Report on Geotechnical Engineering Evaluation

Proposed Huntington National Bank
South Parker Road and Stroh Road
Parker, Colorado

Prepared for

Huntington National Bank
37 West Broad Street
Columbus, Ohio 43215
ATTN: Chris Evans

Prepared by

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July 21, 2025

PSI Project No. 05323040

Project Number: 05323040
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Mr. Chris Evans
Huntington National Bank
37 West Broad Street
Columbus, Ohio 43215

Re: **Report on Geotechnical Engineering Evaluation**
Proposed Huntington National Bank
South Parker Road and Stroh Road
Parker, Colorado
PSI Project No. 05323040

Dear Mr. Evans:

Professional Service Industries, Inc (PSI), an Intertek Company, is pleased to transmit our Report of Geotechnical Engineering Evaluation for the proposed Huntington National Bank to be located in Parker, Colorado. This report includes the results of field exploration and laboratory testing, as well as recommendations for site preparation and foundation design.

If you have questions pertaining to this report, or if we may be of further service, please contact us at your convenience.

PSI thanks you for your business and we look forward to finding ways to grow our partnership, expand our services, and continue Building Better Together.

Professional Service Industries, Inc.

COLORADO LICENSED PROFESSIONAL ENGINEER
HANNAH CHRISTINE TAWFIK

Hannah C. Tawfik, P.E.

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ATTACHMENTS

1.0 INTRODUCTION

Professional Service Industries, Inc. (PSI), an Intertek Company, has conducted a geotechnical engineering evaluation for the site of the proposed Huntington National Bank to be located in Parker, Colorado. The purpose of our study was to characterize the subsurface strata at the subject site and to develop recommendations for site preparation and provide geotechnical parameters for the foundation design for the proposed development. Our services on this project were provided in general accordance with the PSI Proposal Number 450960 dated April 29, 2025, authorized by Mr. Chris Evans on July 3, 2025.

PSI's scope of services for the geotechnical study did not include an assessment of environmental conditions in the soil, bedrock, surface water, groundwater, air, on or below, or around this site. Any statements in this report or on boring logs regarding odors, colors, and unusual or suspicious items or conditions are strictly for informational purposes.

The report, which follows, presents a brief review of our understanding of the project, a discussion of the site and subsurface conditions encountered, and our recommendations for design and construction of foundations and slabs.

2.0 PROJECT INFORMATION

PSI has reviewed information provided by Mr. Evans with Huntington National Bank which included proposed site plan with requested boring locations, dated April 24, 2025. Based on this information, we understand the project is planned to consist of an approximately 2,500 square-foot, single-story building with drive-thru lanes, associated parking, canopy, and trash enclosure. No stormwater detention areas are shown on the site plan.

The latitude and longitude of the subject site is approximately 39.4774° North and -104.7573° West. The site is bounded by a vacant land and Stroh Road to the north, South Parker Road to the west, vacant land and Kinney Creek to the south, and an access road and vacant property to the east. Based on aerial imagery, the site is currently vacant and has been graded as part of a larger overall development. The site is generally level.

Structural load information was not provided. Therefore, our analysis assumes column loads not exceeding 50 kips, wall loads not exceeding 5 kips per linear foot, and slab loads not exceeding 150 psf. Pavement recommendations have been based on an EDLA of 2 and 5 for light and heavy duty pavements, respectively. Grading information was also unavailable; however, as the site is already developed and graded, minimal grading is anticipated. PSI estimates that maximum cuts and fills will not exceed 3 feet from the existing grade.

Descriptions of the site are based upon observations made during our field exploration program. The geotechnical recommendations presented in this report are based upon the project information provided and the subsurface materials described in this report. If any of the noted information is incorrect, please inform us so that we may amend the recommendations presented in this report, if needed.

3.0 SUBSURFACE INFORMATION

The following sections provide information relating to subsurface conditions encountered at the boring locations and published geologic information in the general vicinity of the project site. The geology section is based upon the "Geological Map of Colorado" by Ogden Tweto dated 1979 and information relating to subsurface conditions within the property gathered from our current field study.

3.1 Site Geology and Geologic Hazards

Based on the referenced map by Tweto 1979, the site lies in are a mapped as Modern Alluvium (Quaternary, Qa) can be described as "includes Piney Creek Alluvium and younger deposits".

Based upon historical aerial photographs, the site appears to have been previously occupied by a residence with multiple outbuildings since prior to 1937 (the oldest available Google Earth image). The residence appears to have been demolished around 2018/2019, and the site was subsequently graded as part of a larger surrounding development beginning around 2023. Information regarding the original development or it's removal was not provided, nor was any grading information for the overall development provided.

3.2 Subsurface Conditions

As part of PSI's evaluation of this site, eight (8) exploratory borings were drilled at the approximate locations as indicated on Figure 2, the Boring Location Map. Five (5) borings were drilled in the approximate proposed building footprint area to a depth of approximately 15 feet below existing grade. One boring was performed in the approximate area of the proposed canopy to a depth of approximately 15 feet below existing grade. Two (2) borings were drilled in the planned pavement areas to depths of approximately 10 feet below existing grade. One pavement boring was unable to be performed due to proximity to the gas pipeline easement along South Parker Road.

The borings were advanced using a CME-55 truck mounted drill rig equipped with 4-inch diameter, solid-stem, continuous-flight auger. Soil samples were recovered at selected depths during drilling with the truck-mounted drill rig using a Modified California Sampler (outside diameter- 2.4 inches; inside diameter – 2.0 inches) driven by a 140-lb. weight free falling 30 inches. The number of blows required to drive the sampler 12 inches is designated as the penetration resistance (N-value, blows per foot) and provides an indication of the consistency of cohesive soils and the relative density of granular materials. While the procedure is similar to that employed in the Standard Penetration Test (ASTM D1586) the penetration resistance obtained using the California barrel sampler is generally higher than that obtained using the standard split-spoon sampler. Therefore, a reduction factor of 0.63 is typically used for Modified California data when compared to conventional SPT data. The SPT values on the attached logs were not corrected for the sampler or hammer efficiency.

A representative from our office observed the drilling and prepared boring logs of the conditions encountered. Individual logs of the borings are presented in Figures 3 through 10. It should be noted that the subsurface conditions on the boring logs are representative of the conditions at the specific locations drilled. Variations may occur and should be expected across the site. The soil morphology represents the approximate boundary between subsurface materials and the transitions may be gradual and indistinct. Water level information, if encountered, obtained during our field operations is also shown on the boring logs. Elevations referenced were obtained via Google Earth and should be considered approximations.

3.2.1 Subsurface Profile

PSI encountered a surficial composition of sand containing varying amounts of clay and silt, underlain by sandy clay and claystone bedrock. These sand layers extended from the ground surface to the termination depths of the borings, approximately 15 feet below the existing grade. The sand was generally described as fine- to coarse-grained with occasional gravel, dry to moist, light brown to dark brown in color, and ranged from loose to dense in consistency.

Beneath the sandy strata, sandy clay soils and claystone bedrock were encountered. In Boring B7, an intermittent sandy clay layer was observed between approximately 5 and 12 feet below grade. This layer consisted of fine- to medium-grained sand with gravel, was dry, dark brown in color, and exhibited a stiff to very stiff consistency, with visible iron oxide staining.

Claystone bedrock was encountered at depths ranging from approximately 8 to 12 feet below grade, extending to the bottom of the borings in Borings B1, B2, and B7. The bedrock was generally described as fine- to medium-grained, dry to moist, brown to dark brown and gray to dark gray in color and ranged from weathered to hard in consistency. Iron oxide staining was also present in some areas of the bedrock

The Boring Logs illustrated in Figures 3 through 10 should be reviewed for specific information at individual boring locations. These records include soil descriptions, stratifications, penetration resistances, locations of the samples and laboratory test data.

3.2.2 Swell Potential

PSI performed ASTM D4546 Swell Testing on selected samples of the recovered on-site material from the soil borings. The following table summarizes the results of the Swell tests:

Boring	Depth (feet)	Moisture Content (%)	Volume Change (%)	Swell Pressure (psf)
B1	5	9.3	**0.1**	1,000
B2	2 ½	10.2	**0.3**	600
B3	15	17.9	**0.3**	1,600
B4	5	7.1	**-0.1**	--
B5	2 ½	10.2	**0.0**	--
B7	5	13.3	**0.0**	--
B7	7 ½	33.6	**2.1**	3,400

The laboratory swell test results are included in Appendix A and on the individual boring logs (Figures 3 through 10). The test results indicated swell percentages of -0.1 to 2.1 percent when tested under a surcharge pressure of 250, 500, 750, and 1,000 psf. The surcharge values were applied based on the sample depth, with 100 psf surcharge applied for every 1 foot below the ground surface. Once the samples were hydrated under the surcharge pressure and swelling had stopped, additional pressure was applied until the sample was at or below its initial volume.

Based upon the swell test results, the materials encountered are classified as having a “low” to “slightly moderate” potential for swell, therefore; mitigation for swell not required. However, if excessive drying and rewetting of these soils is allowed to occur, the risk of swell will increase. Proper drainage and good maintenance should be followed.

3.2.3 Groundwater Conditions

Free-flowing groundwater was not observed during drilling operations. It should be noted that it is possible for the groundwater table to fluctuate during the year depending upon climatic and rainfall conditions and changes to surface topography and drainage patterns. Discontinuous zones of perched water may also exist, or develop, within the overburden materials subsequent to the construction of the proposed development. The groundwater levels present in this report are the levels that were measured at the time of our field activities. We recommend the contractor determine the groundwater level prior to construction and assess any potential impacts.

3.2.4 Laboratory Testing

The soil samples obtained during the field exploration were transported to the laboratory and selected soil samples were tested in the laboratory to measure material properties for our geotechnical evaluation. Laboratory testing was accomplished in general accordance with ASTM and other applicable procedures. Laboratory testing was performed on selected samples to evaluate the classification, swell and other engineering characteristics of the subsurface materials. Laboratory test data along with detailed descriptions of the soil can be found on the logs of borings and in Appendix A. The samples that were not altered by laboratory testing will be retained for 90 days from the date of this report and then will be discarded without further notice.

4.0 GEOTECHNICAL EVALUATION

The primary geotechnical concern at this site is the inconsistency of the subgrade at the bearing surface as well as previous site grading for development. Deleterious materials were not observed in our borings, however, due to the previous site usage and site grading for development, we recommend a small contingency be included in the event that unsuitable materials such as organic materials (if encountered), debris or other unsuitable materials are encountered and require additional over-excavation or removal.

It is PSI's opinion that the foundation system for the proposed development may consist of shallow foundations with a slab-on-grade. PSI recommends the soils below foundations, slabs, and pavements be over-excavated to no less than 12-inches and be replaced as moisture conditioned and recompacted structural fill. If areas of organic material or debris are encountered, they should be completely undercut and removed. Organic material or debris should be wasted offsite and not reused. Structural fill should extend 2-feet beyond building limits and to back of curb for pavements.

The on-site overburden materials may be used as structural fill, provided they are cleaned of unsuitable or deleterious materials or debris, and properly mixed, moisture conditioned, and recompacted in accordance with this report. We recommend a contingency for waste of unsuitable materials be included. Bedrock materials, if encountered during grading, are not considered suitable for reuse and should be wasted in non-structural areas or hauled offsite.

Some areas may require additional stabilization effort depending on final grades. This may include additional over-excavation, imported fill, rock, and/or geogrid.

Moisture fluctuation of the onsite soils will increase its swell/collapse potential, therefore maintenance of the structure and pavements, as well as controlling water runoff will be critical to the functionality of the facility. Proper moisture control will be imperative at this site during and following construction. The risk of swelling/collapsible soils can be reduced, but not eliminated, by preventing fluctuations in moisture content. Therefore, it is imperative that positive slope away from the foundations is maintained, hardscape is constructed around the building perimeters, utilities are prevented from transmitting water via trench bedding or broken lines, and pavements are regularly maintained.

PSI has provided recommendations for footing size and bearing depth to limit the amount of vertical movements that the foundations could potentially exhibit. The foundation excavations should be observed by a representative of PSI prior to reinforcing steel or concrete placement to assess that the foundation bearing materials are capable of supporting the design loads and are consistent with the materials discussed in this report.

The allowable bearing capacity has been calculated using minimum footing widths of 18 inches, and for bearing depths of 1-½ and 3 feet below the proposed grade. The potential movement through settlement of foundations has been estimated for the footing depths and can be found in *Section 6.1 Foundations.*

The following geotechnical design recommendations have been developed on the basis of the described project characteristics and subsurface conditions encountered. Once final design/grading plans and specifications are available, a general review by PSI is required as a means to check that the recommendations presented in the following sections of this report are properly interpreted and implemented.

