fifty-fifty")
Unlikely to liquefy ("unlikely")

Almost Certain that it will not liquefy ("none")

USCS	Layer			z		N_m	%	y	y/h	$k_{max}/$	k_{max}	Manual Screening	σ_{vo}	σ'_{vo}	$r_d{}^3$	CSR^4	$C_N{}^5$	$C_R{}^6$	$(N_1)_{60}$	$(N_1)_{60cs}{}^7$	$CRR_{7.5}{}^8$	D_r	Kdr	*f*	K_σ	CRR	fos	Liq? (by	Liq	Liq	LPI (FS)	LPI (P_L)	ε_v	t	ΔH
	top		bottom	(ft)	(m)		Fines	(ft)		u_{max}	(%g)		(kPa)	(kPa)												(corect.)		FOS def'n)	$Prob^{10}$	Likelihood	0.0	0.0	(%)	(ft)	(in.)
SW-SM	4.9	-	6.2	5.6	1.69	13	10	90.6	0.91	0.32	0.11		30.6	30.6	0.99	0.07	1.46	0.75	23	24	0.278	73	1.0	0.64	1.00	0.55	n/a	no	n/a	none	0.00	0.00		1.3	0.0
SP-SC	14.4	-	16.5	15.5	4.71	26	10	100.5	1.00	0.30	0.10		85.1	56.9	0.97	0.10	1.24	0.85	44	n/a	n/a	88	1.0	0.60	1.00	n/a	n/a	no	n/a	none	0.00	0.00		2.1	0.0
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P_G = 0.01 Σ= 0.0
Risk = very low to none