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remove draft from report this is for approval: see CGS comments

Report of Geotechnical Engineering Evaluation

Proposed Multifamily Development
Venetucci Boulevard at South Academy Boulevard
Colorado Springs, Colorado

Prepared for

Thompson Thrift Residential
111 Monument Circle, Suite 1500
Indianapolis, Indiana 46204
ATTN: Mr. Tim Govert

Prepared by

Professional Service Industries, Inc.
1070 West 124th Avenue
Suite 800
Westminster, Colorado 80234

October 11, 2024

PSI Project 05322879

provide recommendations for the foundation preparation and embankment construction of the pond as indicated in DCMV1 11.3.3:

"A geotechnical analysis and report prepared by a Colorado Professional Engineer with recommendations for the foundation preparation and embankment construction shall be submitted to the City/County Engineer with the complete design analysis for all permanent detention facilities."

Project Number: 05322879
October 11, 2024

Professional Service Industries, Inc.
1070 West 124th Avenue, Suite 800
Westminster, Colorado 80234
Phone: (303) 424-5578
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Mr. Tim Govert
Thompson Thrift Residential
111 Monument Circle, Suite 1500
Indianapolis, Indiana 46204

Subject: Report of Geotechnical Engineering Evaluation
Proposed Multi-family Development
Venetucci Boulevard at South Academy Boulevard
Colorado Springs, Colorado

Dear Mr. Tim Govert:

Professional Service Industries, Inc (PSI), an Intertek Company, is pleased to transmit our Report of Geotechnical Engineering Evaluation for the proposed multifamily development in Colorado Springs, Colorado. This report includes the results of the 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.

For Professional Service Industries, Inc.

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Joshua W. Edin
Staff Engineer

Reviewed by: Lloyd Lasher, P.E.
Principal Consultant

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Hannah C. Tawfik, P.E.
Senior Project Engineer

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ATTACHMENTS

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1.0 INTRODUCTION

Professional Service Industries, Inc. (PSI), an Intertek Company, has conducted a geotechnical engineering evaluation for the proposed multifamily development in Colorado Springs, Colorado. The purpose of our study was to characterize the general subsurface strata at the subject site and to develop recommendations for site preparation and provide geotechnical parameters for the pavement and foundation design for the proposed development. Our services on this project were performed in general accordance with PSI Proposal Number 431918 Revision 1 dated August 12, 2024, and authorized by the Agreement for Consulting Services between PSI and Thompson Thrift Residential signed August 20, 2024.

PSI's scope of services for the geotechnical study did not include an assessment of environmental conditions in the soil, bedrock, surface water, groundwater, or air, on or below, or around this site. Any statements in this report or on the 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 pavements.

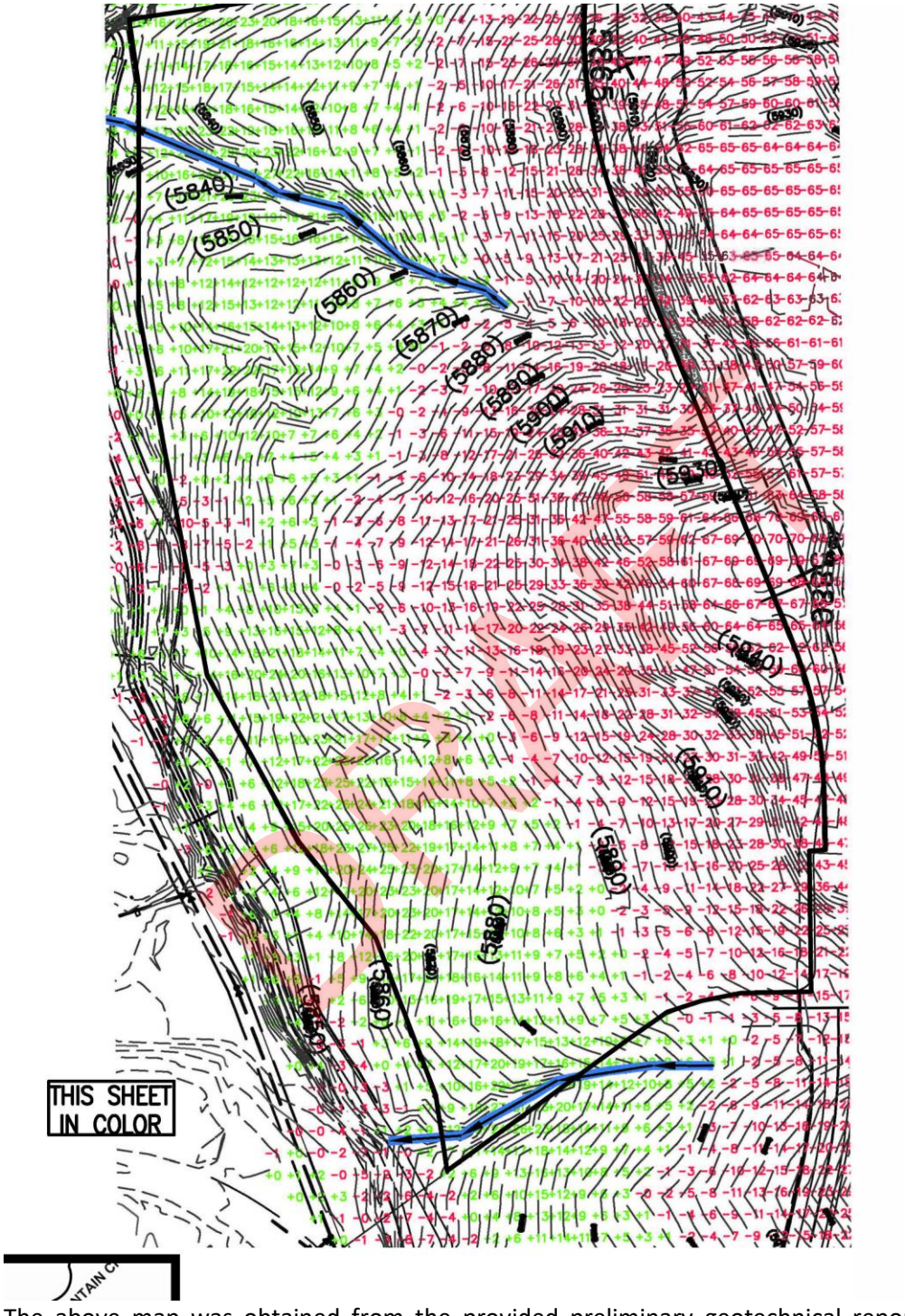
2.0 PROJECT INFORMATION

PSI understands that Thompson Thrift Residential is planning a multifamily development in Colorado Springs Colorado. The site lies at 38.7699 N latitude and 104.7866 W longitude. The site is bordered by vacant land and a creek to the north, Venetucci Boulevard and a commercial development to the east, undeveloped lots and more vacant land to the south, and a creek, additional vacant land, and a residential development to the west.

Project information was provided in an email by Tim Govert, which included a Geotechnical RFP dated July 30, 2024 and a Site Plan dated July 22, 2024. PSI was also provided a preliminary geotechnical report dated July 6, 2023, and testing documents from earthwork performed at the site in 2013. We understand plans are to develop an approximately 16.23-acre site located west of Venetucci Boulevard and approximately ¼ mile north of South Academy Boulevard in Colorado Springs, Colorado. We anticipate the proposed development will consist of 10, three-story multi-family apartment buildings; three, single to two-story amenity buildings; a detention pond; retaining walls 4 to 30 feet in height; and a swimming pool. The apartment buildings are anticipated to be wood frame with no basements planned. Surface parking is also planned with several carport structures.

The site slopes significantly downward towards the northern and western sides of the site up to approximately 60 feet. Significant site grading (cuts of up to 70 feet and fills of up to 20 feet) reportedly occurred in the early 2010s to support surrounding development.

please update to meet County Code requirements of Section 8.4.9 and those of the ECM



The above map was obtained from the provided preliminary geotechnical report by others, showing the grading that reportedly occurred in the early 2010s.

Descriptions of the site are based upon observations made during our field exploration program.

Proposed grades were provided on the July 22, 2024 grading plan. Based on our current project understanding, we anticipate the proposed development will follow existing grades to the extent possible with maximum cuts and/or fills of 5 feet or less across much of the previously graded site area. Fills of up to 40 feet may be required to achieve planned grades along the western side of the site to expand the development area further west. Cuts of 5 to 35 feet are planned for the proposed detention pond area in the northern portion of the site.

It appears retaining walls are planned around the pond and along the western side of the site, ranging from 4 to 30-feet in height, and appear to be supporting new fill. No information was provided regarding the pond or retaining wall design. PSI has provided recommended soil parameters for typical wall backfill including lateral earth pressures to aid in design of the retaining walls by others. Internal stability is typically performed by the wall manufacturer depending on the proposed wall type. External stability is not included in this scope of services but will need to be performed once the wall type and geometry is established. Global and external wall stability analysis can be performed, if requested, for a separate fee once more design information is known.

Anticipated structural loads were provided in the RFP. Based on this, we anticipate structural loads will be on the order of 75 kips for isolated columns in residential buildings and 3 kips per linear foot for walls. No below grade levels are planned.

Pavements are estimated to have a design traffic load of 2 (standard duty) or 5 (heavy duty) EDLAs for a 20-year pavement life. Please notify PSI of the anticipated loads when available, such that our recommendations may be reviewed and modified as necessary.

The geotechnical recommendations presented in this report are based upon the provided project information 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 Pierre Shale-Upper unit (Phanerozoic, Mesozoic, Cretaceous) can be described as “Sedimentary, Clastic, Mudstone, Shale”.

The site was apparently undeveloped prior to 1993, however significant site grading (cuts of up to 70 feet and fills of up to 20 feet) reportedly occurred in the early 2010s to support surrounding development. PSI was provided the testing documents for the mass grading that was performed in 2014. Based on the provided information the fill was generally placed in a controlled manner, however; the 2023 report and previous documentation provided indicate substandard on-site soils were utilized during site grading.

The site may be considered as part of the Colorado Springs Geological Hazard Ordinance area, which includes areas west of I-25. A geological hazard report is not included in this scope of services. Due to the current and proposed slopes, the Colorado Geological Survey may require a geological hazards study.

3.2 Subsurface Conditions

As part of PSI's evaluation of this site, thirty (30) exploratory borings were drilled at the approximate locations as indicated on Figure 2, the Boring Location Map, as follows:

- Fifteen (15) borings were drilled in the approximate areas of the multi-family apartment buildings approximately 25 to 35 feet below existing grade;
- Two (2) borings were drilled in the approximate locations of the amenity buildings to a depth of approximately 20 to 25 feet below existing grade;
- One (1) boring was drilled in the approximate area of the 4 foot retaining wall location to depths of approximately 15 feet below existing grade;
- Four (4) borings were drilled in the approximate location of the 11 to 30 feet retaining wall to depths of approximately 20 to 40 feet below existing grade;
- One (1) boring was drilled in the planned location of the detention pond to depths of approximately 45 feet below existing grade. One boring was also drilled to a depth of 5-feet for a percolation test;
- Six (6) borings were drilled in the pavement areas to depths of approximately 10 to 15 feet below existing grade.

The borings were advanced using a CME-75/55 truck-mounted drill rig equipped with 4-inch diameter, solid-stem, continuous-flight augers. Soil samples were recovered at selected depths during drilling with the truck-mounted drill rig using a Modified California Barrel Sampler (with an inside diameter of 2 inches and an outside diameter of 2.4 inches) or split spoon sampler (with a outside diameter of 2 inches) driven by a 140-pound hammer free-falling 30 inches. The total number of blows required to drive the sampler for 12 inches of penetration is designated as the penetration resistance (N-value, blows per foot) which 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. A correction factor of 0.6 for sand and 0.77 for clay is

used for N-Values collected using the Modified California sampler. The N-values on the logs were not corrected for the Modified California sampler or hammer efficiency.

A representative from our office observed the drilling of the borings and logs were prepared of the encountered conditions. Individual logs of the borings are presented on Figures 3 through 32. It should be noted that the subsurface conditions presented 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 stratification represents the approximate boundary between subsurface materials and the transitions may be gradual and indistinct. Water level information obtained during our field operations is also shown on the boring logs.

3.2.1 General Subsurface Profile

The soil profile generally consisted of documented fill material, low to high plasticity clay, and bedrock. PSI observed the documented fill material from the current ground surface to approximately 14-feet below existing grade in the borings performed along the western portion of the site. However, based on the provided information, we understand deeper fills are likely present on the slopes where PSI was unable to obtain borings. The documented fill material generally consisted of clay with varying amounts of sand, described as dry to moist, brown to dark brown, gray, orange, medium stiff to hard, and medium dense to dense in consistency. Claystone fragments and trace gravel were also observed within the fill. The fill was predominantly encountered along the western side of the site to extend the terrace. It should be noted that the apparent fill can be difficult to discern in the absence of deleterious materials, therefore depths should be considered approximate.

The low to high plasticity clay was observed at surface grade to approximately 3 to 10-feet below existing grade, with the exception of few areas. The clay can be described as having fine to coarse grained sand with trace gravel, dry to moist, brown to dark brown, gray to dark gray, black, and stiff to hard in consistency.

Claystone was encountered at the ground surface generally on the eastern portion of the site where the site was previously cut during grading and varied to up to 29 feet below existing grade. It can be described as containing fine to coarse sand with trace gravel, dry to moist, brown to dark brown, gray to dark gray, black and orange, weathered to hard in consistency. Bedrock depths were variable across the site.

3.2.2 Groundwater Conditions

Groundwater was observed in one boring, B28, as shown in figure 2, approximately 15 feet below existing grade during drilling operations. It should be noted that it is possible for the groundwater to be perched or 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 and bedrock materials. The groundwater levels presented in this report are the levels that were observed at the time of our field activities. We recommend the contractor determine water levels at the time of construction.

3.2.3 Swell Potential

PSI has reviewed the "Potentially Swelling Soil and Rock in the Front Range Urban Corridor, Colorado" by Stephen S. Hart, dated 1972. Based on this published map, the subject site lies with an area described as having "Low and Moderate Swell Potential" designation. Low Swell Potential designation is described as "This category includes several bedrock formations and many surficial deposits. The thickness of the surficial deposits may be variable, therefore, bedrock with a higher swell potential may locally be less than 10 feet below the surface." Moderate Swell Potential designation is described as, "This category includes several bedrock formations and a few surficial deposits of variable thickness. Special foundation designs are generally necessary to prevent damage."

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 Denver Swell tests:

Boring	Depth (feet)	Surcharge Pressure (psf)	Moisture Content (%)	Volume Change (%)	Swell Pressure (psf)
B1	2 ½	250	21.2	**2.7**	2,100
B1	7 ½	750	20.5	**2.7**	3,900
B2	7 ½	750	15.8	**3.5**	4,100
B2	10	1000	10.7	**3.1**	3,800
B3	7 ½	750	15.1	**3.9**	9,300
B3	10	1000	16.8	**2.7**	6,300
B4	2 ½	250	22.9	**9.2**	7,200
B5	5	500	13.6	**6.0**	7,500
B6	5	250	20.5	**6.3**	6,300
B6	7 ½	500	15.2	**4.4**	4,100
B8	7 ½	750	12.7	**15.7**	5,300
B9	5	500	12.2	**17.1**	4,300
B10	2 ½	250	18.6	**5.5**	4,800
B10	5	250	13.0	**6.0**	1,100
B10	7 ½	500	13.2	**13.2**	10,000
B11	5	500	9.6	**2.8**	3,200
B12	5	500	11.6	**3.1**	3,400
B12	10	1000	13.2	**3.1**	5,900
B13	15	1000	18.7	**5.9**	12,400
B14	7 ½	750	21.6	**6.9**	9,600
B14	10	1000	20.3	**7.5**	13,700
B16	2 ½	250	20.1	**8.5**	10,600
B16	5	500	14.2	**7.3**	11,500
B17	5	500	19.0	**5.1**	8,800
B18	5	250	15.3	**12.3**	11,000
B18	10	750	18.9	**4.7**	12,500
B19	5	250	18.2	**7.5**	6,300
B19	7 ½	500	20.4	**5.3**	6,800

B20	7 ½	250	11.6	**7.1**	4,100
B20	10	500	15.4	**4.9**	6,100
B20	15	1000	13.6	**4.1**	6,300
B22	10	500	13.5	**5.1**	4,300
B23	5	500	14.6	**4.8**	3,900
B23	10	1000	15.4	**3.6**	7,600
B24	5	500	15.8	**6.0**	11,100
B25	5	250	14.3	**11.6**	11,600
B26	5	500	24.6	**4.0**	6,200
B26	7 ½	750	21.5	**4.7**	7,800
B27	7 ½	750	12.5	**5.9**	4,100
B27	10	1000	11.9	**-0.8**	NA
B28	2 ½	250	15.1	**6.4**	4,500
B29	10	1000	19.7	**3.1**	6,100
B30	5	500	18.1	**-0.1**	NA
B30	7 1/2	500	19.5	**7.7**	12,800

The laboratory swell test results are included in Appendix A and on the individual boring logs. The test results indicated swell percentages of -0.8 to 17.1 percent when tested under a surcharge pressure of 250, 500, 750 and 1,000 psf. 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 majority of the on-site soils and bedrock materials encountered are classified as having a "very high" potential for swell, therefore; mitigation for swell is required. A Standard Proctor test indicated the remolded clay soils also exhibited a swell percent of 3.9 percent when tested within the range of optimum moisture content. 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.

3.2.4 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 determine material properties for our 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 and other engineering characteristics of the subsurface materials. Laboratory test data along with detailed descriptions of the soils 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 30 days from the date of this report and then will be discarded without further notice.

4.0 GEOTECHNICAL EVALUATION

The primary geotechnical concerns at this site are high swelling and high plastic soils, significant previous and future planned site grading, and variable depths to bedrock.

- The on-site soils and bedrock exhibited very high swell potential. PSI performed a Standard Proctor test on a bulk sample of the high plastic clay soils, which appears to be the majority of the shallow site soils. The majority of the in-place soils were tested to be below optimum moisture content. A remolded sample was tested for swell potential, and exhibited a borderline high result.

  Due to the composition of the soils being high plastic, generally 90 percent clay, and having significant concentrations of high swelling claystone bedrock that is difficult to process, it is PSI's opinion that the on-site soils and bedrock should NOT be reused for structural purposes. An imported fill should be used for structural support of the buildings and pavements.

- Significant site grading has previously occurred on the site, including along the western slopes. We have been provided with testing reports of this fill placement. We understand Thompson Thrift will also perform significant site grading in areas. Due to the thickness and extent of the previously placed fill, there is still an inherent risk of poorly compacted or unsuitable materials may exist. We assess the risk of supporting the proposed development on the previously placed fill materials as relatively low given the relatively light anticipated structural loads associated with the proposed development and the assumption that the materials were likely placed with the intention of supporting commercial or retail development based on the adjacent properties. We recommend a contingency be included in the event that unsuitable materials such as organic materials, debris or other unsuitable/unstable materials are encountered and require additional overexcavation or removal.

  However, due to the amount of site grading and construction of slopes, the depth of the previously placed fill, and the clay soils, secondary post-construction settlement may occur within the deep fills and clay soils. Therefore, PSI recommends using an imported fill in accordance with Section 5.1 with a higher sand content. This will compact more thoroughly and attempt to limit secondary consolidation in the building areas.

- Depths to bedrock were variable across the site. Due to the low permeability rates of the claystone bedrock, excavations into bedrock may trap water and provide opportunity to activate swelling soils and bedrock. Therefore, we recommend placing dry wells within each excavation and the bottom of the excavation should be sloped to drain to the area of the dry well. Permanent sumps are also an option. We further recommend that excavations into bedrock across the site be positively drained to proper drainage channels so as not to create additional pooling areas. Drainage of the excavations will be imperative to reduce the risk of swell of the on-site soils and bedrock.

Based on these concerns, PSI recommends the soils in the building areas be overexcavated to a depth of no less than 10-feet below bottom of proposed slab elevation and replaced with properly placed imported fill, in accordance with this report. Pavements may bear on no less than 5-feet of properly placed imported fill. New fill soils used to bring the site to final grade may be included in the total amount of amended soil below buildings and pavements, provided they are placed in accordance with this report.

In lieu of an overexcavation, PSI recommends consideration of a drilled pier and structural slab design for proposed buildings. Lime treatment may also be considered for pavement areas to potentially reduce the amount of overexcavation.

The recommended minimum pavement thicknesses for the subject development have been based on imported fill and a subgrade support R-Value of at least 20. All pavement areas should bear on no less than 5-feet of structural fill.

Moisture fluctuation of the onsite soils will increase its swell/settlement 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, and for the life of the project. The risk of swelling/collapsing soils can be reduced, but not eliminated, by preventing fluctuations in moisture content. Therefore, it is imperative that positive slope away from the building and foundations is maintained, hardscape is constructed around the building perimeter, utilities are prevented from transmitting water via trench bedding or broken lines, and pavements are regularly maintained. Plantings may be placed near the buildings so long as they are xeric in nature and require only drip irrigation. Positive drainage away from the building must be provided and maintained.

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

Prior to site grading or excavation for foundation construction, the site will need to be stripped of all topsoil, vegetation, abandoned utilities, demolition or other debris, etc. We recommend a stripping depth of approximately 3-inches be anticipated for removal of topsoil and vegetation based on the soil boring results. Structures should bear no less than 10-feet of imported structural fill below bottom of slab in the building areas. Pavements should bear at least 5-feet of imported structural fill. Soils should be compacted in accordance with Section 5.2. Excavations should extend no less than 10-feet laterally outside building limits and to one-foot behind back of curb in pavement areas.

Overexcavation into bedrock can create areas where surface water and slowly infiltrating water to collect in the excavation. Therefore, we recommend placing dry wells within each excavation and the bottom of the excavation should be sloped to drain to the area of the dry well. Permanent sumps are also an option. Drainage of the excavations and overall site will be imperative to reduce the risk of swell of the on-site soils and bedrock.

Following rough grading and over-excavation for moisture conditioning and prior to placement of structural fill, a proofroll should be performed. The proofroll should be conducted with a loaded tandem-axle dump truck or similar pneumatic-tired equipment with a minimum weight of 15 tons. Areas that deflect excessively should be further over-excavated, moisture conditioned and recompacted.

Trash and debris, if encountered, should be removed from the site and disposed of in accordance with local and state regulations.

Some areas may be more difficult to process and may require additional stabilization effort. This may include additional overexcavation, rock, and/or geogrid.

The quantity of bedrock requiring excavation will be dependent on proposed grades. Excavations into the sandstone/claystone bedrock are expected to require moderate effort with standard excavation equipment. No blasting, chiseling, etc. is anticipated to be needed, based on the soils at the boring locations.

5.1 Structural Fill

Based on PSI's field and laboratory data, the on-site overburden and bedrock material is generally unsuitable for re-use as site grading, backfill soils, or for use as structural fill. Therefore, we recommend imported fill as outlined below. Depending on the proposed retaining wall type, stricter backfill specifications may need to be met possibly including permeability and gradation requirements. On-site soils may be used in non-structural areas.

Imported structural fill, if required, 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 select fill criteria is intended as a general guideline. Select 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 and approval. 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 D698). **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.** Clay fill soils should be moisture conditioned to a range from optimum moisture content to four percent above optimum moisture content. Sand fill soils should be moisture conditioned to between 2 percent below and 2 percent above optimum moisture content. Fill material should be placed in maximum eight-inch loose lifts.

PSI must be retained as the materials testing firm to provide full-time testing and observation services. 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 PSI.

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

The proposed structures may be founded on monolithic slab foundations bearing on moisture conditioned and recompacted structural fill soils.

6.1 Monolithic Slab-on-Grade Foundation Recommendations

Based on the information encountered at the boring locations, the site soils and bedrock exhibit moderate to high swell potential. Based on the recommended imported fill, we anticipate the swell potential will be less than 1 percent, if the recommendations are followed in accordance with this report. Therefore, a BRAB Type II monolithic slab-on-ground foundation bearing on a subgrade prepared as recommended may be utilized to support the proposed apartment buildings. A Type III may be used, if preferred by the owner.

The grade beam width and depth shall be determined by the project Structural Engineer. Grade beams may be thickened and widened at column or load bearing wall locations to support concentrated load areas, if necessary. Foundation elements such as grade beams or turned down portions of the slab can be designed for a maximum allowable soil bearing capacity of 3,000 pounds per square foot (psf). Exterior or perimeter foundation elements should be founded no less than 30-inches below adjacent ground surfaces for frost depth. All grade beams and floor slabs should be adequately reinforced with steel to reduce cracking and support bending moments caused by loading and minor movements of foundation soils.

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.

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.

6.2 Seismic Parameters

The project site is located within a municipality that employs the International Building Code, 2018 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 underlay 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 latitude 38.7699° N latitude and 104.7866° W longitude 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)	0.199	F_a = 1.3	S_{ms} = 0.259	S_{Ds}= 0.173	T_0= 0.067
1.0 (S_1)	0.058	F_v = 1.5	S_{m1} = 0.087	S_{D1}= 0.058	T_s= 0.335
			$S_{ms} = F_aS_s$ $S_{m1} = F_vS_1$	$S_{Ds} = ⅔*S_{ms}$ $S_{D1} = ⅔*S_{m1}$	$T_0= 0.2*S_{D1}/S_{Ds}$ $T_s= S_{D1}/S_{Ds}$

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.

6.3 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.

6.3.1 Subgrade Preparation Recommendations

PSI recommends the pavement sections bear on no less than 5-feet of imported structural fill. Lime treatment may be considered to potentially reduce the amount of overexcavation/imported fill. PSI can provide these recommendations if desired.

Once the areas below the parking area have been recompacted, the existing site soils should be proofrolled to identify areas of loose soils. The proofroll should be conducted with a loaded tandem-axle dump truck or similar pneumatic-tired equipment with a minimum weight of 15 tons.

6.3.2 Minimum Pavement Thickness Recommendations

Based on the use of imported soils, PSI has used an R-value of 20 for the support soils of the proposed pavement sections. Pavements will be designed to the minimum asphalt depth for this soil type. Once a source of import is known or if lime treatment is proposed, the pavement recommendations should be reviewed.

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

- 14,600 ESALs (Light-Duty Traffic)
- 36,500 ESALs (Heavy-Duty Traffic)

We have also used the following design criteria; a 20-year design life, a Pavement Serviceability Index (PSI) of 2.5 and a Reliability of 85 percent.

Minimum pavement section options are provided for 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
Light Duty Traffic	4 inches Asphalt over 4 inches Aggregate Base Course	5 inches	5 inches
Heavy Duty Traffic	4 inches Asphalt over 6 inches Aggregate Base Course	5 ½ inches	6 inches

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.

6.3.3 Flexible Pavement

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 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.

6.3.4 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.

6.3.5 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.

6.4 Lateral Earth Pressures

Based on our understanding of the project, retaining walls will be required (approximately 4 to 30-feet in height). We have provided soil parameters for typical wall backfill materials to assist with the design of conventional retaining walls. Additional or different soil parameters may be required for other wall types (mechanically stabilized earth (MSE), sheet pile, tie-back/anchored, etc.). PSI should review retaining wall design once known to verify our parameters are applicable.

Retaining walls should be designed to resist lateral earth pressures. Lateral earth pressure is developed from the soils present within a wedge formed by the vertical retaining wall and an imaginary line extending up and away from the bottom of the wall at an approximate 45° angle. The lateral earth pressures are determined by multiplying the vertical applied pressure by the appropriate lateral earth pressure coefficient K. If the walls are rigidly attached to the structure and not free to rotate or deflect at the top, PSI recommends designing the walls for the “at-rest” lateral earth pressure condition using K_o. Walls that are permitted to rotate and deflect at the top can be designed for the active lateral earth pressure condition using K_a. Passive pressure can be determined using K_p, with a factor of safety of 2.0. Recommended parameters for use in relatively short above grade walls are as follows:

Recommended Parameters Typical Wall Backfill Materials			
Material Type	Drained Friction Angle (ϕ')		
In-Situ Lean Clay***	24°		
On-Site Clayey Sands/Structural Fill***	30°		
Compacted Dense Graded Crushed Stone	42°		
Total Soil Density (pcf)	110		
Maximum Toe Pressure on Structural Fill (psf)	2,000		
Groundwater Elevation	Approximately 5810 in Boring B28; generally dry in remaining (elevations approximate)		
Parameters specific to soil type	**Clays**	**Structural Fill**	**Crushed Stone**
Friction Factor for Base	0.30	0.38	0.60 *
Coefficient of Active Pressure (K_a) **	0.42	0.33	0.20 *
Coefficient of Passive Pressure (K_p) **	2.37	3.00	5.0 *
Coefficient of At-Rest Pressure (K_o) **	0.59	0.50	0.33 *

* These values may be used for design only if the crushed stone backfill extends back from the wall certain distances. These are a horizontal distance approximately equal to or greater than the total height of the wall at the surface, and at least one-foot beyond the heel of the wall footing.

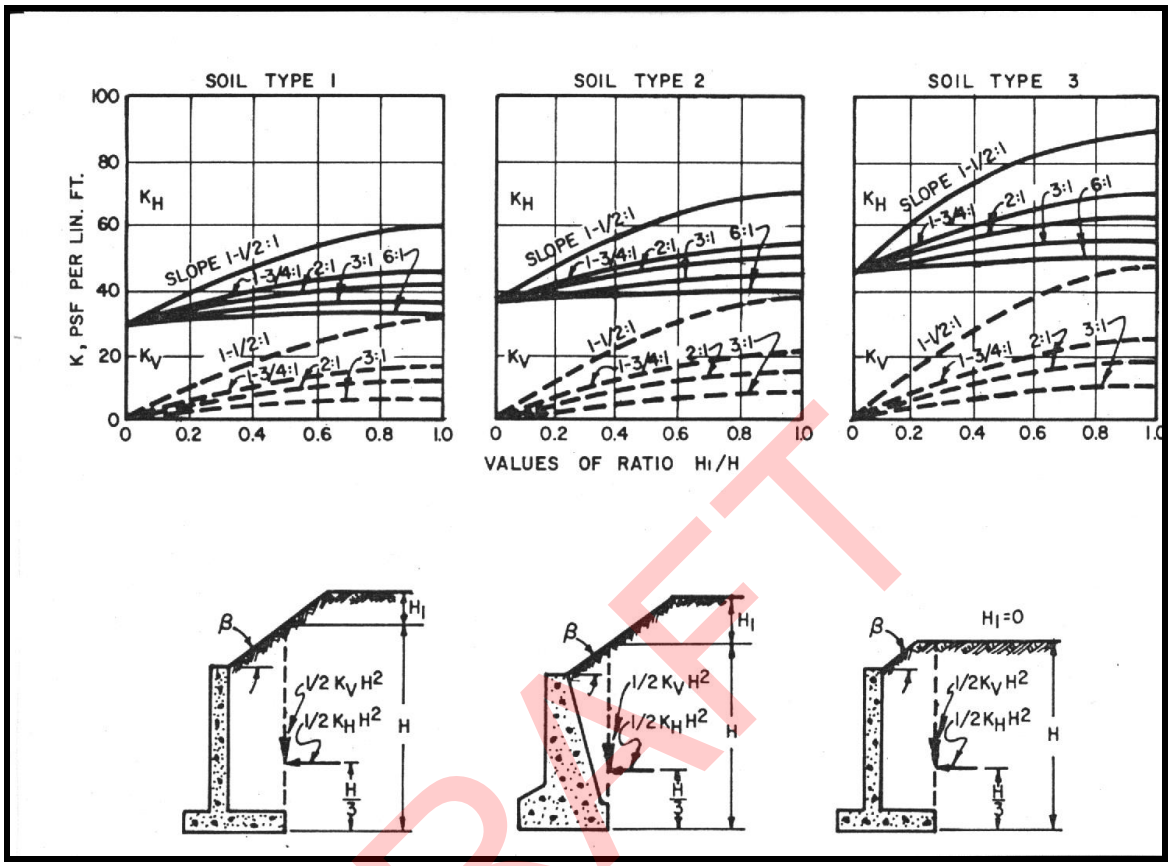
** Earth pressure coefficients valid for level backfill conditions with no surcharge

*** The on-site high plastic clays and bedrock should not be used as wall backfill

The values presented above were calculated based on positive drainage and are provided to prevent the buildup of hydrostatic pressure. If surface loads are placed near the walls, such as traffic loads, they should be designed to resist an additional uniform lateral load of one-half of the vertical surface loads. An "equivalent fluid" pressure can be obtained from the above chart by multiplying the appropriate K-factor times the total unit weight of the soil. This applies to unsaturated conditions only. If a saturated "equivalent fluid" pressure is needed, the effective unit weight (total unit weight minus unit weight of water) should be multiplied times the appropriate K-factor and the unit weight of water added to that resultant. However, PSI does not recommend that earth retaining walls be designed with a hydrostatic load and that drainage should be provided to relieve the pressure.

PSI recommends that retaining wall backfill be provided with positive drainage. In specific design cases where water is allowed to build up on the wall structure, the hydrostatic load correlating to the maximum height of the water build up should be added to the lateral loads acting on the wall.

The designs of retaining walls need to take into account the effects of geometry and loading conditions. The following charts have been included from NAVFAC 7.02 concerning slopes in the grade at the top of below grade wall. Depending on the geometry of the site, the lateral loading on the retaining wall should be modified according to these charts.



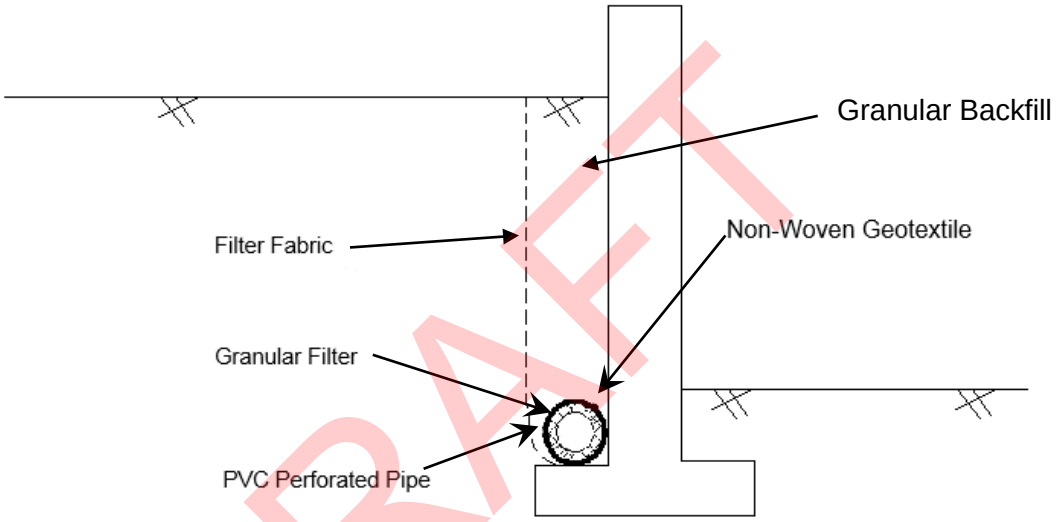
Soil Type 1 – Clean Sand and Gravel, GW, GP, SW, SP
Soil Type 2 – Dirty Sand and Gravel of Restricted Permeability, GM, GM-GP, SM-SP, SM
Soil Type 3 – Stiff Residual Silts and Clays, Silty Fine Sands, Clayey Sands and Gravels: CL, ML, CH, MH, SM, SC, GC

Retaining Wall Backfill and Compaction

Backfill of retaining walls shall consist of low plastic soils or granular materials. The backfill materials should be placed in lifts that do not exceed 8-inches loose. The lift thickness may need to be reduced to thinner lifts immediately behind the walls to achieve the desired about of compaction without overstressing the wall with the compaction process. The backfill materials should be compacted to at least 90 percent of the standard Proctor maximum dry density. Granular material with less than 10 percent passing the #200 sieve should be placed in uniform lifts. Granular material shall be compacted to a minimum dry density of at least 90 percent standard Proctor or 70 percent relative density. Backfill that is placed within 4-feet or 4-feet plus the height of the wall (minus 4-feet) / 2 for wall over 4 feet high, should be placed in thinner lifts with hand compaction equipment to achieve the specified density. Heavy compactors and grading equipment should not be allowed to operate within these limits during the backfilling of the below grade walls to reduce the developing of excessive temporary or long-term lateral soil pressures from the installation process. PSI recommends that a

representative of the geotechnical engineer be present to monitor the below grade wall excavation, construction and backfilling processes. Care should be exercised during the backfilling operation to prevent overstressing and damaging the walls.

PSI recommends that retaining wall backfill be provided with adequate drainage. The actual wall drainage system is a function of the elevation, height and geometry of the wall system and should be designed by a licensed professional engineer. An example of a typical wall drain is as follows:



The placement of a limited amount of granular material behind a retaining wall does not appreciably change the coefficient of lateral earth pressure acting on that wall. The lateral earth pressure acting on a retaining structure is a function of the weight of the soil that exist above the theoretical plane projecting up from the base of the wall. The soil above this plane is held in place by two forces, the strength of the soil itself and the lateral resistance of the retaining wall. Therefore, a thin layer of granular material behind the wall is of little consequence on the forces acting on the wall.

6.5 Pool Recommendations

We recommend the pool bottom and walls should be constructed in and atop no less than 5-feet of imported structural fill. Lateral earth pressure values from the previous section may be used to aid in design of the below grade pool walls.

PSI recommends the following with regard to the proposed swimming pool:

- Special care should be given during construction to prevent surface runoff, rain, or other

precipitation from collecting under the pool. If gravity drainage or sumps are not available this water can cause extreme distress to the pool construction and clog the drainage system.

- PSI recommends installing a free draining granular underdrain system below the bottom of the pool and beside the sidewalls of the pool that is gravity drained or has access to an operating sump system.
- In the presence of plastic clays either under the pool or along the sidewalls, care should be taken to reduce the potential for water to pool, collect or otherwise interact with the high plasticity clays for periods of time exceeding a few days. High plasticity clays can swell in the presence of free water and cause heaving of the floor of the pool or distress in the sidewalls resulting in distress in the pool liner. A non-permeable liner placed on the clay with a free draining granular drain between the liner and the pool structure should be considered in these cases.
- Leaks and other sources of water associated with the swimming pool should be prevented from transmitting water to surrounding soils.

6.6 Soil Corrosivity

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
B7	5	9.0	0.044%
B26	2 ½	7.8	0.31%

The existing soil has a potential for corrosion issues in the presence of water. Consideration should be given to providing cathodic protection for buried metal surfaces greater than 5-feet.

These results classified the soil in the “S0 to S2” 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 “S2” sulfate exposure. PSI recommends using Type V Portland Cement. A corrosion engineer should be contacted prior to construction. The source of imported fill should be tested for corrosivity properties.

6.7 Percolation Test

On September 19, 2024, PSI conducted a percolation test near Boring Nos. B28, within the proposed detention pond area. The soil in that area generally consisted of low to high plasticity clay. Based on the percolation test performed, the soil has an estimated percolation rate of 8

inches per hour. The underlying clay soils and bedrock will percolate at a much slower rate. Depending on the grading of the pond area and the imported soils used, a percolation test should be performed at that time. An appropriate factor of safety should be applied. The grading and pond soils should be reviewed prior to design.

6.8 Drainage Recommendations

PSI recommends that surface infiltration be minimized to reduce the potential for surface water to saturate the soils below the foundations. The ground surface, landscaping, and flatwork should be sloped to drain away from the building. Roof down spouts and drains should discharge well beyond the limits of the building or into the sewer collection system. Additionally, drains should be placed behind retaining walls to prevent hydrostatic buildup.

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.

- 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. Drought tolerant planting design as well as low-pressure, drip irrigation utilizing a master valve and flow sensor should be used within 5-feet of the building foundations.