5.0 SITE GRADING RECOMMENDATIONS

The site should be stripped of any vegetation and root systems in the proposed building area. Existing utilities should also be removed and properly capped if not used for new development. Where organic material and/or debris is encountered, it should be removed to the extent encountered and replaced with structural fill. Loose soils or stockpiled soils resulting from the over-excavation may be incorporated and placed as structural fill provided it meets the recommended specifications. Trash and debris should be removed from the site and disposed of in accordance with local and state regulations.

The building area should be over-excavated to no less than 12-inches below the proposed bottom of foundation, slab section, and pavement section elevation and replaced as structural fill. If fill that contains organic material or debris is encountered, it should be completely removed to the depth encountered. The over-excavation should extend 2-feet beyond building footprint and to back of curb in pavement areas. The on-site material can be reused as structural fill provided it is properly mixed, cleaned of debris and deleterious material (if necessary), moisture conditioned and recompacted in accordance with Section 5.2 of this report. Bedrock materials, if encountered, should not be reused as structural fill.

Following site stripping and over-excavation, the exposed grade should be proofrolled to identify potential areas of soft soils prior to replacement of the moisture conditioned fill. The proofroll should be conducted with a loaded tandem-axle dump truck or similar pneumatic-tired equipment with a minimum weight of 15 tons.

5.1 Structural Fill

Based on PSI's field and laboratory data, it is our opinion that the on-site overburden soils appears to generally be suitable for re-use as backfill soils and for use as structural fill, provided they are properly mixed, cleaned of debris and organics (if encountered), and properly moisture conditioned and recompacted. Bedrock materials, if encountered, should not be reused. If material such as construction debris, trash, or other undesirable material is encountered during construction, they should be removed off site.

Imported fill, if used, should be free of organic or other deleterious materials, have a liquid limit less than 30, a plasticity index less than 10, and meet the following gradation outlined below. This imported fill criteria are intended as a general guideline. Selecting imported fill materials should have a swell potential of less than 1 percent when compacted to 95 percent of maximum dry unit weight (MDUW) and at 2 percent below optimum moisture content (OMC) and tested under a swell test surcharge of 500 psf. The MDUW and OMC should be determined by ASTM D698 (Standard Proctor).

Screen Size	Percent Passing
2 Inch	100
#4	50 – 100
#200	10 - 30

Imported fill material proposed for use on this site that does not meet these criteria should be submitted to the project geotechnical engineer for evaluation. The geotechnical engineer should evaluate the proposed import fill prior to purchase and delivery. Fine-grained soils used for fill require close moisture content control and careful placement by the contractor to achieve the recommended degree of compaction and to address swell potential and settlement issues.

5.2 General Fill Placement and Testing

Unless otherwise specified, imported fill material should be compacted to at least 95 percent of the maximum dry unit weight as determined by the Standard Proctor Test (ASTM D 698). **For fill depths in excess of 5 feet, compaction should be 100 percent maximum dry unit weight.** Each lift of compacted fill should be tested for density by a representative of the geotechnical engineer prior to placement of subsequent lifts. Fill soils should be moisture conditioned to a range from optimum moisture content to four percent above optimum moisture content. Fill material should be placed in maximum eight-inch loose lifts.

A sample(s) of the proposed backfill soil(s) should be obtained for moisture density relationship (proctor test) three to four days prior to backfilling operations to expedite compaction and moisture content testing by the materials testing service provider.

Weather conditions in the site area are typically dry in the summer and early fall. Precipitation in the form of snowfall is common from October through March. While grading can be inhibited for short periods during and following times of precipitation, grading can generally be conducted year-round. The major factor that must be considered during the winter months is ground freezing. During extended periods of sub-freezing weather, it can be difficult to properly moisture condition and compact soils. Grading must be conducted during the warmer parts of the day in freezing weather.

6.0 GEOTECHNICAL RECOMMENDATIONS

6.1 Shallow Footing Foundations

PSI recommends that the proposed structure be supported on continuous or individual column footings and should be designed for an allowable soil bearing capacity as shown in the following tables:

Allowable Bearing Capacity of Continuous Footing (18 Inches Wide Minimum)		**Allowable Bearing Capacity**	**Estimated Potential Settlement**
Bearing Depth of Foundation Below Finished Grade	1 ½ feet	2,000 psf	1 inch
	3 feet	2,250 psf	1 inch

Allowable Bearing Capacity of Individual Column Pad Footing (minimum 3-foot square)		**Allowable Bearing Capacity**	**Estimated Potential Settlement**
Bearing Depth of Foundation Below Finished Grade	1-½ feet	2,250 psf	1 inch
	3 feet	2,500 psf	1 inch

The allowable bearing capacities provided in the tables above are based on maximum 5 kips per linear foot continuous footing load, up to 50-kip column loads, a safety factor of 3, and that the final floor elevation is within 3 feet of existing grade. The potential settlements displayed in the above tables were calculated using the corresponding allowable soil bearing capacities.

Continuous footings supporting bearing walls should incorporate a minimum lateral dimension of 18 inches. Exterior footings should bear at a minimum of 36 inches below final grade for frost protection. Interior footings should bear at a minimum of 18 inches below final grade. Column footings should be at least 3-foot square and limited to maximum dimension of 5 feet by 5 feet to limit settlement to 1 inch or less.

The uplift capacity of shallow foundations should be limited to the weight of the foundation concrete plus the weight of the soil immediately above the footing. A concrete unit weight of 145 pcf and a soil unit weight of 115 pcf should be used for design purposes.

Lateral loads applied to the foundations will be resisted by a combination of passive pressure against the sides and friction along the base. For design purposes, based on a mobilized friction angle of 30^{o}, PSI recommends using an equivalent fluid pressure of 38 pcf for the “active” case and 57 pcf for the “at-rest” case, along with a coefficient of friction of 0.38. A passive pressure of 172 pcf is recommended for soils to a depth of 10 feet, based on a factor of safety of 2.0 to limit strain in the foundation.

The foundation excavations should be observed by a representative of PSI prior to reinforcing steel or concrete placement to assess that the foundation bearing materials are capable of supporting the design loads and are consistent with the materials discussed in this report. Soft or loose zones encountered at the bottom of the footing should be removed and replaced with properly compacted fill as directed by the geotechnical engineer.

After the foundation bearing materials have been approved, steel reinforcement and concrete should be placed as quickly as possible to avoid exposure of the footing bottoms to wetting and drying. Surface run-off water should be drained away from the excavations and not be allowed to pond. If possible, the foundation concrete should be placed during the same day the excavation is made. If it is required that the excavation be left open for more than one day, they should be protected to reduce evaporation or entry of moisture.

6.2 Slab-on-Grade

A slab-on-grade interior floor slab system may be utilized for the proposed structure. PSI anticipates that slab-on-grade sections placed on at least 12-inches of moisture conditioned and compacted soil could experience total movement on the order of a 1 inch with differential movements on the order of a ½ inch between adjacent columns or over a 50-foot span.

PSI recommends a subgrade support modulus (k-value) of 100-pci (based on a 1-foot square plate load test) be used for slab design. However, depending on how the slab load is applied, the value will have to be geometrically modified. The value should be adjusted for larger areas using the following expression for cohesive and cohesionless soil:

Modulus of Subgrade Reaction, $k_s = (\frac{k}{B})$ for cohesive soil and

$k_s = k\,(\frac{B+1}{2B})^2$ for cohesionless soil

where:
k_s = coefficient of vertical subgrade reaction for loaded area,
k = coefficient of vertical subgrade reaction for 1x1 square foot area, and
B = width of area loaded, in feet

Where concrete slabs will be covered with tile or other moisture sensitive covering, we recommend the use of a vapor retarder beneath the slabs on grade to reduce vapor transmission through the slab.

The precautions listed below are considered good construction practice. These recommendations are not required but can be followed to prevent moisture content variation and help reduce potential damage caused by movement of the supporting subgrade.

- Cracking of slabs-on-grade can occur as a result of heaving or compression of the supporting soil, but also as a result of concrete curing stresses. The occurrence of concrete shrinkage cracks, and problems associated with concrete curing may be reduced and/or controlled by limiting the slump of the concrete, proper concrete placement, finishing, and curing, and by the placement of crack control joints at frequent intervals, particularly, where re-entrant slab corners occur. The American Concrete Institute (ACI) recommends a maximum panel size (in feet) equal to approximately three times the thickness of the slab (in inches) in both directions. For example, joints are recommended at a maximum spacing of 12 feet based on using a four-inch thick slab. We also recommend that control joints be scored three feet in from and parallel to all foundation walls. Using fiber reinforcement in the concrete can also control shrinkage cracking.

- Slabs should be separated from exterior walls, column posts, interior bearing members and utility lines to allow independent vertical movement of the slab. If project structural and architectural details require the slab on grade to be structurally tied to the exterior wall/foundation system, then control joints should be placed in the slab within approximately 3 feet of the wall. The owner must understand and accept the risk of cracking at or near the control joints if the slab on grade is tied to the foundation system.

- Some increase in moisture content is inevitable as a result of development and associated landscaping. However, extreme moisture content increases can be largely controlled by proper and responsible site drainage, building maintenance and irrigation practices. Proper slope away from the proposed canopy and walkways (5 to 10 percent) should be maintained.

- Utility backfill in areas supporting slabs should be moisture conditioned or dried by scarification and compacted. Backfill in all interior and exterior water and sewer line trenches should be uniformly compacted.

- Exterior slabs should be isolated from the building. These slabs should be reinforced to function as independent units. Movement of these slabs should not be transmitted to the building foundation or superstructure.

6.3 Seismic Parameters

The project site is located within a municipality that employs the International Building Code, 2021 edition. As part of this code, the design of structures must consider dynamic forces resulting from seismic events. These forces are dependent upon the magnitude of the earthquake event as well as the properties of the soils that underlie the site. As part of the procedure to evaluate seismic forces, the code requires the evaluation of the Seismic Site Class, which categorizes the site based upon the characteristics of the subsurface profile within the upper 100 feet of the ground surface. To define the Site Class for this project, we have interpreted the expected results of soil test borings drilled with the project site and estimated appropriate soil properties below grade to a depth of 100 feet, as permitted by Chapter 20.3-1 of the code. The estimated soil properties were based upon data available in published geologic reports and our experience with subsurface conditions in the general site area.

Based upon our evaluation, it is our opinion that the subsurface conditions within the site are consistent with the characteristics of **Site Class C** as defined in Chapter 20.3-1 of the ASCE 7-16 code.

The USGS-NEHRP interpolated probabilistic ground motion values near 39.4774° North and -104.7573° West obtained from the USGS geohazards web page are as follows:

Period (seconds)	2% Probability of Event in 50 years (g)	Site Coefficients	Maximum Spectral Acceleration Parameters	Design Spectral Acceleration Parameters	
0.2 (S_s)	0.201	$F_a = 1.3$	$S_{ms} = 0.262$	$S_{Ds}= 0.175$	$T_0= 0.064$
1.0 (S_1)	0.056	$F_v = 1.5$	$S_{m1} = 0.084$	$S_{D1}= 0.056$	$T_s= 0.32$

$S_{ms} = F_aS_s$ $S_{Ds} = ⅔*S_{ms}$ $T_0= 0.2*S_{D1}/S_{Ds}$
$S_{m1} = F_vS_1$ $S_{D1} = ⅔*S_{m1}$ $T_s= S_{D1}/S_{Ds}$

The Site Coefficients, Fa and Fv presented in the above table were interpolated from Chapter 20.3-1 as a function of the site classification and mapped spectral response acceleration at the short (S_s) and 1 second (S_1) periods.

6.4 Lateral Earth Pressures –Canopy Foundations

We understand the proposed canopies may be founded on precast or augered cast in place foundations. Typically, these foundations are installed to nominal depths of 4 to 10 feet below grade and are designed for torsional, moment or overturning loads due to wind forces rather than axial capacity due to the canopy weight. The following lateral earth pressures may be used for the on-site soils to a maximum depth of 10 feet to aid in design of canopy foundations such as these, to be designed by others.

Recommended Parameters for use in Canopy Foundation Design	
Material Type	Drained Friction Angle (ϕ')
On-Site Clay Materials	24°
Bedrock	30°
Total Soil Density (pcf)	115
Groundwater Elevation	Not observed
Allowable Soil Bearing Capacity (psf)*	1,500 psf
Allowable Bedrock Bearing Capacity (psf)	4,000 psf

Parameters specific to soil type	On-Site Clayey or Silty Sand	Bedrock
Friction Factor for Base	0.30	0.38
Coefficient of Active Pressure (K_a) **	0.42	0.33
Coefficient of Passive Pressure (K_p) **	2.37	3.0
Coefficient of At-Rest Pressure (K_o) **	0.59	0.5

*Allowable soil bearing capacity based on a minimum foundation diameter of 12 inches and a minimum bearing depth of 48 inches below planned grade

6.5 Pavement Recommendations

The following analysis and minimum pavement thickness recommendations are in general accordance with AASHTO and the Colorado Department of Transportation Manual for Road and Bridge Construction based upon our current understanding of the project.

