Kumar & Associates, Inc.®
Geotechnical and Materials Engineers
and Environmental Scientists

2390 South Lipan Street
Denver, CO 80223
phone: (303) 742-9700
fax: (303) 742-9666
email: kadenver@kumarusa.com
www.kumarusa.com

An Employee Owned Company

Office Locations: Denver (HQ), Parker, Colorado Springs, Fort Collins, Glenwood Springs, and Summit County, Colorado

PRELIMINARY GEOTECHNICAL ENGINEERING STUDY
HARVEY BROWN PARCELS
152ND AVENUE AND MONACO STREET
THORNTON, COLORADO

Prepared By:

Kamal Hasan E.I.

Reviewed By:

James A. Noll, P.E.

COLORADO REGISTERED PROFESSIONAL ENGINEER
JAMES A. NOLL
27051
7-14-2022

Prepared For:

City of Thornton
9500 Civic Center Drive
Thornton, Colorado 80229

Attention: Mr. Jim Jensen

Project No. 22-1-322

July 14, 2022

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SUMMARY

1. The borings generally encountered a thin veneer of rooted topsoil underlain by natural, soils extending to generally hard to very hard claystone and/or sandstone bedrock. The natural soils were underlain by bedrock at depths ranging from about 8 feet to about 18 feet.

   Groundwater was encountered in five of the borings during drilling at depths ranging from about 14.5 feet to about 24.5 feet. Stabilized groundwater was measured in the borings 15 days after drilling at depths ranging from about 8.5 feet to about 14.5 feet.

2. Due to the presence of high swelling soils, we recommend considering straight-shaft piers drilled into bedrock be used as the primary foundation alternative for support of the proposed structure. Depending on foundation loads and slab subgrade support approach, shallow spread footing or post-tensioned slab foundations may be feasible, in the event the shallow foundations are placed on a layer moisture conditioned, structural fill.

3. While structural floor systems would present the least risk at the site, slab-on-grade construction should be feasible provided floor slabs and movement-sensitive exterior flatwork are underlain by a zone of non-expansive, moisture-conditioned, structural fill likely ranging in thickness from about 6 feet to 10 feet.

4. Full-depth asphalt or flexible composite pavement sections, and concrete pavement sections, should be feasible at the site depending on site subgrade conditions. Depending on traffic loading conditions, the design thickness of full-depth asphalt sections will probably range from 7 to 8 inches, and composite sections will probably consist of consist of 5 to 6 inches of asphalt over 6 to 8 inches of compacted aggregate base course material. Concrete pavement should be at least 7 inches thick, with 8 inches recommended for truck-turning areas.

PURPOSE AND SCOPE OF STUDY

This report presents the results of a preliminary geotechnical engineering study for the proposed Harvey Brown Parcels development located about 1,000 lf north of the intersection of East 152nd Avenue and Monaco Street in Thornton, Colorado. The project site is shown on Fig. 1. The study was conducted to characterize the general site subsurface conditions and provide preliminary geotechnical engineering recommendations to be used for planning purposes. The study was conducted in general accordance with the scope of work in our Proposal No. P-22-359 to the City of Thornton, dated April 4, 2022.

A field exploration program consisting of 6 exploratory borings was conducted to obtain information on general subsurface conditions. Samples of the soils and bedrock obtained from the exploratory borings were tested in the laboratory to determine their classification and general engineering characteristics. The results of the field exploration and laboratory testing programs were used to evaluate site geotechnical considerations and develop preliminary geotechnical engineering recommendations.

This report has been prepared to summarize the data obtained during this study and to present our conclusions and preliminary recommendations based on our understanding of the proposed construction and the subsurface conditions encountered. Preliminary geotechnical design parameters and a discussion of geotechnical engineering considerations related to construction of the proposed development are included in the report.

PROPOSED DEVELOPMENT

We understand the project consists of a fire station construction on the eastern 5 acres of the 25.92-acre parcel. Development on the remaining 20.92 acres was not known at the time of this report. We assume the construction will consist of one- to two-story commercial or retail facility.
If the proposed development varies significantly from that generally described above or depicted throughout this report, we should be notified to reevaluate the preliminary recommendations provided herein.