- Proper slope away from building (5 to 10 percent) and in parking areas (3 to 5 percent) should be maintained. ADA ramp areas may be designed as needed for accessibility, provided the area is sloped to drain away from the building and foundations. The proper drainage away from the building should extend at least 10-feet outside building limits.

- Swales placed within 10-feet of the building should be designed to prevent water collection next to the building foundations. The positive drainage away from buildings should be properly constructed and maintained. Sedimentation build up or other flow and/or grade changes should be prevented.

- 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. Care must be taken to prevent water transmission via bedding material.

7.0 LIMITATIONS

The recommendations submitted are based on the subsurface information obtained by PSI and design details provided by Thompson Thrift Residential. 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 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 Thompson Thrift Residential and their consultants for the specific application to the proposed multifamily development to be located at Venetucci Boulevard at South Academy Boulevard in Colorado Springs, Colorado.

Taken From Google Earth

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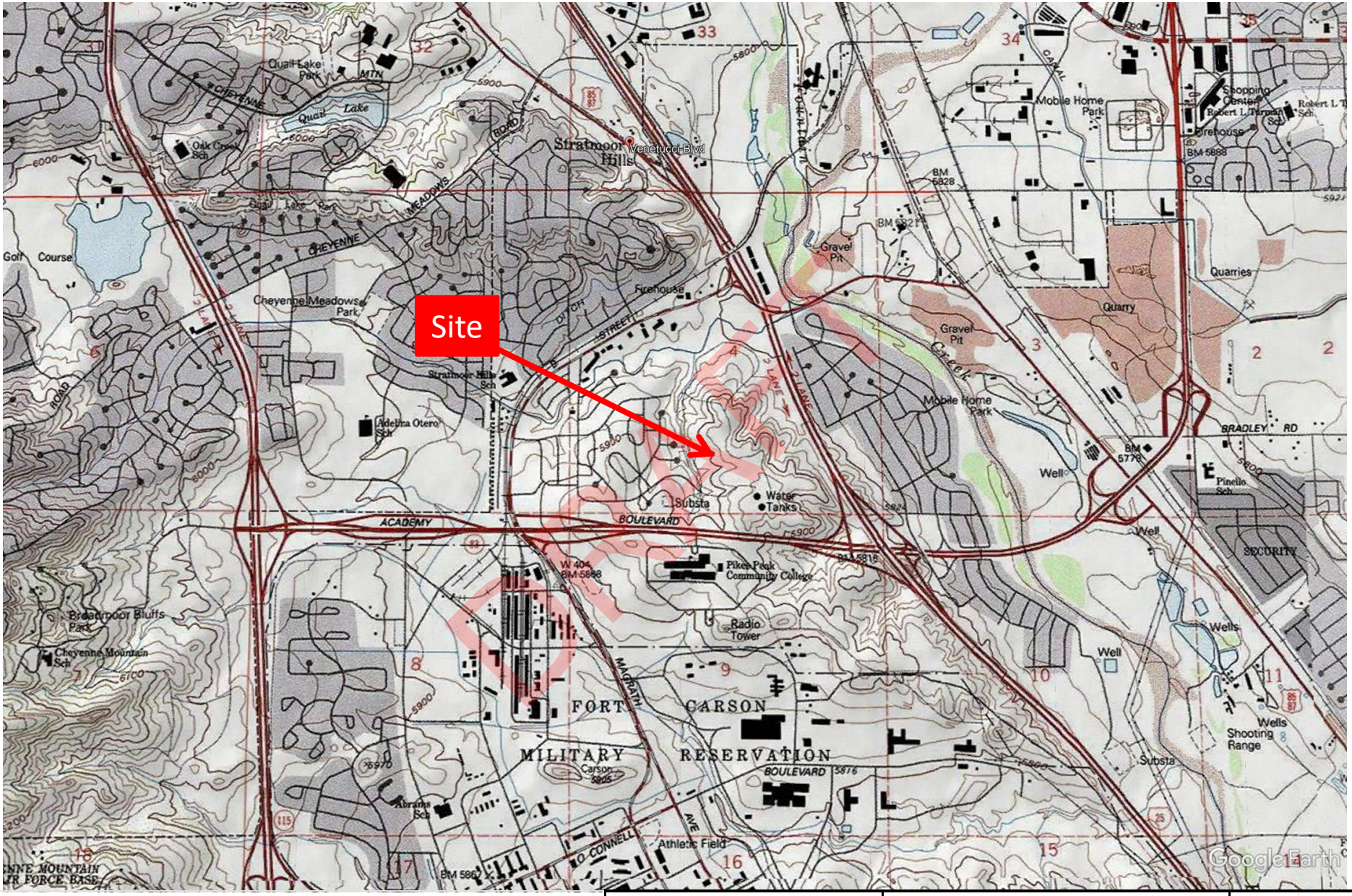
TTRes Multifamily Venetucci – Colorado Springs ,CO

JOB NO. 05322874

Site Vicinity Map

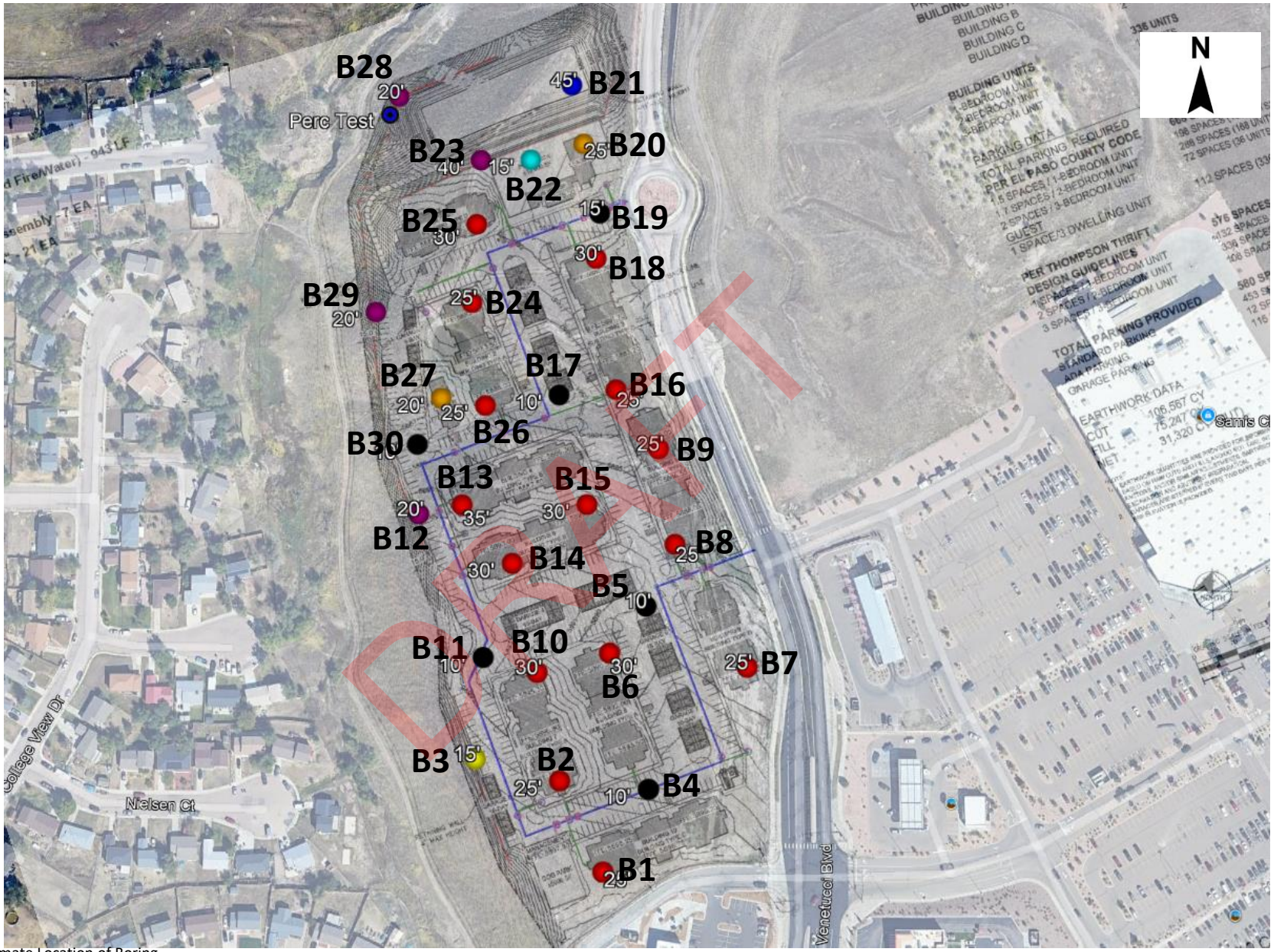
FIGURE NO. 1a



Taken From USGS Map -

intertek psi

TTRes Multifamily Venetucci – Colorado Springs ,CO	JOB NO. 05322874
Site Topographical Map	FIGURE NO. 1b



Indicates Approximate Location of Boring

Taken From Google Earth

intertek psi	TTRes Multifamily Venetucci – Colorado Springs ,CO	JOB NO. 05322874
	Boring Location Map	FIGURE NO. 2

FIGURE: 3

DATE STARTED:	9/11/24	**DRILL COMPANY:**	Dakota Drilling, Inc.		
DATE COMPLETED:	9/11/24	**DRILLER:**	DER	**LOGGED BY:**	DW
COMPLETION DEPTH	25.0 ft	**DRILL RIG:**	CME-75		
BENCHMARK:	N/A	**DRILLING METHOD:**	Solid Stem Auger		
ELEVATION:	5900 ft	**SAMPLING METHOD:**	Modified California		
LATITUDE:	38.7686°	**HAMMER TYPE:**	Manual		
LONGITUDE:	-104.7854°	**EFFICIENCY**	N/A		
STATION:	N/A	**OFFSET:**	N/A	**REVIEWED BY:**	HT

REMARKS:

BORING B 1

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

BORING LOCATION:
Building 10

See Figure No. 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification		Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ / STRENGTH, tsf	Additional Remarks
	0					**Apparent Fill:** Consists of clay and fine to coarse grained sand, dry to moist, brown to dark brown/gray/orange, medium stiff to stiff.					
				1	12			10-12 N=22	21		-200 = 98.2% DD = 101 pcf S(250) = 2.7% P = 2.1K
5895	5			2	12			10-12 N=22	17		-200 = 94.8% DD = 91 pcf
				3	12			5-5 N=10	21		DD = 101 pcf LL = 66 PL = 24
5890	10			4	12	**Claystone:** Dry, black, hard, iron oxidation staining.		7-5 N=12			S(750) = 2.7% P = 3.9K
5885	15			5	7			50/7"	18		-200 = 99.4%
5880	20			6	6			50/6"			
5875	25			7	7			50/7"			

intertek psi
Professional Service Industries, Inc.
1070 West 124th Avenue, Suite 800
Westminster, CO 80234
Telephone: (303) 424-5578

PROJECT NO.: 05322879
PROJECT: TTRes Venetucci Multifamily
LOCATION: Venetucci Blvd at South Academy Blvd
Colorado Springs, CO

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

FIGURE: 4

DATE STARTED:	9/11/24	**DRILL COMPANY:**	Dakota Drilling, Inc.		
DATE COMPLETED:	9/11/24	**DRILLER:** DER	**LOGGED BY:** DW		
COMPLETION DEPTH	25.0 ft	**DRILL RIG:**	CME-75		
BENCHMARK:	N/A	**DRILLING METHOD:**	Solid Stem Auger		
ELEVATION:	5899 ft	**SAMPLING METHOD:**	Modified California		
LATITUDE:	38.7689°	**HAMMER TYPE:**	Manual		
LONGITUDE:	-104.7861°	**EFFICIENCY**	N/A		
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	HT		
REMARKS:					

BORING B 2

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

BORING LOCATION:
Building 7

See Figure No. 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification		Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0 25 50) STRENGTH, tsf ▲ Qu ✳ Qp (0 2.0 4.0)	Additional Remarks
	0					**Apparent Fill:** Consists of clay and fine grained sand with trace gravel, dry to moist, brown to dark brown/orange, very stiff to hard, medium dense to dense.					
5895	5			1	12			8-18 N=26	12		-200 = 44.7%
				2	8			50/8"	18		>> -200 = 97.4%
				3	11			50/11"	16		>> -200 = 98.6% DD = 110 pcf S(750) = 3.5% P = 4.1K S(1000) = 3.1% P = 3.8K DD = 114 pcf GRAD
5890	10			4	12	**Claystone:** Dry, dark brown/black, weathered to hard		50/12"	11		>>
5885	15			5	12			50/12"			>> -200 = 43.8%
5880	20			6	12			16-32 N=48	20		-200 = 99.0%
5875	25			7	10	Weathered Bedrock Zone from 18 to 22 feet		50/10"			>>

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LOCATION: Venetucci Blvd at South Academy Blvd
Colorado Springs, CO

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

FIGURE: 5

DATE STARTED:	9/11/24	**DRILL COMPANY:**	Dakota Drilling, Inc.
DATE COMPLETED:	9/11/24	**DRILLER:** DER	**LOGGED BY:** DW
COMPLETION DEPTH	15.0 ft	**DRILL RIG:**	CME-75
BENCHMARK:	N/A	**DRILLING METHOD:**	Solid Stem Auger
ELEVATION:	5898 ft	**SAMPLING METHOD:**	Modified California
LATITUDE:	38.7688°	**HAMMER TYPE:**	Manual
LONGITUDE:	-104.7864°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	HT
REMARKS:			

BORING B 3

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

BORING LOCATION:
Retaining Wall

See Figure No. 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification		Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ / STRENGTH, tsf	Additional Remarks
	0									Moisture ✕ PL ◪ LL ✚ (0, 25, 50) / Qu ▲ Qp ✳ (0, 2.0, 4.0)	
5895				1	8	**Apparent Fill:** Consists of clay and poorly graded sand with trace gravel, dry to moist, brown to dark brown, very stiff to hard.		50/8"		>>◎	
	5			2	12			20-22 N=42		◎	GRAD -200 = 59.9%
5890				3	7	**Claystone:** Dry, brown/black, weathered to hard, iron oxidation staining.		50/7"	15	✕ >>◎	DD = 122 pcf S(750) = 3.9% P = 9.3K
	10			4	12			20-24 N=44	17	✕ ◎	-200 = 97.0% S(1000) = 2.7% P = 6.3K DD = 112 pcf
5885						Weathered Bedrock Zone from 8 to 12 feet					
	15			5	8			50/8"		>>◎	

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LOCATION: Venetucci Blvd at South Academy Blvd
Colorado Springs, CO

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

FIGURE: 6

DATE STARTED:	9/11/24	**DRILL COMPANY:**	Dakota Drilling, Inc.
DATE COMPLETED:	9/11/24	**DRILLER:** DER	**LOGGED BY:** DW
COMPLETION DEPTH	10.0 ft	**DRILL RIG:**	CME-75
BENCHMARK:	N/A	**DRILLING METHOD:**	Solid Stem Auger
ELEVATION:	5897 ft	**SAMPLING METHOD:**	Modified California
LATITUDE:	38.7688°	**HAMMER TYPE:**	Manual
LONGITUDE:	-104.7855°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	HT

REMARKS:

BORING B 4

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

BORING LOCATION:
Pavement

See Figure No. 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification		Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL 0 25 50 STRENGTH, tsf ▲ Qu ✳ Qp 0 2.0 4.0	Additional Remarks
	0					**Claystone:** Dry to moist, brown to dark brown/black/orange, weathered to hard, trace gravel.					
5895				1	12			16-21 N=37	23	× ◎	GRAD -200 = 98.1% DD = 109 pcf S(250) = 9.2% P = 7.2K
	5			2	9			50/9"		>>◎	
5890				3	6			50/6"		>>◎	
	10			4	3			50/3"		>>◎	

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LOCATION: Venetucci Blvd at South Academy Blvd
Colorado Springs, CO

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

FIGURE: 7

BORING B 5

DATE STARTED:	9/11/24	**DRILL COMPANY:**	Dakota Drilling, Inc.
DATE COMPLETED:	9/11/24	**DRILLER:** DER	**LOGGED BY:** DW
COMPLETION DEPTH	10.0 ft	**DRILL RIG:**	CME-75
BENCHMARK:	N/A	**DRILLING METHOD:**	Solid Stem Auger
ELEVATION:	5892 ft	**SAMPLING METHOD:**	Modified California
LATITUDE:	38.7697°	**HAMMER TYPE:**	Manual
LONGITUDE:	-104.7852°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	HT

REMARKS:

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

BORING LOCATION:
Pavement

See Figure No. 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification		Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0 25 50) STRENGTH, tsf ▲ Qu ✳ Qp (0 2.0 4.0)	Additional Remarks
	0					**Claystone:** Dry, black, hard.					
5890				1	9			50/9"			>>◎
	5			2	7			50/7"	14		>>◎ S(500) = 6.0% P = 7.5K GRAD
5885				3	4			50/4"			>>◎ -200 = 99.3% DD = 113 pcf
	10			4	5			50/5"	13		>>◎ -200 = 99.0%

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Colorado Springs, CO

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

FIGURE: 8

BORING B 6

DATE STARTED:	9/11/24	**DRILL COMPANY:**	Dakota Drilling, Inc.
DATE COMPLETED:	9/11/24	**DRILLER:** DER	**LOGGED BY:** DW
COMPLETION DEPTH	30.0 ft	**DRILL RIG:**	CME-75
BENCHMARK:	N/A	**DRILLING METHOD:**	Solid Stem Auger
ELEVATION:	5896 ft	**SAMPLING METHOD:**	Modified California
LATITUDE:	38.7694°	**HAMMER TYPE:**	Manual
LONGITUDE:	-104.7856°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	HT

Water

BORING LOCATION:
Building 8

See Figure No. 2

REMARKS:

Elevation (feet)	Depth, (feet)	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification		Moisture, %	Additional Remarks
5895	0			**Claystone:** Dry to moist, brown/dark gray/black, hard				
		1	9			50/9"		>>@
	5	2	9			50/9"	21	>>@ 200 = 99.0% S(250) = 6.3% P = 6.3K DD = 104 pcf
5890		3	3			50/3"	15	>>@ DD = 110 pcf S(500) = 4.4%
	10	4	5			50/5"		>>@ P = 4.1K
5885								
	15	5	5			50/5"	17	>>@ DD = 108 pcf
5880								
	20	6	3			50/3"		>>@
5875								
	25	7	3			50/3"	11	>>@ 200 = 99.7%
5870								
	30	8	0			50/0"		>>@

STANDARD PENETRATION TEST DATA
N in blows/ft ◎
× Moisture ◪ PL ✚ LL
0 25 50
STRENGTH, tsf
▲ Qu ✳ Qp
0 2.0 4.0

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PROJECT NO.: 05322879
PROJECT: TTRes Venetucci Multifamily
LOCATION: Venetucci Blvd at South Academy Blvd
Colorado Springs, CO

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

FIGURE: 9

DATE STARTED:	9/12/24	**DRILL COMPANY:**	Dakota Drilling, Inc.		
DATE COMPLETED:	9/12/24	**DRILLER:** DER	**LOGGED BY:** DW		
COMPLETION DEPTH	25.0 ft	**DRILL RIG:**	CME-75		
BENCHMARK:	N/A	**DRILLING METHOD:**	Solid Stem Auger		
ELEVATION:	5890 ft	**SAMPLING METHOD:**	Modified California		
LATITUDE:	38.7695°	**HAMMER TYPE:**	Manual		
LONGITUDE:	-104.7851°	**EFFICIENCY**	N/A		
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	HT		

REMARKS:

BORING B 7

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

BORING LOCATION:
Building 9

See Figure No. 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification		Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL 0 25 50 STRENGTH, tsf ▲ Qu ✳ Qp 0 2.0 4.0	Additional Remarks
	0					**Claystone:** Dry, dark gray/black, hard.					
				1	7			50/7"	14	×	>>◎
5885	5			2	5			50/5"	14	× ◪	>>◎ LL = 94 PL = 20
				3	5			50/5"	11	×	>>◎ GRAD -200 = 99.3%
5880	10			4	4			50/4"			>>◎
5875	15			5	4			50/4"	12	×	>>◎
5870	20			6	5			50/5"			>>◎
5865	25			7	6			50/6"			>>◎

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Colorado Springs, CO

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

FIGURE: 10

DATE STARTED:	9/12/24	**DRILL COMPANY:**	Dakota Drilling, Inc.
DATE COMPLETED:	9/12/24	**DRILLER:** DER	**LOGGED BY:** DW
COMPLETION DEPTH	25.0 ft	**DRILL RIG:**	CME-75
BENCHMARK:	N/A	**DRILLING METHOD:**	Solid Stem Auger
ELEVATION:	5887 ft	**SAMPLING METHOD:**	Modified California
LATITUDE:	38.7761°	**HAMMER TYPE:**	Manual
LONGITUDE:	-104.7853°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	HT

REMARKS:

BORING B 8

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

BORING LOCATION:
Building 5

See Figure No. 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification		Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ / STRENGTH, tsf	Additional Remarks
5885	0					**Claystone:** Dry, dark gray/black, hard.					
				1	4			50/4"		>>◎	
	5			2	4			50/4"	12	>>◎	
5880				3	4			50/4"	13	>>◎	200 = 96.4%
	10			4	3			50/3"	12	>>◎	DD = 101 pcf S(750) = 15.7% P = 5.3K
5875											
	15			5	6			50/6"	12	>>◎	DD = 112 pcf
5870											
	20			6	3			50/3"	12	>>◎	
5865											
	25			7	6			50/6"		>>◎	

Moisture: × ; PL: ◪ ; LL: ✚ (0 – 25 – 50)
STRENGTH, tsf: ▲ Qu ; ✳ Qp (0 – 2.0 – 4.0)

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

FIGURE: 11

DATE STARTED:	9/12/24	**DRILL COMPANY:**	Dakota Drilling, Inc.
DATE COMPLETED:	9/12/24	**DRILLER:** DER	**LOGGED BY:** DW
COMPLETION DEPTH	25.0 ft	**DRILL RIG:**	CME-75
BENCHMARK:	N/A	**DRILLING METHOD:**	Solid Stem Auger
ELEVATION:	5889 ft	**SAMPLING METHOD:**	Modified California
LATITUDE:	38.7704°	**HAMMER TYPE:**	Manual
LONGITUDE:	-104.7854°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	HT

REMARKS:

BORING B 9

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

BORING LOCATION:
Building 5

See Figure No. 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification		Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ / Moisture × / PL ◪ / LL ✚ (0, 25, 50) / STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
	0					**Claystone:** Dry, dark gray/black, hard.					
				1	7			50/7"	16	>>◎	-200 = 99.2%
5885											
	5			2	4			50/4"	12	>>◎	S(500) = 17.1% P = 6.5K DD = 97 pcf
				3	4			50/4"		>>◎	
5880											
	10			4	4			50/4"	13	>>◎	
5875											
	15			5	4			50/4"		>>◎	
5870											
	20			6	4			50/4"		>>◎	
5865											
	25			7	6			50/6"		>>◎	

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LOCATION: Venetucci Blvd at South Academy Blvd
Colorado Springs, CO

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

FIGURE: 12

DATE STARTED:	9/12/24	**DRILL COMPANY:**	Dakota Drilling, Inc.
DATE COMPLETED:	9/12/24	**DRILLER:** DER	**LOGGED BY:** DW
COMPLETION DEPTH	30.0 ft	**DRILL RIG:**	CME-75
BENCHMARK:	N/A	**DRILLING METHOD:**	Solid Stem Auger
ELEVATION:	5898 ft	**SAMPLING METHOD:**	Modified California
LATITUDE:	38.7684°	**HAMMER TYPE:**	Manual
LONGITUDE:	-104.7863°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	HT
REMARKS:			

BORING B10

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

BORING LOCATION:
Building 7

See Figure No. 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification		Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ / STRENGTH, tsf	Additional Remarks
5895	0			1	12	**Fat Clay:** Coarse grained sand, dry, brown to dark brown, very stiff.	CH	11-24 N=35	19		-200 = 94.3% DD = 109 pcf S(250) = 5.5% P = 4.8K
	5			2	11	**Claystone:** Dry, brown/dark gray/black, hard. trace gravel		50/11"	13		-200 = 96.1% S(250) = 6.0%
5890				3	10			50/10"	13		P = 1.1K DD = 92 pcf
	10			4	5			50/5"	17		DD = 115 pcf S(500) = 13.2% P = 10.0K -200 = 97.9%
5885											
	15			5	11			50/11"			
5880											
	20			6	11			50/11"	19		
5875											
	25			7	6			50/6"			
5870											
	30			8	6			50/6"	15		

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LOCATION: Venetucci Blvd at South Academy Blvd
Colorado Springs, CO

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

FIGURE: 13

DATE STARTED:	9/12/24	**DRILL COMPANY:**	Dakota Drilling, Inc.
DATE COMPLETED:	9/12/24	**DRILLER:** DER	**LOGGED BY:** DW
COMPLETION DEPTH	10.0 ft	**DRILL RIG:**	CME-75
BENCHMARK:	N/A	**DRILLING METHOD:**	Solid Stem Auger
ELEVATION:	5899 ft	**SAMPLING METHOD:**	Modified California
LATITUDE:	38.7694°	**HAMMER TYPE:**	Manual
LONGITUDE:	-104.7866°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	HT

REMARKS:

BORING B11

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

BORING LOCATION:
Pavement

See Figure No. 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification		Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ / STRENGTH, tsf	Additional Remarks
	0									Moisture ✕ PL ◪ LL ✚ (0, 25, 50) / Qu ▲ Qp ✳ (0, 2.0, 4.0)	
5895				1	7	**Apparent Fill:** Consists of clay and fine to medium grained sand with gravel, moist, brown to dark brown, hard.		50/7"		>>◎	
	5			2	7			50/7"	10	>>◎ ✕	#200 = 42.5% S(500) = 2.8% P = 3.2K DD = 119 pcf
				3	7	**Claystone:** Dry, dark gray/black, hard.		50/7"		>>◎	
5890				4	9			50/9"		>>◎	
	10										

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LOCATION: Venetucci Blvd at South Academy Blvd
Colorado Springs, CO

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

FIGURE: 14

DATE STARTED:	9/12/24	**DRILL COMPANY:**	Dakota Drilling, Inc.
DATE COMPLETED:	9/12/24	**DRILLER:** DER	**LOGGED BY:** DW
COMPLETION DEPTH	20.0 ft	**DRILL RIG:**	CME-75
BENCHMARK:	N/A	**DRILLING METHOD:**	Solid Stem Auger
ELEVATION:	5895 ft	**SAMPLING METHOD:**	Modified California
LATITUDE:	38.77°	**HAMMER TYPE:**	Manual
LONGITUDE:	-104.7867°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	HT

REMARKS:

BORING B12

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

BORING LOCATION:
Retaining Wall

See Figure No. 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification		Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ / STRENGTH, tsf	Additional Remarks
	0					**Fat Clay:** Fine to medium grained sand with gravel, moist, brown/dark gray/black, stiff to very stiff, claystone (bedrock) interface.	CH	7-11 N=18	17		LL = 61 PL = 21
5890	5			1	12			15-28 N=43	12		S(500) = 3.1% P = 3.4K GRAD
				2	12	**Claystone:** Dry, brown/dark gray/black, weathered to hard, trace gravel					
				3	6			50/6"			200 = 85.2% DD = 111 pcf
5885	10			4	12			50/12"	13		S(1000) = 3.1% P = 5.9K DD = 112 pcf
5880	15			5	12			14-26 N=40	16		DD = 114 pcf
						Weathered Bedrock Zone from 13 to 17 feet					
5875	20			6	8			50/8"			

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

FIGURE: 15

DATE STARTED:	9/12/24	**DRILL COMPANY:**	Dakota Drilling, Inc.
DATE COMPLETED:	9/12/24	**DRILLER:** DER	**LOGGED BY:** DW
COMPLETION DEPTH	35.0 ft	**DRILL RIG:**	CME-75
BENCHMARK:	N/A	**DRILLING METHOD:**	Solid Stem Auger
ELEVATION:	5898 ft	**SAMPLING METHOD:**	Modified California
LATITUDE:	38.7701°	**HAMMER TYPE:**	Manual
LONGITUDE:	-104.7866°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	HT

REMARKS:

BORING B13

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

BORING LOCATION:
Building 4

See Figure No. 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification		Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ / Moisture × / PL ◪ / LL ✚ (0, 25, 50) / STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
	0										
5895				1	12	**Apparent Fill:** Consists of clay and medium to coarse grained sand with trace gravel, dry to moist, brown to dark brown, stiff to hard, claystone fragments, claystone (bedrock) interface.		7-7 N=14	12		-200 = 72.9%
	5			2	11			50/11"			>>
5890				3	6			50/6"			>>
	10			4	12			16-21 N=37			GRAD -200 = 64.2%
5885											
	15			5	6	**Claystone:** Dry, brown/dark gray/black, hard, trace gravel.		50/6"	19		>> S(1000) = 5.9% P = 12.4K DD = 111 pcf
5880											
	20			6	6			50/6"	21		>>
5875											
	25			7	6			50/6"			>>
5870											
	30			8	4			50/4"	12		>> DD = 100 pcf
5865											
	35			9	2	Weathered Bedrock Zone from 10 to 12 feet.		50/2"			>>

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

FIGURE: 16

DATE STARTED:	9/12/24	**DRILL COMPANY:**	Dakota Drilling, Inc.
DATE COMPLETED:	9/12/24	**DRILLER:** DER	**LOGGED BY:** DW
COMPLETION DEPTH	30.0 ft	**DRILL RIG:**	CME-75
BENCHMARK:	N/A	**DRILLING METHOD:**	Solid Stem Auger
ELEVATION:	5898 ft	**SAMPLING METHOD:**	Modified California
LATITUDE:	38.7698°	**HAMMER TYPE:**	Manual
LONGITUDE:	-104.7864°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	HT

REMARKS:

BORING B14

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

BORING LOCATION:
Building 6

See Figure No. 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification		Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ / STRENGTH, tsf	Additional Remarks
5895	0			1	12	**Fat Clay:** Medium to coarse grained sand with trace gravel, moist, brown to dark brown, hard.		50/12"	12		
	5			2	10		CH	50/10"			
5890				3	12			17-20 N=37	22		DD = 109 pcf LL = 74 PL = 21 S(750) = 6.9% P = 9.6K -200 = 99.3% S(1000) = 7.5% P = 13.7K DD = 110 pcf
	10			4	12	**Claystone:** Dry, brown to dark brown/dark gray/black/orange, weathered to hard, trace gravel.		50/12"	20		
5885	15			5	9			50/9"			
5880	20			6	11			50/11"	21		
5875	25			7	4			50/4"			
5870	30			8	6			50/6"			

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FIGURE: 17

DATE STARTED:	9/12/24	**DRILL COMPANY:**	Dakota Drilling, Inc.	**BORING B15**	
DATE COMPLETED:	9/12/24	**DRILLER:** DER	**LOGGED BY:** DW	**Water**	While Drilling: Not Observed
COMPLETION DEPTH	30.0 ft	**DRILL RIG:**	CME-75		Upon Completion: Not Observed
BENCHMARK:	N/A	**DRILLING METHOD:**	Solid Stem Auger		Delay: N/A
ELEVATION:	5894 ft	**SAMPLING METHOD:**	Modified California		
LATITUDE:	38.7699°	**HAMMER TYPE:**	Manual	**BORING LOCATION:** Building 6	
LONGITUDE:	-104.7858°	**EFFICIENCY**	N/A	See Figure No. 2	
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	HT		
REMARKS:					

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification		Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
	0					**Claystone:** Dry, dark gray/black, hard					
				1	6			50/6"		>>◎	
5890											
	5			2	4			50/4"	12	>>◎	
				3	4			50/4"		>>◎	
5885											
	10			4	4			50/4"	12	>>◎	
5880											
	15			5	4			50/4"	6	>>◎	200 = 99.9%
5875											
	20			6	3			50/3"		>>◎	
5870											
	25			7	0			50/3"		>>◎	
5865											
	30			8	0			50/3"		>>◎	

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

FIGURE: 18

DATE STARTED:	9/13/24	**DRILL COMPANY:**	Dakota Drilling, Inc.
DATE COMPLETED:	9/13/24	**DRILLER:** DER	**LOGGED BY:** DW
COMPLETION DEPTH	25.0 ft	**DRILL RIG:**	CME-75
BENCHMARK:	N/A	**DRILLING METHOD:**	Solid Stem Auger
ELEVATION:	5880 ft	**SAMPLING METHOD:**	Modified California
LATITUDE:	38.7708°	**HAMMER TYPE:**	Manual
LONGITUDE:	-104.7857°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	HT

REMARKS:

BORING B16

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

BORING LOCATION:
Building 3

See Figure No. 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification		Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ / STRENGTH, tsf	Additional Remarks
	0					**Claystone:** Dry, dark gray/black, hard					
				1	12			13-41 N=54	20		>>◎GRAD -200 = 98.5% DD = 109 pcf
5875	5			2	4			50/4"	14		>>◎S(250) = 8.5% P = 10.6K S(500) = 7.3%
				3	4			50/4"			>>◎P = 11.5K DD = 122 pcf LL = 63
5870	10			4	4			50/4"	14		>>◎PL = 19
5865	15			5	2			50/2"			>>◎
5860	20			6	4			50/4"	12		>>◎DD = 92 pcf
5855	25			7	4			50/4"			>>◎

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LOCATION: Venetucci Blvd at South Academy Blvd
Colorado Springs, CO

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

FIGURE: 19

DATE STARTED:	9/13/24	**DRILL COMPANY:**	Dakota Drilling, Inc.
DATE COMPLETED:	9/13/24	**DRILLER:** DER	**LOGGED BY:** DW
COMPLETION DEPTH	10.0 ft	**DRILL RIG:**	CME-75
BENCHMARK:	N/A	**DRILLING METHOD:**	Solid Stem Auger
ELEVATION:	5885 ft	**SAMPLING METHOD:**	Modified California
LATITUDE:	38.7708°	**HAMMER TYPE:**	Manual
LONGITUDE:	-104.7858°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	HT

REMARKS:

BORING B17

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

BORING LOCATION:
Pavement

See Figure No. 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification		Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ / STRENGTH, tsf	Additional Remarks
	0			1	12	**Fat Clay:** Moist, brown to dark gray/black, very stiff, claystone fragments.	CH	15-14 N=29	21		-200 = 97.7%
5880	5			2	9	**Claystone:** Dry to moist, dark gray/black, hard.		50/9"	19		>>◎-200 = 97.0% S(500) = 5.1% P = 8.8K DD = 115 pcf
				3	4			50/4"			>>◎
5875	10			4	5			50/5"			>>◎

Moisture ✕ PL ◪ LL — 0 25 50

Qu ▲ Qp ✳ — 0 2.0 4.0

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PROJECT NO.: 05322879
PROJECT: TTRes Venetucci Multifamily
LOCATION: Venetucci Blvd at South Academy Blvd
Colorado Springs, CO

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

FIGURE: 20

DATE STARTED:	9/13/24	**DRILL COMPANY:**	Dakota Drilling, Inc.
DATE COMPLETED:	9/13/24	**DRILLER:** DER	**LOGGED BY:** DW
COMPLETION DEPTH	30.0 ft	**DRILL RIG:**	CME-75
BENCHMARK:	N/A	**DRILLING METHOD:**	Solid Stem Auger
ELEVATION:	5883 ft	**SAMPLING METHOD:**	Modified California
LATITUDE:	38.769°	**HAMMER TYPE:**	Manual
LONGITUDE:	-104.7859°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	HT

REMARKS:

BORING B18

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

BORING LOCATION:
Building 3

See Figure No. 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification		Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ / STRENGTH, tsf	Additional Remarks
5880	0			1	12	**Claystone:** Dry, brown/gray to dark gray/black, weathered to hard, trace gravel.		22-25 N=47			
	5			2	6			50/6"	15		S(500) = 12.3% P = 11.0K DD = 113 pcf
5875				3	5			50/5"			
	10			4	8			50/8"	19		-200 = 96.0% S(750) = 4.7% P = 12.5K DD = 115 pcf
5870											
	15			5	6			50/6"	20		DD = 107 pcf
5865											
	20			6	12			13-15 N=28	16		
5860											
	25			7	2			50/2"	13		
5855											
	30			8	4	Weathered Bedrock Zone 0 to 3 feet and 18 to 22 Feet		50/4"			

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PROJECT NO.: 05322879
PROJECT: TTRes Venetucci Multifamily
LOCATION: Venetucci Blvd at South Academy Blvd
Colorado Springs, CO

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

FIGURE: 21

DATE STARTED:	9/13/24	**DRILL COMPANY:**	Dakota Drilling, Inc.
DATE COMPLETED:	9/13/24	**DRILLER:** DER	**LOGGED BY:** DW
COMPLETION DEPTH	15.0 ft	**DRILL RIG:**	CME-75
BENCHMARK:	N/A	**DRILLING METHOD:**	Solid Stem Auger
ELEVATION:	5884 ft	**SAMPLING METHOD:**	Modified California
LATITUDE:	38.7718°	**HAMMER TYPE:**	Manual
LONGITUDE:	-104.7816°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	HT

REMARKS:

BORING B19

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

BORING LOCATION:
Pavement

See Figure No. 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification		Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ / STRENGTH, tsf	Additional Remarks
	0									Moisture ✕ PL ◪ LL ✚ (0, 25, 50) / Qu ▲ Qp ✳ (0, 2.0, 4.0)	
5880	5			1	12	**Clay:** Fine to coarse grained sand with trace gravel, dry, brown to dark brown/gray, stiff to very stiff.		11-15 N=26			
				2	12		CL	11-26 N=37	18		S(250) = 7.5% P = 6.3K GRAD -200 = 92.9% DD = 114 pcf
				3	12			13-13 N=26	20		DD = 106 pcf S(500) = 5.3% P = 6.8K
5875	10			4	12	**Claystone:** Dry, dark gray/black, hard.		9-10 N=19			
5870	15			5	4			50/4"		>>◎	

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PROJECT NO.: 05322879
PROJECT: TTRes Venetucci Multifamily
LOCATION: Venetucci Blvd at South Academy Blvd
Colorado Springs, CO

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

FIGURE: 22

DATE STARTED:	9/13/24	**DRILL COMPANY:**	Dakota Drilling, Inc.
DATE COMPLETED:	9/13/24	**DRILLER:** DER	**LOGGED BY:** DW
COMPLETION DEPTH	25.0 ft	**DRILL RIG:**	CME-75
BENCHMARK:	N/A	**DRILLING METHOD:**	Solid Stem Auger
ELEVATION:	5885 ft	**SAMPLING METHOD:**	Modified California
LATITUDE:	38.7719°	**HAMMER TYPE:**	Manual
LONGITUDE:	-104.7859°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	HT

REMARKS:

BORING B20

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

BORING LOCATION:
Amenity Building

See Figure No. 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification		Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ / STRENGTH, tsf	Additional Remarks
	0					**Claystone:** Fine to coarse grained sand with gravel, brown/gray to dark gray/black/orange, very stiff to hard.					
				1	7			50/7"			>>◎
5880	5			2	5			50/5"			>>◎
				3	6			50/6"	12		>>◎ DD = 116 pcf, LL = 48, PL = 18
5875	10			4	7			50/7"	15		>>◎ S(250) = 7.1%, P = 4.1K, S(500) = 4.9%, P = 6.1K, GRAD -200 = 95.6%, DD = 110 pcf
5870	15			5	12			18-16 N=34	14		S(1000) = 4.1%, P = 6.3K, DD = 110 pcf
5865	20			6	6			50/6"			>>◎
5860	25			7	7	Weathered Bedrock Zone from 13 to 17 feet.		50/7"	20		>>◎ DD = 106 pcf

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PROJECT NO.: 05322879
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LOCATION: Venetucci Blvd at South Academy Blvd
Colorado Springs, CO

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

FIGURE: 23

DATE STARTED:	9/13/24	**DRILL COMPANY:**	Dakota Drilling, Inc.
DATE COMPLETED:	9/13/24	**DRILLER:** DER	**LOGGED BY:** DW
COMPLETION DEPTH	45.0 ft	**DRILL RIG:**	CME-75
BENCHMARK:	N/A	**DRILLING METHOD:**	Solid Stem Auger
ELEVATION:	5886 ft	**SAMPLING METHOD:**	Modified California
LATITUDE:	38.7723°	**HAMMER TYPE:**	Manual
LONGITUDE:	-104.7859°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	HT

REMARKS:

BORING B21

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

BORING LOCATION:
Detention Pond

See Figure No. 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification		Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ / Moisture × / PL ◪ / LL ✚ (0, 25, 50) / STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
5885	0					**Fat Clay:** Fine to coarse grained sand with trace gravel, dry, dark brown, hard.					
				1	10		CH	50/10"		>>◎	
	5			2	7			50/7"	13	>>◎	-200 = 93.2%
5880						**Claystone:** Dry to moist, brown/gray to dark gray/black/orange, weathered to hard. trace gravel					
				3	10			50/10"		>>◎	
	10			4	11			50/11"		>>◎	
5875											
	15			5	9			50/9"	12	>>◎	-200 = 87.3%
5870											
	20			6	8			50/8"		>>◎	
5865											
	25			7	7			50/7"	14	>>◎	-200 = 88.3%
5860											
	30			8	7			50/7"	12	>>◎	-200 = 86.7%
5855											
	35			9	12			16-17 N=33	21	◎	-200 = 94.7%
5850											
	40			10	12			16-20 N=36		◎	
5845											
	45			11	12	Weathered Bedrock Zone from 35 to 45 feet.		18-16 N=34	22	◎	-200 = 98.3%

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PROJECT NO.: 05322879
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LOCATION: Venetucci Blvd at South Academy Blvd
Colorado Springs, CO

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

FIGURE: 24

DATE STARTED:	9/13/24	**DRILL COMPANY:**	Dakota Drilling, Inc.
DATE COMPLETED:	9/13/24	**DRILLER:** DER	**LOGGED BY:** DW
COMPLETION DEPTH	15.0 ft	**DRILL RIG:**	CME-75
BENCHMARK:	N/A	**DRILLING METHOD:**	Solid Stem Auger
ELEVATION:	5885 ft	**SAMPLING METHOD:**	Modified California
LATITUDE:	38.7701°	**HAMMER TYPE:**	Manual
LONGITUDE:	-104.7863°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	HT

REMARKS:

BORING B22

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

BORING LOCATION:
Pool

See Figure No. 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification		Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ / STRENGTH, tsf	Additional Remarks
	0					**Fat Clay:** Dry, dark brown/dark gray/black, very stiff to hard, trace gravel, claystone fragments					
				1	12		CH	11-17 N=28			
5880	5			2	6			50/6"		>>	
						Claystone: Dry, brown/dark gray/black, weathered to hard, trace gravel					
				3	7			50/7"	12	>>	200 = 97.3%
				4	12			16-24 N=40	14		S(500) = 5.1% P = 4.3K DD = 109 pcf
5875	10										
						Weathered Bedrock Zone from 8 to 12 feet.					
5870	15			5	9			50/9"		>>	

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LOCATION: Venetucci Blvd at South Academy Blvd
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The stratification lines represent approximate boundaries. The transition may be gradual.