6.5.1 Subgrade Preparation Recommendations

New pavements should bear on no less than 12-inches of moisture conditioned and recompacted structural fill.

Once the proposed pavement areas have been cleared and stripped, the exposed soils should moisture conditioned to a depth of at least 1-feet below bottom of pavement section. Proof-rolling of the exposed grade should be conducted to identify areas of loose soils prior to placement of compacted structural fill (either on-site or imported). The proof-roll should be conducted with a loaded tandem-axle dump truck or similar pneumatic-tired equipment with a minimum weight of 15-tons. Areas that rut or deflect greater than 1 inch should be moisture-conditioned and recompacted.

6.5.2 Pavement Thickness Recommendations

Based on the re-use of the on-site soils replaced as structural fill, PSI has used an R-value of 5 for support of the proposed pavement sections.

PSI has identified two pavement categories based on the proposed development anticipated traffic use and traffic loads.

- 14,600 ESALs/EDLA of 2 (Light-Duty Traffic)
- 36,500 ESALs/EDLA of 5 (Heavy-Duty Traffic)

We have also used the following design criteria; a 20-yr design life, a Pavement Serviceability Index (PSI) of 2.0 and a Reliability of 80 percent.

Minimum pavement section options are provided for full depth asphalt, asphalt over aggregate base course (composite section), and rigid (Portland Cement Concrete) pavement. Based on this information for the subject pavement, the following minimum pavement sections were determined, as presented in the following table.

Pavement Area	Composite Section	Full-Depth Asphalt	Full-Depth Portland Cement Concrete
14,600 ESALs	4 inches Asphalt over 6 inches Aggregate Base Course	5 ½ inches	5 inches
36,500 ESALs	5 inches Asphalt over 6 inches Aggregate Base Course	6 ½ inches	6 inches

Concrete pavement should be considered in high traffic areas where significant stopping or turning movements are also anticipated such as the drive-thru lane. Concrete pavement at least **seven inches thick** is recommended for the **trash dumpster run-ups** due to the heavy wheel and impact loads that this area receives. The run-up should extend far enough away to support all wheels of the sanitation truck while stopped and in the loading position. Concrete pavement is also recommended in areas, which receive continuous repetitive traffic such as product unloading areas and parking lot entrances.

6.5.3 Flexible Pavement

Structural sections for parking lot and drive lane pavements may be full depth asphalt or a composite section of asphalt pavement over aggregate base course. It is our experience that composite pavement sections consisting of asphalt over a base course outperform full-depth asphalt sections.

Flexible pavement is not recommended for Dumpster Pad/ Sanitation Truck Run-up areas. For Dumpster Pad/Sanitation Truck Run-up areas, we recommend rigid pavement as discussed in the following *Rigid Pavement Section*. Allowances for proper drainage and proper material selection of base materials are most important for performance of asphaltic pavements. Ruts and birdbaths in asphalt pavement allow for quick deterioration of the pavement primarily due to saturation of the underlying base and subgrade.

Hot bituminous pavement should meet the requirements as detailed for SuperPave Mixtures in Colorado Department of Transportation Standard Specifications for Road and Bridge Construction. Material meeting the Colorado Department of Transportation requirements for Grading S (¾ inch nominal) or Grading SG (1½ inch nominal) is recommended. In addition, the following are presented as general guidelines for properties of asphaltic concrete.

Parking Lot	
Asphalt Cement	PG 58-28 or PG 64-22
Asphalt Content	As per mix design
Percent Air Voids	3½-5

Asphalt material should be obtained from an approved mix design stating the SuperPave Mixture properties, including optimum asphalt content, job mix formula, and recommended mixing and placing temperatures. Materials and construction methods should be in accordance with the CDOT Standard Specifications for Road and Bridge Construction Section 403.

6.5.4 Aggregate Base Course

If aggregate base course is used as part of the pavement section, the materials should conform to CDOT requirements for Class 6 aggregate base course per Table 703-2 and construction methods should conform to Section 304 of the Colorado Department of Transportation Standard Specifications for Road and Bridge Construction.

6.5.5 Rigid Pavement

The use of concrete for on-site pavements may be considered by the owner. Should concrete pavement be utilized, the concrete should be properly reinforced and jointed and should be constructed from a concrete mixture, which has a 28-day minimum laboratory compressive strength of 4,000 psi. We recommend a maximum water cement ratio of 0.45 and an air-entrainment specification of 5 percent (±1.5 percent) be followed. Expansion joints should be sealed with a polyurethane sealant so that moisture infiltration into the subgrade soils and resultant concrete deterioration at the joints is reduced.

6.6 Soil Corrosivity

Composite samples obtained in the subsurface profile of the upper 5 feet was tested to evaluate the chemical reactivity of the on-site soils and are shown in the following table. Soil pH was performed using method AASHTO T289-91. Water Soluble Sulfate testing was performed using AASHTO T290-91/ASTM D4327.

Summary of Chemical Reactivity Testing

Boring ID	Depth (feet)	Soil pH	Water Soluble Sulfates
B1	2 ½	8.3	0.005%
B3	5	8.1	0.005%

The existing soils have a potential for corrosion issues. Consideration should be given to providing cathodic protection for metal surfaces buried deeper than 5 feet below final FFE grade.

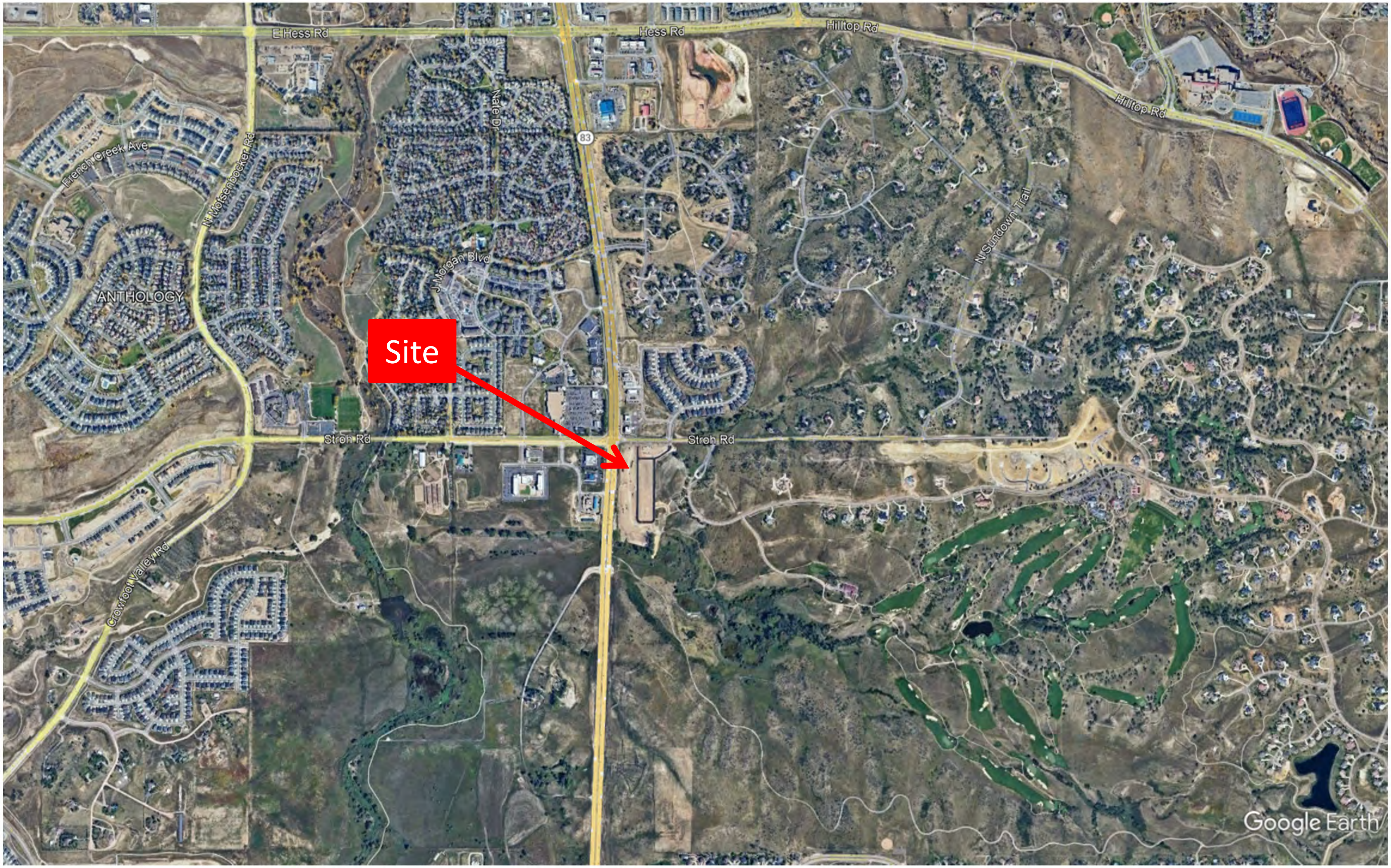
Our test results indicated water-soluble sulfate concentrations of less than 0.1 percent, which are classified in the "negligible" sulfate exposure category according to the American Concrete Institute (ACI) Design Manual Section 318, Chapter 4, 2014 Edition. It is our opinion that concrete in contact with the existing soils may be designed for "negligible" sulfate exposure. PSI recommends using Type I/II Portland Cement.

7.0 LIMITATIONS

The recommendations submitted are based on the subsurface information obtained by PSI and design details furnished by Huntington National Bank. If there are revisions to the plans for this project or if deviations from the subsurface conditions noted in this report are encountered during construction, PSI should be notified immediately to determine if changes in the foundation recommendations are required. If PSI is not retained to perform these functions, PSI will not be responsible for the impact of those conditions on the project.

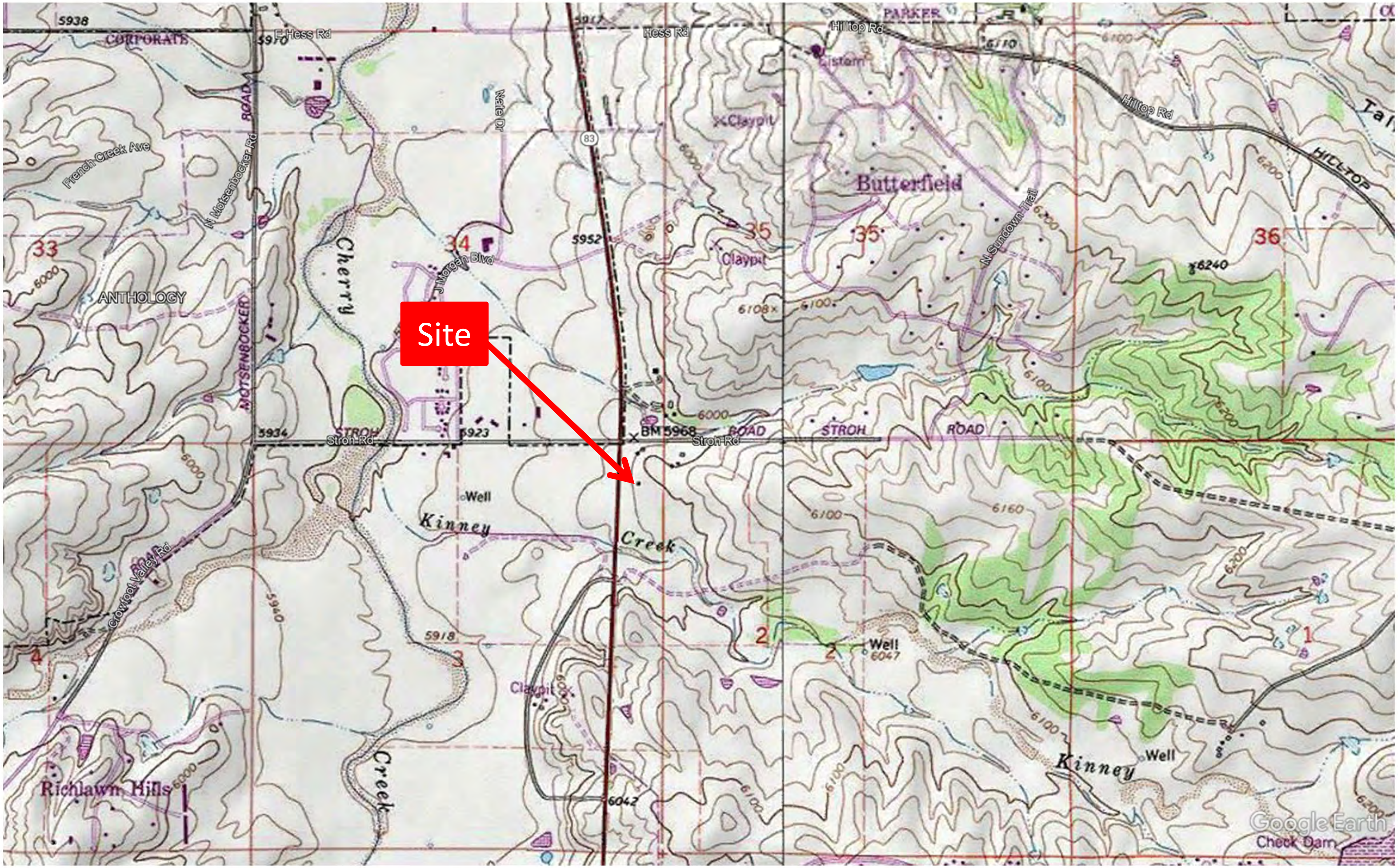
The geotechnical engineer warrants that the findings, recommendations, specifications, or professional advice contained herein have been made in accordance with generally accepted professional geotechnical engineering practices in the local area. No other warranties are implied or expressed.