SITE CONDITIONS

The site is an approximately 25.92 acres parcel consisting of a single-family residential structure and an oil well occurs on 5 acres near the center of the site. The majority of the site is used as agricultural land. The overall site is bounded on the west by Holly Street and agricultural lands further west, on the north by under-construction apartment buildings, on the east by Monaco

Street and a vacant lot further east, and on the south by single-family residential structures and agricultural lands. Based on available topographic information, the site is sloping down from west to east, with about 25 to 30 feet of relief across the site.

FIELD EXPLORATION

The subsurface conditions were explored by drilling 6 exploratory borings at the approximate locations shown on Fig. 1. The borings were advanced through a thin veneer of vegetated topsoil, natural soils, and into the underlying bedrock using 4-inch-diameter, continuous-flight augers. The borings were logged by a representative of K+A. Samples of the soils were obtained with a 2-inch-I.D. California-liner sampler driven into the various strata with blows from a 140-pound hammer falling 30 inches. The California-liner sampling procedure is similar to the standard penetration test (SPT) described by ASTM International (ASTM) Method D1586. The California-liner sampling procedure is used locally for obtaining relatively undisturbed cohesive soil and bedrock samples. Penetration resistance values (blow counts), when properly evaluated, indicate the relative density or consistency of the materials encountered.

Depths at which samples were taken and the associated blow counts are shown on the boring logs presented on Fig. 2. A legend and notes associated with the graphic logs describing the soils encountered are presented on Fig. 3.

SUBSURFACE CONDITIONS

The borings generally encountered a thin veneer of rooted topsoil underlain by natural soils extending to bedrock. The natural soils were underlain by bedrock at depths ranging from about 8 feet to 18 feet.

The natural soils consisted primarily of lean clay with variable fine- to medium-grained sand fraction, and occasional lenses of clayey sand. The natural lean clays were slightly moist to moist, tan to brown to dark brown, and calcareous in places. An isolated zone of natural clayey sand fine- to coarse-grained was encountered in Boring 1, and was overlaid by natural lean clay at a depth of about 13 feet and underlain by sandstone bedrock at a depth of about 17 feet. The natural clayey sand was moist and brown. Based on sampler penetration resistance (blow counts), the natural clay soils were stiff to hard and the natural clayey sand was dense.

Primarily bedrock consisted of claystone with isolated sandstone zones. The claystone bedrock was moist to very moist, tan to gray to dark brown claystone with a variable fine- to coarse-grained sand fraction. The sandstone was fine- to coarse-grained, moist to wet (below groundwater), tan- to gold-brown, and was clayey in places. Based on blow counts, the bedrock ranged from medium hard to very hard.

Groundwater was encountered in five of the borings during drilling at depths ranging from about 14.5 feet to about 24.5 feet. Stabilized groundwater was measured in the borings 15 days after drilling at depths ranging from about 8.5 feet to about 14.5 feet. The borings were backfilled upon completion of stabilized groundwater measurements.

Representative samples of the on-site natural soils and bedrock obtained from the exploratory borings were tested in our laboratory to evaluate classification properties and swell-consolidation characteristics. The results of these tests are shown adjacent to the boring logs on Fig. 2 and summarized in Table I.

The results of the swell-consolidation tests are presented on Figs. 4 through 8 and indicate the natural clay soils exhibited low to very high swell potential when wetted under constant surcharge pressures of 200 psf and 1,000 psf, and the claystone bedrock exhibited high swell potential when wetted under constant surcharge pressures of 1,000 psf.

GEOTECHNICAL ENGINEERING CONSIDERATIONS

The primary geotechnical consideration at the site is the swell potential of the clay overburden soils and claystone bedrock.

To limit potentially excessive foundation movement due to possible moisture-related expansion of the natural clays and/or claystone bedrock, we recommend straight-shaft piers drilled into bedrock be used as the primary foundation alternative for support of the building structures and floor slabs. A drilled pier foundation system is intended to place the bottoms of the piers in a zone of relatively stable moisture content, and to make it possible to load the pier sufficiently to resist uplift movements caused by potentially expansive natural soils.