FIGURE: 25

DATE STARTED:	9/13/24	**DRILL COMPANY:**	Dakota Drilling, Inc.
DATE COMPLETED:	9/13/24	**DRILLER:** DER	**LOGGED BY:** DW
COMPLETION DEPTH	40.0 ft	**DRILL RIG:**	CME-75
BENCHMARK:	N/A	**DRILLING METHOD:**	Solid Stem Auger
ELEVATION:	5884 ft	**SAMPLING METHOD:**	Modified California
LATITUDE:	38.7718°	**HAMMER TYPE:**	Manual
LONGITUDE:	-104.7865°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	HT

REMARKS:

BORING B23

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

BORING LOCATION:
Retaining Wall

See Figure No. 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification		Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ / Moisture × / PL ◪ / LL ✚ (0, 25, 50) / STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
	0					**Apparent Fill:** Consists of clay and medium grained sand with gravel, dry, dark brown, very stiff to hard, claystone fragments					
				1	12			19-21 N=40			
5880	5			2	6			50/6"	15	>>	S(500) = 4.8% P = 3.9K GRAD
				3	8			50/8"		>>	-200 = 97.9% DD = 110 pcf
5875	10			4	7	**Clay:** Coarse grained sand with gravel, dry to moist, brown to dark brown, very stiff to hard, claystone fragments		50/7"	15	>>	-200 = 95.3% S(1000) = 3.6% P = 7.6K DD = 115 pcf
5870	15			5	6			50/6"	12	>>	
5865	20			6	12		CL	15-19 N=34	18		-200 = 88.5%
5860	25			7	7			50/7"	14	>>	
5855	30			8	6	**Claystone:** Fine to coarse grained sand with trace gravel, moist, brown to dark brown/gray, weathered to hard.		50/6"	16	>>	-200 = 93.5%
5850	35			9	12			11-15 N=26			
5845	40			10	7	Weathered Bedrock Zone from 33 to 37 feet.		50/7"		>>	

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LOCATION: Venetucci Blvd at South Academy Blvd
Colorado Springs, CO

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

FIGURE: 26

DATE STARTED:	9/14/24	**DRILL COMPANY:**	Dakota Drilling, Inc.
DATE COMPLETED:	9/14/24	**DRILLER:** DER	**LOGGED BY:** DW
COMPLETION DEPTH	25.0 ft	**DRILL RIG:**	CME-75
BENCHMARK:	N/A	**DRILLING METHOD:**	Solid Stem Auger
ELEVATION:	5882 ft	**SAMPLING METHOD:**	Modified California
LATITUDE:	38.7712°	**HAMMER TYPE:**	Manual
LONGITUDE:	-104.7866°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	HT

REMARKS:

BORING B24

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

BORING LOCATION:
Building 2

See Figure No. 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification		Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft / STRENGTH, tsf	Additional Remarks
5880	0			1	12	**Apparent Fill:** Consists of clay and fine to coarse grained sand, moist, brown to dark brown, stiff.		9-11 N=20			GRAD
	5			2	9	**Claystone:** Medium to coarse grained sand with trace gravel, dry to moist, brown to dark brown/dark gray/black, weathered to hard.		50/9"	16	>>	-200 = 83.8% S(500) = 6.0% P = 11.1K DD = 117 pcf
5875				3	9			50/9"		>>	
	10			4	12			17-23 N=40	13		-200 = 83.8%
5870											
	15			5	12			15-17 N=32			
5865											
	20			6	12			11-13 N=24	18		-200 = 92.6%
5860						Weathered Bedrock Zone from 5 to 25 Feet					
	25			7	12			20-22 N=42			

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PROJECT NO.: 05322879
PROJECT: TTRes Venetucci Multifamily
LOCATION: Venetucci Blvd at South Academy Blvd
Colorado Springs, CO

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

FIGURE: 27

DATE STARTED:	9/14/24	**DRILL COMPANY:**	Dakota Drilling, Inc.
DATE COMPLETED:	9/14/24	**DRILLER:** DER	**LOGGED BY:** DW
COMPLETION DEPTH	30.0 ft	**DRILL RIG:**	CME-75
BENCHMARK:	N/A	**DRILLING METHOD:**	Solid Stem Auger
ELEVATION:	5884 ft	**SAMPLING METHOD:**	Modified California
LATITUDE:	38.7714°	**HAMMER TYPE:**	Manual
LONGITUDE:	-104.7866°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	HT

REMARKS:

BORING B25

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

BORING LOCATION:
Building 1

See Figure No. 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification		Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ / Moisture × / PL ◪ / LL ✚ (0, 25, 50) / STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
	0					**Apparent Fill:** Consists of clay and medium to coarse grained sand with gravel, dry, brown to dark brown, very stiff.	CL				
				1	12			17-21			
5880	5			2	12	**Claystone:** Medium to coarse grained sand with gravel, dry, brown/gray to dark gray/black, hard		N=38 50/12"	14	>>◎	S(250) = 11.6% P = 11.6K DD = 115 pcf
				3	6			50/6"	14	>>◎	200 = 82.6%
5875	10			4	7			50/7"		>>◎	
5870	15			5	10			50/10"		>>◎	
5865	20			6	10			50/10"	14	>>◎	200 = 85.7%
5860	25			7	10			50/10"	15	>>◎	200 = 92.3%
5855	30			8	6			50/6"		>>◎	

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LOCATION: Venetucci Blvd at South Academy Blvd
Colorado Springs, CO

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

FIGURE: 28

DATE STARTED:	9/19/24	**DRILL COMPANY:**	Dakota Drilling, Inc.
DATE COMPLETED:	9/19/24	**DRILLER:** ERC	**LOGGED BY:** JW
COMPLETION DEPTH	25.0 ft	**DRILL RIG:**	CME-55
BENCHMARK:	N/A	**DRILLING METHOD:**	Solid Stem Auger
ELEVATION:	5882 ft	**SAMPLING METHOD:**	Modified California
LATITUDE:	38.7707°	**HAMMER TYPE:**	Manual
LONGITUDE:	-104.7867°	**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	HT

REMARKS:

BORING B26

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

BORING LOCATION:
Building 2
See Figure No. 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification		Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ / STRENGTH, tsf	Additional Remarks
5880	0			1	12	**Apparent Fill:** Consists of clay and fine to coarse grained sand with gravel, dry to moist, brown to dark brown/black, medium stiff to very stiff.		5-6 N=11	24		DD = 95 pcf LL = 58 PL = 20
	5			2	12			8-20 N=28	25		GRAD -200 = 97.1% S(500) = 4.0%
5875				3	12	**Claystone:** Fine to coarse grained sand, dry to moist, dark brown/dark gray/black, hard		50/12"	22		P = 6.2 Ksf DD = 105 pcf DD = 106 pcf
	10			4	12			50/12"	21		S(750) = 4.7% P = 7.8 Ksf DD = 105 pcf -200 = 98.1%
5870											
	15			5	10			50/10"			
5865											
	20			6	6			50/6"	18		DD = 106 pcf Q_u = 3.8 tsf
5860											
	25			7	4			50/4"			

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PROJECT NO.: 05322879
PROJECT: TTRes Venetucci Multifamily
LOCATION: Venetucci Blvd at South Academy Blvd
Colorado Springs, CO

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FIGURE: 29

DATE STARTED:	9/19/24	**DRILL COMPANY:**	Dakota Drilling, Inc.	**BORING B27**	
DATE COMPLETED:	9/19/24	**DRILLER:** ERC	**LOGGED BY:** JW	**Water**	While Drilling: Not Observed
COMPLETION DEPTH	20.0 ft	**DRILL RIG:**	CME-55		Upon Completion: Not Observed
BENCHMARK:	N/A	**DRILLING METHOD:**	Solid Stem Auger		Delay: N/A
ELEVATION:	5882 ft	**SAMPLING METHOD:**	Modified California		
LATITUDE:	38.7708°	**HAMMER TYPE:**	Manual	**BORING LOCATION:** Amenity Building	
LONGITUDE:	-104.7868°	**EFFICIENCY**	N/A	See Figure No. 2	
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	HT		
REMARKS:					

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification		Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
5880	0					**Apparent Fill:** Conists of clay and fine to medium grained sand with gravel, dry, light brown to brown/gray, very stiff, claystone fragments.					
				1	12			10-20 N=30	13	× ◎	-200 = 96.0%
	5			2	12			15-20 N=35			
5875				3	12	**Claystone:** Dry, brown to dark brown/dark gray, weathered to hard, trace gravel, iron oxidation staining.		20-25 N=45	13	× ◎	DD = 121 pcf -200 = 97.5% S(750) = 5.9%
	10			4	11			50/11"	12	× >>◎	P = 4.1 Ksf DD = 114 pcf S(1000) = -0.8%
5870											
	15			5	11			50/11"		>>◎	
5865											
	20			6	10	Weathered Bedrock Zone from 7 to 9 feet.		50/10"	20	× >>◎	DD = 107 pcf

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PROJECT NO.: 05322879
PROJECT: TTRes Venetucci Multifamily
LOCATION: Venetucci Blvd at South Academy Blvd
Colorado Springs, CO

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

FIGURE: 30

DATE STARTED:	9/19/24	**DRILL COMPANY:**	Dakota Drilling, Inc.	**BORING B28**	
DATE COMPLETED:	9/19/24	**DRILLER:** ERC	**LOGGED BY:** JW	**Water**	While Drilling 15 feet
COMPLETION DEPTH	20.0 ft	**DRILL RIG:**	CME-55		Upon Completion 15 feet
BENCHMARK:	N/A	**DRILLING METHOD:**	Solid Stem Auger		Delay N/A
ELEVATION:	5825 ft	**SAMPLING METHOD:**	Modified California		
LATITUDE:	38.7721°	**HAMMER TYPE:**	Manual	**BORING LOCATION:** Retaining Wall	
LONGITUDE:	-104.7872°	**EFFICIENCY**	N/A		
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	HT	See Figure No. 2	
REMARKS:					

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification		Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0 25 50) STRENGTH, tsf ▲ Qu ✳ Qp (0 2.0 4.0)	Additional Remarks
	0					**Fat Clay:** Fine to medium grained sand with gravel and debris, dry to moist, brown to dark brown/dark gray, stiff to very stiff. claystone fragments.					
				1	12			9-10 N=19	15		GRAD -200 = 94.9% S(250) = 6.4% P = 4.5 Ksf DD = 104 pcf
5820	5			2	12			10-20 N=30			
				3	12		CH	10-10 N=20	26		DD = 98 pcf -200 = 88.5%
5815	10			4	12			10-15 N=25			
				5	12	**Weathered Claystone:** Moist, dark brown/dark gray, very stiff.		10-14 N=24	28		DD = 96 pcf -200 = 90.6%
5810	15										
				6	12			14-15 N=29			
5805	20										

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Professional Service Industries, Inc.
1070 West 124th Avenue, Suite 800
Westminster, CO 80234
Telephone: (303) 424-5578

PROJECT NO.: 05322879
PROJECT: TTRes Venetucci Multifamily
LOCATION: Venetucci Blvd at South Academy Blvd
Colorado Springs, CO

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

FIGURE: 31

DATE STARTED:	9/19/24	**DRILL COMPANY:**	Dakota Drilling, Inc.		
DATE COMPLETED:	9/19/24	**DRILLER:** ERC	**LOGGED BY:** JW		
COMPLETION DEPTH	20.0 ft	**DRILL RIG:**	CME-55		
BENCHMARK:	N/A	**DRILLING METHOD:**	Solid Stem Auger		
ELEVATION:	N/A	**SAMPLING METHOD:**	Modified California		
LATITUDE:	38.7713°	**HAMMER TYPE:**	Manual		
LONGITUDE:	-104.7873°	**EFFICIENCY**	N/A		
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	HT		
REMARKS:					

BORING B29

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

BORING LOCATION:
Retaining Wall

See Figure No. 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification		Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ / STRENGTH, tsf	Additional Remarks
	0			1	12	**Fat Clay:** Fine to medium grained sand with gravel, dry to moist, dark brown/black, stiff, observable debris.	CH	9-9 N=18	15		DD = 81 pcf -200 = 85.2%
	5			2	12			7-8 N=15	17		DD = 99 pcf -200 = 86.3%
				3	10	**Claystone:** Dry, dark brown/dark gray/black, hard, trace gravel.		50/10"		>>◎	
	10			4	10			50/10"	20	>>◎	DD = 108 pcf S(1000) = 3.1% P = 6.1 Ksf
	15			5	6			50/6"	20	>>◎	DD = 105 pcf Q_u = 6.0 tsf
	20			6	6			50/6"		>>◎	

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PROJECT NO.: 05322879
PROJECT: TTRes Venetucci Multifamily
LOCATION: Venetucci Blvd at South Academy Blvd
Colorado Springs, CO

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

FIGURE: 32

DATE STARTED:	9/19/24	**DRILL COMPANY:**	Dakota Drilling, Inc.		
DATE COMPLETED:	9/19/24	**DRILLER:**	ERC	**LOGGED BY:**	JW
COMPLETION DEPTH	10.0 ft	**DRILL RIG:**	CME-55		
BENCHMARK:	N/A	**DRILLING METHOD:**	Solid Stem Auger		
ELEVATION:	5875 ft	**SAMPLING METHOD:**	Modified California		
LATITUDE:	38.7707°	**HAMMER TYPE:**	Manual		
LONGITUDE:	-104.7871°	**EFFICIENCY**	N/A		
STATION:	N/A	**OFFSET:**	N/A	**REVIEWED BY:**	HT

REMARKS:

BORING B30

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

BORING LOCATION:
Pavement

See Figure No. 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification		Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ / STRENGTH, tsf	Additional Remarks
	0			1	12	**Apparent Fill:** Consists of clay and fine to medium grained sand with gravel, dry, brown to dark brown, stiff. observable debris		6-10 N=16	19		DD = 98 pcf GRAD -200 = 86.6%
5870	5			2	12	**Fat Clay:** Dry, brown/dark gray, stiff, trace gravel. **Claystone:** Moist, dark brown/dark gray, hard, trace gravel.	CH	10-12 N=22	18	>>	DD = 109 pcf LL = 67 PL = 22
				3	7			50/7"	20	>>	S(250) = -0.1% DD = 113 pcf
5865	10			4	7			50/7"	12	>>	S(500) = 7.7% P = 12.8 Ksf DD = 121 pcf

Moisture × PL ◪ LL ✚ — 0 / 25 / 50

Qu ▲ Qp ✳ — 0 / 2.0 / 4.0

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PROJECT NO.: 05322879
PROJECT: TTRes Venetucci Multifamily
LOCATION: Venetucci Blvd at South Academy Blvd
Colorado Springs, CO

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

KEY TO SYMBOLS


Apparent Fill


USCS High Plasticity Clay


USCS Low Plasticity Clay


Bedrock


Weathered Shale

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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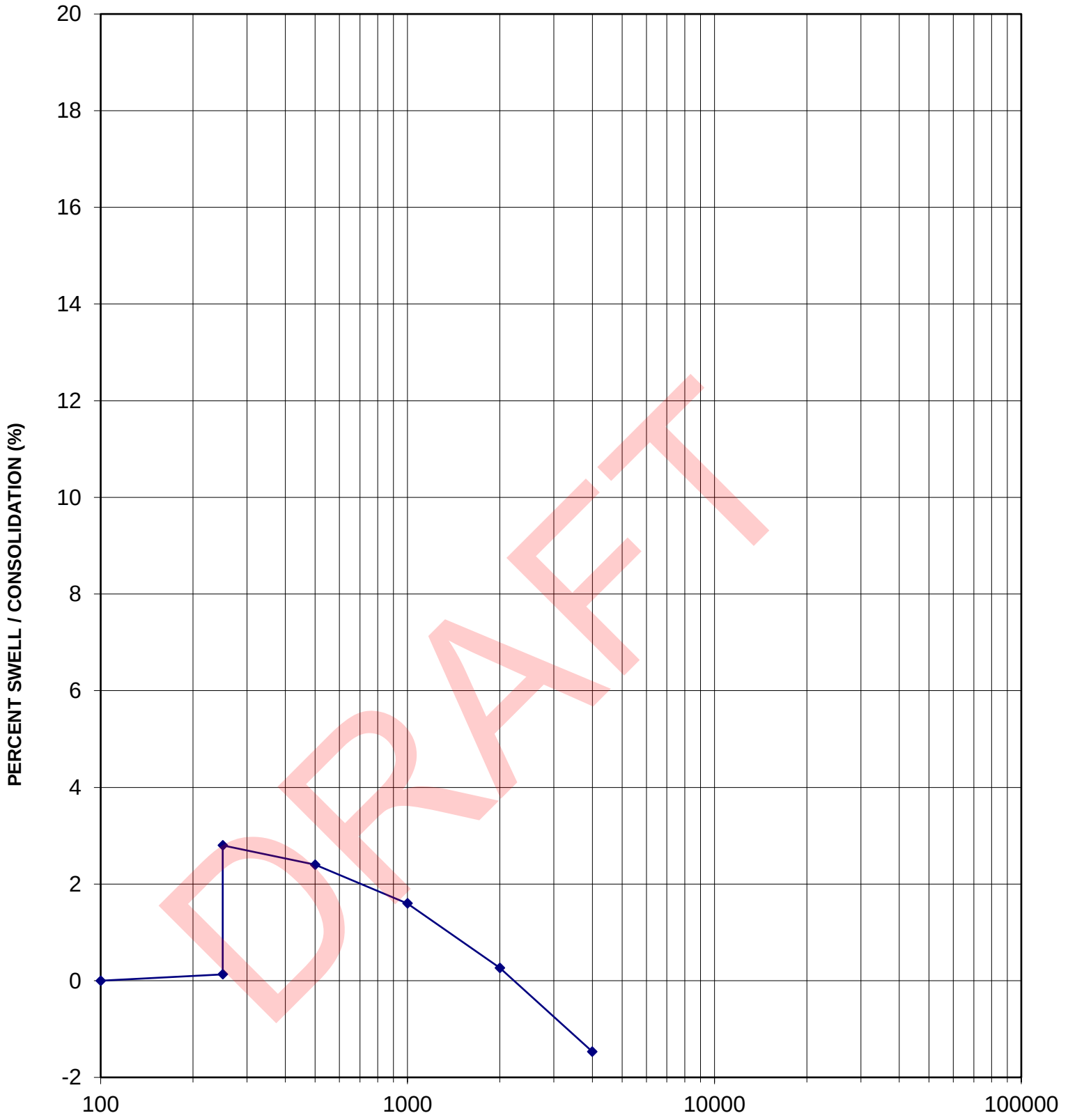
PSI Job No.: 05322879
Project: TTRes Venetucci Multifamily
Location: Venetucci Blvd at South Academy Blvd
Colorado Springs, CO

groundwater boring results include

Appendix A

Laboratory Test Results

SWELL-CONSOLIDATION TEST

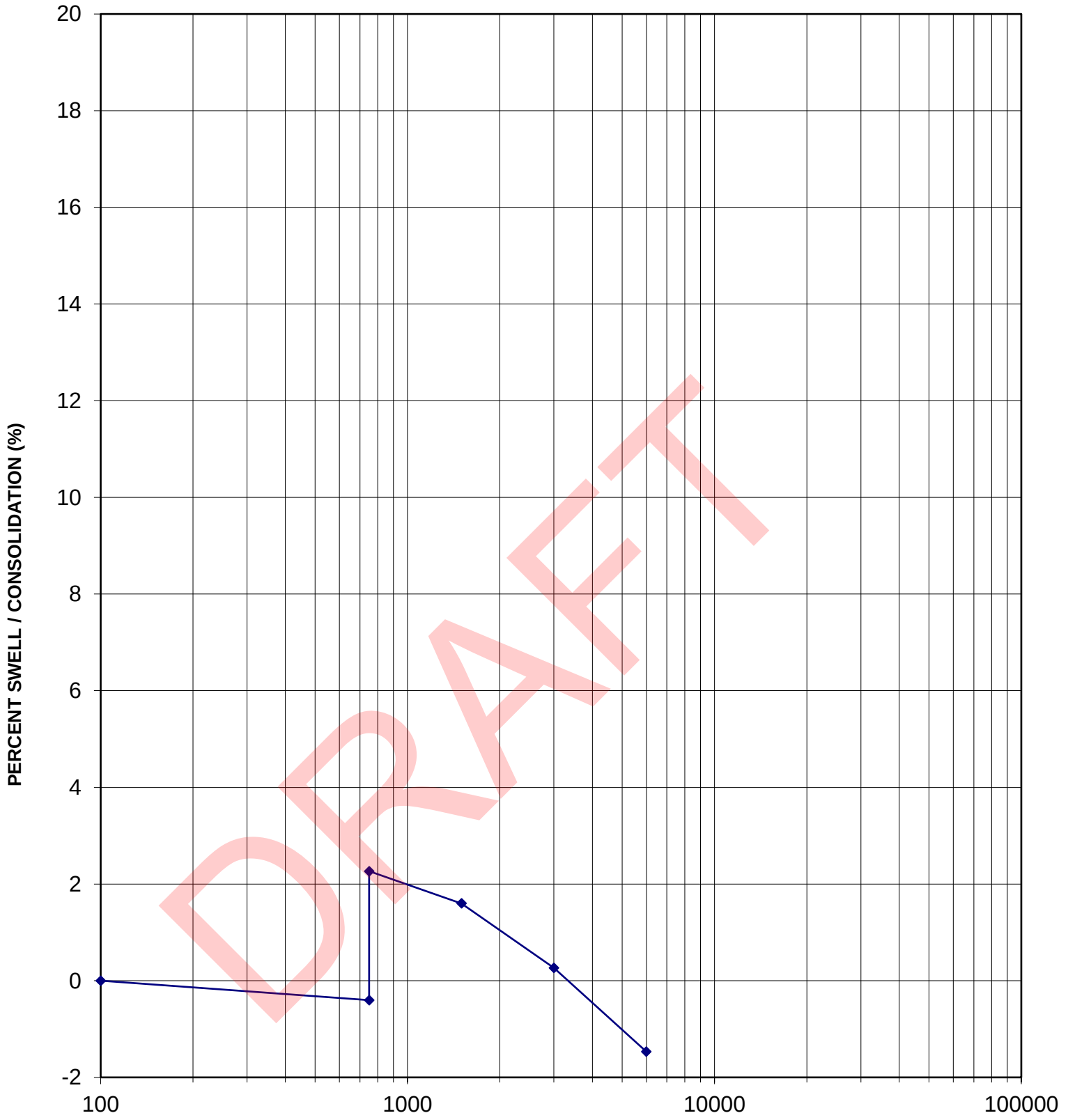


Sample Location	B1
Sample Depth	2.5 feet
Sample Description	Apparent Fill
USCS Classification	

Dry Density	101 pcf
In-Situ Moisture Content	21.2 %
Volume Change	2.7 %
Swell Pressure	2,100 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO.**	**5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A1**

SWELL-CONSOLIDATION TEST

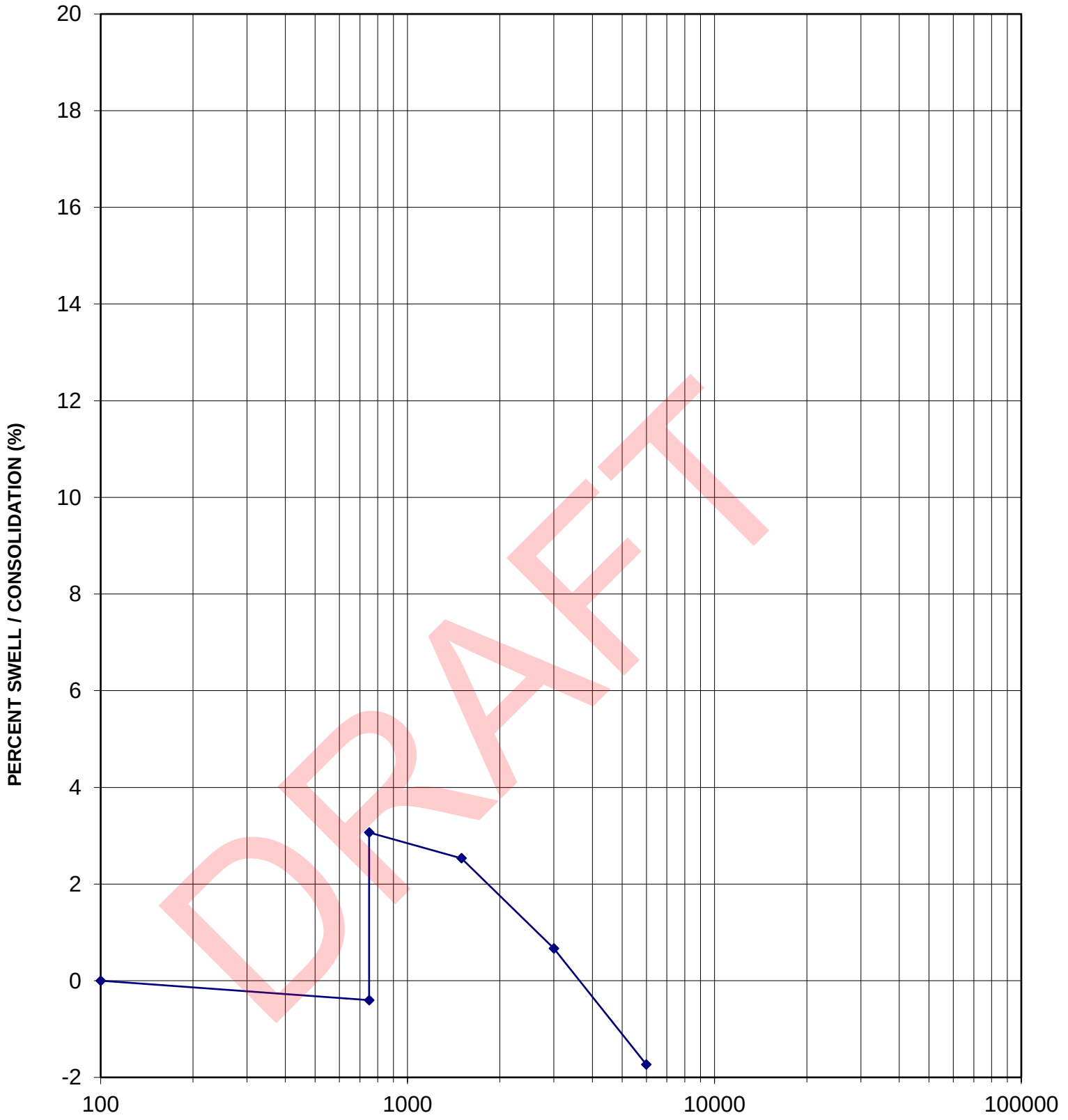


Sample Location	B1
Sample Depth	7.5 feet
Sample Description	Apparent Fill
USCS Classification	

Dry Density	101 pcf
In-Situ Moisture Content	20.5 %
Volume Change	2.7 %
Swell Pressure	3,900 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO.**	**5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A2**

SWELL-CONSOLIDATION TEST

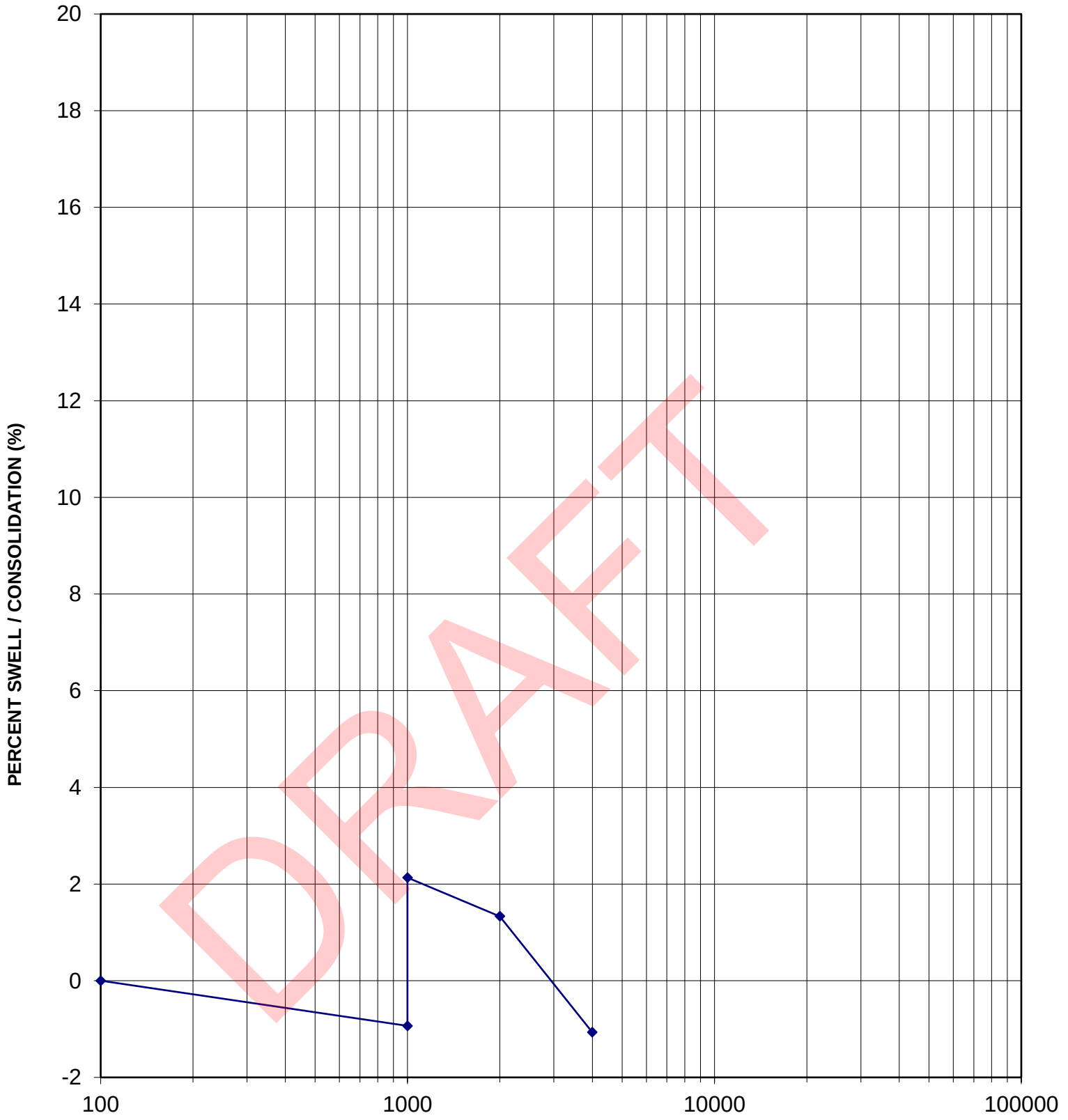


Sample Location	B2
Sample Depth	7.5 feet
Sample Description	Apparent Fill
USCS Classification	

Dry Density	110 pcf
In-Situ Moisture Content	15.8 %
Volume Change	3.5 %
Swell Pressure	4,100 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO.**	**5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A3**

SWELL-CONSOLIDATION TEST

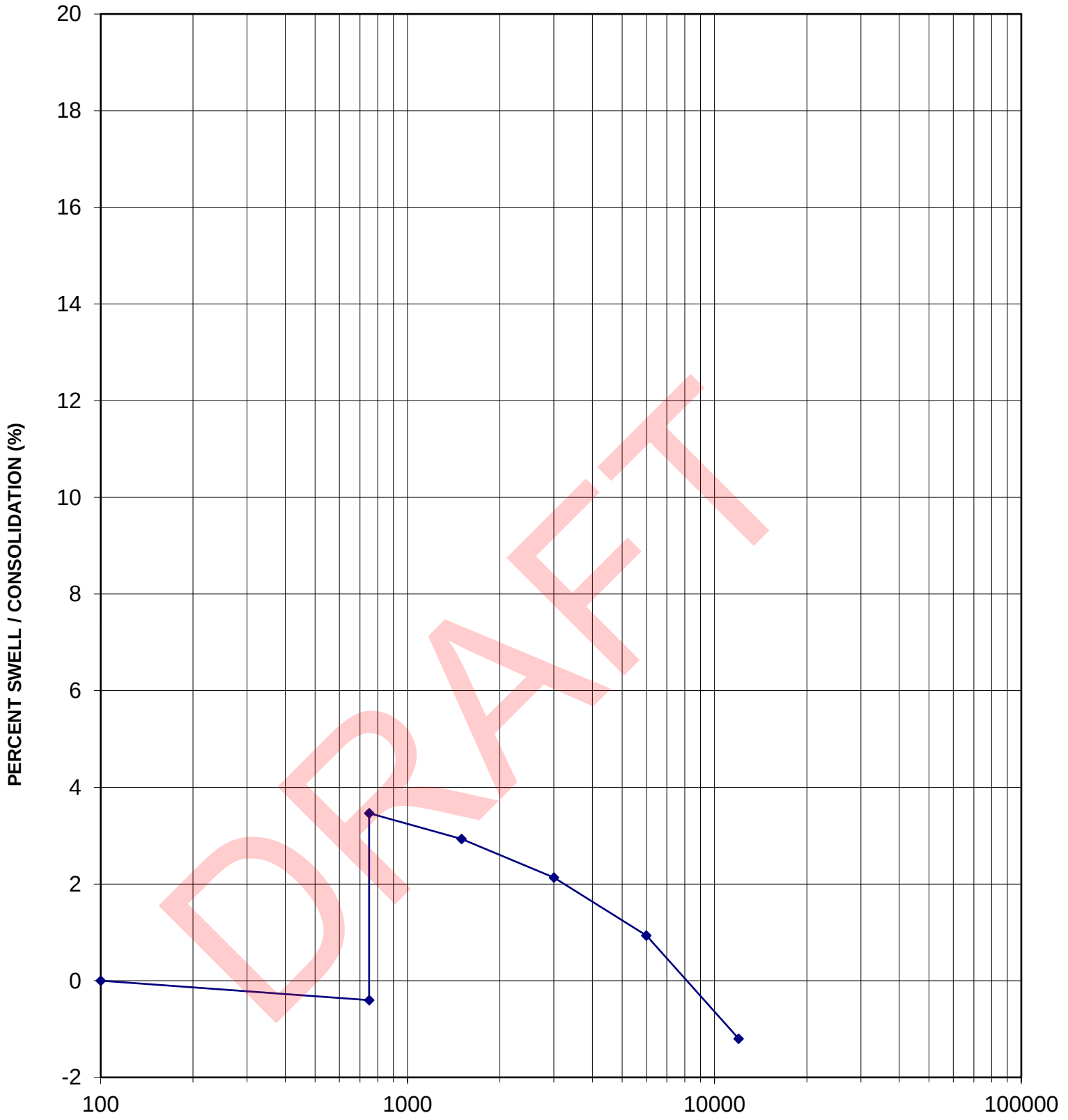


Sample Location	B2
Sample Depth	10 feet
Sample Description	Bedrock
USCS Classification	

Dry Density	114 pcf
In-Situ Moisture Content	10.7 %
Volume Change	3.1 %
Swell Pressure	3,800 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO.**	**5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A4**