After the plans and specifications are more complete, the geotechnical engineer should be retained and provided with the opportunity to review the final design plans and specifications to check that our engineering recommendations have been properly incorporated into the design documents. This report has been prepared for the exclusive use of Huntington National Bank and their consultants for the specific application to the proposed Huntington National Bank to be located near South Parker Road and Stroh Road in Parker, Colorado.



Taken From Google Earth

	Huntington National Bank – Parker, CO	JOB NO.	05323040
	Site Vicinity Map	FIGURE NO.	1a



Taken From USGS Map -

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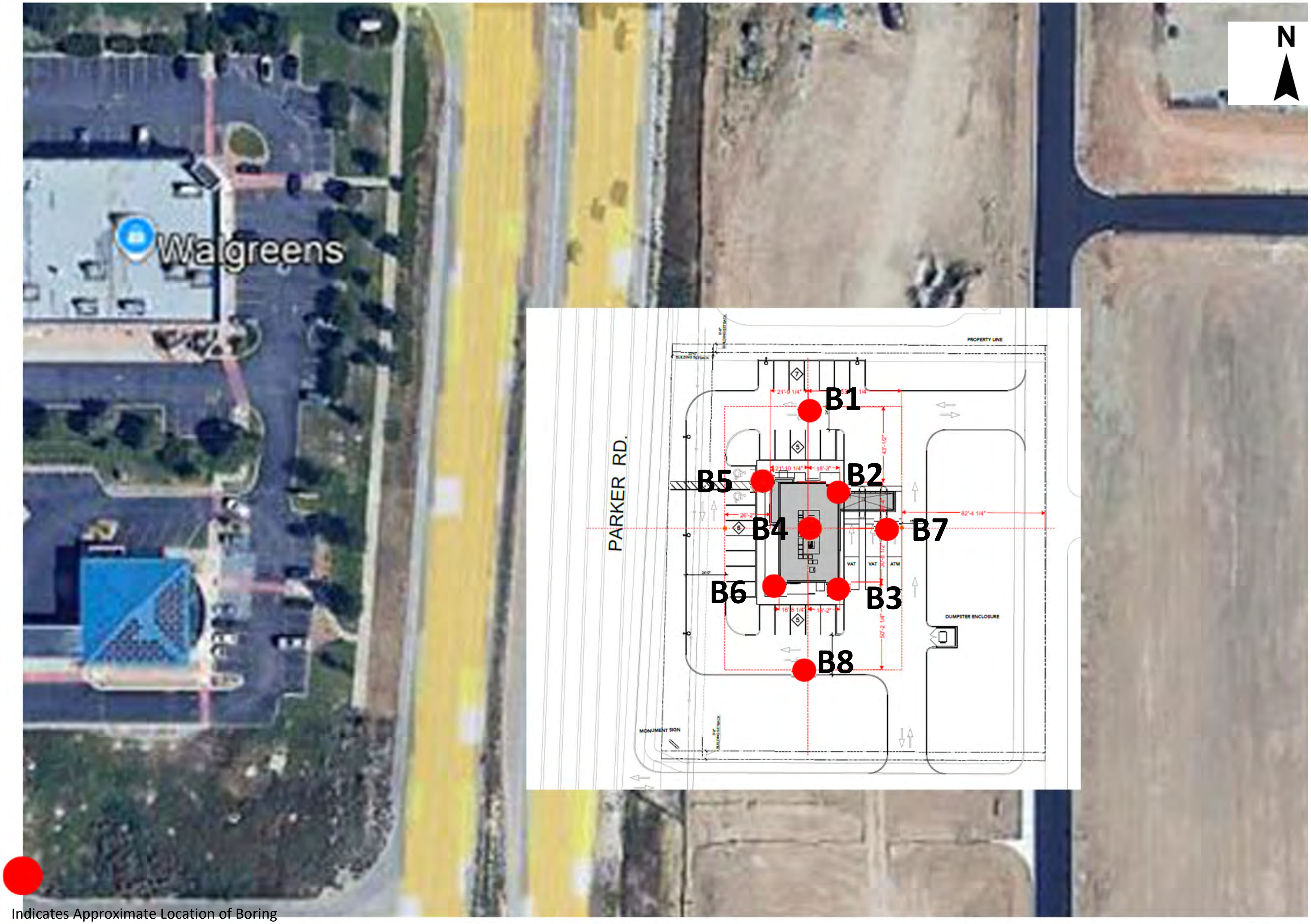
Huntington National Bank – Parker, CO

JOB NO. 05323040

Site Topographical Map

FIGURE NO. 1b



● Indicates Approximate Location of Boring

Taken From Google Earth	intertek psi	Huntington National Bank – Parker, CO	JOB NO. 05323040
		Boring Location Map	FIGURE NO. 2

FIGURE: 3

BORING B1

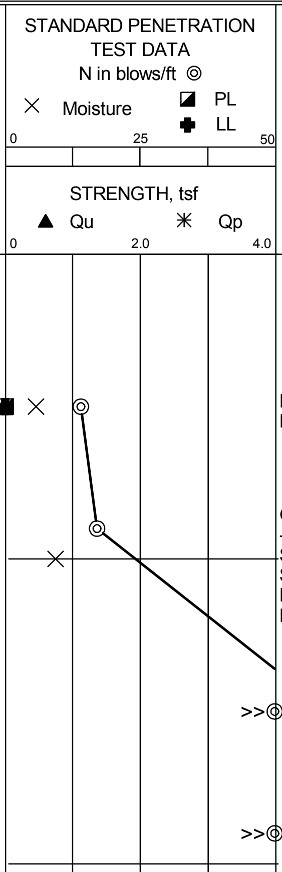
DATE STARTED: 6/19/25
DATE COMPLETED: 6/19/25
COMPLETION DEPTH 10.0 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE:
LONGITUDE:
STATION: N/A **OFFSET:** N/A
REMARKS:

DRILL COMPANY: Dakota Drilling
DRILLER: DD **LOGGED BY:** AV
DRILL RIG: CME-55
DRILLING METHOD: Solid Stem Auger
SAMPLING METHOD: Modified California
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: HT

Water		
▽	While Drilling	Not Observed
▼	Upon Completion	Not Observed
▽	Delay	N/A

BORING LOCATION:
Parking
See Figure 2

Elevation (feet)	Depth, (feet)	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification		Moisture, %	Additional Remarks
	0			**Silty Sand:** Fine to coarse grained sand with gravel, dry to moist, brown to dark brown, loose to dense.				
		1	12			7-7 N=14	6	DD = 106 pcf Non-Plastic
					SM			
		2	12			9-8 N=17		GRAD: -200 = 23.6% SC-SM S(500) = 0.1% P = 1.0K DD = 105 pcf
	5						9	
		3	12			50/12"		
				Claystone: Fine grained sand, moist, brown to dark brown, hard.				
		4	12			50/12"		
	10							



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PROJECT NO.: 05323040
PROJECT: HNB - Parker
LOCATION: S Parker Rd & Stroh Rd
Parker, CO

The stratification lines represent approximate boundaries. The transition may be gradual.

FIGURE: 4

BORING B2

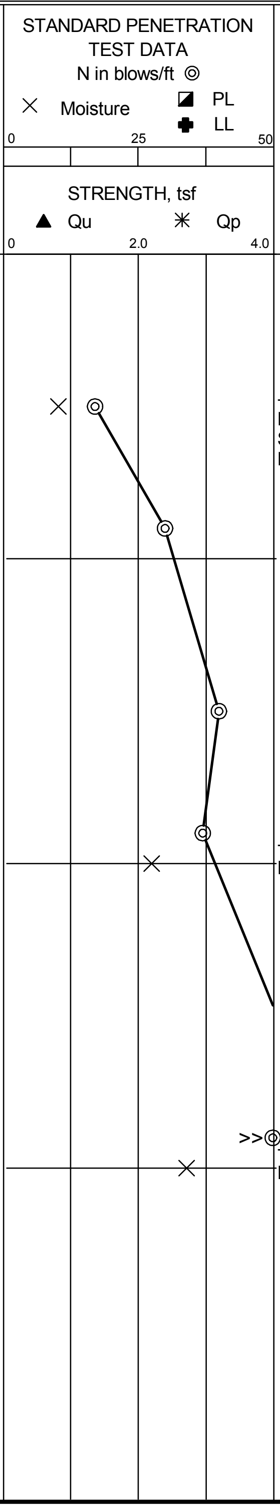
DATE STARTED: 6/19/25
DATE COMPLETED: 6/19/25
COMPLETION DEPTH 15.0 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE:
LONGITUDE:
STATION: N/A **OFFSET:** N/A
REMARKS:

DRILL COMPANY: Dakota Drilling
DRILLER: DD **LOGGED BY:** AV
DRILL RIG: CME-55
DRILLING METHOD: Solid Stem Auger
SAMPLING METHOD: Modified California
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: HT

Water		
▽	While Drilling	Not Observed
▼	Upon Completion	Not Observed
▼	Delay	N/A

BORING LOCATION:
Building
See Figure 2

Elevation (feet)	Depth, (feet)	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification		Moisture, %	Additional Remarks
	0			**Silty Sand:** Fine to coarse grained sand with gravel, dry to moist, brown to dark brown, medium dense	SM			
		1	12			9-8 N=17	10	-200 = 28.7% DD = 106 pcf S(250) = 0.3% P = 0.6K
	5	2	12			13-17 N=30		
		3	12			18-22 N=40		
				Claystone: Fine grained sand, dry, dark brown/dark gray, weathered to hard, iron oxidation staining.				
	10	4	12			17-20 N=37	28	-200 = 95.7% DD = 94 pcf
	15	5	12			50/9"	34	-200 = 90.1% DD = 86 pcf



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The stratification lines represent approximate boundaries. The transition may be gradual.

FIGURE: 5

BORING B3

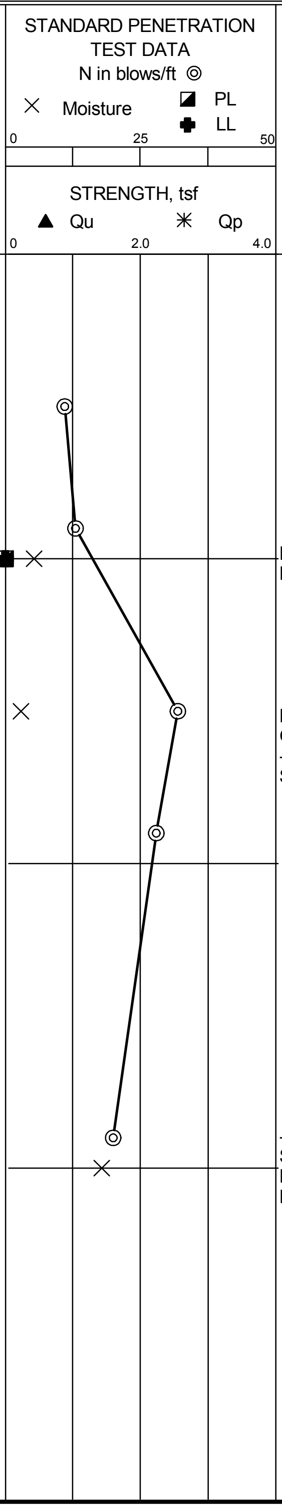
DATE STARTED: 7/3/25
DATE COMPLETED: 7/3/25
COMPLETION DEPTH 15.0 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE:
LONGITUDE:
STATION: N/A **OFFSET:** N/A
REMARKS:

DRILL COMPANY: Dakota Drilling
DRILLER: DD **LOGGED BY:** JWE
DRILL RIG: CME-55
DRILLING METHOD: Solid Stem Auger
SAMPLING METHOD: Modified California
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: HT

Water		
▽	While Drilling	Not Observed
▼	Upon Completion	Not Observed
⊻	Delay	N/A

BORING LOCATION:
Building
See Figure 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification		Moisture, %	Additional Remarks
	0					**Silty Sand:** Fine to coarse grained sand, dry to moist, light brown to brown, loose to medium dense.	SM			
				1	12			4-7 N=11		
	5			2	12			5-8 N=13	5	DD = 109 pcf Non-Plastic
				3	12			12-20 N=32	3	DD = 114 pcf GRAD: -200 = 15.4% SC-SM
	10			4	12			11-17 N=28		
						Clayey Sand: Fine to coarse grained sand with gravel, dry to moist, brown to dark brown, medium dense.	SC			
	15			5	12			7-13 N=20	18	-200 = 37.1% S(1000) = 0.3% P = 1.6K DD = 105 pcf



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Parker, CO

The stratification lines represent approximate boundaries. The transition may be gradual.