It may not be cost-effective to use pier-supported structural floors. An alternative to structural floors would be to support floor slabs, as well as movement-sensitive exterior flatwork and pavements, on a zone of moisture-conditioned structural fill consisting of on-site or imported soils. Depending on the thickness of the structural fill zone, shallow foundation alternatives such as spread footings or post-tensioned slabs (PT-slabs) should be feasible, with the understanding shallow foundation systems will be at higher risk of movement than drilled pier foundation systems.

Properly moisture-conditioned and compacted natural clay soils should be feasible for use as moisture-conditioned fill beneath floor slabs and movement-sensitive exterior flatwork, and may be feasible for use as fill beneath lightly loaded shallow foundations. Use of on-site materials, including excavated bedrock, as engineered fill should be further evaluated in a design-level geotechnical study.

FOUNDATION RECOMMENDATIONS

As discussed above, we recommend considering straight-shaft piers drilled into bedrock be used as the primary foundation alternative for support of building structures. Based on the limited explorations performed for this preliminary study, we anticipate allowable end-bearing capacities ranging from 25,000 psf to 30,000 psf may be used for design of straight-shaft piers drilled at least 15 feet into bedrock. We anticipate allowable side shear unit capacities ranging from 1,500 psf to 4,000 psf may be used for the portion of the pier in bedrock. Piers should also be designed for minimum dead load pressures between 5,000 and 15,000 psf. We anticipate total pier lengths will be in the range of 20 to 30 feet, depending on final site grades and foundation levels. The presence of groundwater indicates that pier holes extending into bedrock may require dewatering or casing.

Shallow foundations such as spread footings may be feasible when underlain by a zone of non-expansive, moisture-conditioned, structural fill. Post-tensioned slab (PT-slab) foundation systems similarly supported on a zone of moisture-conditioned, structural fill, of similar may also be feasible. These alternatives should be further evaluated in a design-level geotechnical study. It should be noted that a shallow foundation system would be more susceptible to total and differential movement than a drilled pier foundation system.

Shallow foundations bearing directly on moisture-conditioned, structural fill should be designed for allowable soil bearing pressures between 2,000 and 3,500 psf, with minimum dead loads equal to 1/3 of the allowable bearing pressure. The structural fill layer may be as much as 10 feet thick, depending upon the subsurface conditions and swell potentials of the subsurface materials present beneath the building areas.

SEISMIC DESIGN

Based on conditions encountered in the borings, the site soil profile to a depth of 100 feet following construction is anticipated to consist generally of less than 20 feet of relatively stiff and/or dense overburden soils underlain by generally hard to very hard bedrock. The overburden soils will classify as IBC Site Class D, and, based on our experience, the bedrock anticipated to underlie the site would classify overall as IBC Site Class C. Based on our experience on sites with similar soil profiles, the site subsurface profile is considered to correspond to Site Class C. However, final determination of the soil profile site class should be based on the results of a design-level geotechnical engineering study. Based on the subsurface profile, site seismicity, and the anticipated depth of ground water, liquefaction is not a design consideration.

FLOOR SLABS

Slab-on-grade construction carries a risk of heave-related movement, the natural clay subgrade soils and claystone bedrock experience moisture change subsequent to construction. If slab movement is not acceptable, a structural floor supported by drilled piers and grade beams should be used. Considering the relative expense of a structural slab, slab-on-grade construction may be considered as an alternate to structural slabs, provided the increased risk of distress resulting from slab movement is accepted by the owner and precautions are taken to reduce the effects of movement.

Movement of slab-on-grade floors can be mitigated by placing a zone of stabilizing fill below the slab and constructing slab-supported elements designed to accommodate movement. Areas of existing expansive under-slab soils should be removed and replaced with moisture-conditioned, structural fill to provide acceptable performance. The thickness of replacement fills will depend on the swell profile of the natural clay soils underlying the slab, as determined during the design-level geotechnical study, but is expected to range between 6 feet and 10 feet at the site, depending on subsurface conditions. The thickness will also depend upon the reduction in swell potential which is achieved in the moisture-density conditioning. Sub-excavation of similar magnitudes may be required where site finish grades are not raised above existing grades.