SWELL-CONSOLIDATION TEST

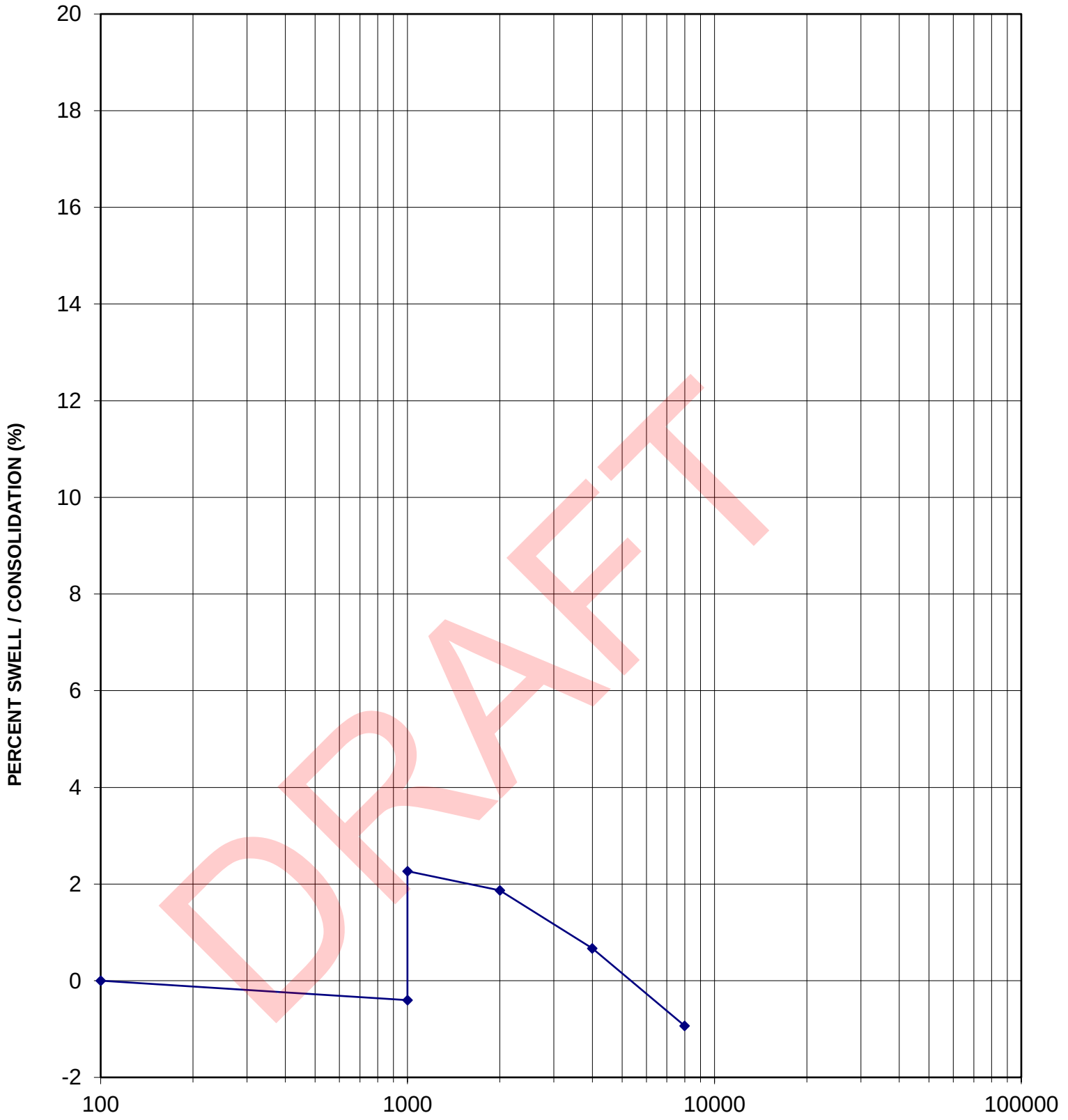


Sample Location	B3
Sample Depth	7.5 feet
Sample Description	Bedrock
USCS Classification	

Dry Density	122 pcf
In-Situ Moisture Content	15.1 %
Volume Change	3.9 %
Swell Pressure	9,300 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO.**	**5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A5**

SWELL-CONSOLIDATION TEST

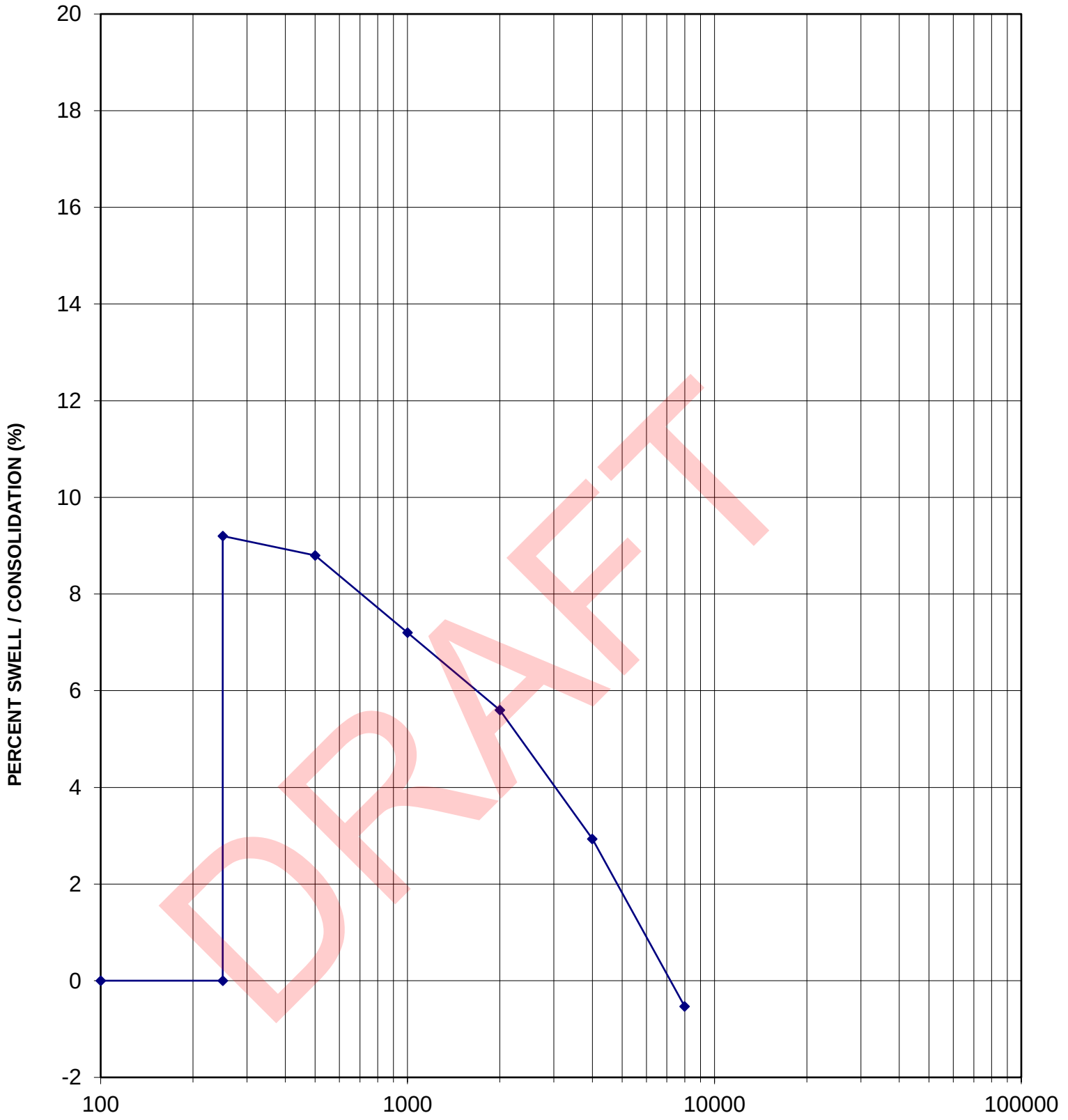


Sample Location	B3
Sample Depth	10 feet
Sample Description	Bedrock
USCS Classification	

Dry Density	112 pcf
In-Situ Moisture Content	16.8 %
Volume Change	2.7 %
Swell Pressure	6,300 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO.**	**5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A6**

SWELL-CONSOLIDATION TEST

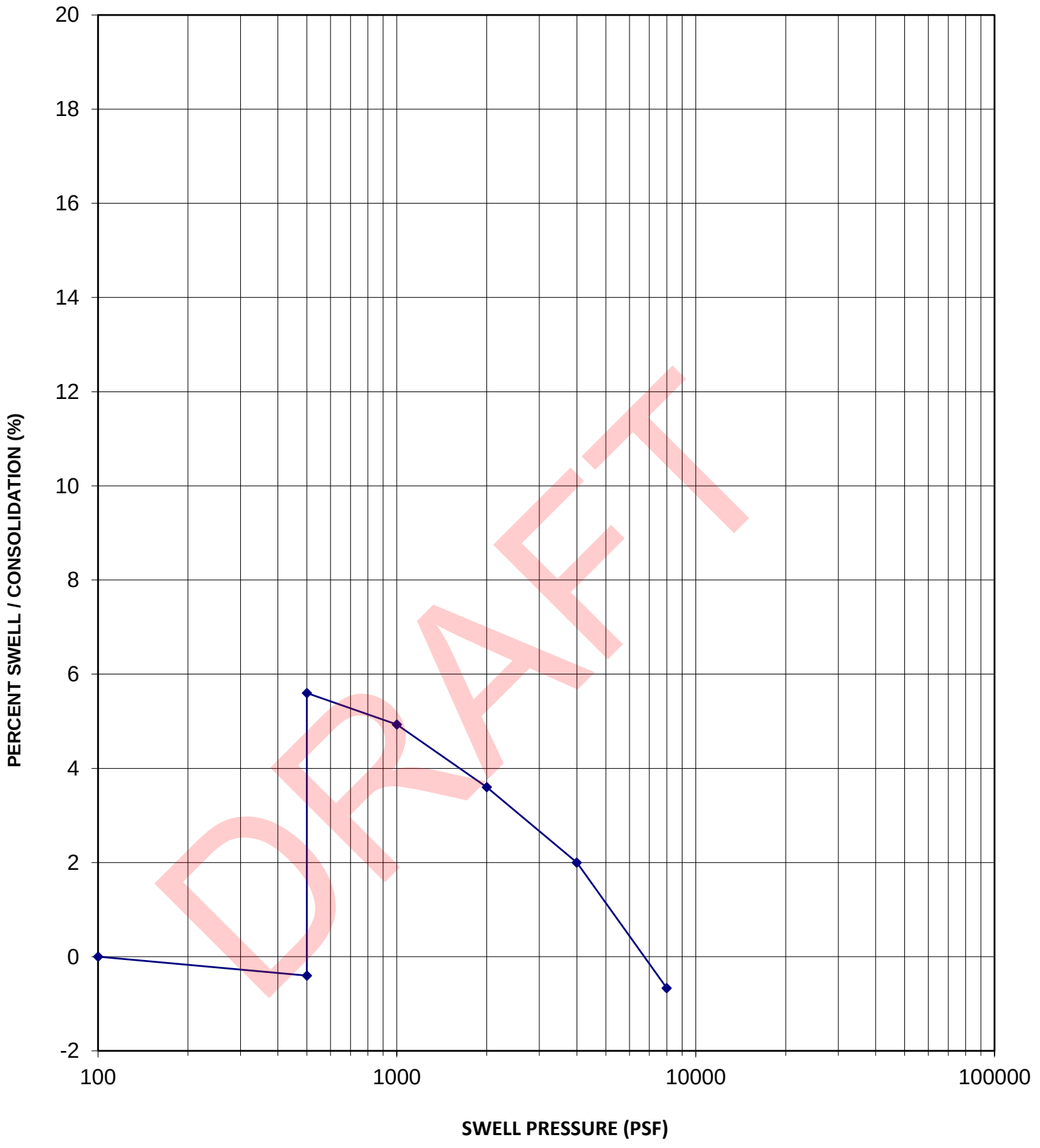


Sample Location	B4
Sample Depth	2.5 feet
Sample Description	Bedrock
USCS Classification	

Dry Density	109 pcf
In-Situ Moisture Content	22.9 %
Volume Change	9.2 %
Swell Pressure	7,200 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO.**	**5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A7**

SWELL-CONSOLIDATION TEST

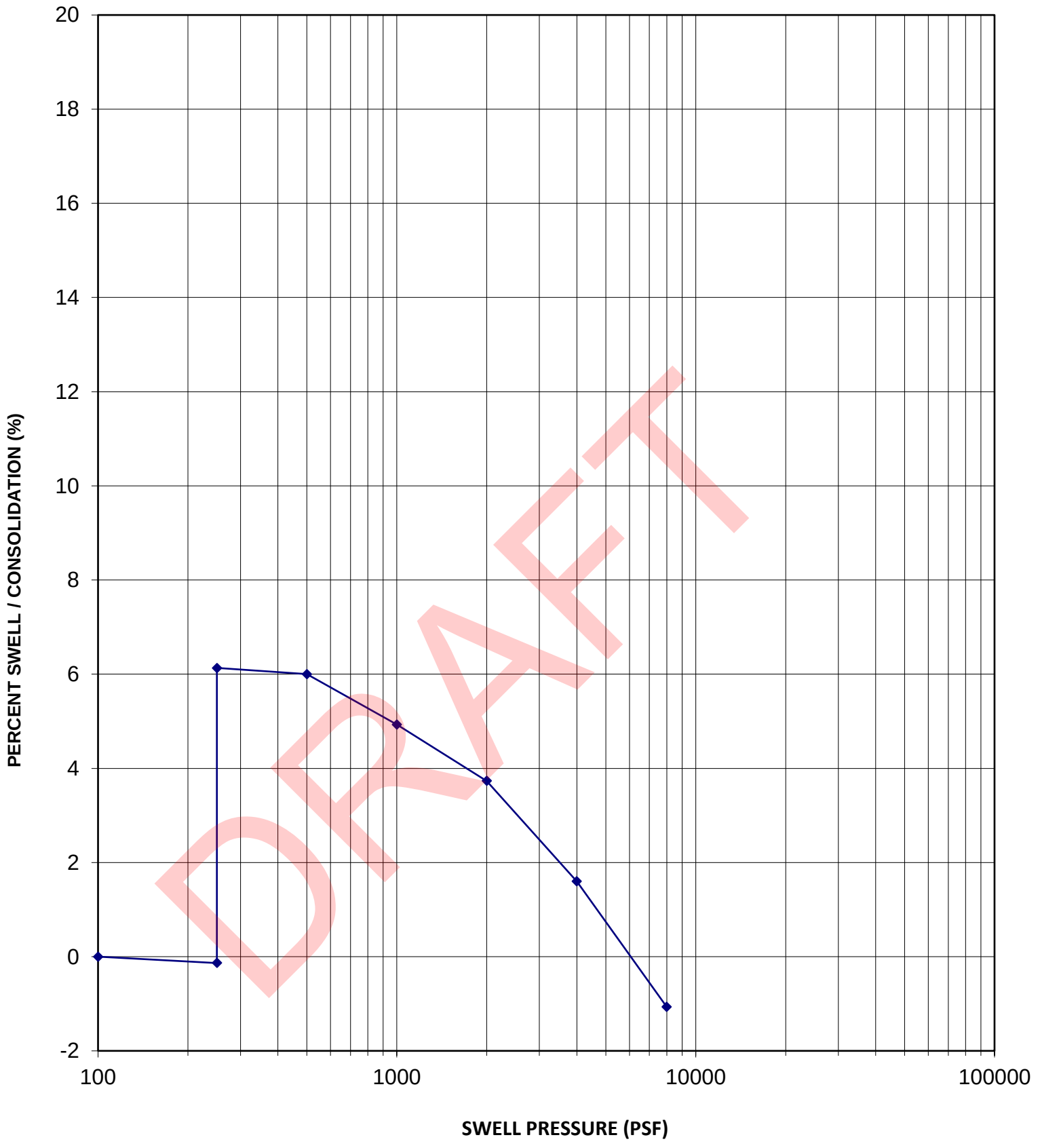


Sample Location	B5
Sample Depth	5 feet
Sample Description	Bedrock
USCS Classification	

Dry Density	113 pcf
In-Situ Moisture Content	13.6 %
Volume Change	6.0 %
Swell Pressure	7,500 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO.**	**5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A8**

SWELL-CONSOLIDATION TEST

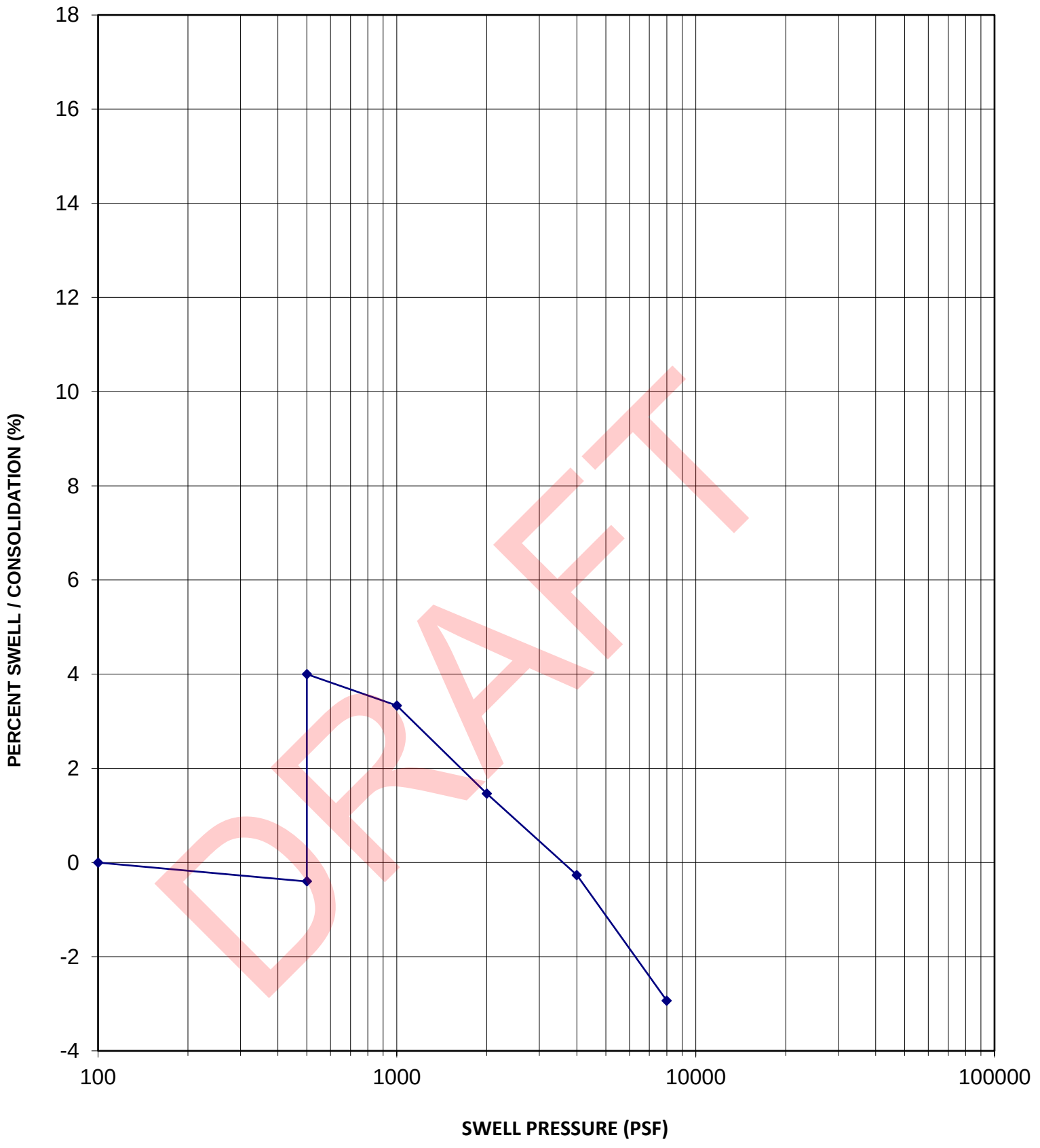


Sample Location	B6
Sample Depth	5 feet
Sample Description	Bedrock
USCS Classification	

Dry Density	104 pcf
In-Situ Moisture Content	20.5 %
Volume Change	6.3 %
Swell Pressure	6,300 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO.**	**5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A9**

SWELL-CONSOLIDATION TEST

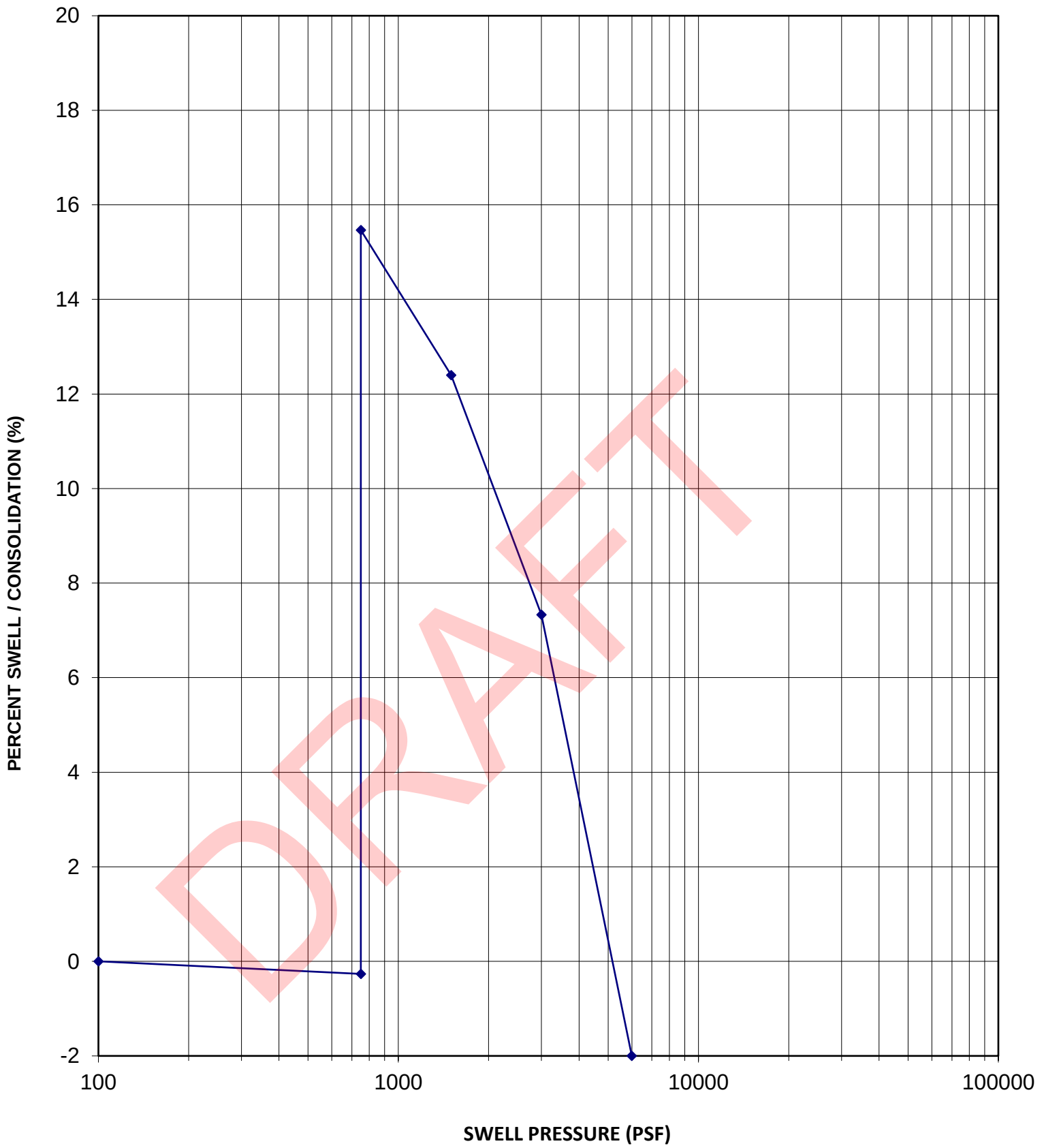


Sample Location	B6
Sample Depth	7.5 feet
Sample Description	Bedrock
USCS Classification	

Dry Density	110 pcf
In-Situ Moisture Content	15.2 %
Volume Change	4.4 %
Swell Pressure	4,100 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO.**	**5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A10**

SWELL-CONSOLIDATION TEST

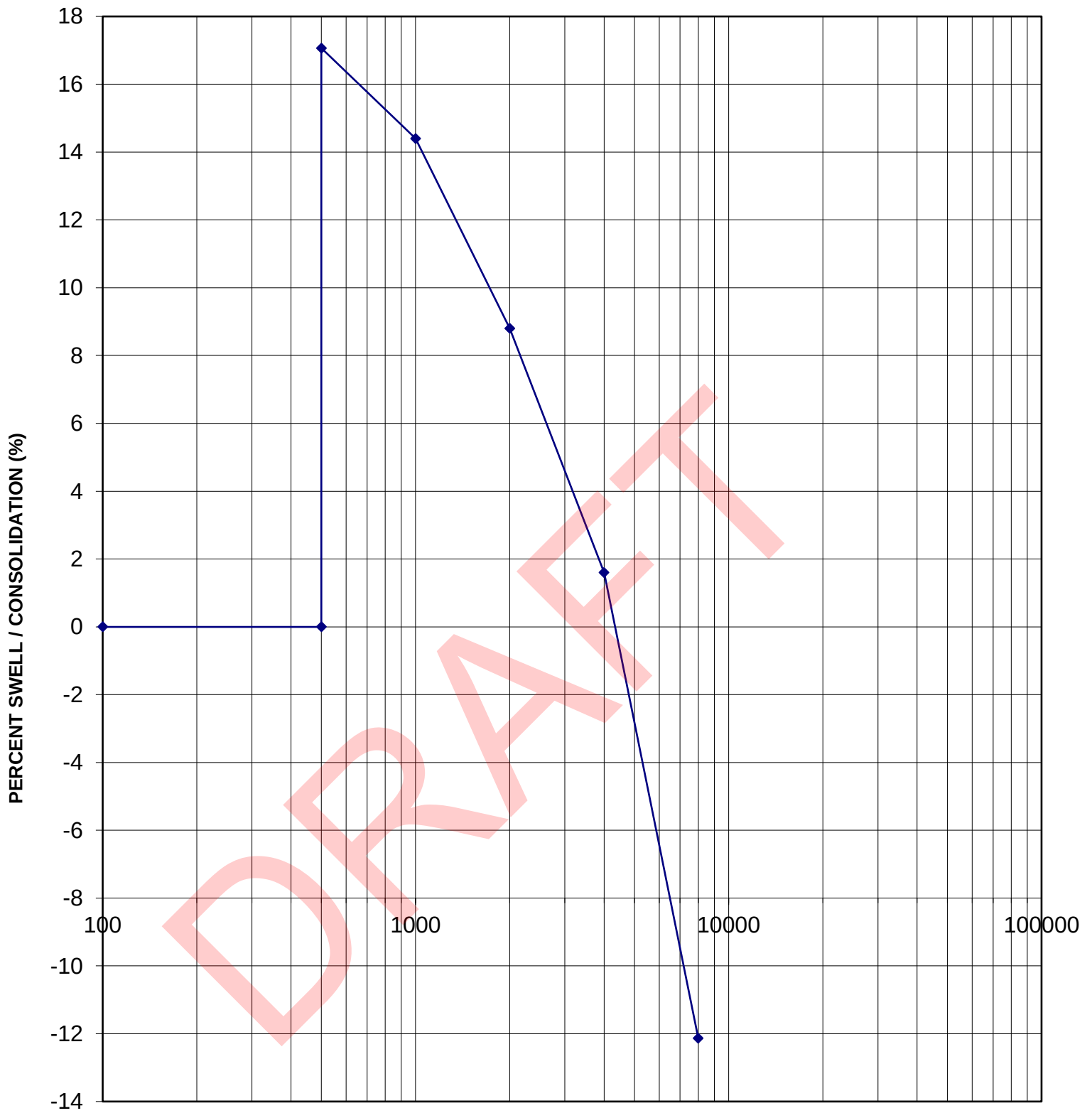


Sample Location	B8
Sample Depth	7.5 feet
Sample Description	Bedrock
USCS Classification	

Dry Density	101 pcf
In-Situ Moisture Content	12.7 %
Volume Change	15.7 %
Swell Pressure	5,300 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO.**	**5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A11**

SWELL-CONSOLIDATION TEST

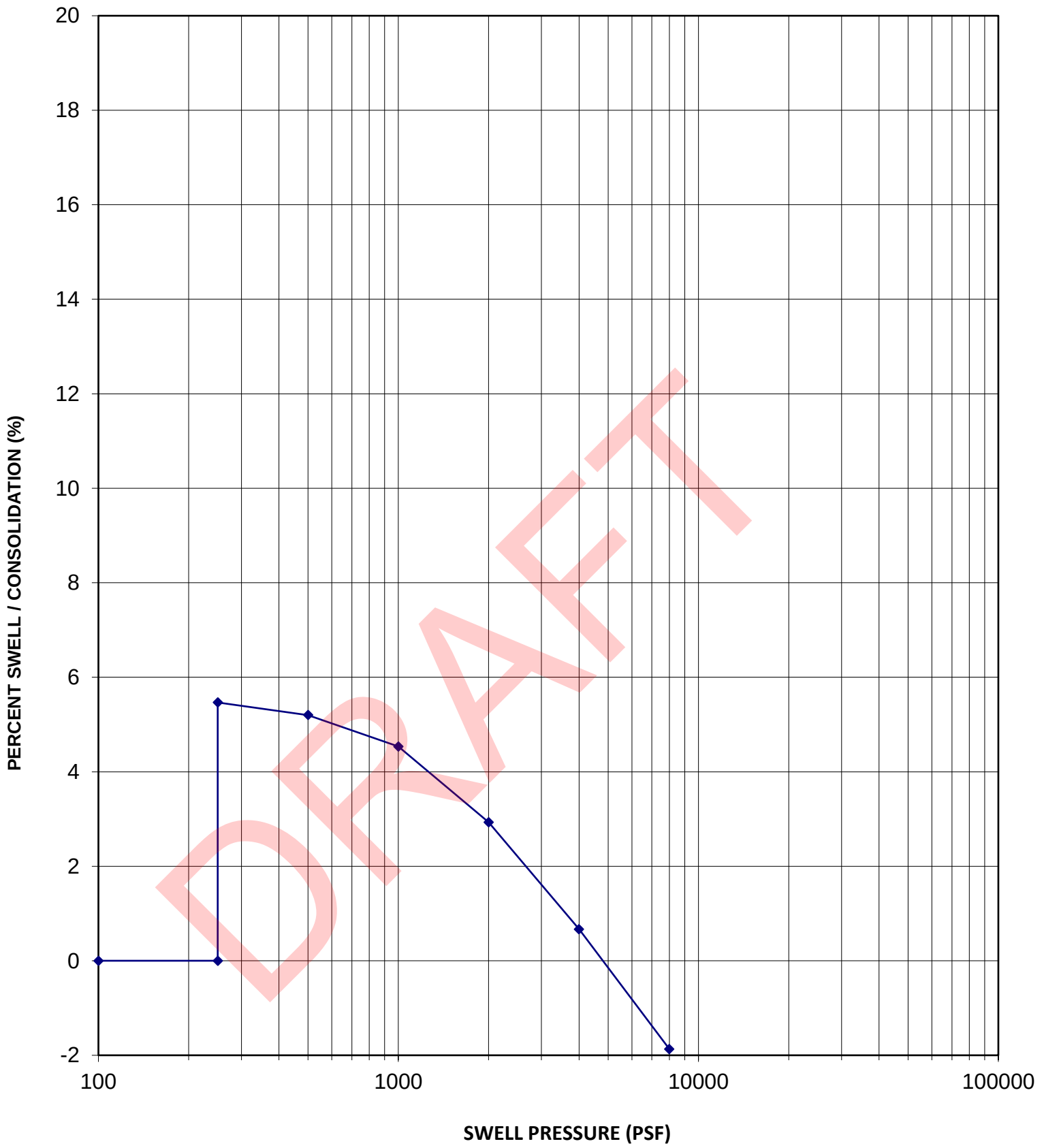


Sample Location	B9
Sample Depth	5 feet
Sample Description	Bedrock
USCS Classification	

Dry Density	97 pcf
In-Situ Moisture Content	12.2 %
Volume Change	17.1 %
Swell Pressure	4,300 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO. 5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO. A12**

SWELL-CONSOLIDATION TEST

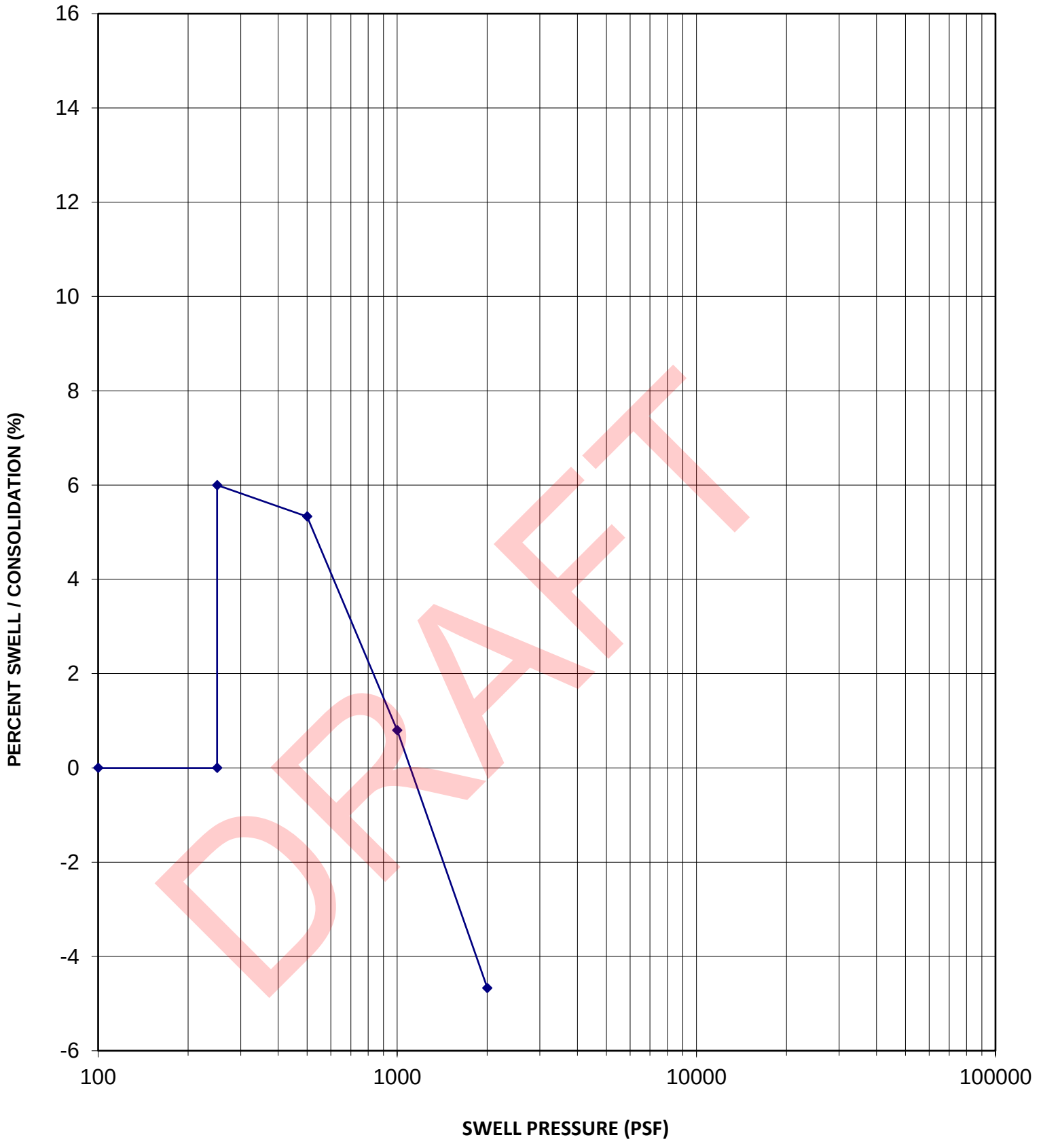


Sample Location	B10
Sample Depth	2.5 feet
Sample Description	Clay
USCS Classification	CH

Dry Density	109 pcf
In-Situ Moisture Content	18.6 %
Volume Change	5.5 %
Swell Pressure	4,800 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO.**	**5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A13**

SWELL-CONSOLIDATION TEST

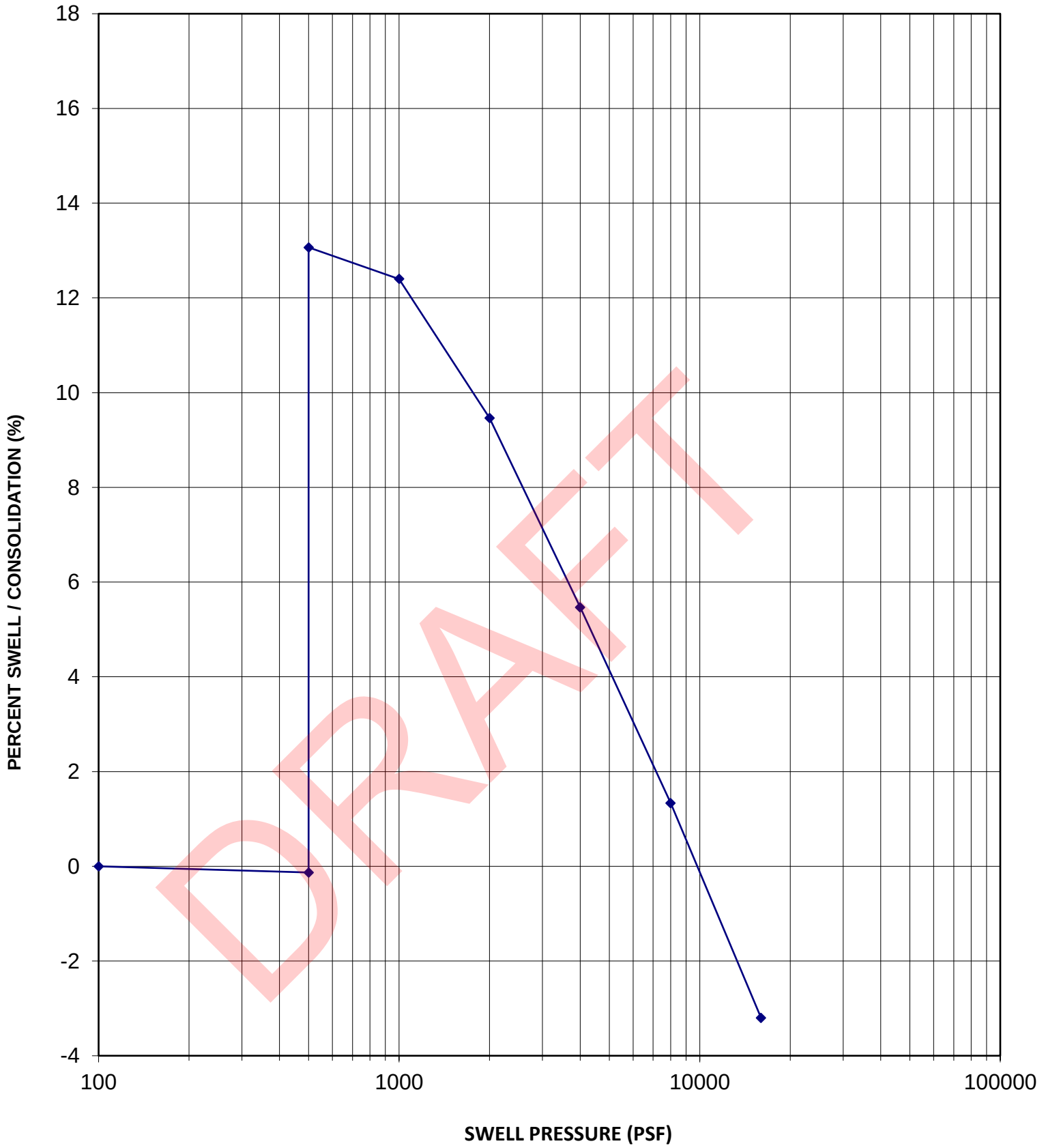


Sample Location	B10
Sample Depth	5 feet
Sample Description	Bedrock
USCS Classification	

Dry Density	92 pcf
In-Situ Moisture Content	13.0 %
Volume Change	6.0 %
Swell Pressure	1,100 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO. 5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO. A14**