Sheet 1 of 1

FIGURE: 6

BORING B4

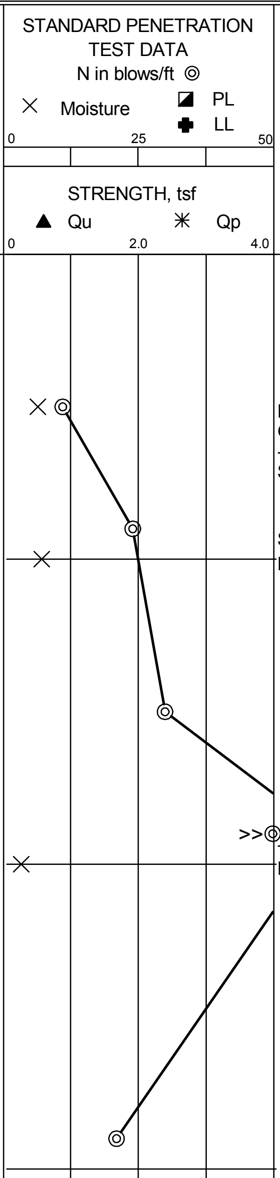
DATE STARTED: 7/3/25
DATE COMPLETED: 7/3/25
COMPLETION DEPTH 15.0 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE:
LONGITUDE:
STATION: N/A **OFFSET:** N/A
REMARKS:

DRILL COMPANY: Dakota Drilling
DRILLER: DD **LOGGED BY:** JWE
DRILL RIG: CME-55
DRILLING METHOD: Solid Stem Auger
SAMPLING METHOD: Modified California
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: HT

Water		
▽	While Drilling	Not Observed
▼	Upon Completion	Not Observed
▽	Delay	N/A

BORING LOCATION:
Building
See Figure 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification		Moisture, %	Additional Remarks
	0					**Clayey Sand:** Fine to coarse grained sand with gravel, dry, light brown to brown, loose to dense.				
				1	12			5-6 N=11	6	DD = 109 pcf GRAD: -200 = 16.4% SC-SM
				2	12			9-15 N=24		S(500) = -0.1%
	5								7	DD = 119 pcf
				3	12		SC	12-18 N=30		
				4	12			50/12"		
	10								3	-200 = 17.7% DD = 117 pcf
				5	12			9-12 N=21		
	15									



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PROJECT NO.: 05323040
PROJECT: HNB - Parker
LOCATION: S Parker Rd & Stroh Rd
Parker, CO

The stratification lines represent approximate boundaries. The transition may be gradual.

FIGURE: 7

BORING B5

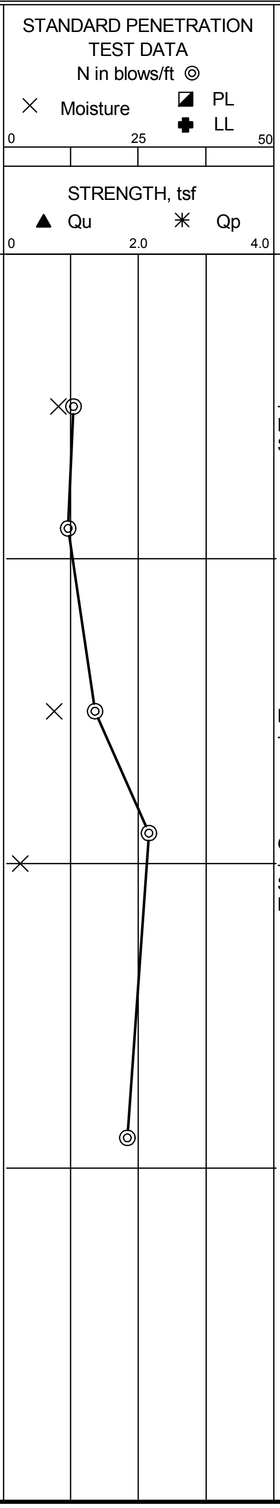
DATE STARTED: 7/3/25
DATE COMPLETED: 7/3/25
COMPLETION DEPTH 15.0 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE:
LONGITUDE:
STATION: N/A **OFFSET:** N/A
REMARKS:

DRILL COMPANY: Dakota Drilling
DRILLER: DD **LOGGED BY:** JWE
DRILL RIG: CME-55
DRILLING METHOD: Solid Stem Auger
SAMPLING METHOD: Modified California
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: HT

Water		
▽	While Drilling	Not Observed
▼	Upon Completion	Not Observed
▼	Delay	N/A

BORING LOCATION:
Building
See Figure 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification		Moisture, %	Additional Remarks
	0					**Clayey Sand:** Fine to coarse grained sand with gravel, dry to moist, light brown to brown, loose to medium dense.				
				1	12			6-7 N=13	10	-200 = 27.2% DD = 107 pcf S(250) = 0.0%
				2	12			4-8 N=12		
	5									
				3	12		SC	7-10 N=17	9	DD = 111 pcf -200 = 25.1%
				4	12			12-15 N=27		GRAD: -200 = 17.7% SC-SM DD = 110 pcf
	10								3	
				5	12			8-15 N=23		
	15									



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PROJECT NO.: 05323040
PROJECT: HNB - Parker
LOCATION: S Parker Rd & Stroh Rd
Parker, CO

The stratification lines represent approximate boundaries. The transition may be gradual.

FIGURE: 8

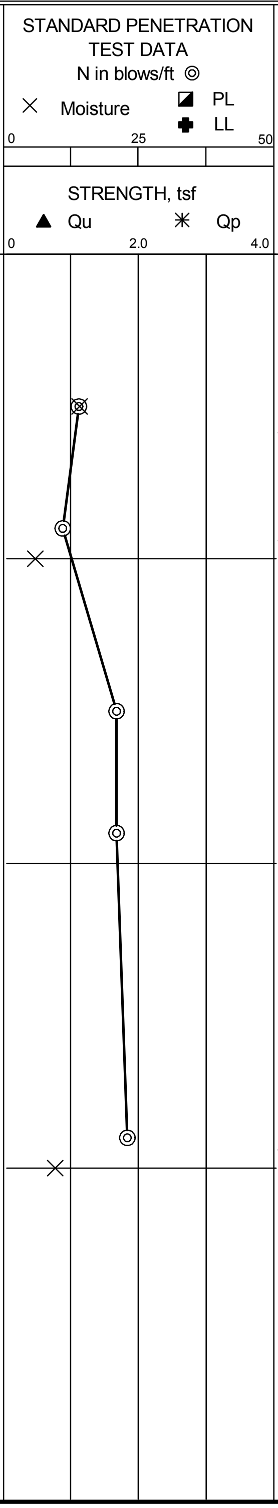
BORING B6

DATE STARTED: 7/3/25
DATE COMPLETED: 7/3/25
COMPLETION DEPTH 15.0 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE:
LONGITUDE:
STATION: N/A **OFFSET:** N/A
REMARKS:

DRILL COMPANY: Dakota Drilling
DRILLER: DD **LOGGED BY:** JWE
DRILL RIG: CME-55
DRILLING METHOD: Solid Stem Auger
SAMPLING METHOD: Modified California
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: HT

Water		
▽	While Drilling	Not Observed
▼	Upon Completion	Not Observed
▽	Delay	N/A

BORING LOCATION:
Building
See Figure 2



Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification		Moisture, %	Additional Remarks
	0					**Clayey Sand:** Fine to coarse grained sand with gravel, dry, light brown to dark brown, loose.	SC			
				1	12			6-8 N=14	14	DD = 114 pcf -200 = 43.7%
						Sand with Clay: Fine to coarse grained sand with gravel, dry, light brown, loose.	SP-SC			
				2	12			5-6 N=11		-200 = 14.6%
	5					**Clayey Sand:** Fine to coarse grained sand with gravel, dry to moist, light brown to brown, medium dense			6	DD = 108 pcf
				3	12			7-14 N=21		
				4	12			7-14 N=21		
	10						SC			
				5	12			8-15 N=23		-200 = 33.7%
	15								10	DD = 116 pcf

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PROJECT NO.: 05323040
PROJECT: HNB - Parker
LOCATION: S Parker Rd & Stroh Rd
Parker, CO

The stratification lines represent approximate boundaries. The transition may be gradual.

FIGURE: 9

DATE STARTED: 7/3/25
DATE COMPLETED: 7/3/25
COMPLETION DEPTH 15.0 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE:
LONGITUDE:
STATION: N/A **OFFSET:** N/A
REMARKS:

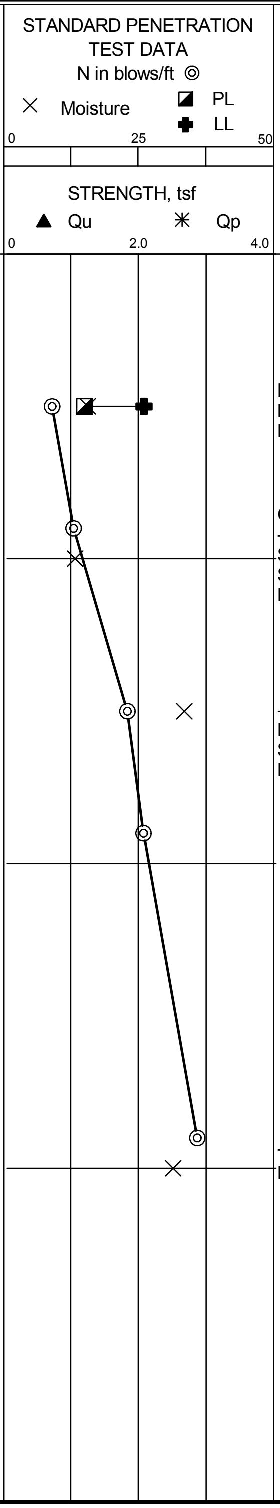
DRILL COMPANY: Dakota Drilling
DRILLER: DD **LOGGED BY:** JWE
DRILL RIG: CME-55
DRILLING METHOD: Solid Stem Auger
SAMPLING METHOD: Modified California
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: HT

BORING B7

Water		
▽	While Drilling	Not Observed
▼	Upon Completion	Not Observed
▽	Delay	N/A

BORING LOCATION:
Canopy
See Figure 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification		Moisture, %	Additional Remarks
	0					**Clayey Sand:** Fine to coarse grained sand with gravel, dry to moist, brown, loose.				
				1	12		SC	4-5 N=9	16	DD = 106 pcf LL = 26 PL = 15
				2	12			5-8 N=13		GRAD: -200 = 30.1% SC S(500) = 0.0% DD = 99 pcf
	5					**Sandy Clay:** Fine to medium grained sand with gravel, dry, dark brown, stiff to very stiff, iron oxdiation staining.			13	
				3	12			10-13 N=23	34	-200 = 56.5% DD = 89 pcf S(750) = 2.1% P = 3.4K
							CL			
				4	12			10-16 N=26		
	10									
						Sandy Claystone: Fine to medium grained sand, dry, gray to dark gray, weathered.				
				5	12			13-23 N=36		-200 = 57.3% DD = 88 pcf
	15								32	



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PROJECT NO.: 05323040
PROJECT: HNB - Parker
LOCATION: S Parker Rd & Stroh Rd
Parker, CO

The stratification lines represent approximate boundaries. The transition may be gradual.