A design-level geotechnical study should provide detailed recommendations for fill placement where extensive grading and/or deep replacement fills are planned. The recommendations should include evaluation of the use of the natural clay soils beneath floor slabs.

Design of slab-on-grade floors will need to incorporate typical precautions, including isolating slabs from the building foundations, providing slip joints below slab bearing walls, constructing slab control joints to reduce the potential for cracking and isolation joints around utilities penetrating the slab. Design of slab-on-grade floors may need to consider inclusion of a sub-slab capillary break consisting possibly of free-draining gravel, and a vapor barrier.

SITE GRADING

Based on our understanding of the proposed construction and observed site topography, site grading is expected to consist of cuts and fills to establish building pads and possibly exterior flatwork and pavements, and over-excavation required for foundation and slab subgrade preparation. In our opinion, excavation of the overburden soils during site grading should be possible with heavy-duty, conventional, earth-moving equipment.

Temporary excavations should be constructed in accordance with OSHA requirements, as well as state, local and other applicable requirements. Site excavations will generally encounter existing clay fills and natural soils. Deeper excavations for below-grade levels, or fill zone preparation beneath shallow foundations, may encounter claystone and sandstone bedrock. The natural clay soils will generally classify as Type B and Type C soils. Claystone bedrock will generally classify as Type A soils, although fractured and weathered bedrock may classify as Type B, and sandstone bedrock may classify as Type C. Excavations encountering groundwater seepage could require much shallower side slopes than those allowed by OSHA and/or temporary shoring.

Excavated slopes in clay soils, may soften due to construction traffic and erode from surface runoff. Measures to keep surface runoff from excavation slopes, including diversion berms, should be considered.

Permanent unretained cuts in the overburden soils and bedrock slopes, up to 15 feet high should be constructed at a 2H:1V (horizontal to vertical) or flatter inclination for stability purposes and 3H:1V or flatter for limiting the potential for erosion. If groundwater seepage is encountered during or prior to slope excavation, a stability evaluation should be conducted to determine if the seepage would adversely affect the cut.

On-site natural clay soils should be suitable for use as site grading fill outside of building areas provided these materials are properly moisture-conditioned, and may be suitable for use as structural fill beneath shallow foundations and soil-supported floor slabs. As previously mentioned, use of the on-site materials as compacted fill beneath structures and movement-sensitive hardscape would need to be evaluated further prior to use. In general, the bedrock materials are not suitable for reuse beneath shallow foundations and soil-supported slabs.

Fill placed for both general site grading and building pad construction should be moisture conditioned to a uniform moisture content between optimum and 3 percentage points above optimum. Fill placed for general site grading should be compacted to at least 95% of the standard Proctor (ASTM D 698) maximum dry density. The fill compaction should be increased to a minimum of 98% of ASTM D 698. Higher compactive efforts may be required depending upon fill thickness.

SURFACE DRAINAGE

The ground surrounding the exterior of buildings and movement-sensitive exterior flatwork should be sloped to drain away in all directions. For preliminary planning, a slope of at least 12 inches within the first 10 feet should be assumed. The probability of shallow foundations, if constructed, and soil-supported slabs remaining stable for the design life of the project will be significantly increased by planning a well-drained site without excessive irrigation or storm water accumulation within 10 to 20 feet of buildings and movement-sensitive flatwork.

PRELIMINARY PAVEMENT THICKNESS DESIGN

A pavement section is a layered system designed to distribute concentrated traffic loads to the subgrade. Performance of the pavement structure is directly related to the physical properties of the subgrade soils and traffic loadings. Soils are represented for pavement design purposes by means of a soil support value for flexible pavements and a modulus of subgrade reaction for rigid pavements.