SWELL-CONSOLIDATION TEST

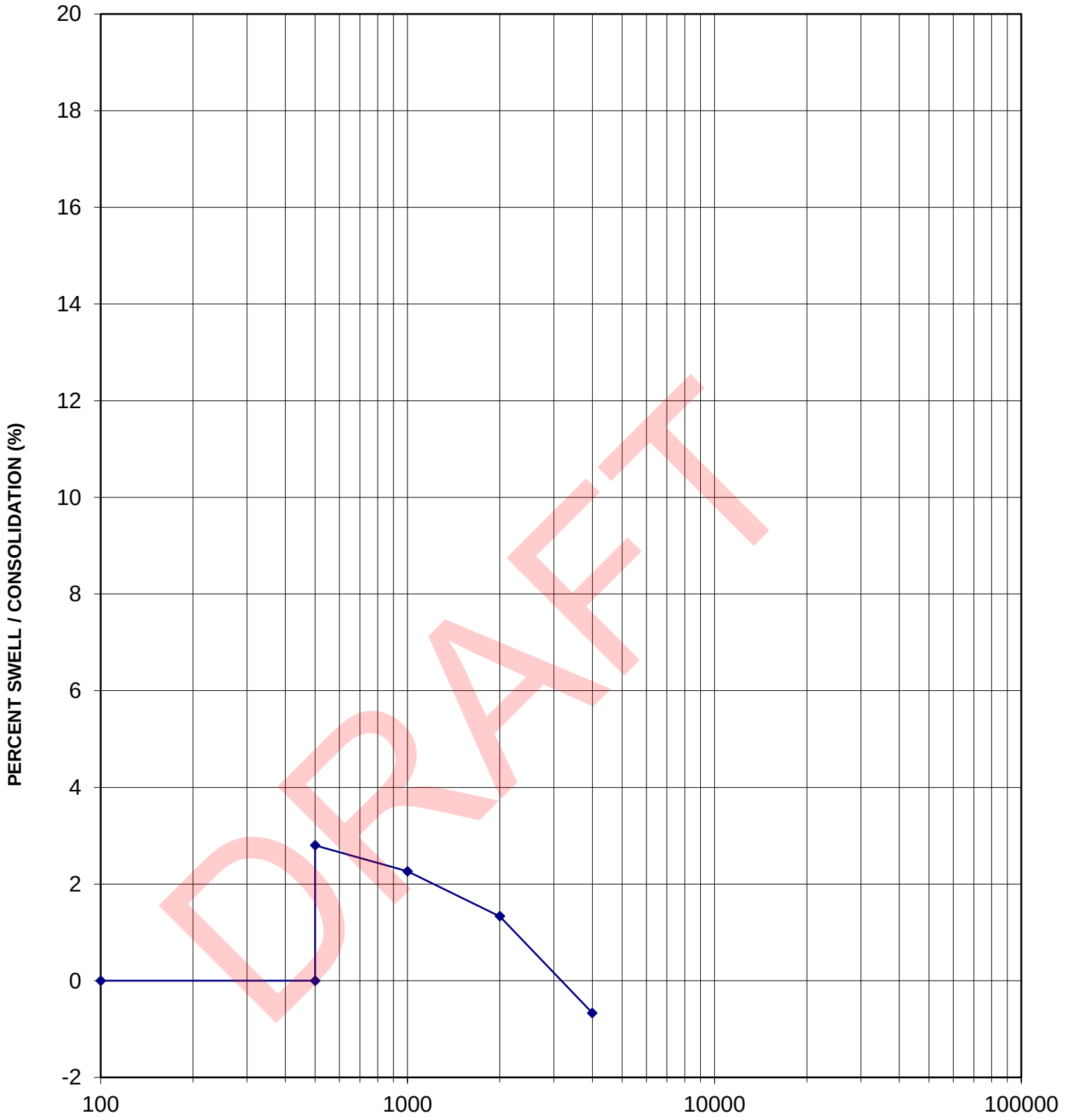


Sample Location	B10
Sample Depth	7.5 feet
Sample Description	Bedrock
USCS Classification	

Dry Density	115 pcf
In-Situ Moisture Content	13.2 %
Volume Change	13.2 %
Swell Pressure	10,000 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO.**	**5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A15**

SWELL-CONSOLIDATION TEST

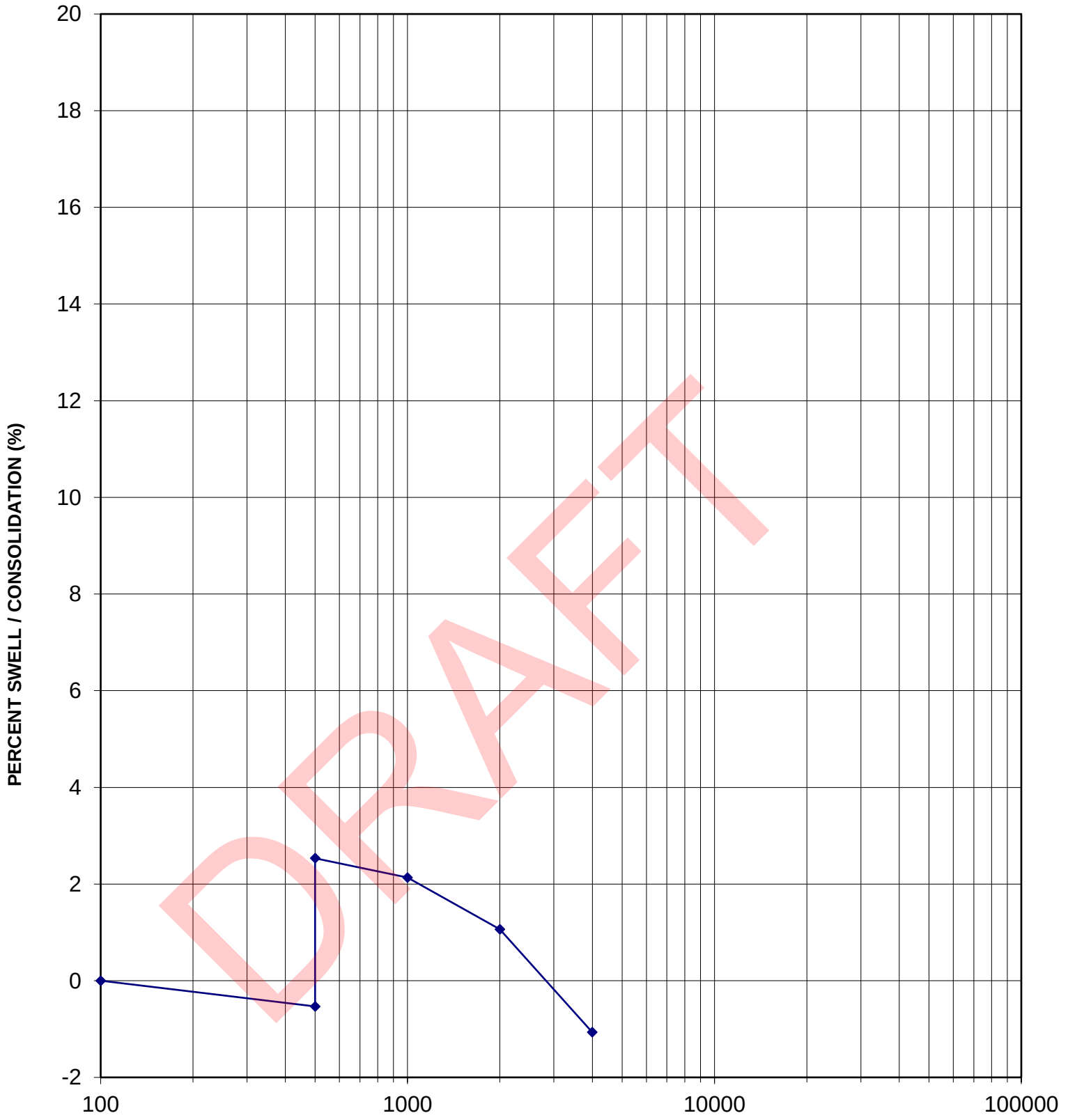


Sample Location	B11
Sample Depth	5 feet
Sample Description	Bedrock
USCS Classification	

Dry Density	119 pcf
In-Situ Moisture Content	9.6 %
Volume Change	2.8 %
Swell Pressure	3,200 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO.**	**5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A16**

SWELL-CONSOLIDATION TEST

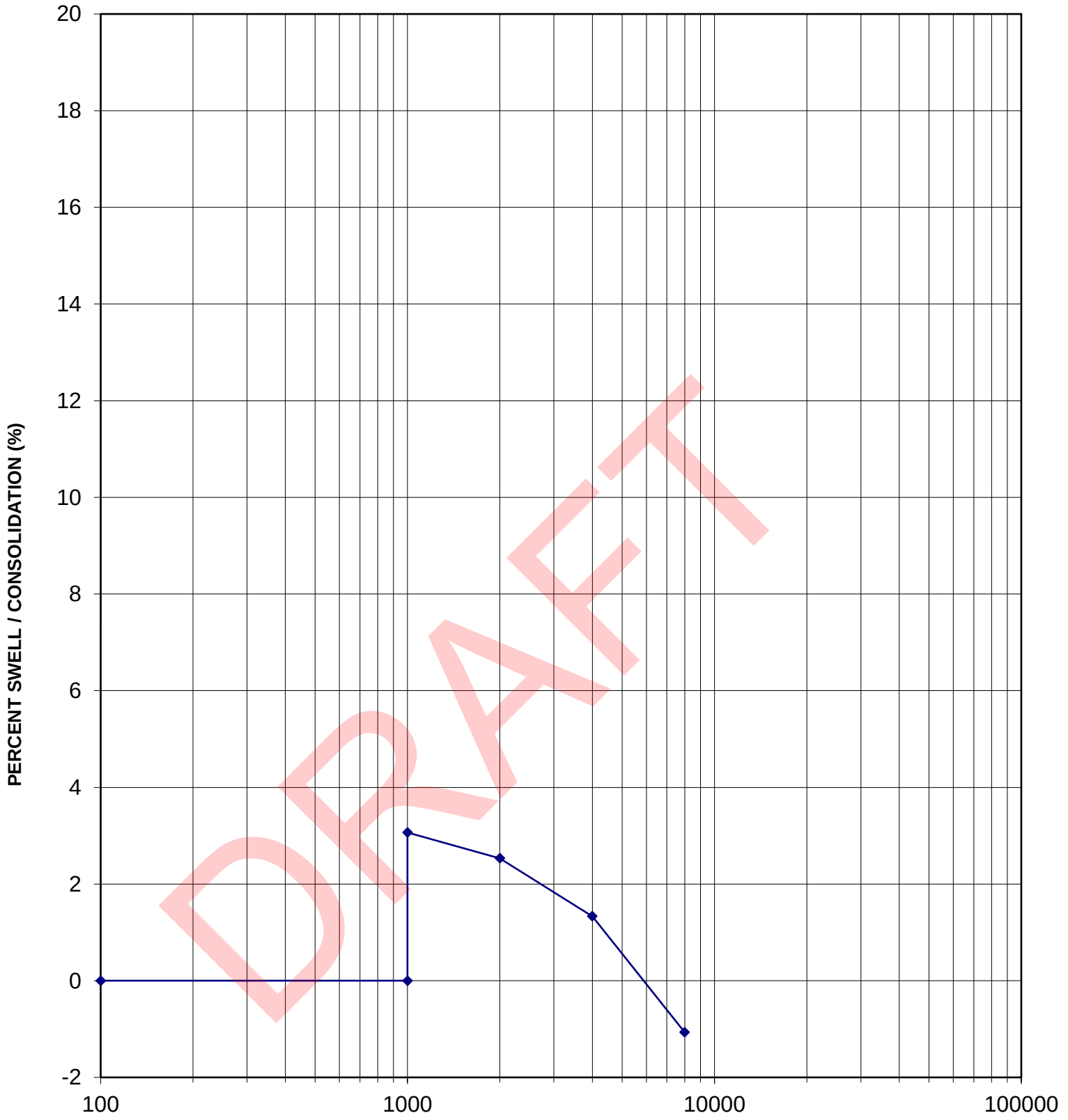


Sample Location	B12
Sample Depth	5 feet
Sample Description	Bedrock
USCS Classification	

Dry Density	111 pcf
In-Situ Moisture Content	11.6 %
Volume Change	3.1 %
Swell Pressure	3,400 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO.**	**5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A17**

SWELL-CONSOLIDATION TEST

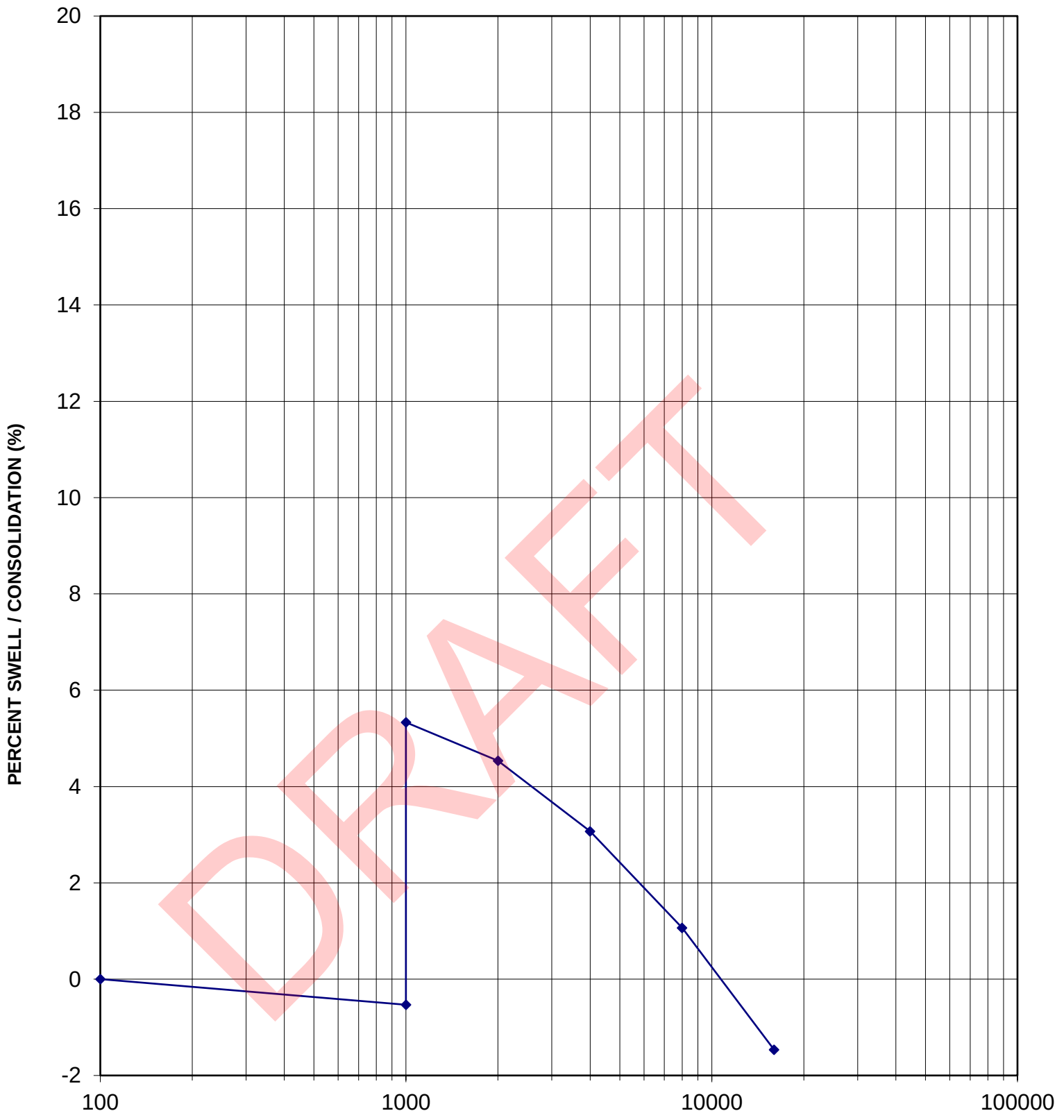


Sample Location	B12
Sample Depth	10 feet
Sample Description	Bedrock
USCS Classification	

Dry Density	112 pcf
In-Situ Moisture Content	13.2 %
Volume Change	3.1 %
Swell Pressure	5,900 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO.**	**5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A18**

SWELL-CONSOLIDATION TEST

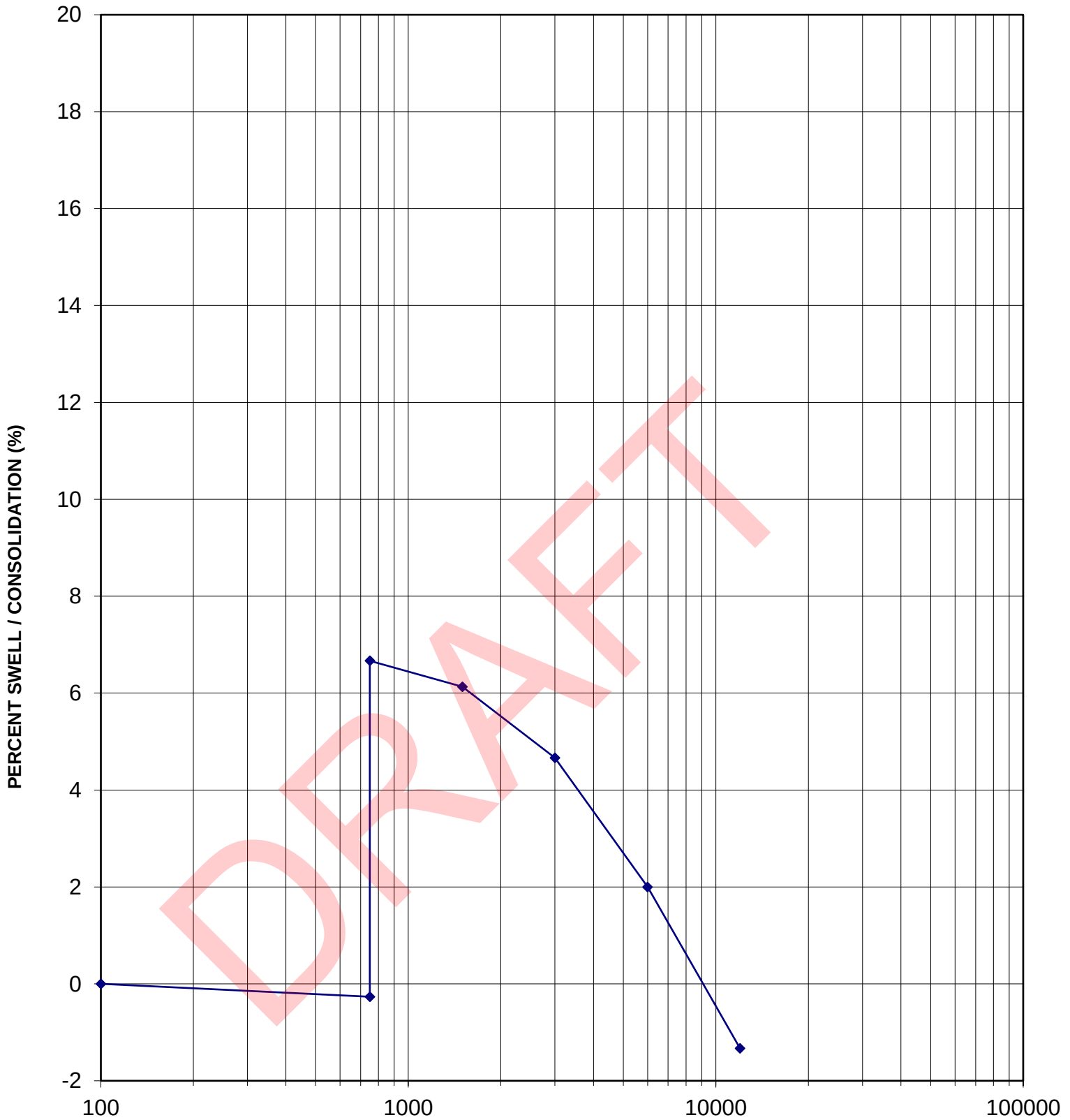


Sample Location	B13
Sample Depth	15 feet
Sample Description	Bedrock
USCS Classification	

Dry Density	111 pcf
In-Situ Moisture Content	18.7 %
Volume Change	5.9 %
Swell Pressure	12,400 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO.**	**5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A19**

SWELL-CONSOLIDATION TEST

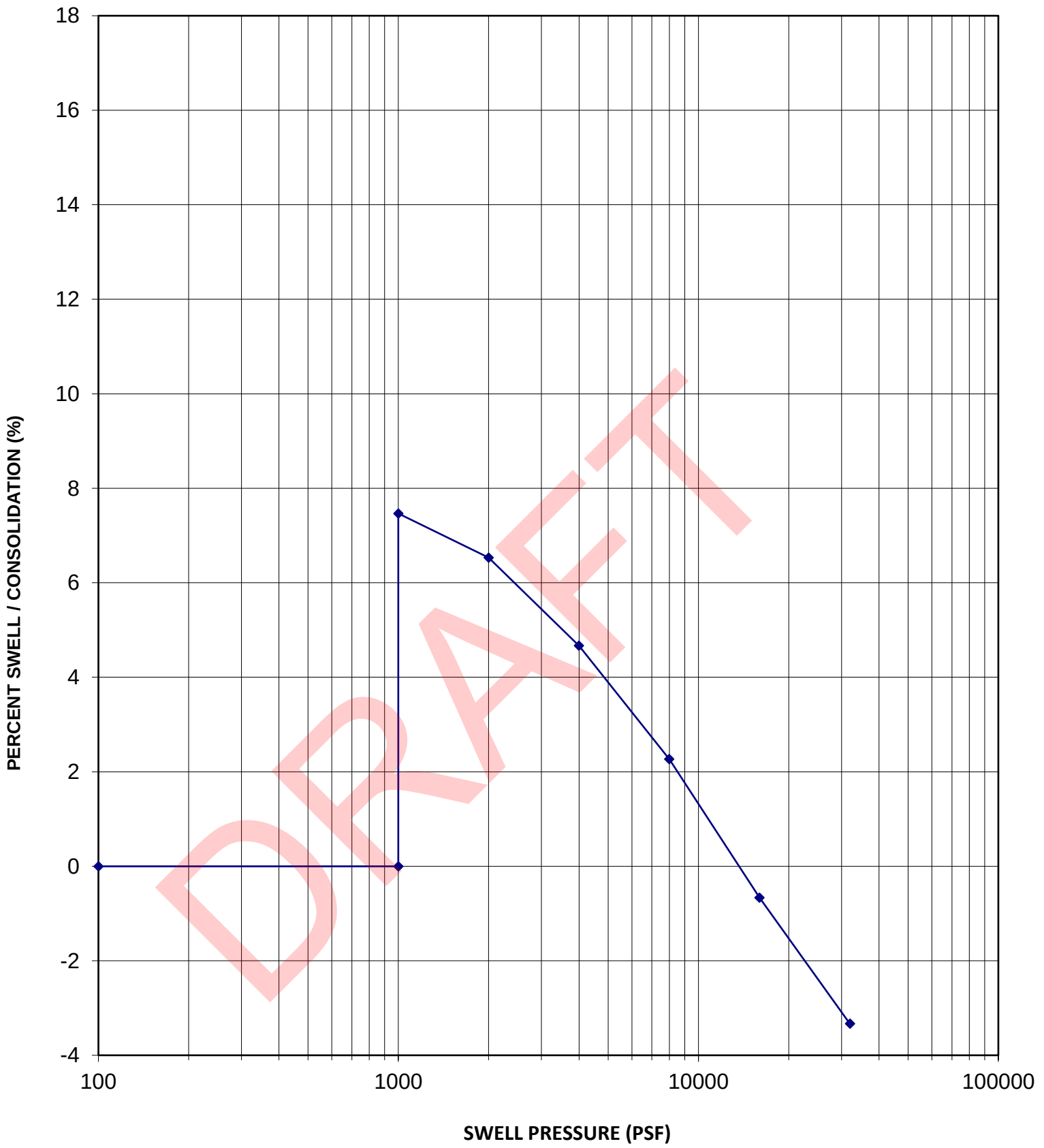


Sample Location	B14
Sample Depth	7.5 feet
Sample Description	Bedrock
USCS Classification	

Dry Density	109 pcf
In-Situ Moisture Content	21.6 %
Volume Change	6.9 %
Swell Pressure	9,600 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO.**	**5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A20**

SWELL-CONSOLIDATION TEST

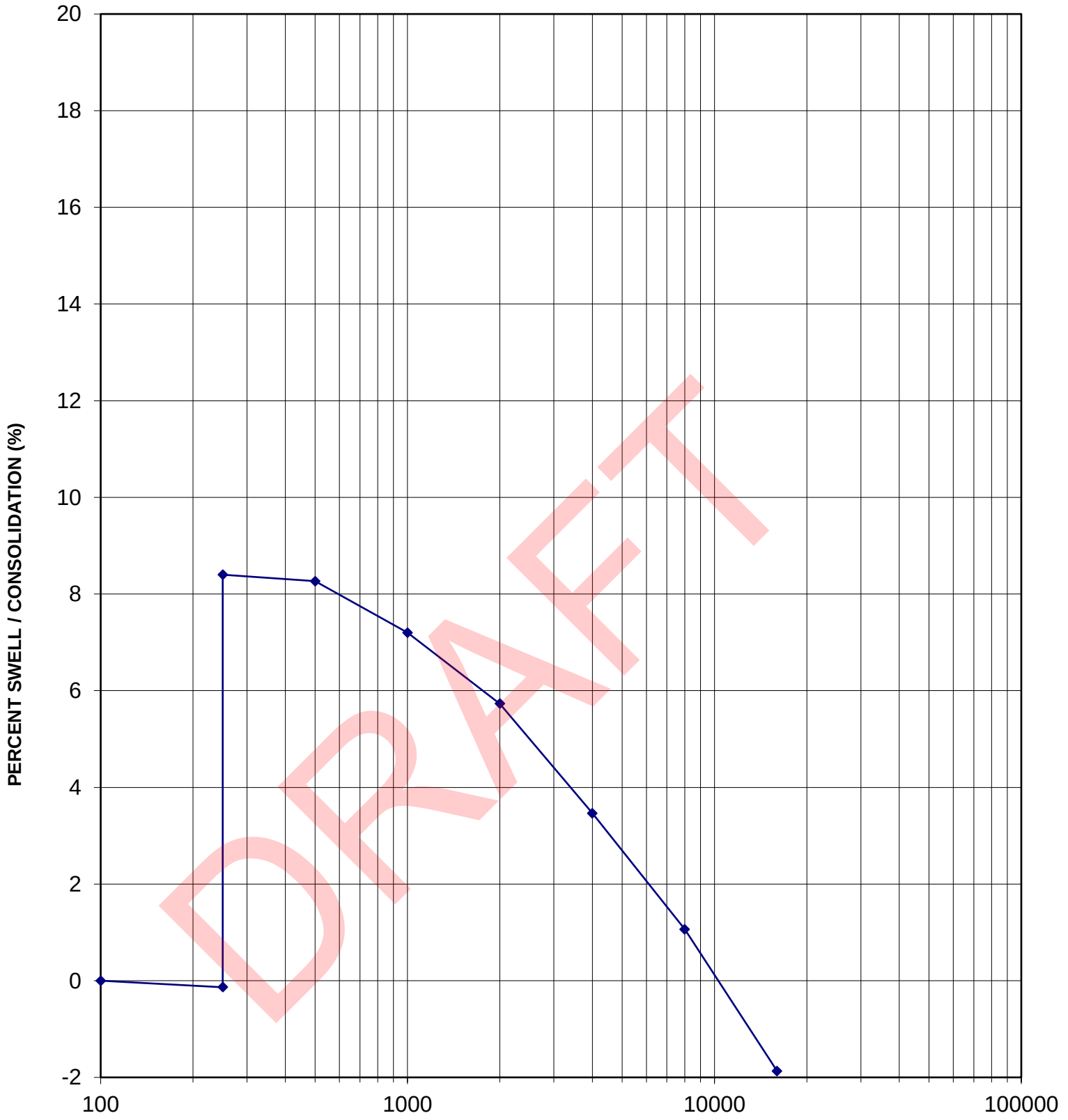


Sample Location	B14
Sample Depth	10 feet
Sample Description	Bedrock
USCS Classification	

Dry Density	110 pcf
In-Situ Moisture Content	20.3 %
Volume Change	7.5 %
Swell Pressure	13,700 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO.**	**5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A21**

SWELL-CONSOLIDATION TEST

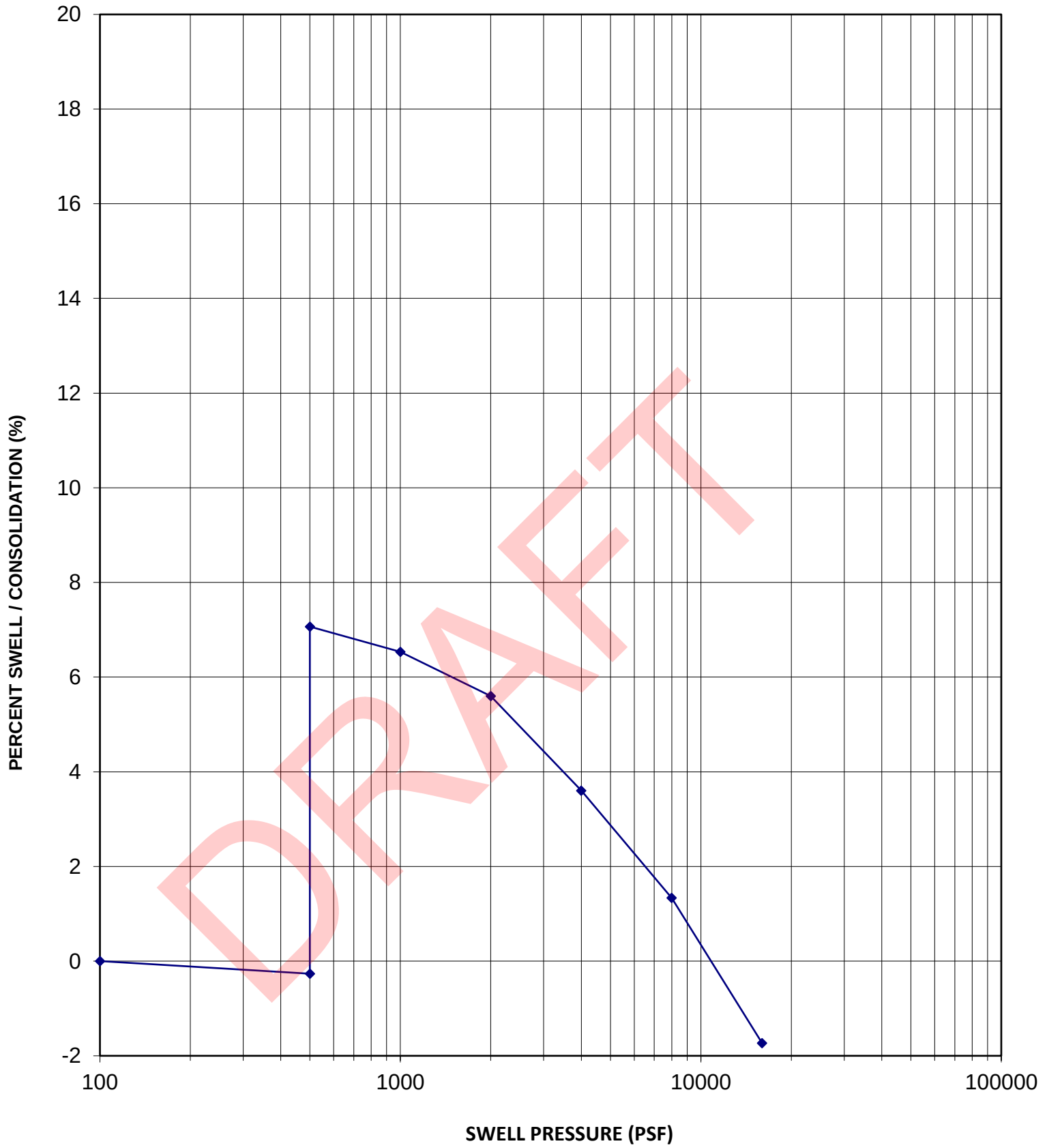


Sample Location	B16
Sample Depth	2.5 feet
Sample Description	Bedrock
USCS Classification	

Dry Density	109 pcf
In-Situ Moisture Content	20.1 %
Volume Change	8.5 %
Swell Pressure	10,600 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO.**	**5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A22**

SWELL-CONSOLIDATION TEST

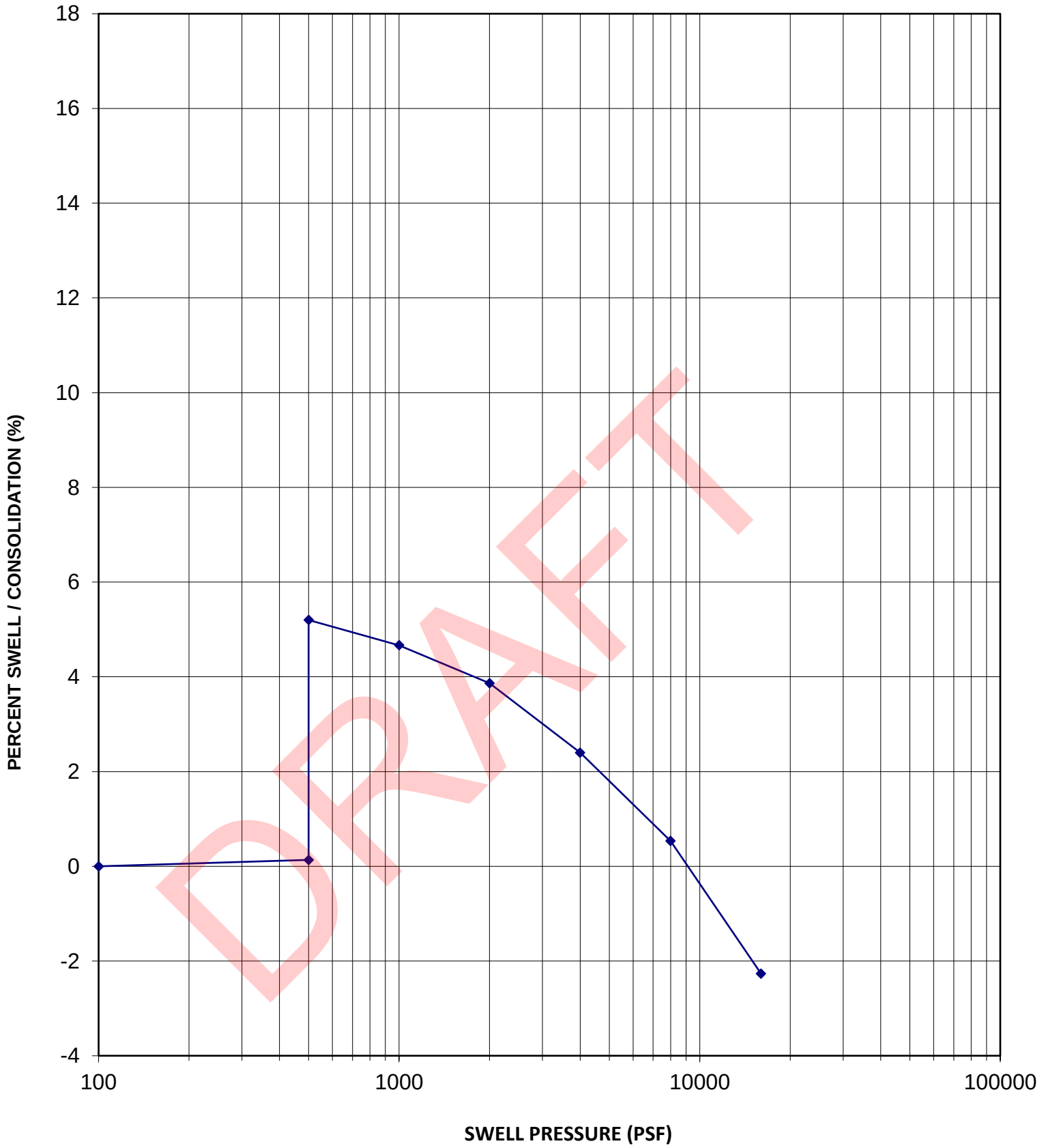


Sample Location	B16
Sample Depth	5 feet
Sample Description	Bedrock
USCS Classification	

Dry Density	122 pcf
In-Situ Moisture Content	14.2 %
Volume Change	7.3 %
Swell Pressure	11,500 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO.**	**5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A23**

SWELL-CONSOLIDATION TEST

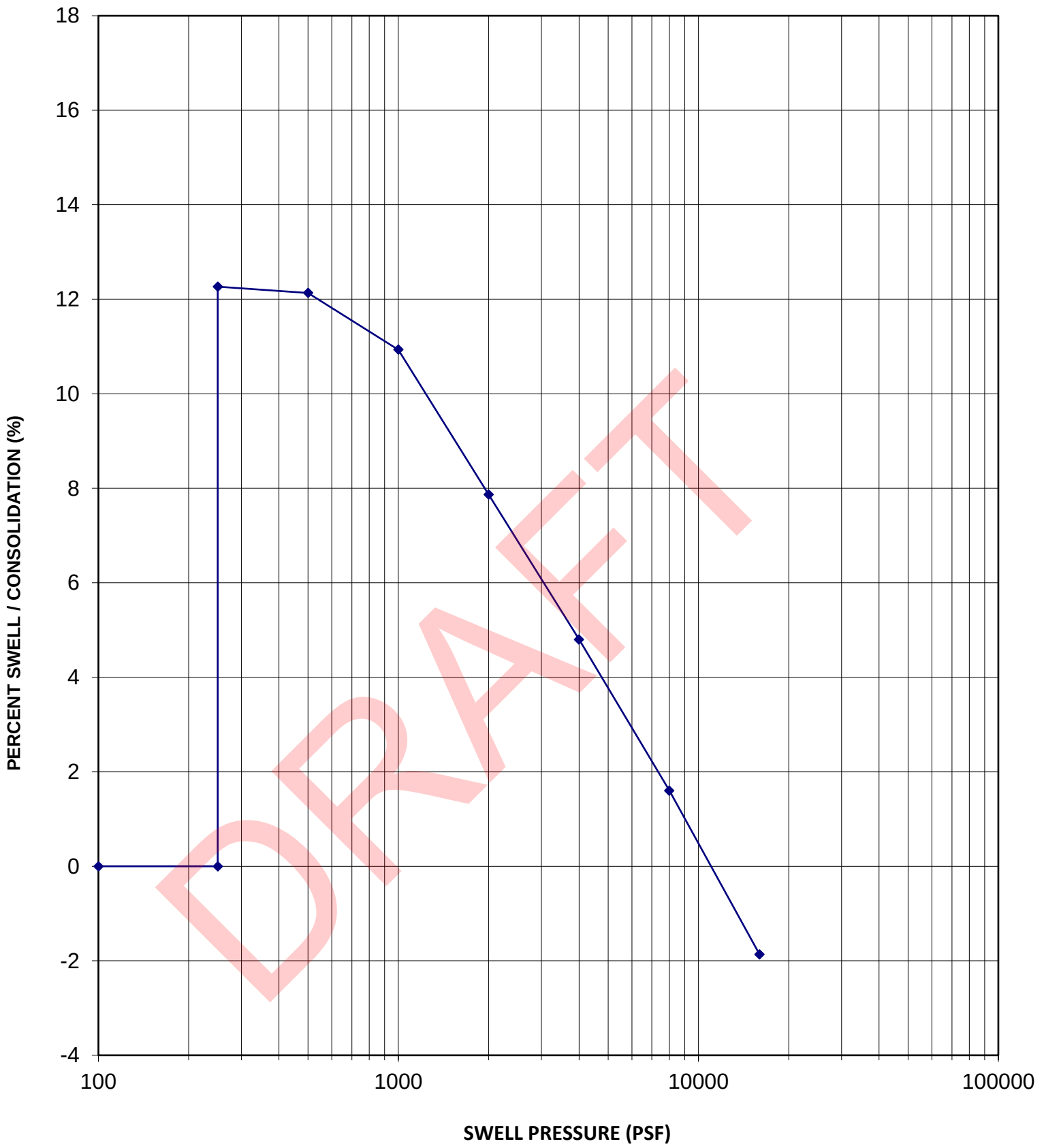


Sample Location	B27
Sample Depth	5 feet
Sample Description	Bedrock
USCS Classification	