FIGURE: 10

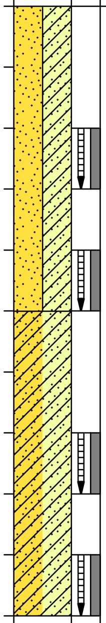
BORING B8

DATE STARTED: 7/3/25
DATE COMPLETED: 7/3/25
COMPLETION DEPTH 10.0 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE:
LONGITUDE:
STATION: N/A **OFFSET:** N/A
REMARKS:

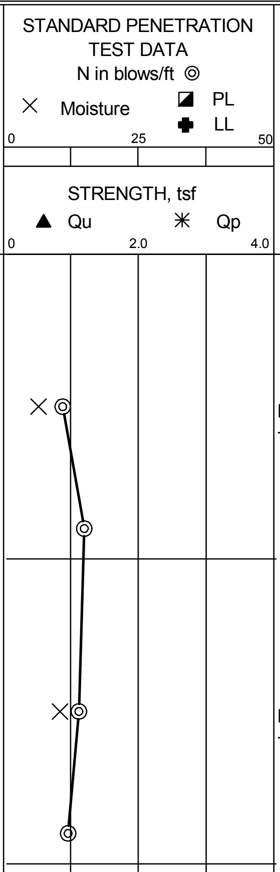
DRILL COMPANY: Dakota Drilling
DRILLER: DD **LOGGED BY:** JWE
DRILL RIG: CME-55
DRILLING METHOD: Solid Stem Auger
SAMPLING METHOD: Modified California
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: HT

Water		
▽	While Drilling	Not Observed
▼	Upon Completion	Not Observed
▽	Delay	N/A

BORING LOCATION:
Parking
See Figure 2



Elevation (feet)	Depth, (feet)	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification		Moisture, %	Additional Remarks
	0			**Sand with Clay:** Fine to coarse grained sand with gravel, dry, light brown, loose.				
		1	12		SP-SC	5-6 N=11	7	DD = 104 pcf -200 = 14.6%
		2	12			6-9 N=15		
	5			**Clayey Sand:** Fine to coarse grained sand with gravel, dry to moist, light brown to brown, loose.				
		3	12		SC	6-8 N=14	11	DD = 115 pcf -200 = 25.7%
		4	12			6-6 N=12		
	10							



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PROJECT NO.: 05323040
PROJECT: HNB - Parker
LOCATION: S Parker Rd & Stroh Rd
Parker, CO

The stratification lines represent approximate boundaries. The transition may be gradual.

KEY TO SYMBOLS

▥ USCS Silty Sand

▨ USCS Poorly-graded Sand with Clay

▨ USCS Clayey Sand

▨ USCS Low Plasticity Clay

▩ Bedrock

SSA = Solid Stem Auger

HSA = Hollow Stem Auger

CFA = Continuous Flight Auger

SPT = Standard Penetration Test

MC - Modified California Sampler

SS = Split-spoon Sampler

ST = Shelby Tube Sampler

RC = Rock Core

DD = Dry Density

MC = Moisture Content

LL = Liquid Limit

PL = Plastic Limit

-200 = Percent Passing the No. 200 Sieve (%)

S(250) = Swell under 250 psf surcharge pressure (%)

S(500) = Swell under 500 psf surcharge pressure (%)

S(1000) = Swell under 1000 psf surcharge pressure (%)

Qu = Unconfined Compressive Strength

RQD = Rock Quality Designation

REC'D = Rock Core Recovery Percentage

PID = Photo Ionic Detector (ppm)

The borings were advanced into the ground using 4-inch solid stem augers. At regular intervals throughout the boring depths, soil samples were obtained with either a 1.4-inch I.D., 2.0-inch O.D., split-spoon sampler or a 2.0-inch I.D., 2.4-inch O.D. Modified California sampler. The samplers were first seated 6-inches to penetrate any loose cuttings and then driven an additional foot where possible with blows of a 140-pound hammer falling 30-inches. The number of hammer blows required to drive the sampler each 6-inch increment is recorded in the field. The penetration resistance "N-value" is redesignated as the number of hammer blows required to drive the sampler the final foot and, when properly evaluated, is an index to cohesion for clays and relative density for sands. N-values recorded on the boring logs are uncorrected. The split-spoon sampling procedures used during this exploration are in general accordance with ASTM Designation D 1586.

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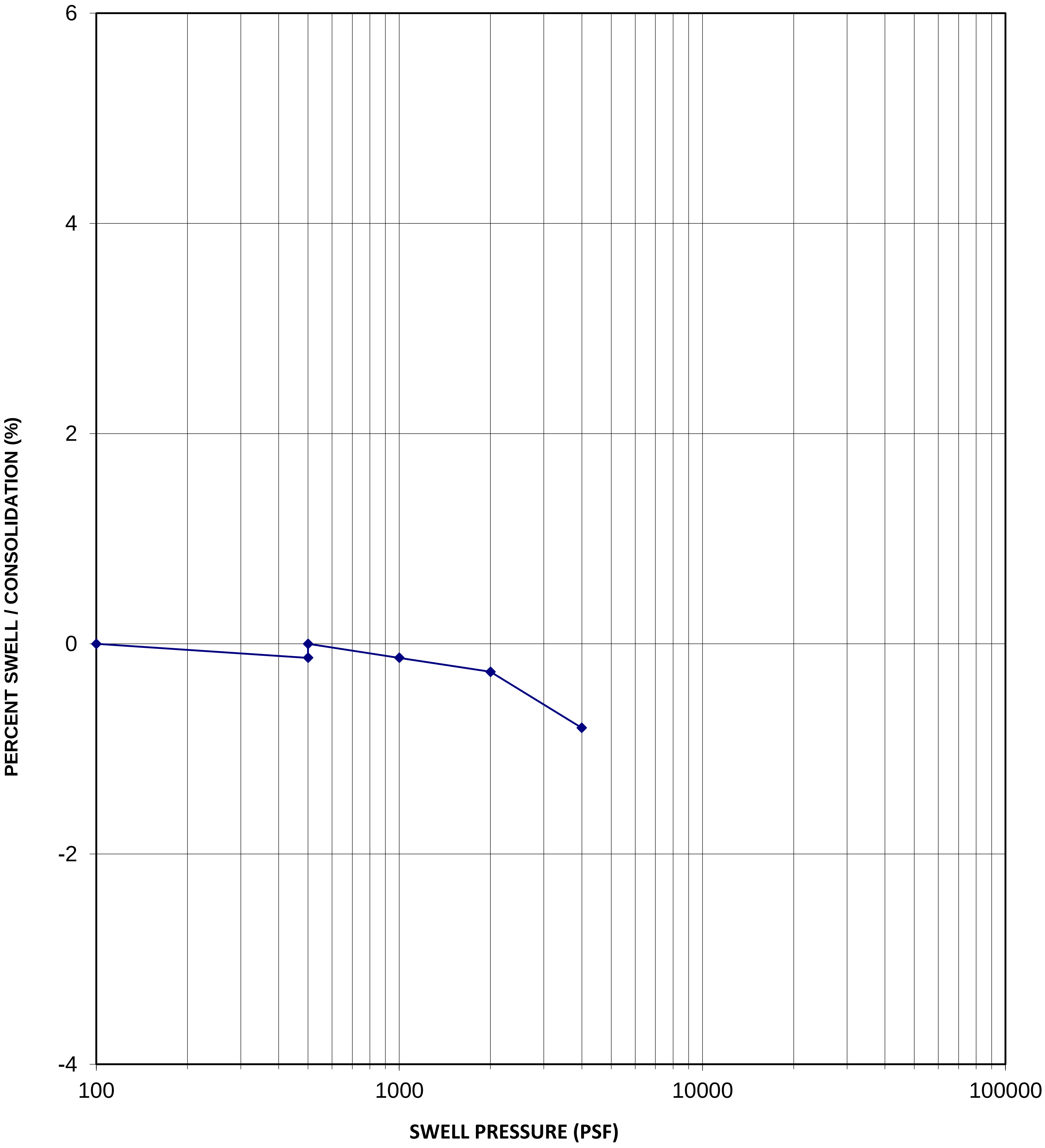
PSI Job No.: 05323040
Project: HNB - Parker
Location: S Parker Rd & Stroh Rd
Parker, CO

Appendix A

Laboratory Test Results

SWELL-CONSOLIDATION TEST

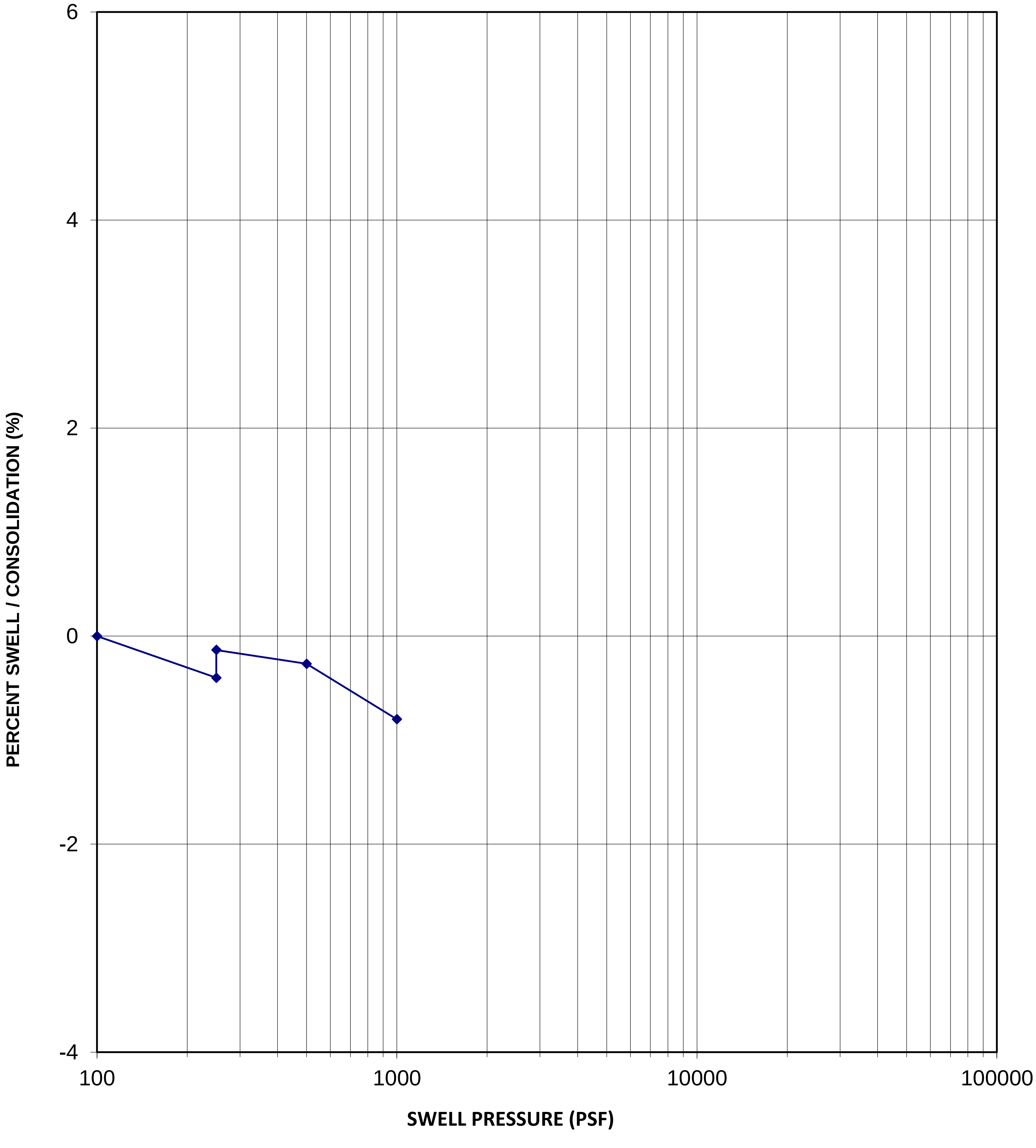


Sample Location	B1
Sample Depth	5 feet
Sample Description	Silty Sand
USCS Classification	SM

Dry Density	105 pcf
In-Situ Moisture Content	9.3 %
Volume Change	0.1 %
Swell Pressure	1,000 psf

intertek psi	**HNB - Parker & Stroh**	**JOB NO.**	**5323040**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A1**