Subgrade Materials: Based on the results of the field exploration and laboratory testing programs, the soils anticipated to be at or near the pavement subgrade generally classify as A-6 and A-7-6 soils with group indices between 15 and 25, in accordance with the AASHTO soil classification system. These materials are generally considered to provide poor subgrade support. For preliminary design purposes, a resilient modulus value of 3,562 psi was selected for flexible pavements and a modulus of subgrade reaction of 75 pci was selected for rigid pavements bearing on the on-site overburden soils, prepared claystone, or new site grading fill consisting of on-site materials.

Design Traffic: Since anticipated traffic loading information was not available at the time of this report preparation, an 18-kip equivalent single axle loading (ESAL) value of 36,500 was assumed for the paved parking surfaces (Standard-Duty), and an ESAL of 109,000 was assumed for drive and fire lane areas (Heavy-Duty). The values are selected based on our past experience for facilities of this nature. The Heavy-Duty pavement section should be constructed in locations of concentrated vehicular traffic movements.

Preliminary Pavement Thickness Design: Preliminary asphalt and concrete pavement sections were determined in accordance with the 1993 AASHTO pavement design procedure. Based on this procedure, we believe that pavement thicknesses in the range of 7 to 8 inches of full-depth asphalt pavement, or a flexible composite pavement section consisting of 5 to 6 inches of asphalt over 6 to 8 inches of compacted aggregate base course material, are feasible. In lieu of an asphalt pavement section, a 7.0-inch Portland cement concrete pavement section should be feasible, although concrete pavement used in delivery or trash collection areas may need to be at least 8 inches in thickness. The thickness of concrete for the fire station facility should be further evaluated based on the design fire truck loading. Concrete pavement will be more sensitive to settlement- or heave-related differential movement than flexible pavement.

Subgrade Preparation: Where the exposed subgrade materials consist of natural clay soils, over-excavation of these materials to a depth of one to two feet, and possibly more, and replacement with site grading fill may be necessary. Prior to backfilling, the exposed subgrade materials at the base of the over-excavation should be scarified to a depth of at least one foot, moisture conditioned, and compacted to the recommendations contained in the “Site Grading” section, followed by proof-rolling to identify soft zones requiring additional preparation.

Drainage: The collection and diversion of surface drainage away from paved areas is extremely important to the satisfactory performance of pavement. Drainage design should provide for the removal of water from paved areas and prevent the wetting of the subgrade soils.

LIMITATIONS

This report has been prepared for use by the client for preliminary design and planning purposes. The preliminary conclusions and recommendations submitted in this report are based upon the data obtained from the widely-spaced exploratory borings drilled at the locations indicated on Fig. 1. Additional investigation must be conducted once building locations and floor elevations have been determined to provide final recommendations. We recommend on-site observation of site grading by a representative of the geotechnical engineer.

Swelling soils and bedrock occur on this site. Such materials are stable at their natural moisture content but will undergo high volume changes with changes in moisture content. The extent and amount of perched water beneath buildings as a result of area irrigation and inadequate surface drainage is difficult, if not impossible, to foresee.

The recommendations presented in this report are based on current theories and experience of our engineers on the behavior of swelling soil and bedrock in this area. The owner should be aware that there is a risk in constructing buildings in an expansive soil and bedrock area. Following the recommendations given by a geotechnical engineer, careful construction practice, and prudent maintenance by the owner can, however, decrease the risk of foundation movement due to expansive materials.

KMH/mr
Rev. by: JAN
Enclosures
cc: File

100 0 100 200

APPROXIMATE SCALE—FEET

VICINITY MAP
NOT TO SCALE

22-1-322	Kumar & Associates	PROPOSED FUTURE FIRE STATION – HARVEY BROWN PARCELS, THORNTON, COLORADO	LOCATION OF EXPLORATORY BORINGS	Fig. 1