Dry Density	115 pcf
In-Situ Moisture Content	19.0 %
Volume Change	5.1 %
Swell Pressure	8,800 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO.**	**5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A24**

SWELL-CONSOLIDATION TEST

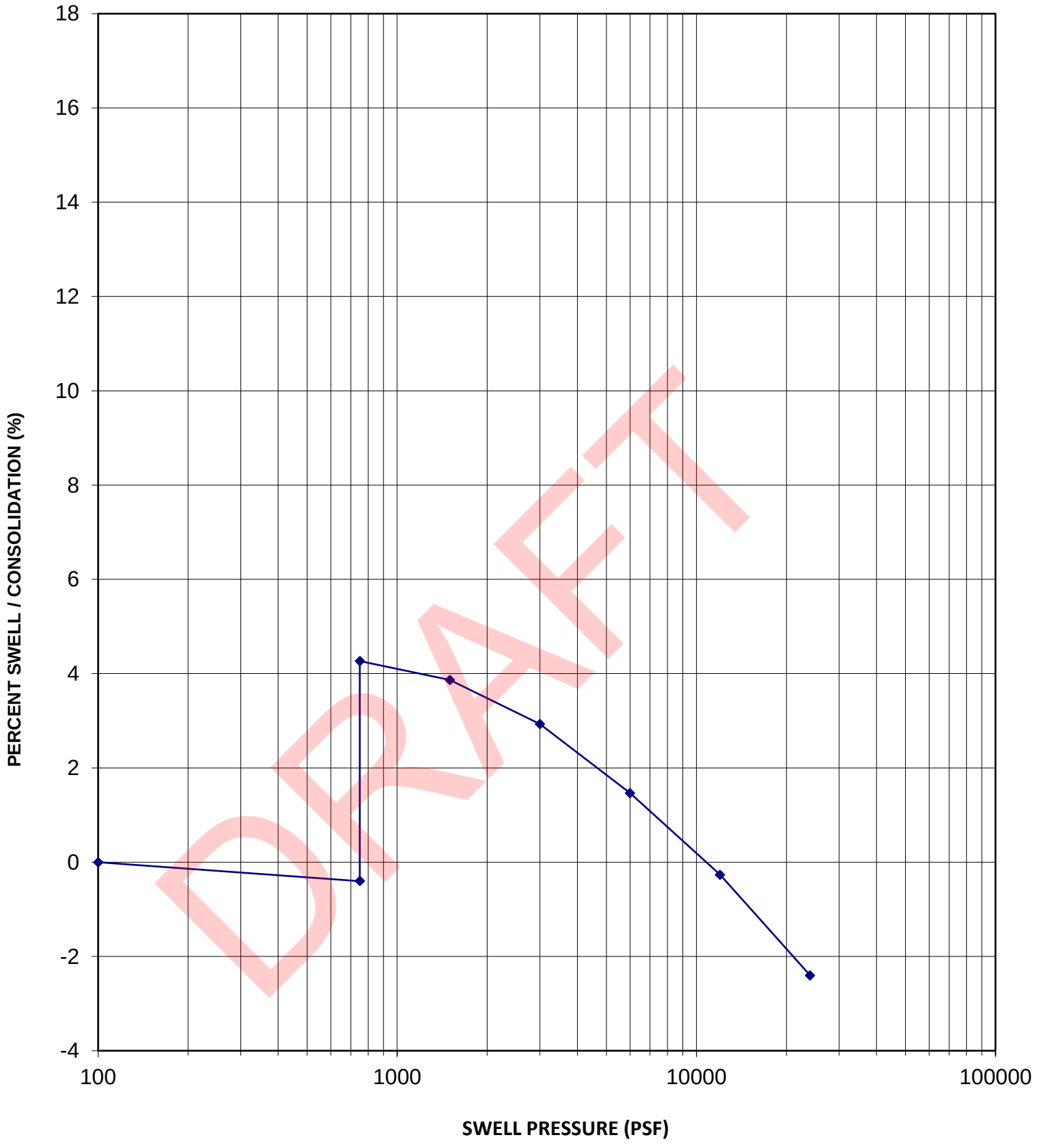


Sample Location	B18
Sample Depth	5 feet
Sample Description	Bedrock
USCS Classification	

Dry Density	113 pcf
In-Situ Moisture Content	15.3 %
Volume Change	12.3 %
Swell Pressure	11,000 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO.**	**5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A25**

SWELL-CONSOLIDATION TEST

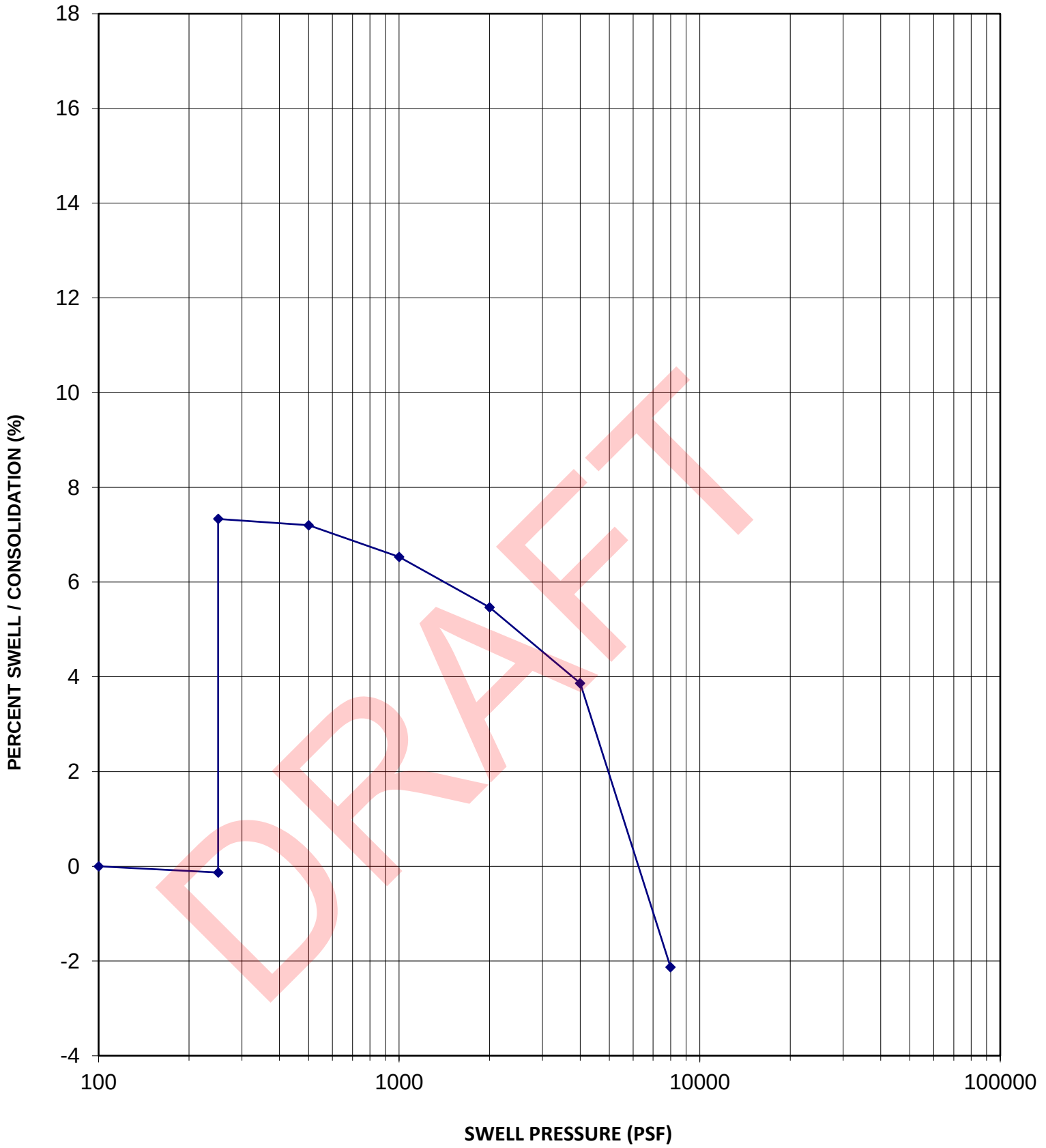


Sample Location	B18
Sample Depth	10 feet
Sample Description	Bedrock
USCS Classification	

Dry Density	115 pcf
In-Situ Moisture Content	18.9 %
Volume Change	4.7 %
Swell Pressure	12,500 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO.**	**5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A26**

SWELL-CONSOLIDATION TEST

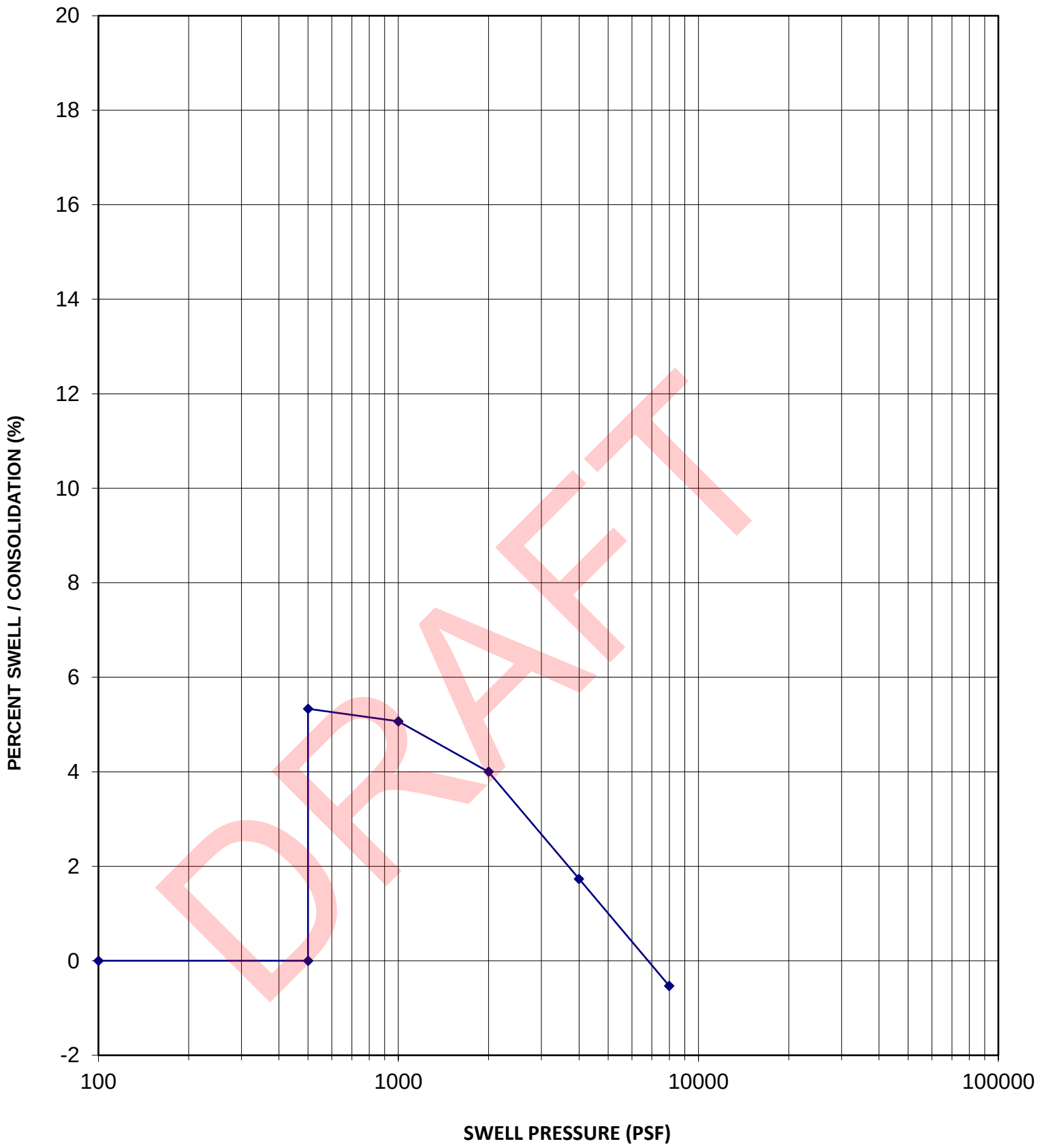


Sample Location	B19
Sample Depth	5 feet
Sample Description	Clay
USCS Classification	CL

Dry Density	114 pcf
In-Situ Moisture Content	18.2 %
Volume Change	7.5 %
Swell Pressure	6,300 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO.**	**5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A27**

SWELL-CONSOLIDATION TEST

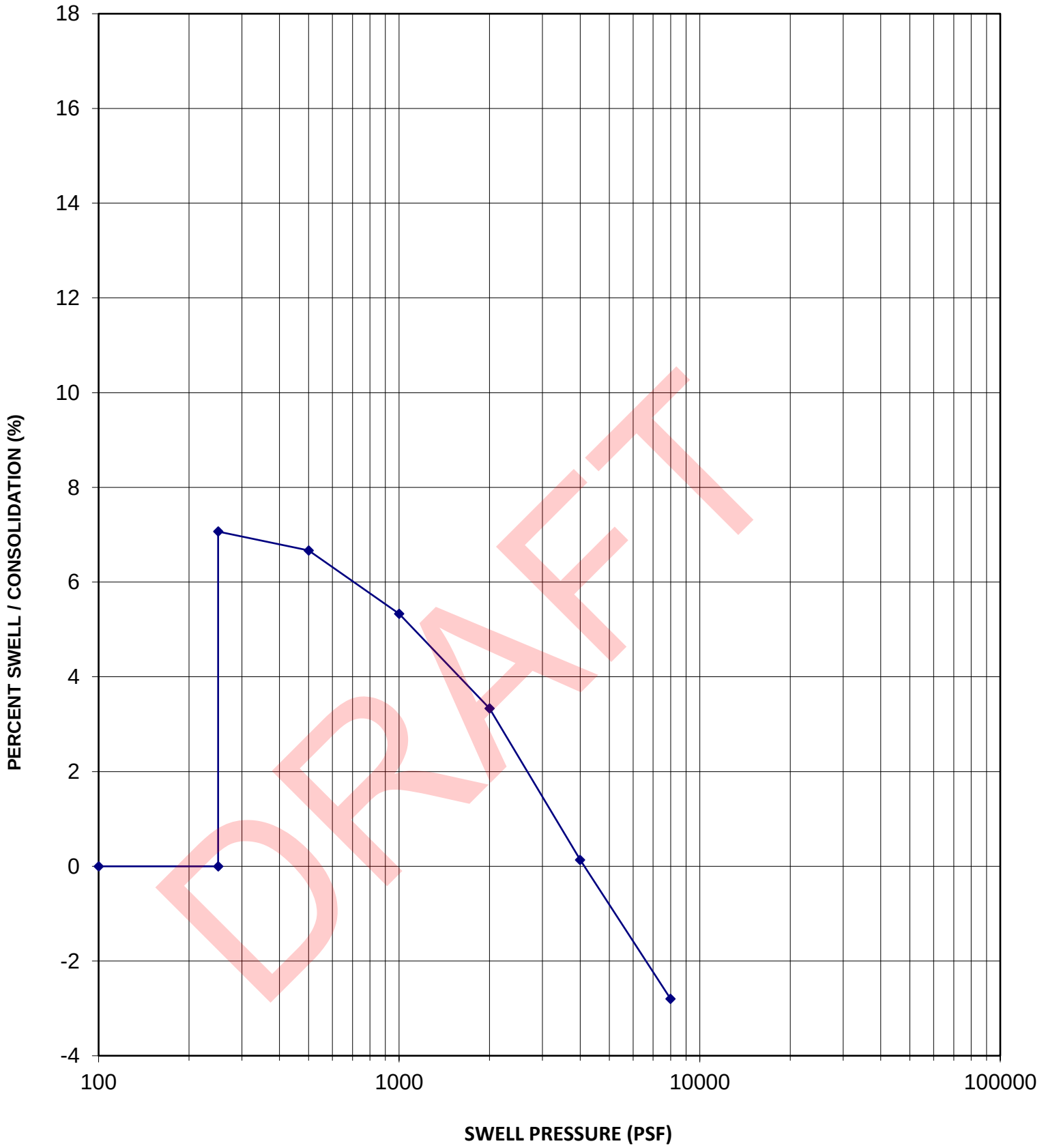


Sample Location	B19
Sample Depth	7.5 feet
Sample Description	Clay
USCS Classification	CL

Dry Density	106 pcf
In-Situ Moisture Content	20.4 %
Volume Change	5.3 %
Swell Pressure	6,800 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO. 5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO. A28**

SWELL-CONSOLIDATION TEST

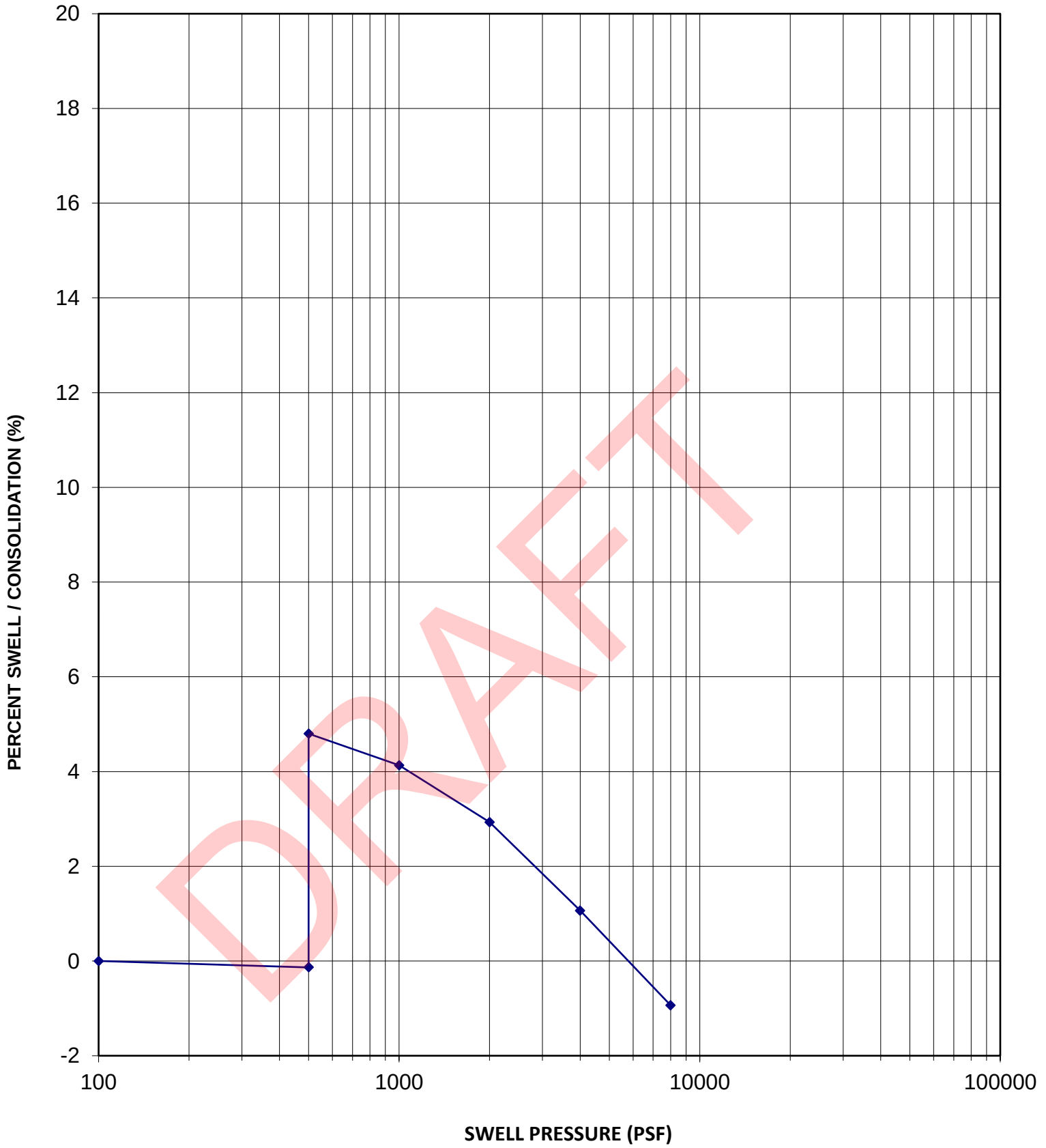


Sample Location	B20
Sample Depth	7.5 feet
Sample Description	Bedrock
USCS Classification	

Dry Density	116 pcf
In-Situ Moisture Content	11.6 %
Volume Change	7.1 %
Swell Pressure	4,100 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO.**	**5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A29**

SWELL-CONSOLIDATION TEST

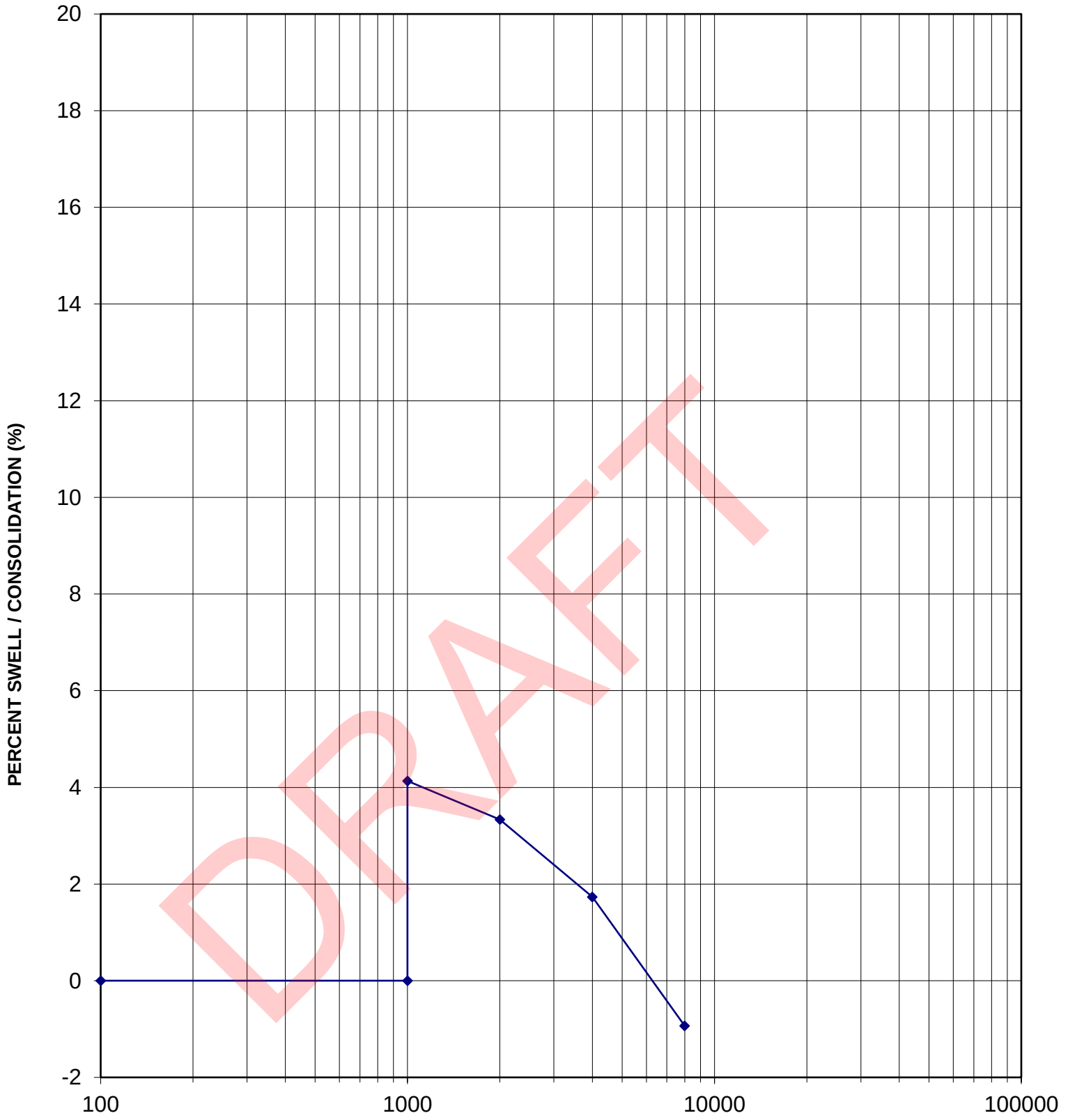


Sample Location	B20
Sample Depth	10 feet
Sample Description	Bedrock
USCS Classification	

Dry Density	110 pcf
In-Situ Moisture Content	15.4 %
Volume Change	4.9 %
Swell Pressure	6,100 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO.**	**5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A30**

SWELL-CONSOLIDATION TEST

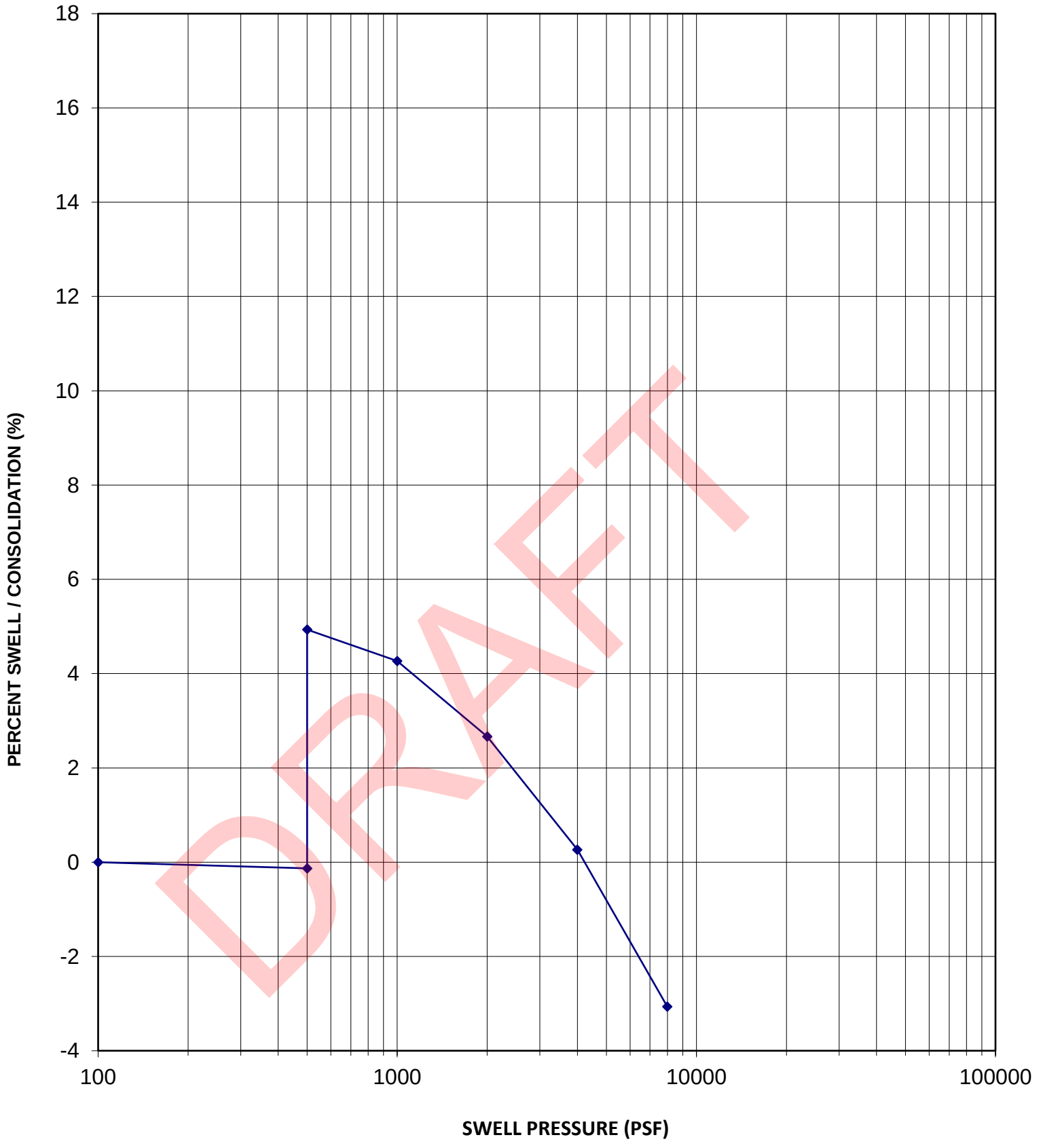


Sample Location	B20
Sample Depth	15 feet
Sample Description	Bedrock
USCS Classification	

Dry Density	110 pcf
In-Situ Moisture Content	13.6 %
Volume Change	4.1 %
Swell Pressure	6,300 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO.**	**5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A31**

SWELL-CONSOLIDATION TEST

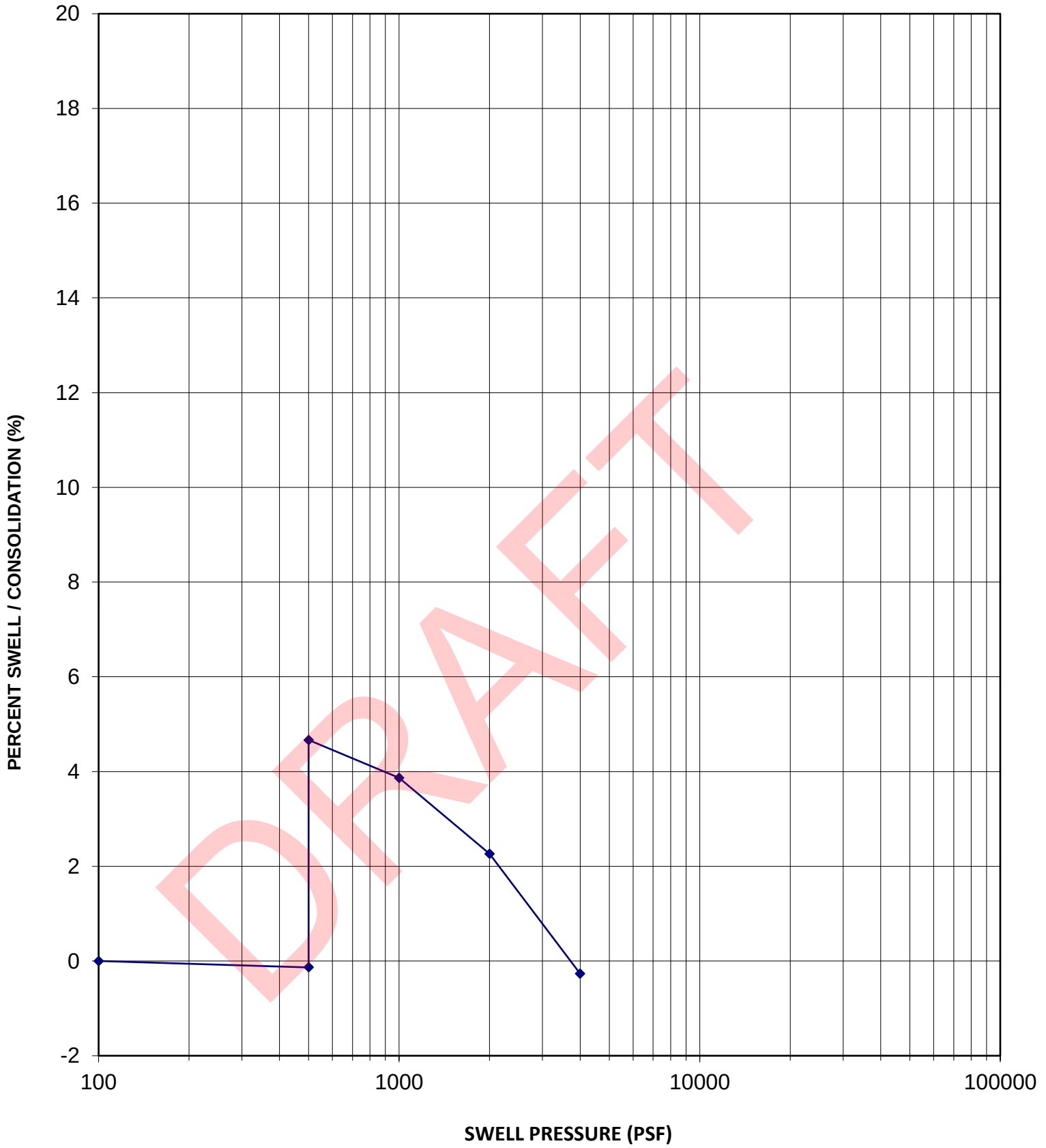


Sample Location	B22
Sample Depth	10 feet
Sample Description	Bedrock
USCS Classification	

Dry Density	109 pcf
In-Situ Moisture Content	13.5 %
Volume Change	5.1 %
Swell Pressure	4,300 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO.**	**5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A32**

SWELL-CONSOLIDATION TEST

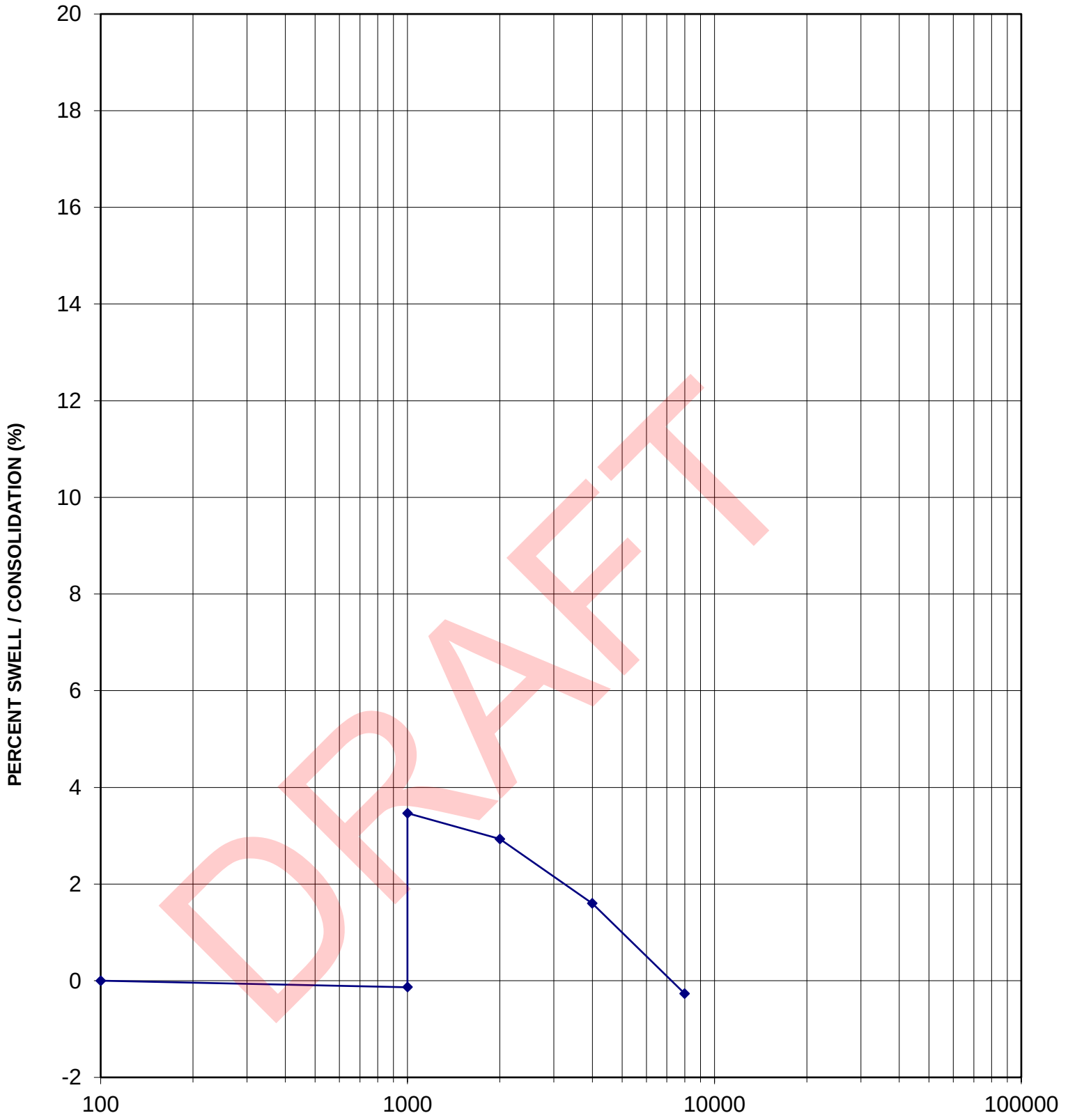


Sample Location	B23
Sample Depth	5 feet
Sample Description	Apparent Fill
USCS Classification	

Dry Density	110 pcf
In-Situ Moisture Content	14.6 %
Volume Change	4.8 %
Swell Pressure	3,900 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO.**	**5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A33**

SWELL-CONSOLIDATION TEST

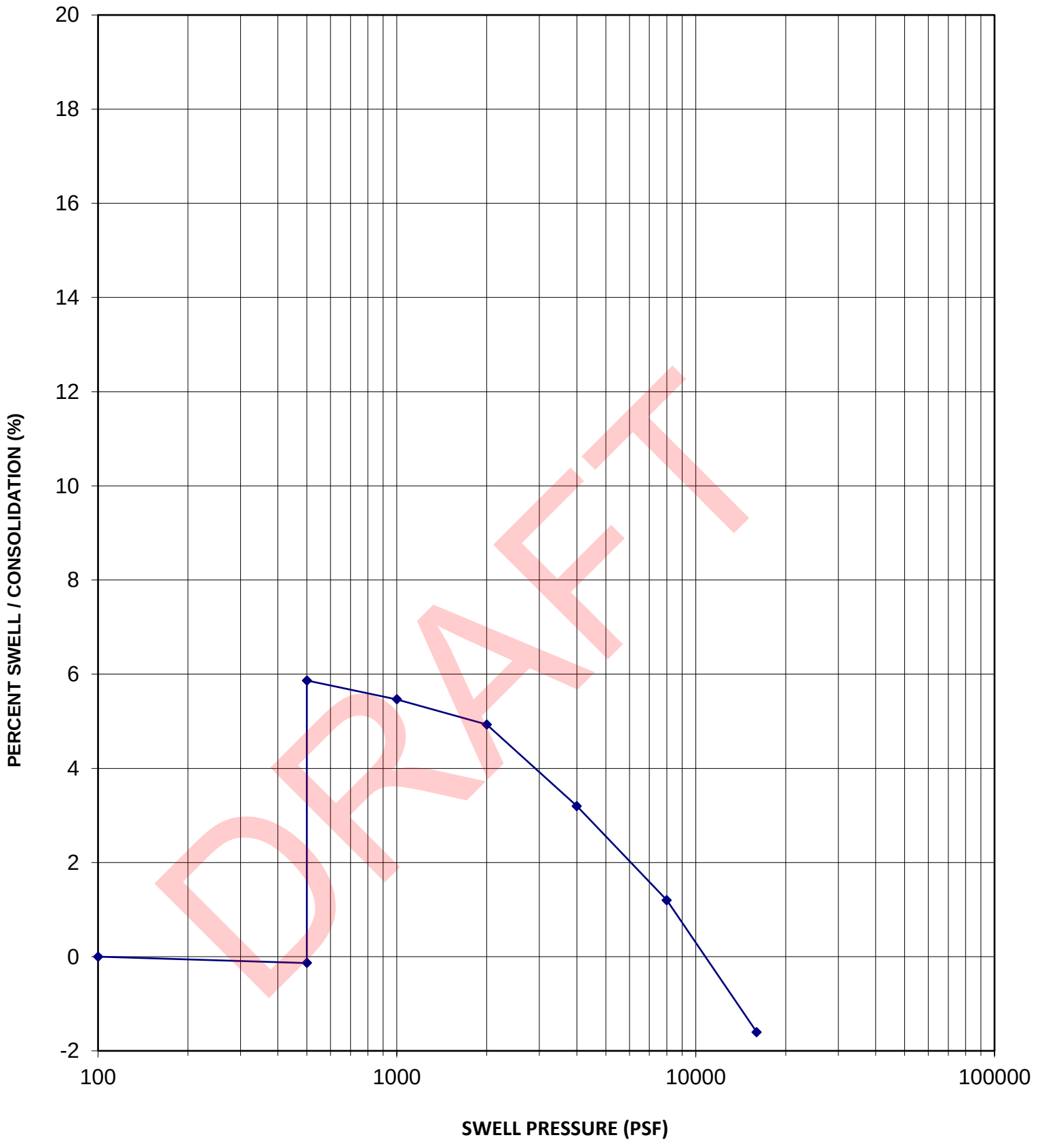


Sample Location	B23
Sample Depth	10 feet
Sample Description	Clay
USCS Classification	CL