SWELL-CONSOLIDATION TEST

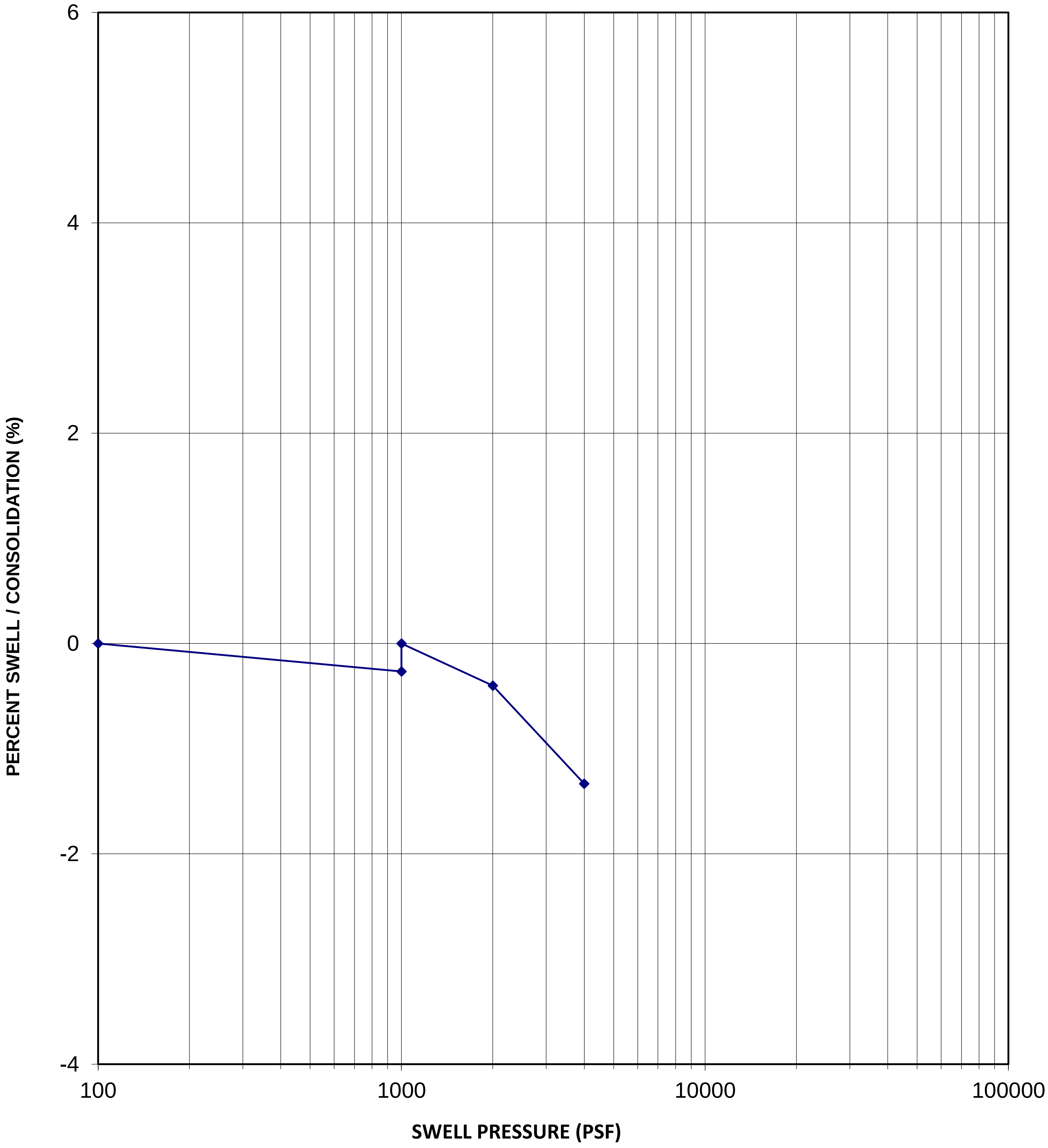


Sample Location	B2
Sample Depth	2.5 feet
Sample Description	Silty Sand
USCS Classification	SM

Dry Density	106 pcf
In-Situ Moisture Content	10.2 %
Volume Change	0.3 %
Swell Pressure	600 psf

intertek psi	**HNB - Parker & Stroh**	**JOB NO.** **5323040**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.** **A2**

SWELL-CONSOLIDATION TEST

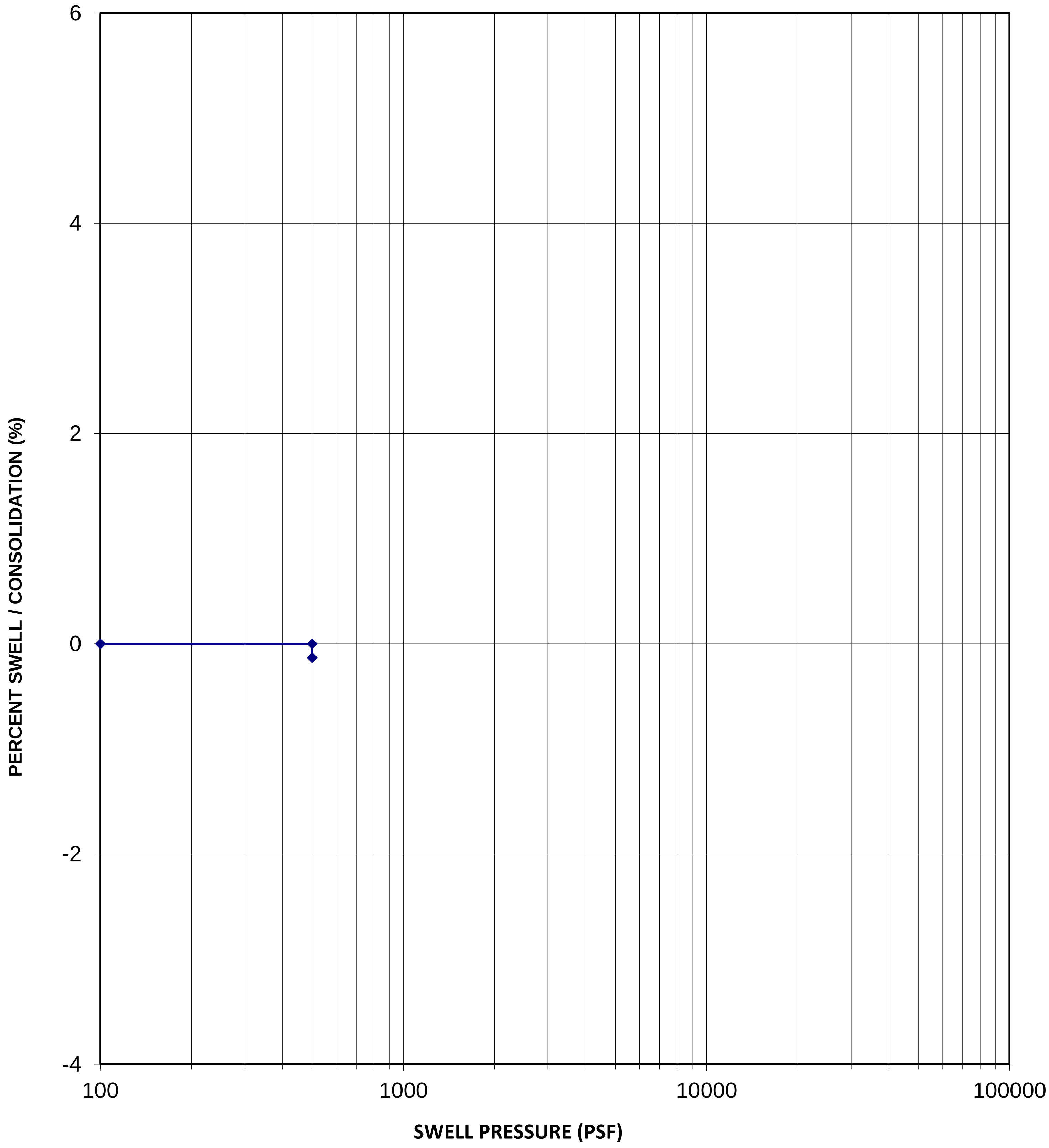


Sample Location	B3
Sample Depth	15 feet
Sample Description	Clayey Sand
USCS Classification	SC

Dry Density	105 pcf
In-Situ Moisture Content	17.9 %
Volume Change	0.3 %
Swell Pressure	1,600 psf

intertek psi	**HNB - Parker & Stroh**	**JOB NO.**	**5323040**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A3**

SWELL-CONSOLIDATION TEST



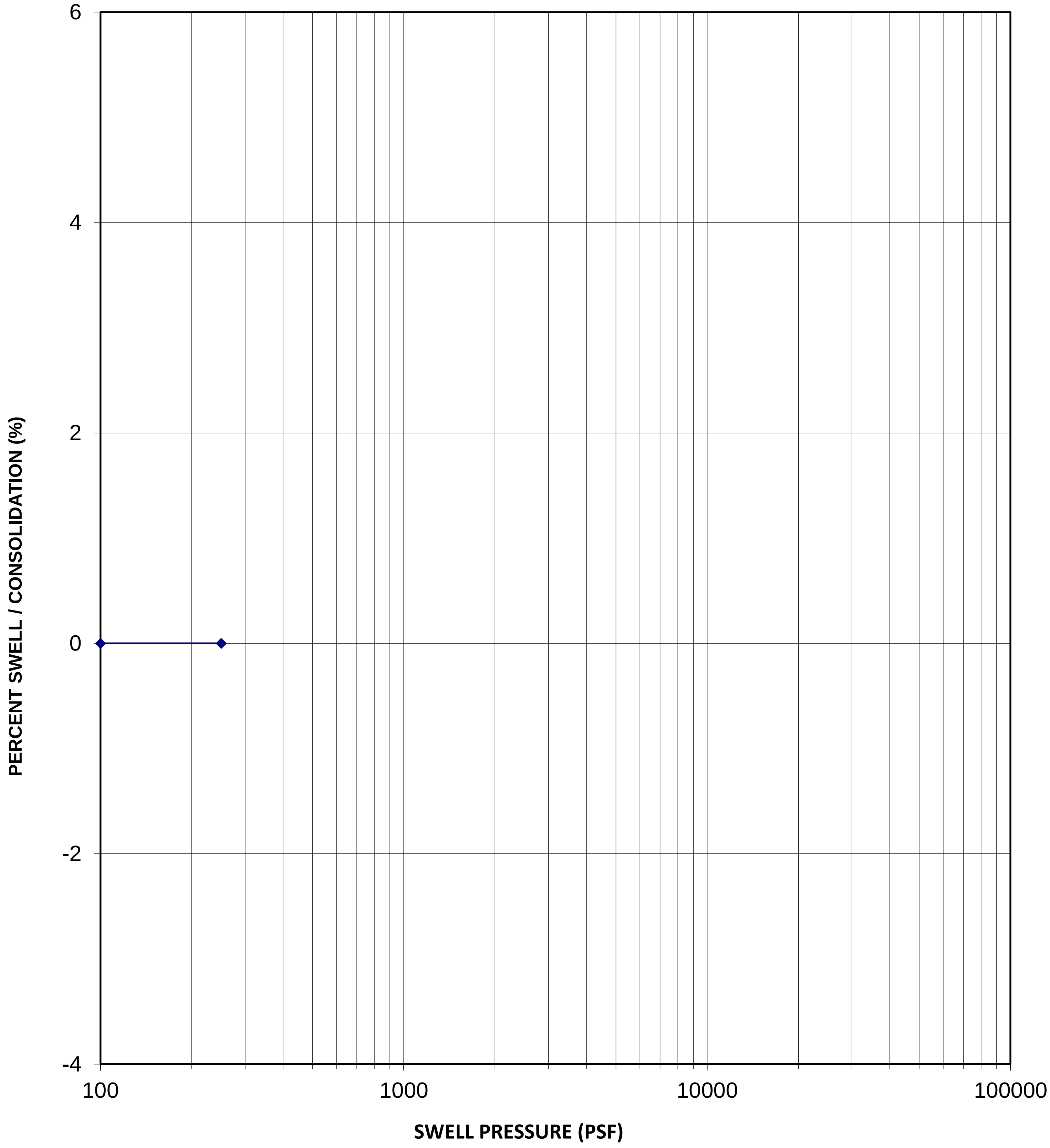
Sample Location	B4
Sample Depth	5 feet
Sample Description	Clayey Sand
USCS Classification	SC

Dry Density	119 pcf
In-Situ Moisture Content	7.1 %
Volume Change	-0.1 %
Swell Pressure	NA psf

intertek psi

HNB - Parker & Stroh	**JOB NO.**	**5323040**
SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A4**

SWELL-CONSOLIDATION TEST

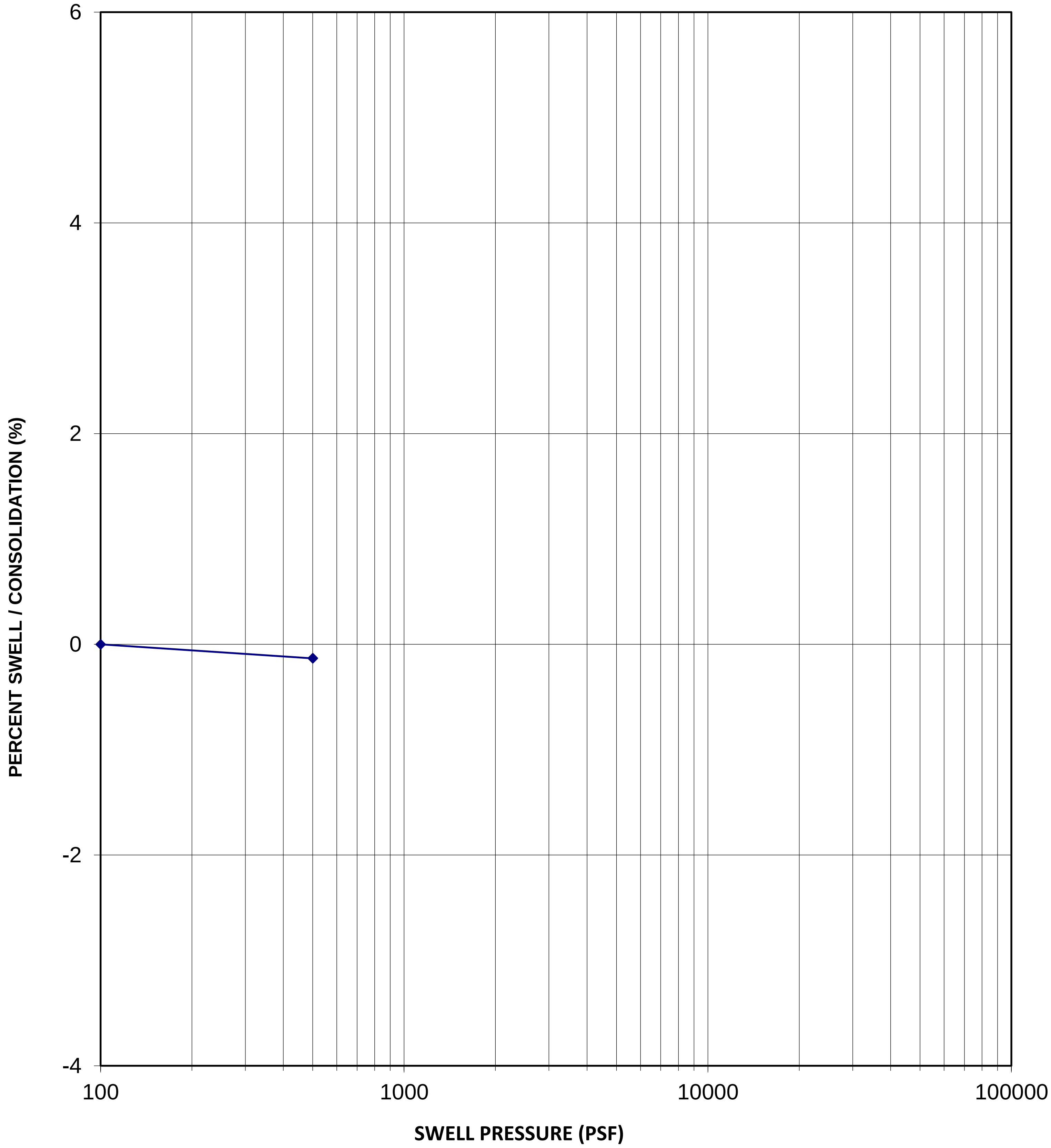


Sample Location	B5
Sample Depth	2.5 feet
Sample Description	Clayey Sand
USCS Classification	SC

Dry Density	107 pcf
In-Situ Moisture Content	10.2 %
Volume Change	0.0 %
Swell Pressure	NA psf

intertek psi	**HNB - Parker & Stroh**	**JOB NO.**	**5323040**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A5**

SWELL-CONSOLIDATION TEST

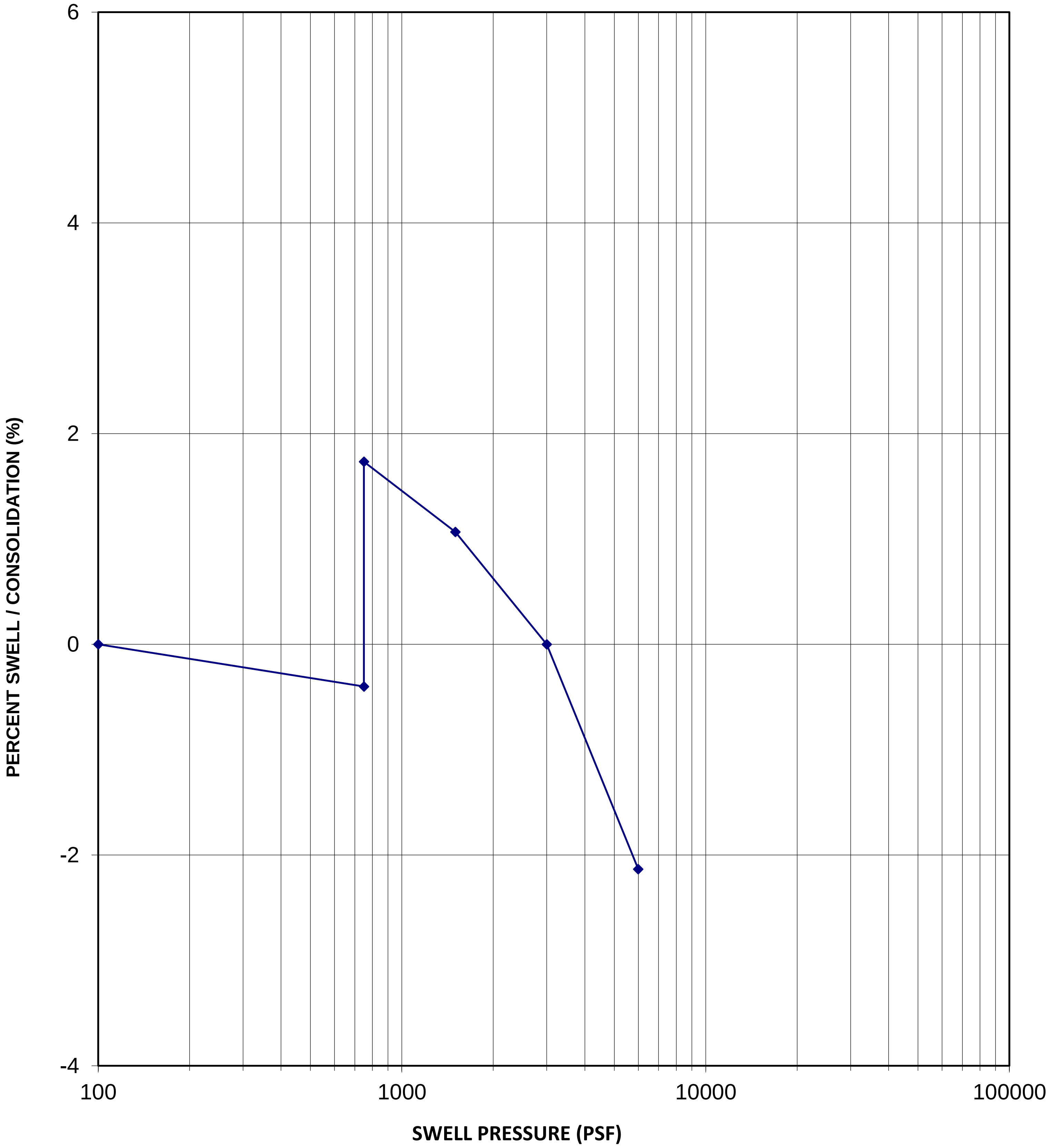


Sample Location	B7
Sample Depth	5 feet
Sample Description	Clayey Sand
USCS Classification	SC

Dry Density	99 pcf
In-Situ Moisture Content	13.3 %
Volume Change	0.0 %
Swell Pressure	NA psf

intertek psi	**HNB - Parker & Stroh**	**JOB NO.**	**5323040**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A6**

SWELL-CONSOLIDATION TEST

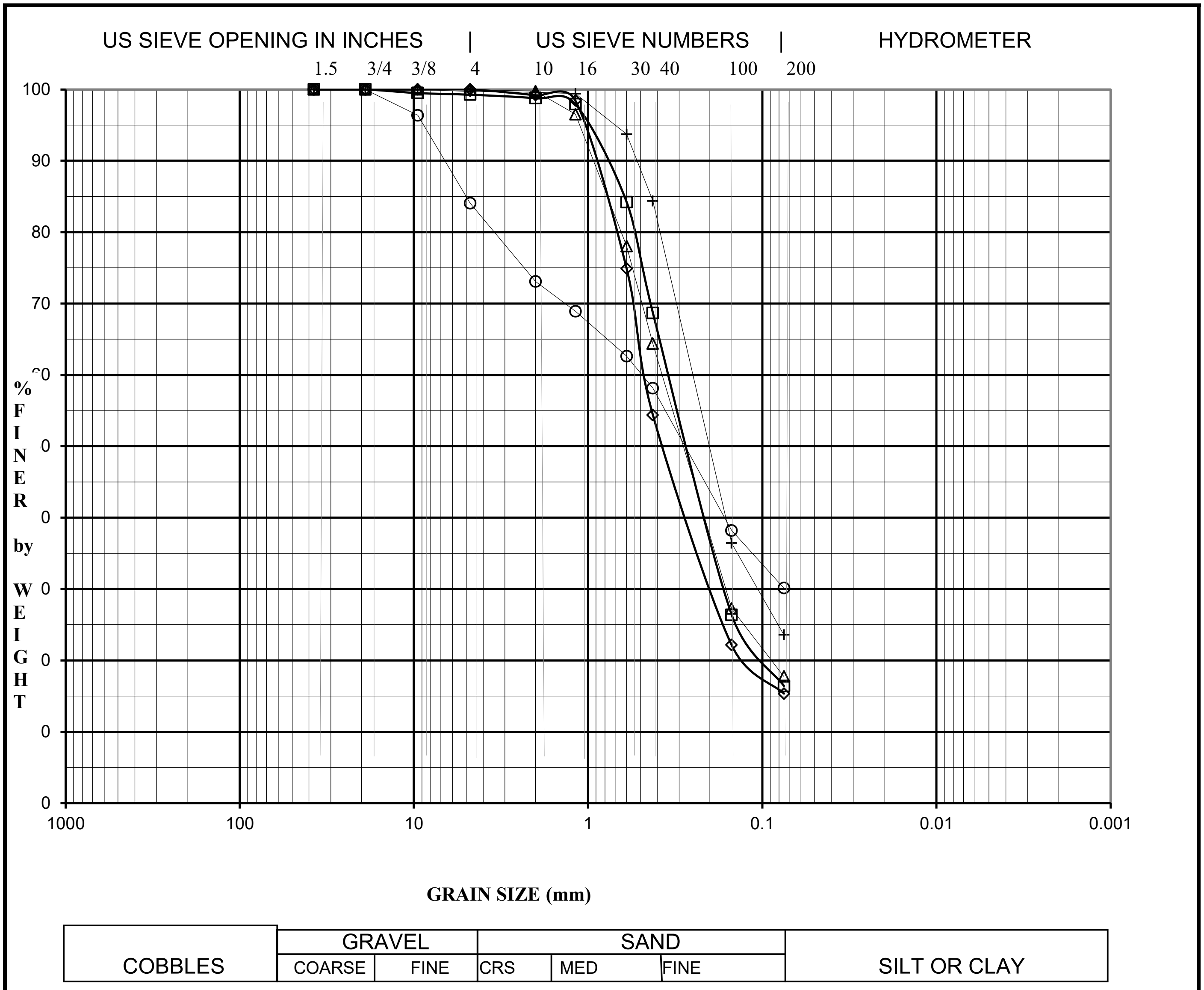


Sample Location	B7
Sample Depth	7.5 feet
Sample Description	Sandy Clay
USCS Classification	CL

Dry Density	89 pcf
In-Situ Moisture Content	33.6 %
Volume Change	2.1 %
Swell Pressure	3,400 psf

intertek psi

HNB - Parker & Stroh	**JOB NO.**	**5323040**
SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A7**



Specimen I.D.	Description	USCS	AASHTO	Group Index	LL	PI	PL
◊ B3 @ 7.5 FEET	Silty Sand	SM	A-2-4	0	NP	NP	NP
□ B4 @ 2.5 FEET	Clayey Sand	SC	A-2-6	0	26	11	15
△ B5 @ 10 FEET	Clayey Sand	SC	A-2-6	0	26	11	15
○ B7 @ 5 FEET	Clayey Sand	SC	A-2-6	0	26	11	15
+ B1 @ 5 FEET	Silty Sand	SM	A-2-4	0	NP	NP	NP

Specimen I.D.	D100	D60	D30	D10	Cc	Cu	%Gravel	%Sand	%Silt&Clay
◊ B3 @ 7.5 FEET	4.75	0.47	0.217				0	85	15
□ B4 @ 2.5 FEET	19.00	0.37	0.173				1	83	16
△ B5 @ 10 FEET	4.75	0.39	0.170				0	82	18
○ B7 @ 5 FEET	19.00	0.50					16	54	30
+ B1 @ 5 FEET	9.50	0.29	0.113				0	76	24

HNB - Parker and Stroh	JOB NO. 05323040
GRADATION CURVES	FIGURE NO. A8