Dry Density	115 pcf
In-Situ Moisture Content	15.4 %
Volume Change	3.6 %
Swell Pressure	7,600 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO.**	**5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A34**

SWELL-CONSOLIDATION TEST

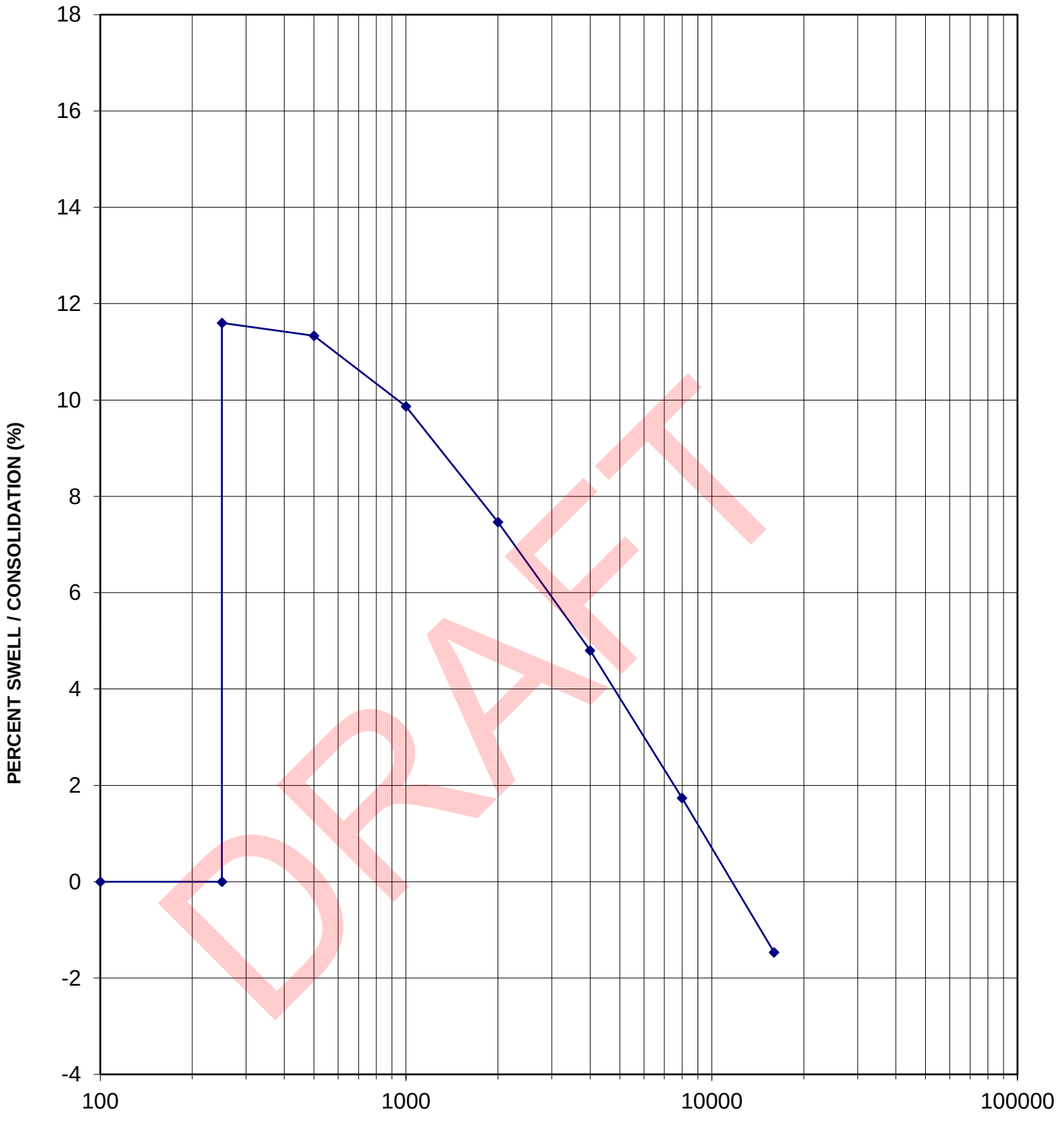


Sample Location	B24
Sample Depth	5 feet
Sample Description	Bedrock
USCS Classification	

Dry Density	117 pcf
In-Situ Moisture Content	15.8 %
Volume Change	6.0 %
Swell Pressure	11,100 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO.**	**5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A35**

SWELL-CONSOLIDATION TEST

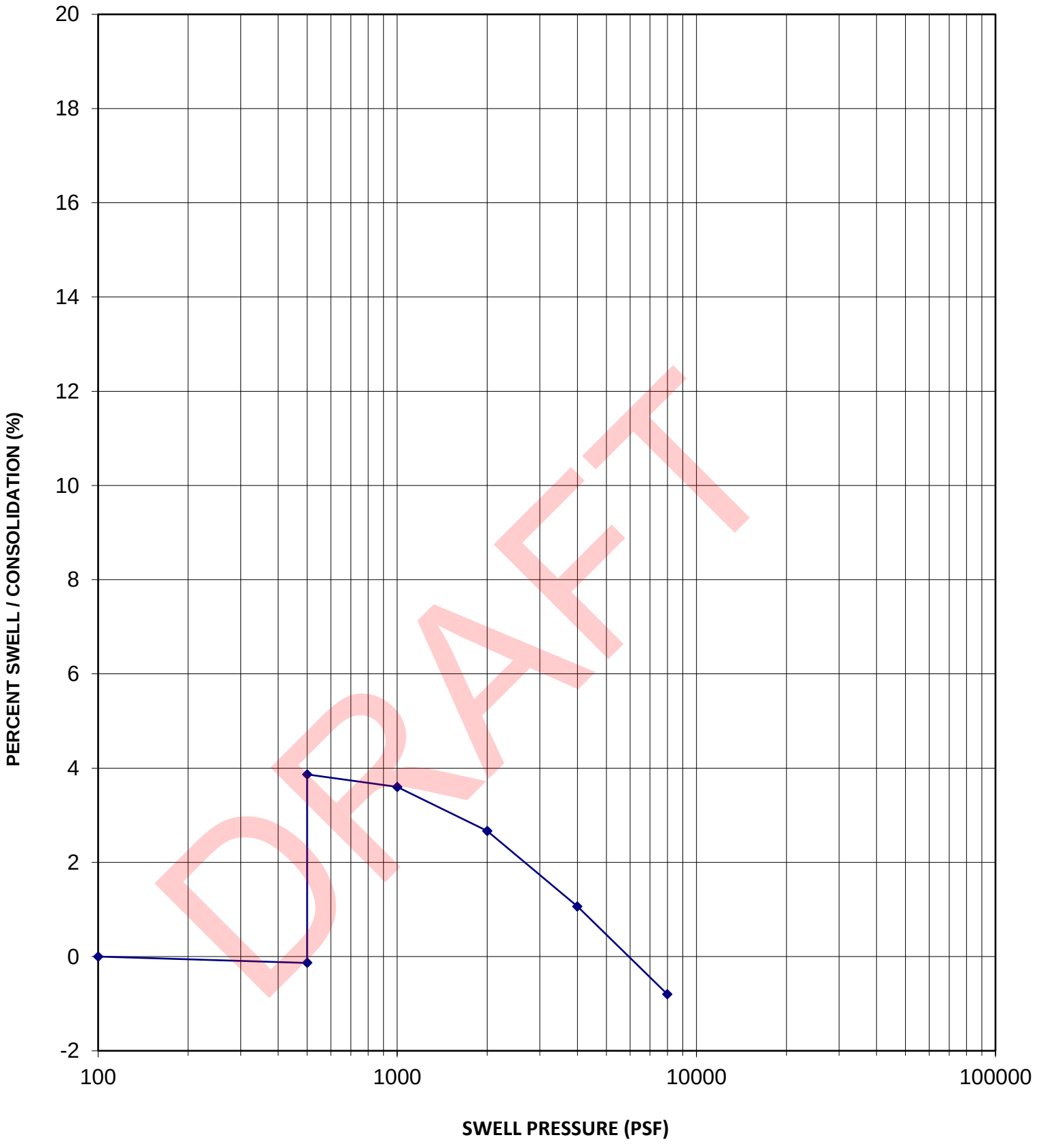


Sample Location	B25
Sample Depth	5 feet
Sample Description	Bedrock
USCS Classification	

Dry Density	115 pcf
In-Situ Moisture Content	14.3 %
Volume Change	11.6 %
Swell Pressure	11,600 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO.**	**5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A36**

SWELL-CONSOLIDATION TEST

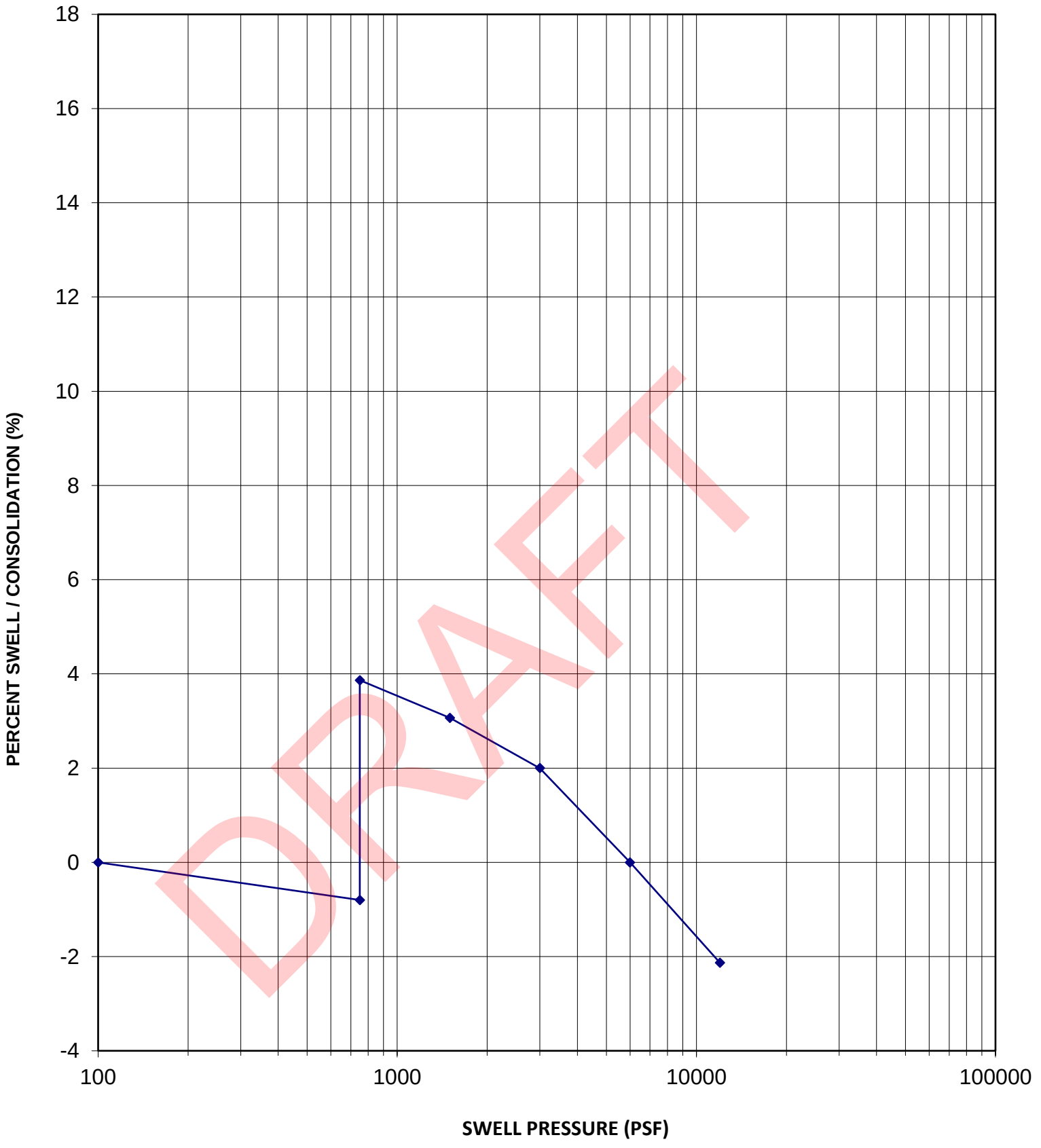


Sample Location	B26
Sample Depth	5 feet
Sample Description	Apparent Fill
USCS Classification	

Dry Density	105 pcf
In-Situ Moisture Content	24.6 %
Volume Change	4.0 %
Swell Pressure	6,200 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO.**	**5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A37**

SWELL-CONSOLIDATION TEST

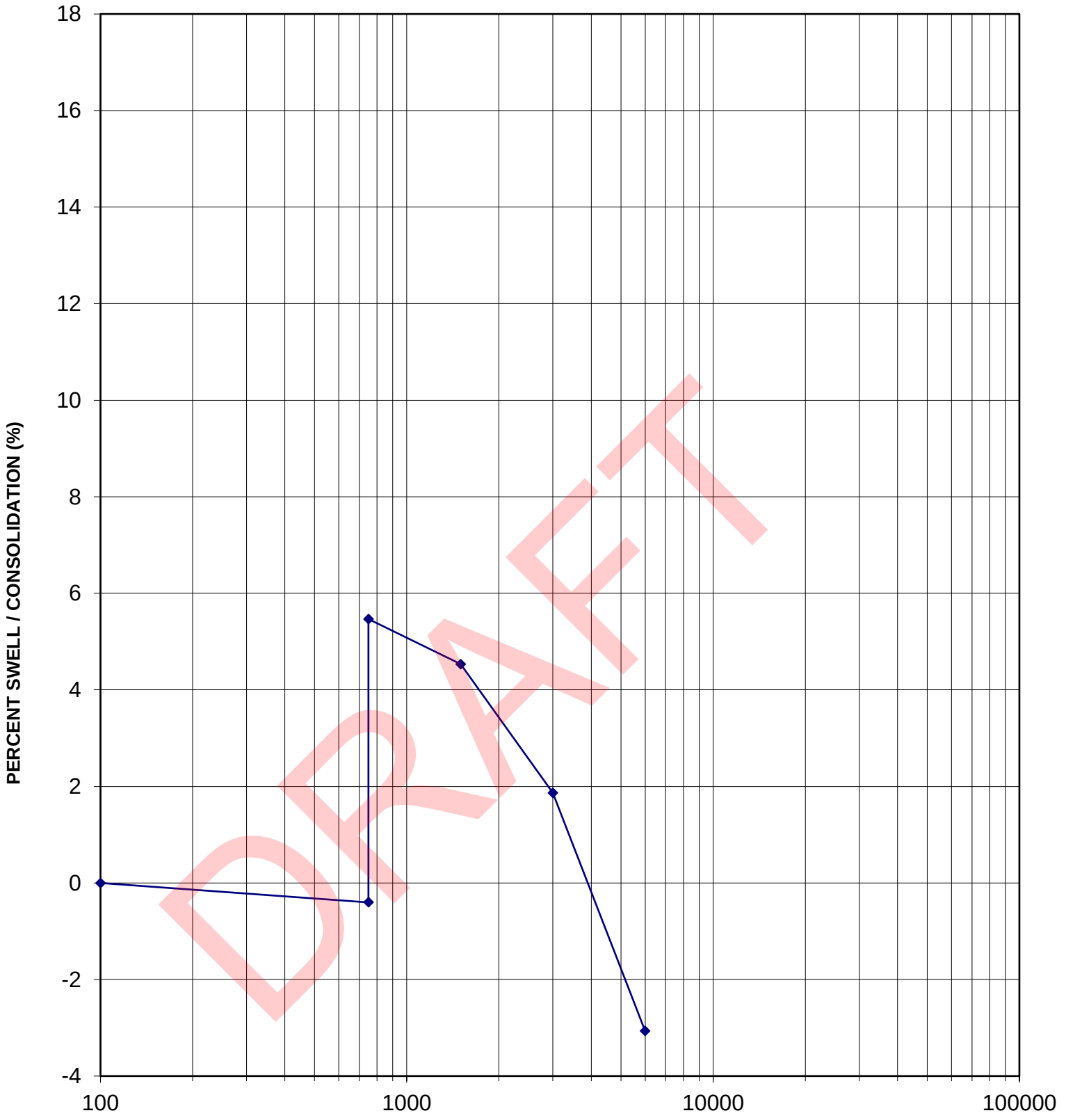


Sample Location	B26
Sample Depth	7.5 feet
Sample Description	Bedrock
USCS Classification	

Dry Density	106 pcf
In-Situ Moisture Content	21.5 %
Volume Change	4.7 %
Swell Pressure	7,800 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO. 5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO. A38**

SWELL-CONSOLIDATION TEST

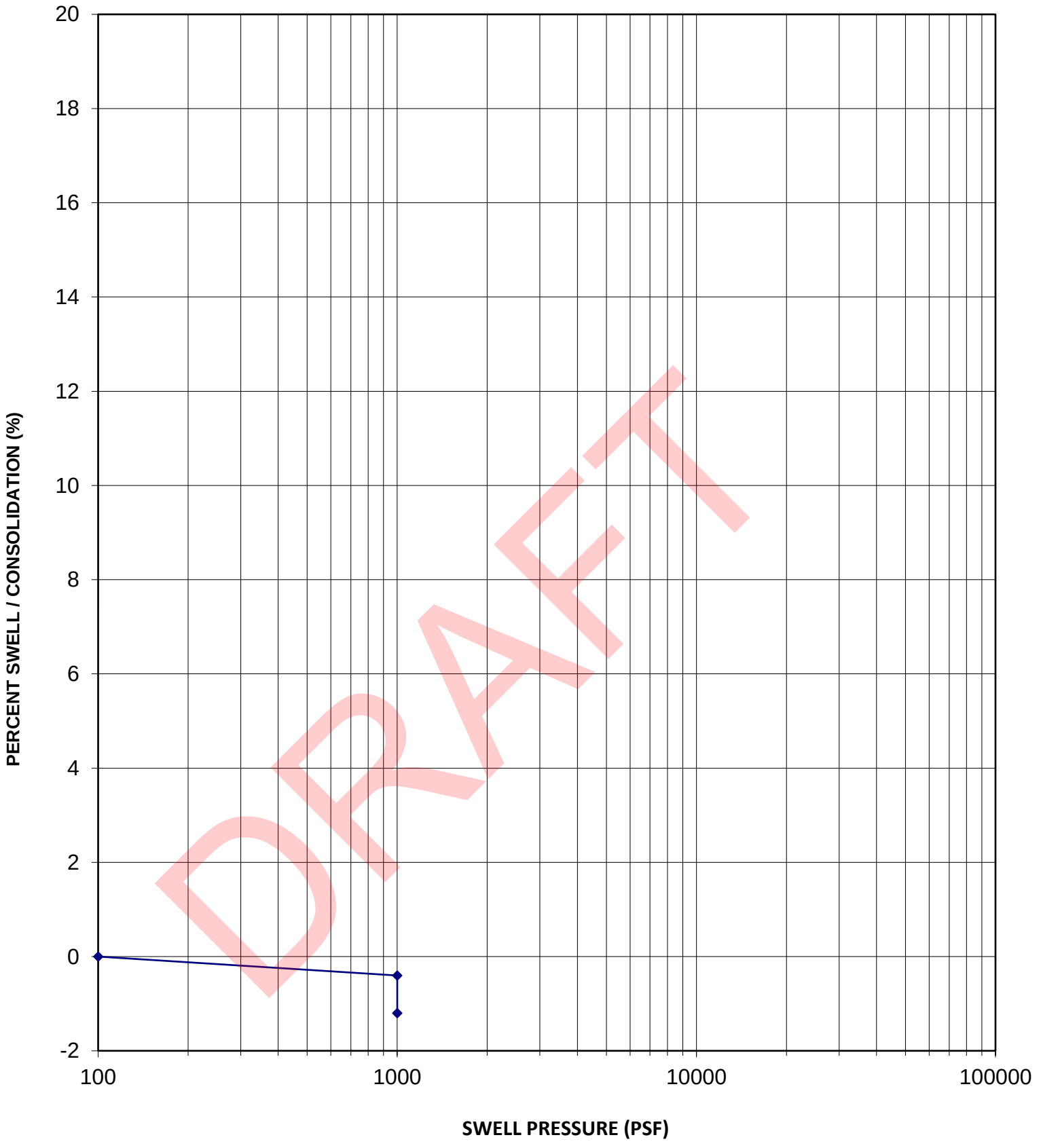


Sample Location	B27
Sample Depth	7.5 feet
Sample Description	Bedrock
USCS Classification	

Dry Density	121 pcf
In-Situ Moisture Content	12.5 %
Volume Change	5.9 %
Swell Pressure	4,100 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO.**	**5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A39**

SWELL-CONSOLIDATION TEST

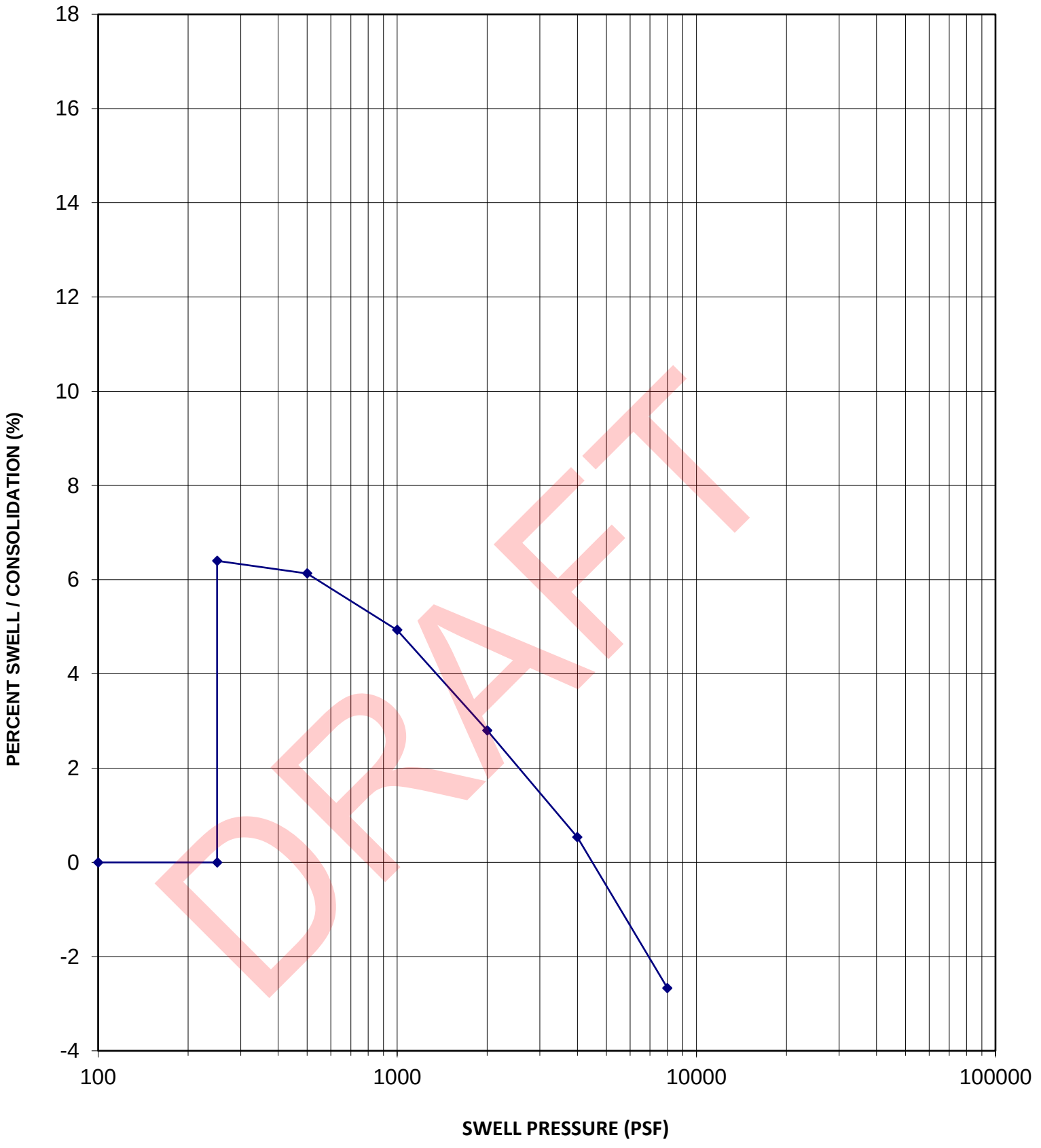


Sample Location	B27
Sample Depth	10 feet
Sample Description	Bedrock
USCS Classification	

Dry Density	114 pcf
In-Situ Moisture Content	11.9 %
Volume Change	-0.8 %
Swell Pressure	psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO.**	**5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A40**

SWELL-CONSOLIDATION TEST

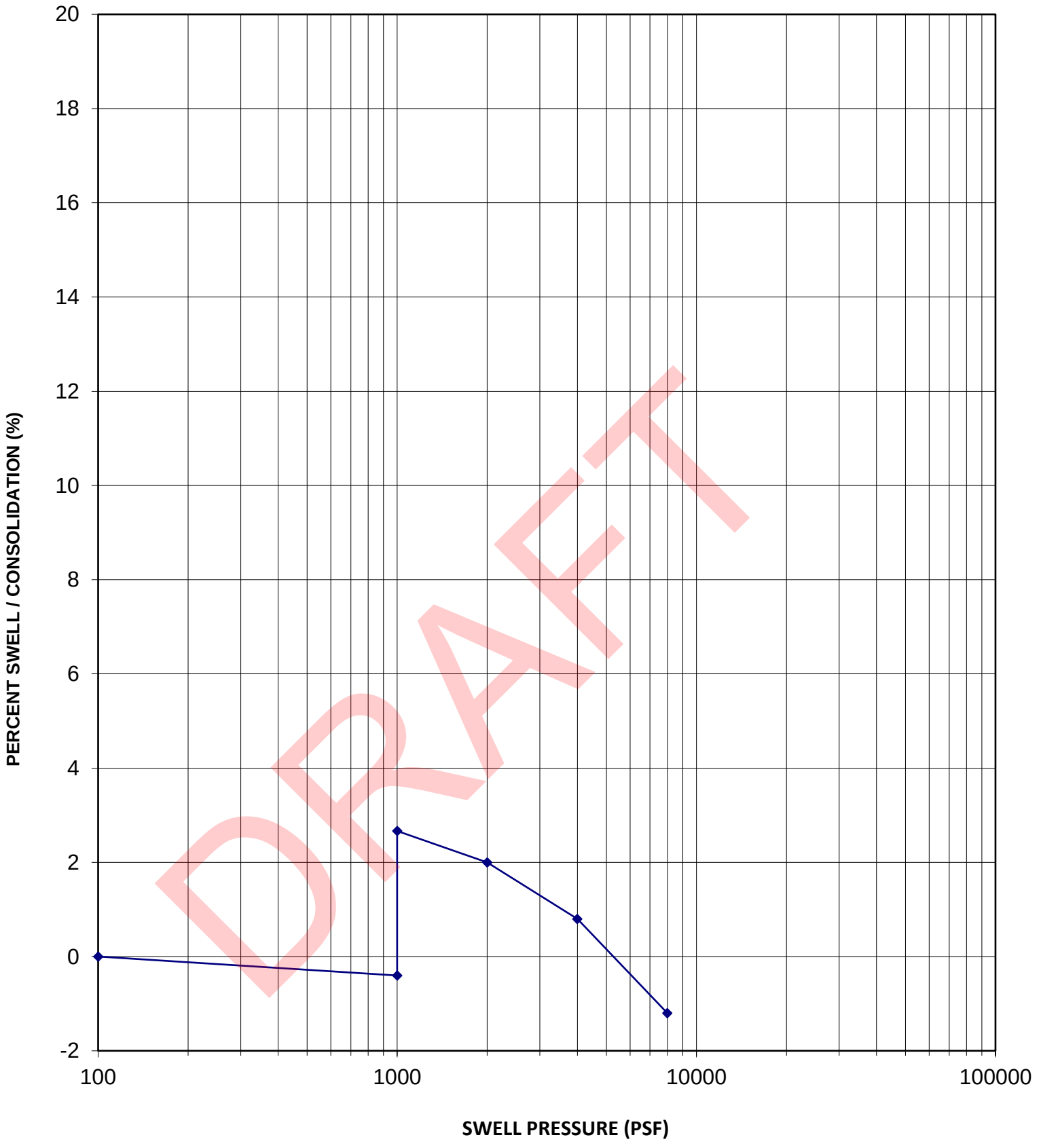


Sample Location	B28
Sample Depth	2.5 feet
Sample Description	Clay
USCS Classification	CH

Dry Density	104 pcf
In-Situ Moisture Content	15.1 %
Volume Change	6.4 %
Swell Pressure	4,500 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO.**	**5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A41**

SWELL-CONSOLIDATION TEST

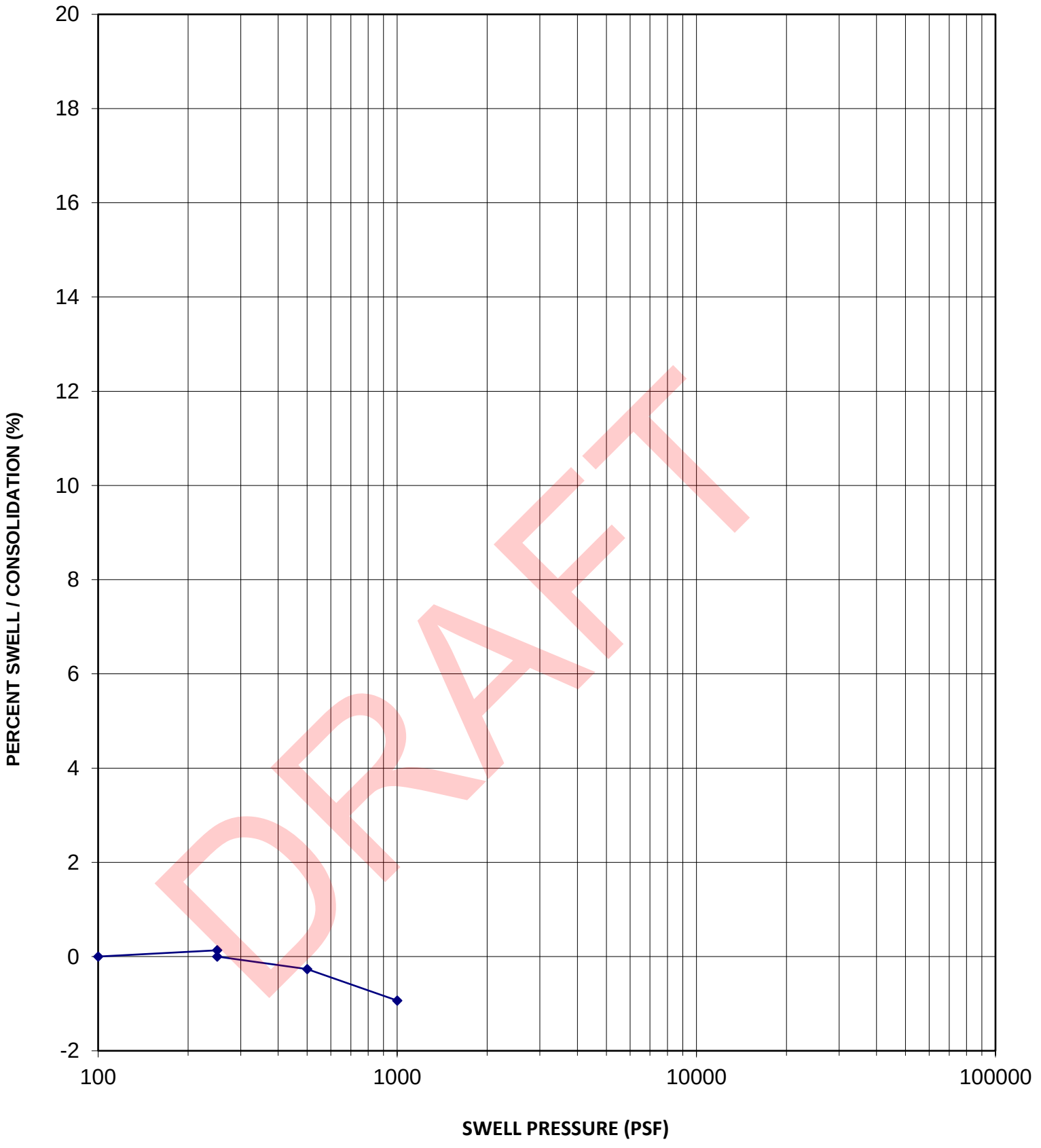


Sample Location	B29
Sample Depth	10 feet
Sample Description	Bedrock
USCS Classification	

Dry Density	108 pcf
In-Situ Moisture Content	19.7 %
Volume Change	3.1 %
Swell Pressure	6,100 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO. 5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO. A42**

SWELL-CONSOLIDATION TEST

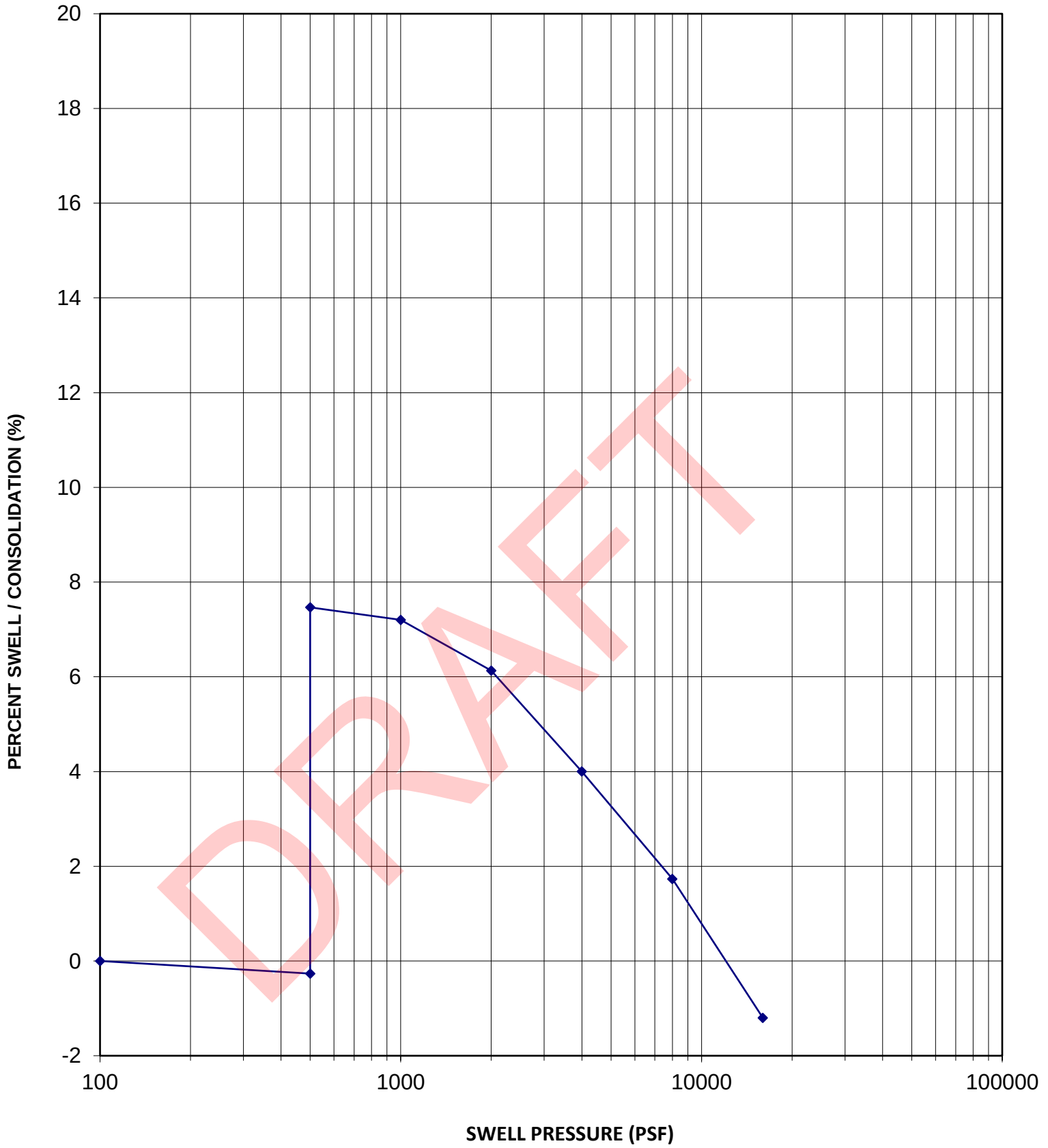


Sample Location	B30
Sample Depth	5 feet
Sample Description	Bedrock
USCS Classification	

Dry Density	109 pcf
In-Situ Moisture Content	18.1 %
Volume Change	-0.1 %
Swell Pressure	psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO.**	**5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**A43**

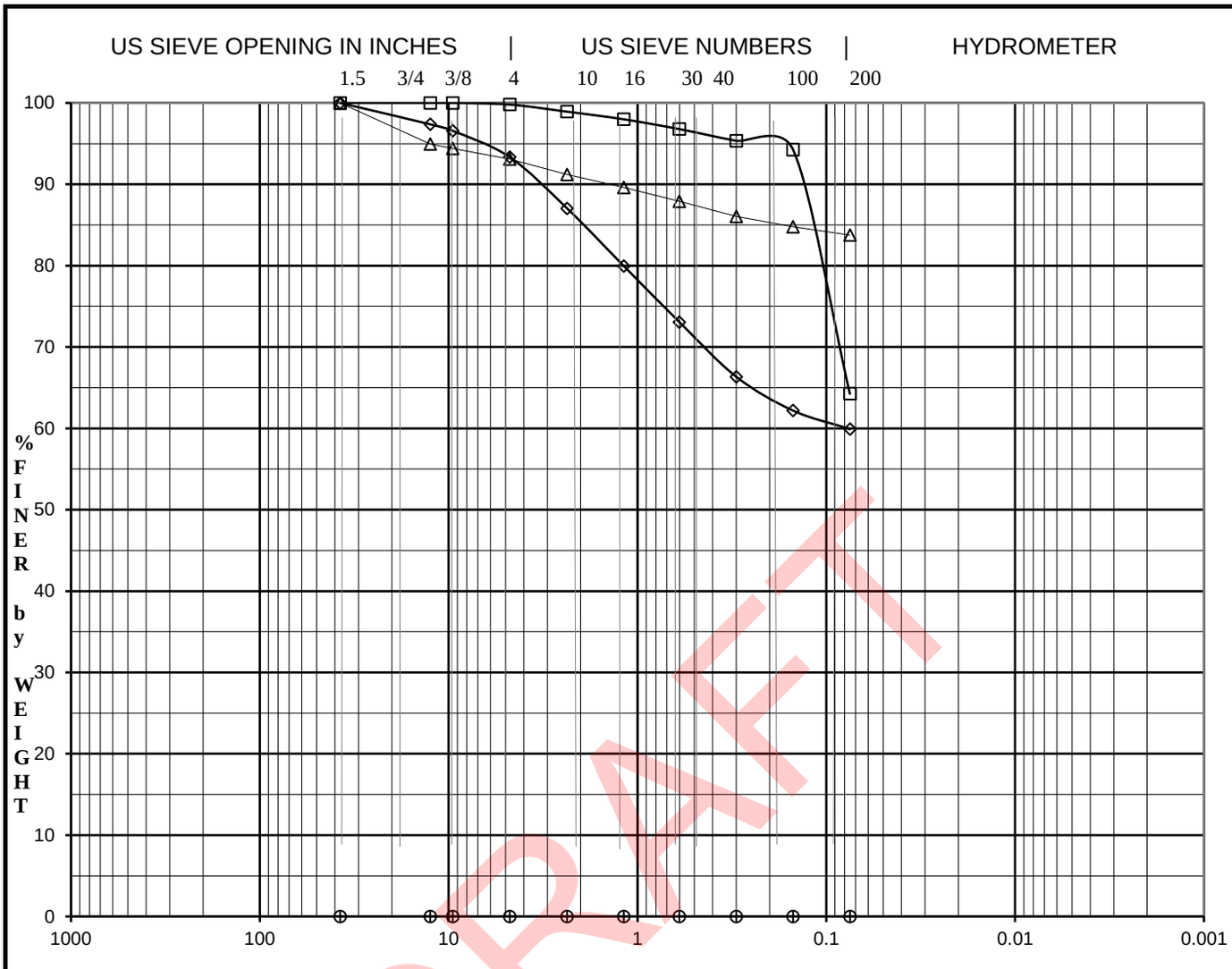
SWELL-CONSOLIDATION TEST



Sample Location	B30
Sample Depth	7.5 feet
Sample Description	Bedrock
USCS Classification	

Dry Density	113 pcf
In-Situ Moisture Content	19.5 %
Volume Change	7.7 %
Swell Pressure	12,800 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO. 5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO. A44**



Specimen I.D.	Description	USCS	AASHTO	Group Index	LL	PI	PL
◇ B3 @ 5 FEET	High Plastic Clay	CH	A-7-6	23	66	42	24
□ B13 @ 10 FEET	High Plastic Clay	CH	A-7-6	32	74	53	21
△ B24 @ 2.5 FEET	High Plastic Clay	CH	A-7-6	33	58	38	20
○							
+							

Specimen I.D.	D100	D60	D30	D10	Cc	Cu	%Gravel	%Sand	%Silt&Clay
◇ B3 @ 5 FEET	37.50	0.08					7	33	60
□ B13 @ 10 FEET	9.50						0	36	64
△ B24 @ 2.5 FEET	37.50						7	9	84
○									
+									

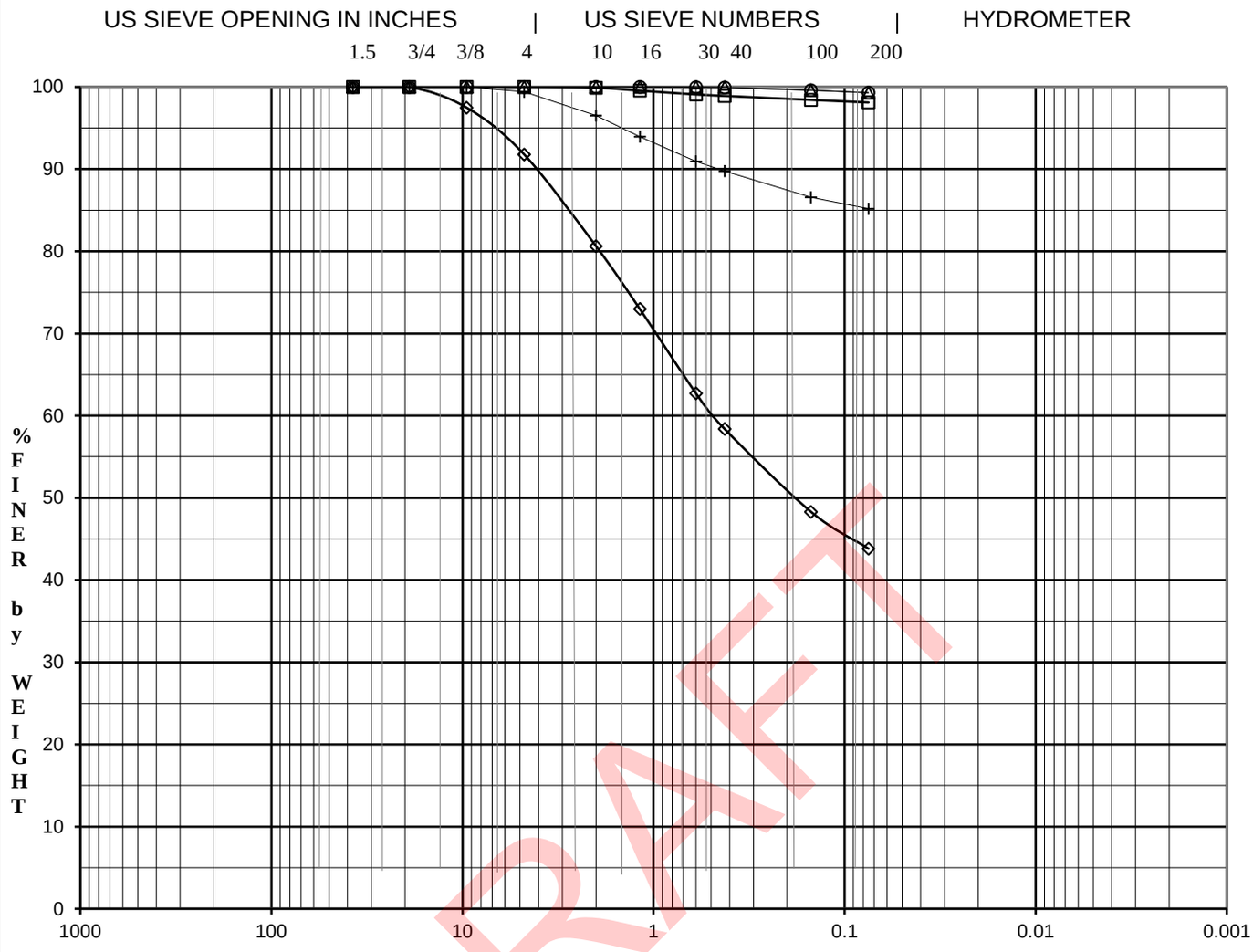
intertek psi

TTRes Venetucci Multifamily

JOB NO. 5322879

GRADATION CURVES

FIGURE NO. A45



Specimen I.D.	Description	USCS	AASHTO	Group Index	LL	PI	PL
◇ B2 @ 10 FEET	Clayey Sand	SC	A-7-6	12	66	42	24
□ B4 @ 2.5 FEET	High Plastic Clay	CH	A-7-6	47	66	42	24
△ B5 @ 5 FEET	High Plastic Clay	CH	A-7-6	85	95	75	20
○ B7 @ 2.5 FEET	High Plastic Clay	CH	A-7-6	85	95	75	20
+ B12 @ 5 FEET	High Plastic Clay	CH	A-7-6	49	74	53	21

Specimen I.D.	D100	D60	D30	D10	Cc	Cu	%Gravel	%Sand	%Silt&Clay
◇ B2 @ 10 FEET	19.00	0.49					8	48	44
□ B4 @ 2.5 FEET	4.75						0	2	98
△ B5 @ 5 FEET	2.00						0	1	99
○ B7 @ 2.5 FEET	1.18						0	1	99
+ B12 @ 5 FEET	9.50						1	14	85

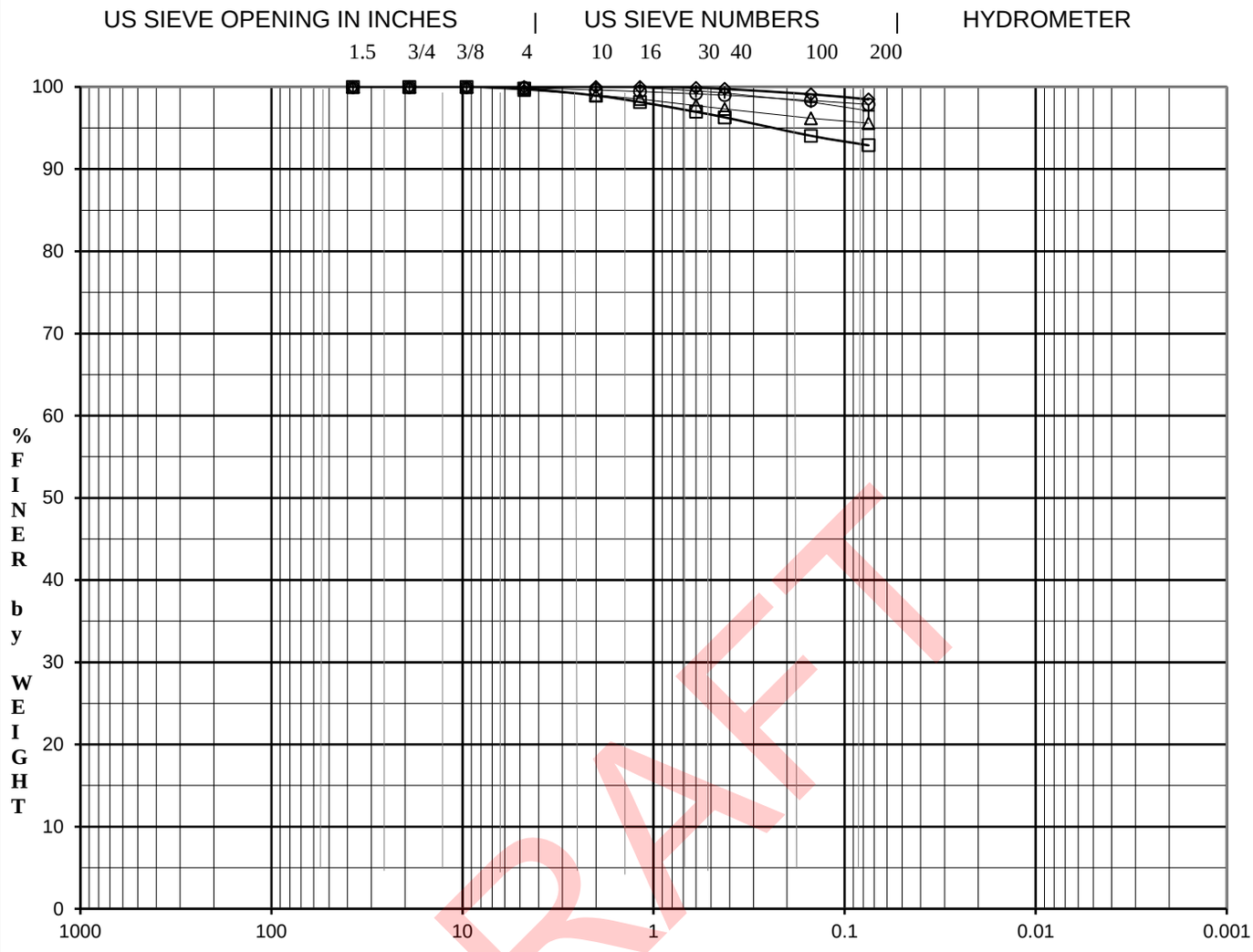
intertek psi

TTRes Venetucci Multifamily

JOB NO. 5322879

GRADATION CURVES

FIGURE NO. A46



Specimen I.D.	Description	USCS	AASHTO	Group Index	LL	PI	PL
◇ B16 @ 2.5 FEET	High Plastic Clay	CH	A-7-6	48	63	44	19
□ B19 @ 5 FEET	Low Plastic Clay	CL	A-7-6	29	48	30	18
△ B20 @ 10 FEET	Low Plastic Clay	CL	A-7-6	31	48	30	18
○ B23 @ 5 FEET	Low Plastic Clay	CL	A-7-6	32	48	30	18
+ B26 @ 5 FEET	High Plastic Clay	CH	A-7-6	41	58	38	20

Specimen I.D.	D100	D60	D30	D10	Cc	Cu	%Gravel	%Sand	%Silt&Clay
◇ B16 @ 2.5 FEET	2.00						0	2	98
□ B19 @ 5 FEET	9.50						0	7	93
△ B20 @ 10 FEET	9.50						0	4	96
○ B23 @ 5 FEET	9.50						0	2	98
+ B26 @ 5 FEET	4.75						0	3	97

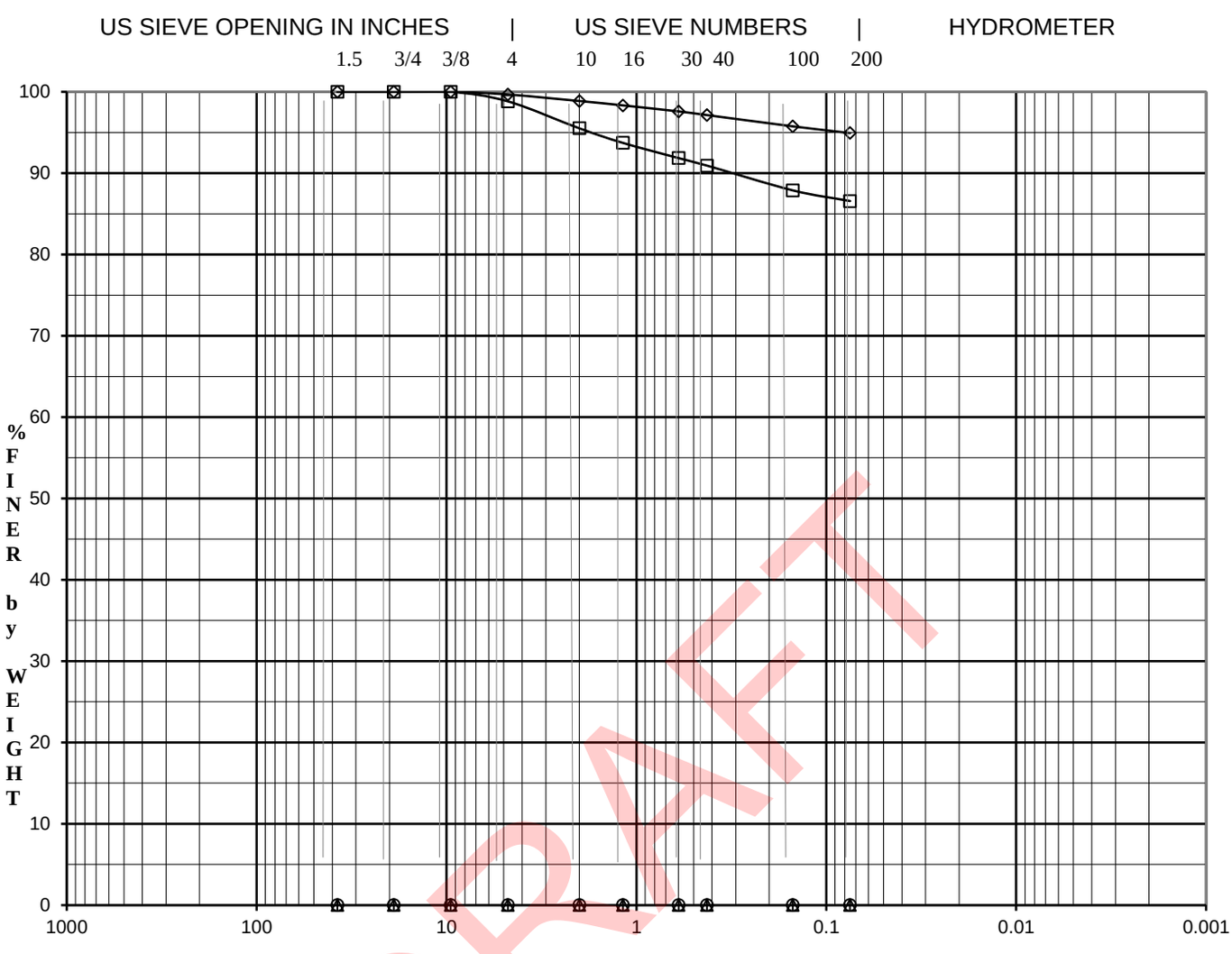
intertek psi

TTRes Venetucci Multifamily

JOB NO. 5322879

GRADATION CURVES

FIGURE NO. A47



Specimen I.D.	Description	USCS	AASHTO	Group Index	LL	PI	PL
◇ B28 @ 2.5 FEET	High Plastic Clay	CH	A-7-6	48	67	45	22
□ B30 @ 2.5 FEET	High Plastic Clay	CH	A-7-6	42	67	45	22
△							
○							
+							

Specimen I.D.	D100	D60	D30	D10	Cc	Cu	%Gravel	%Sand	%Silt&Clay
◇ B28 @ 2.5 FEET	9.50						0	5	95
□ B30 @ 2.5 FEET	9.50						1	12	87
△									
○									
+									

intertek psi

TTRes Venetucci Multifamily

JOB NO. 5322879

GRADATION CURVES

FIGURE NO. A48

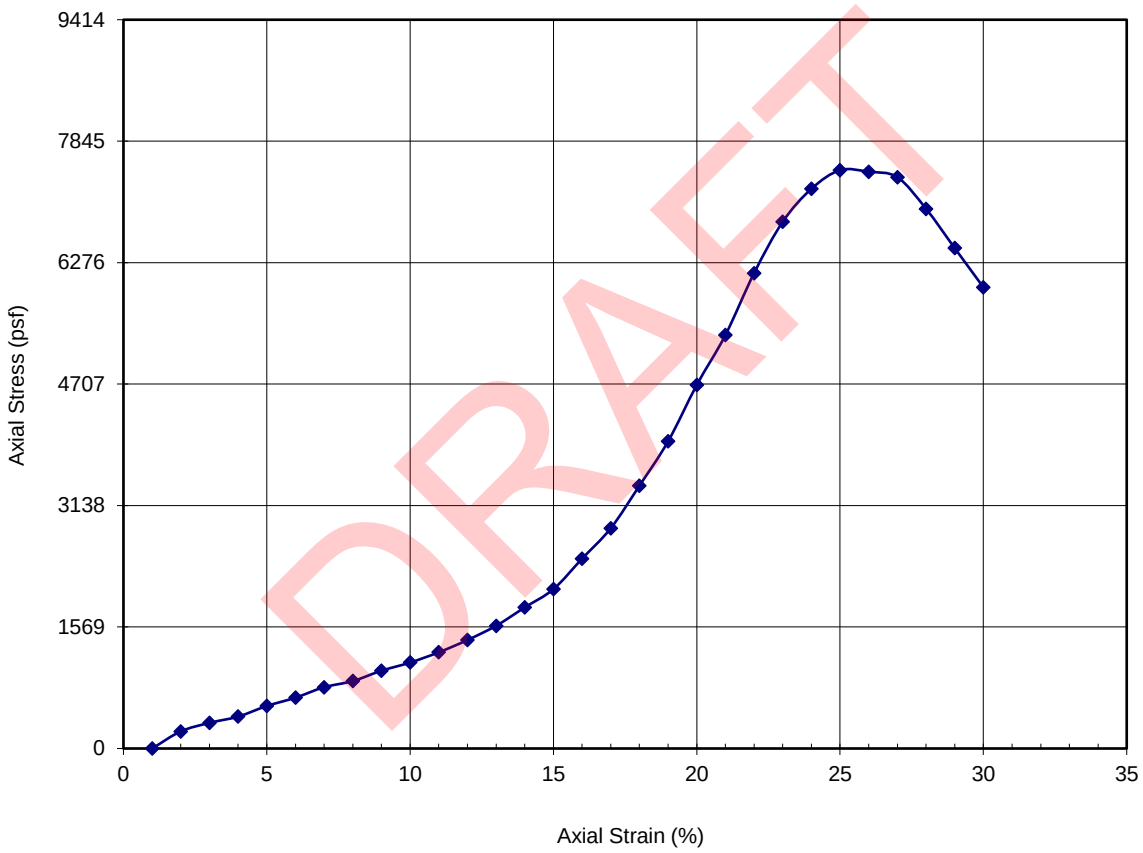
Information To Build On
Engineering • Consulting • Testing

UNCONFINED COMPRESSION REPORT

Tested For: Thompson Thrift Residential
111 Monument Circle, Suite 1500
Indianapolis, Indiana 46204

Project Name: Proposed Multi-Family Development
Sample Date: September 14, 2024
Project No. 05322879
Sample No. B26
Depth 20

UNCONFINED COMPRESSION TEST: ASTM D2166



Wet Density (pcf)	125.0	**Initial Height (in)**	3.96
Dry Density (pcf)	105.6	**Initial Diameter (in)**	1.92
Moisture Content (%)	18.3	**Relative Compaction (%)**	N/A
Compressive Strength (psf)	7,500	**Deviation From OMC (%)**	N/A

Remarks:

Respectfully Submitted,
Professional Service Industries, Inc.

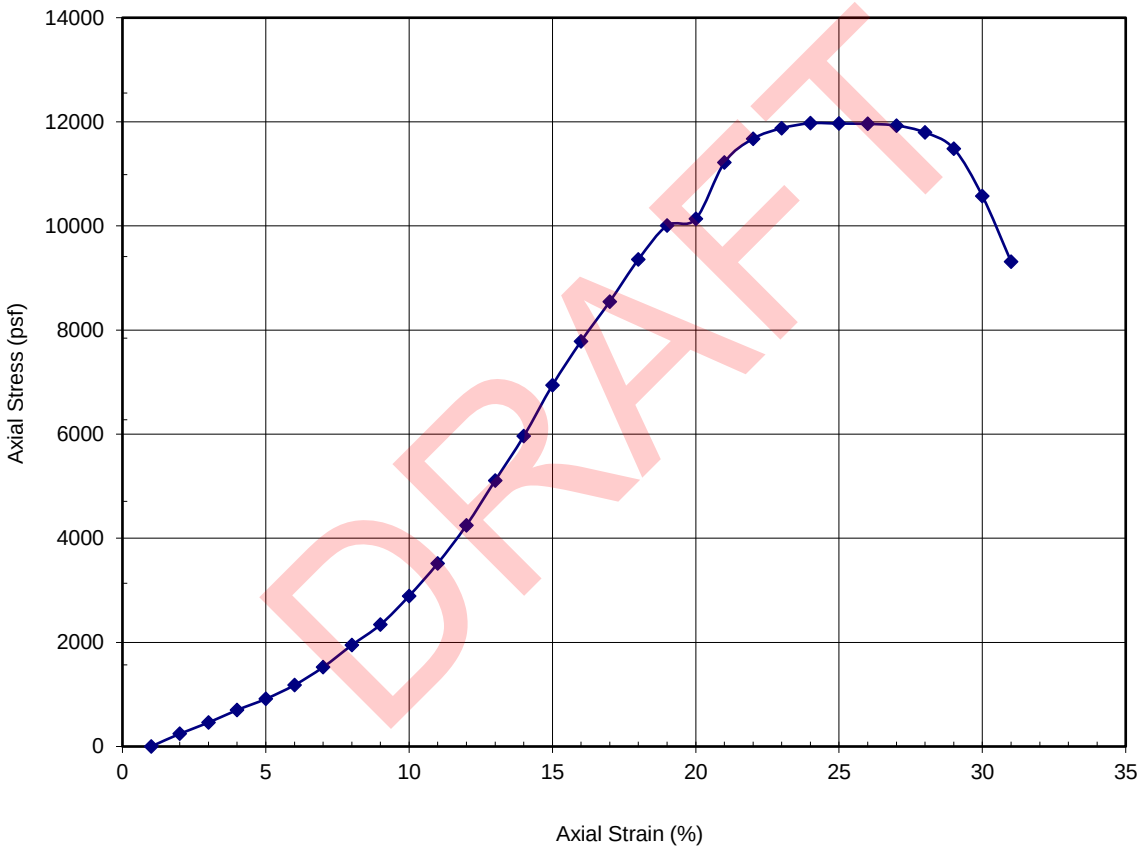
Information To Build On
Engineering • Consulting • Testing

UNCONFINED COMPRESSION REPORT

Tested For: Thompson Thrift Residential
111 Monument Circle, Suite 1500
Indianapolis, Indiana 46204

Project Name: Proposed Multi-Family Development
Sample Date: September 14, 2024
Project No. 05322879
Sample No. B29
Depth 15

UNCONFINED COMPRESSION TEST: ASTM D2166



Wet Density (pcf)	126.2	**Initial Height (in)**	4.01
Dry Density (pcf)	105.2	**Initial Diameter (in)**	1.94
Moisture Content (%)	20.0	**Relative Compaction (%)**	N/A
Compressive Strength (psf)	12,000	**Deviation From OMC (%)**	N/A

Remarks:

Respectfully Submitted,
Professional Service Industries, Inc.

Information To Build On
Engineering • Consulting • Testing

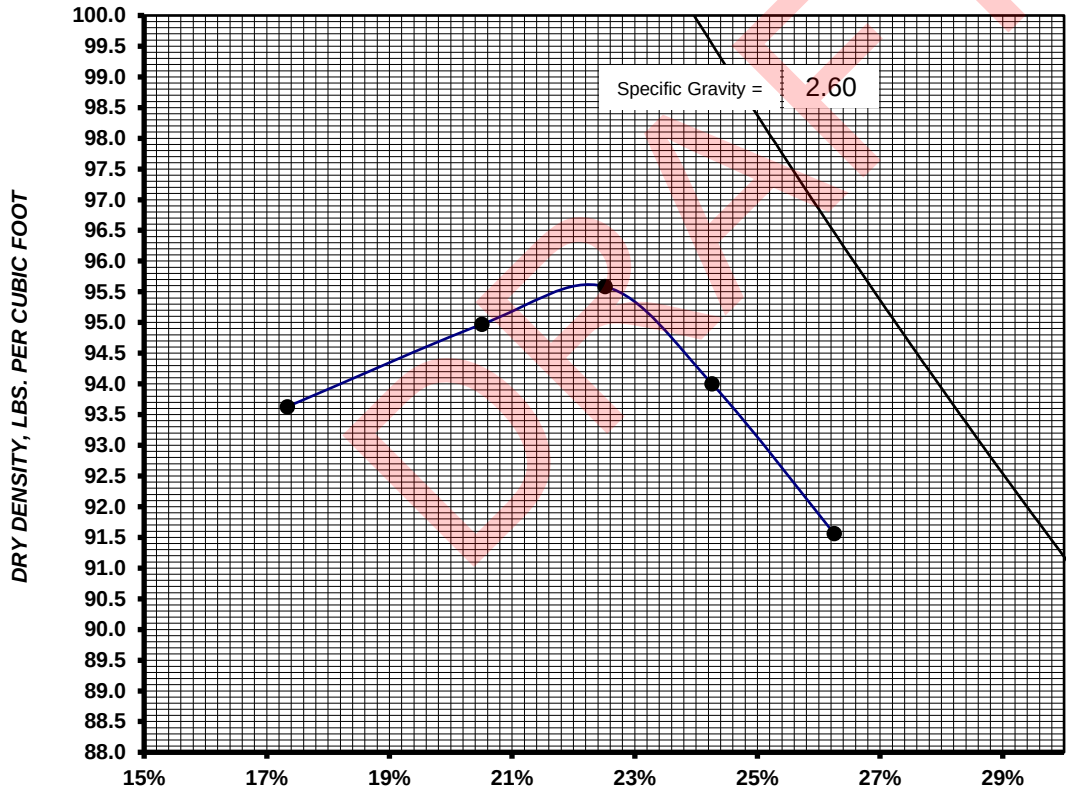
REPORT OF MOISTURE DENSITY RELATIONSHIP OF SOIL

Tested For: Thompson Thrift Residential

Project Name: TTRes Venetucci Blvd

Sample Date: September 11, 2024
Project No. 05322879-1
Report No. 1
Sample No. 1

Sample Source:
Sample Classification: A-7-6 (51) CH fat clay
General Description:
Test Method: **ASTM D698 Method A**
Rammer: Manual **Method of Preparation:** Moist
Atterberg Limits (AASHTO T-89/T-90)
LL: 67.8 **PL:** 20.06 **PI:** 47.7
Specific Gravity: 2.60 Estimate
Maximum Dry Density (pcf): 95.6
Optimum Moisture Content (%): 22.2



Grain Size Analysis
(ASTM C136 and/ or C117)

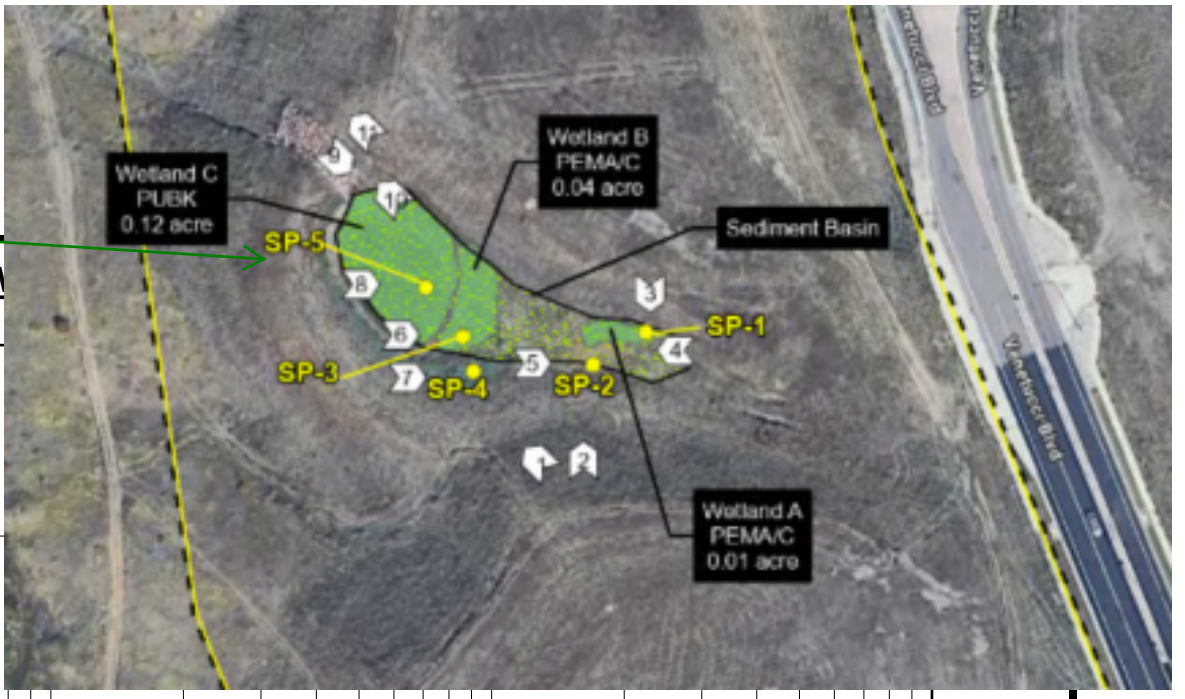
Sieve Size	Percent Passing
3"	100
3"	100
11/2"	100
3/4"	100
1/2"	100
3/8"	100
No. 4	99
No. 8	99
No. 10	98
No. 16	98
No. 30	97
No. 40	97
No. 50	97
No. 100	96
No. 200	95

Respectfully Submitted,
Professional Service Industries, Inc.

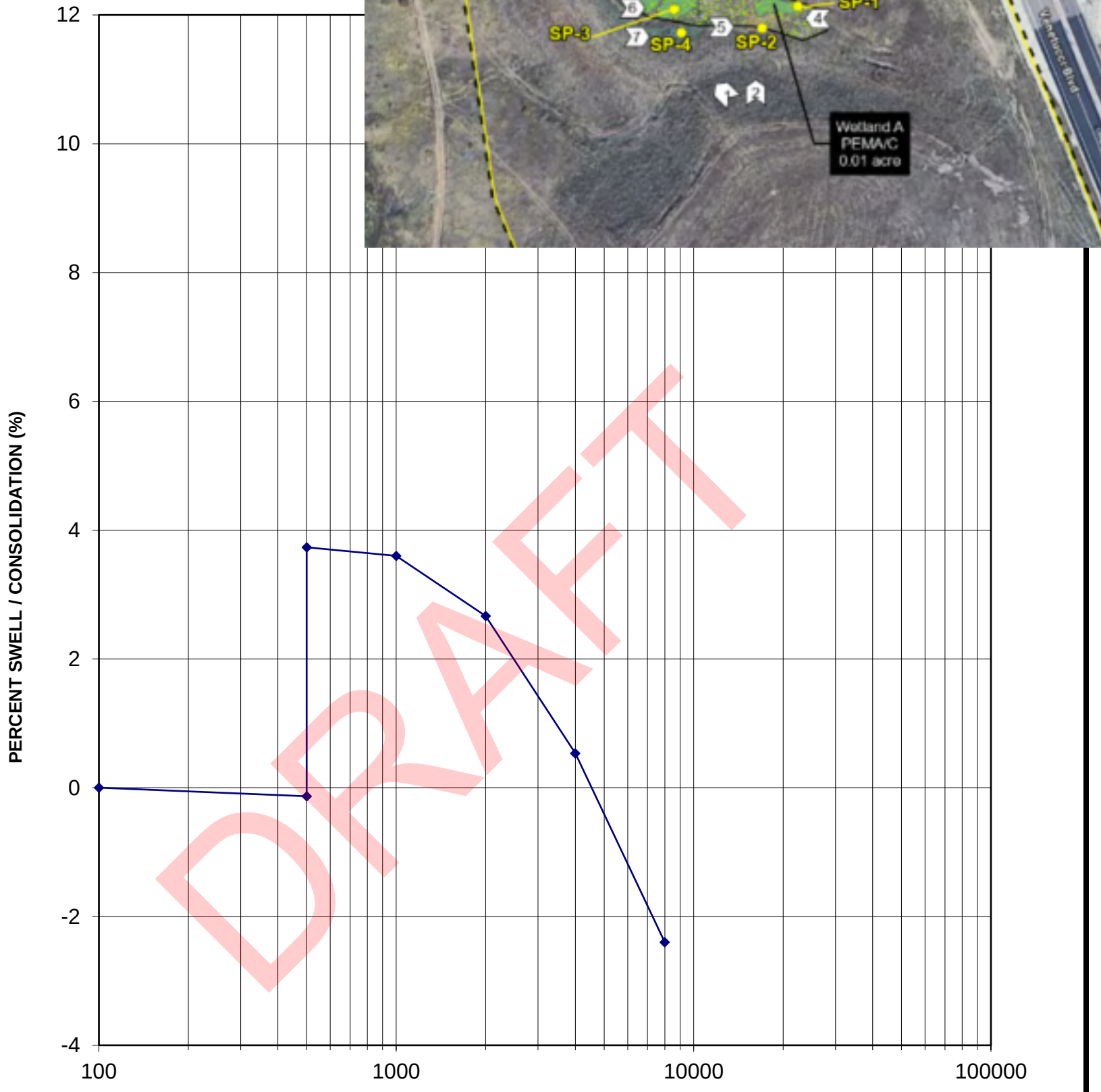
Remarks:

Lab Tech: TH

hazards shall be mapped and mitigation method identified



SW



Sample Location	Remolded
Sample Depth	0 feet
Sample Description	Fat Clay
USCS Classification	CH

Dry Density	102 pcf
In-Situ Moisture Content	24.5 %
Volume Change	3.9 %
Swell Pressure	4,700 psf

intertek psi	**TTRes Venetucci Multifamily**	**JOB NO.**	**5322879**
	SWELL - CONSOLIDATION TEST	**FIGURE NO.**	**0**

Provide a map of the site with the constraints and hazards identified

V1_Soils & Geology Report.pdf Markup Summary

Callout (3)

Subject: Callout
Page Label: 1
Author: dsdparsons
Date: 12/16/2024 11:58:37 AM
Status:
Color:
Layer:
Space:

remove draft from report this is for approval: see CGS comments

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Subject: Callout
Page Label: 4
Author: dsdparsons
Date: 12/16/2024 11:59:23 AM
Status:
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please update to meet County Code requirements of Section 8.4.9 and those of the ECM

Subject: Callout
Page Label: 111
Author: dsdparsons
Date: 12/16/2024 12:02:41 PM
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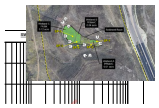
hazards shall be mapped and mitigation method identified

Image (1)



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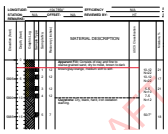

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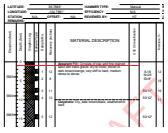

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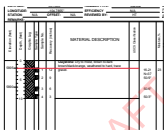

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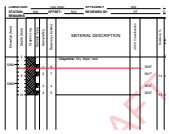

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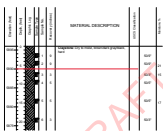

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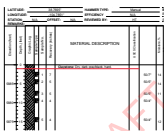

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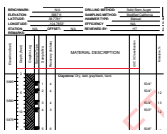

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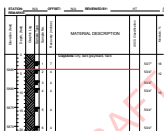

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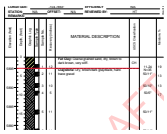

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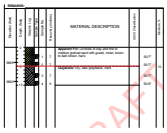

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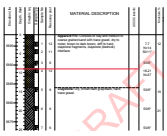

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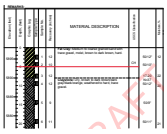

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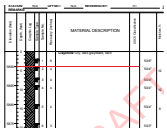

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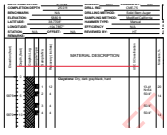

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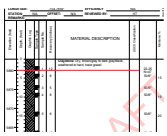

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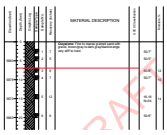

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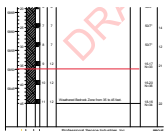

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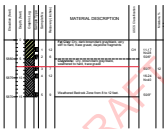

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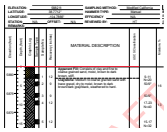

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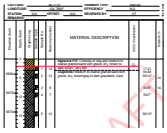

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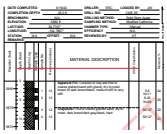

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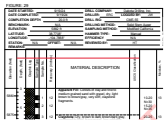

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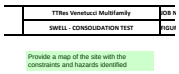
Planner (1)



Subject: Planner
Page Label: 111
Author: dsdparsons
Date: 12/16/2024 12:00:55 PM
Status:
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Provide a map of the site with the constraints and hazards identified

Text Box (2)

Subject: Text Box
Page Label: 59
Author: dsdparsons
Date: 12/16/2024 12:05:05 PM
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Color:
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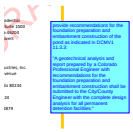
groundwater boring results include



Subject: Text Box
Page Label: 1
Author: Daniel Torres
Date: 12/22/2024 10:49:20 PM
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provide recommendations for the foundation preparation and embankment construction of the pond as indicated in DCMV1 11.3.3:

"A geotechnical analysis and report prepared by a Colorado Professional Engineer with recommendations for the foundation preparation and embankment construction shall be submitted to the City/County Engineer with the complete design analysis for all permanent detention facilities."