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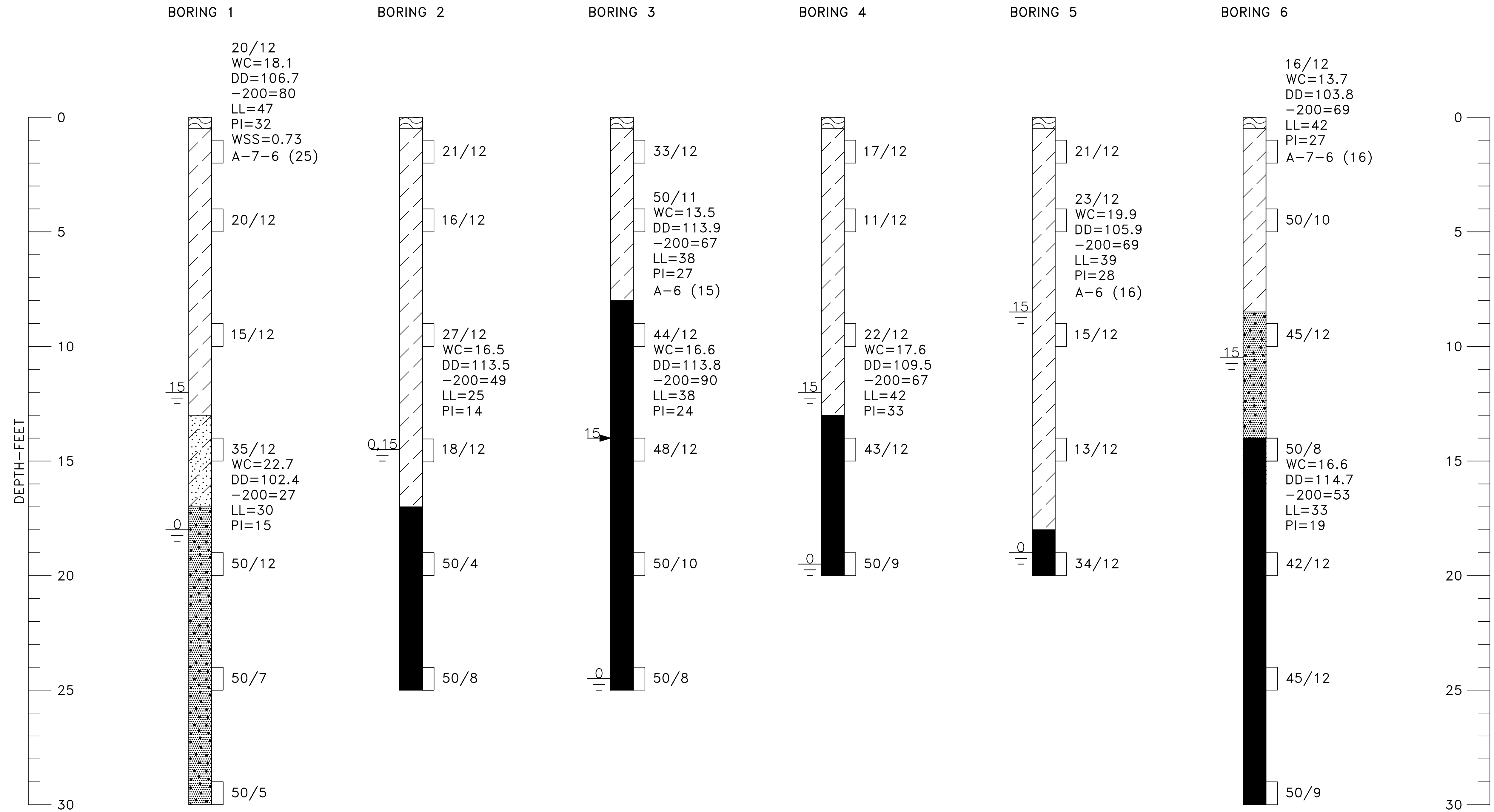

22-1-322	Kumar & Associates	PROPOSED FUTURE FIRE STATION - HARVEY BROWN PARCELS, THORNTON, COLORADO	LOGS OF EXPLORATORY BORINGS	Fig. 2

LEGEND

TOPSOIL.

LEAN CLAY WITH SAND TO SANDY LEAN CLAY (CL) WITH VARIABLE FINE- TO COARSE-GRAINED SAND FRACTION AND CLAYEY SAND (SC) LENSES, STIFF TO HARD, SLIGHTLY MOIST TO MOIST, TAN TO BROWN TO DARK BROWN, CALCAREOUS IN PLACES.

CLAYEY SAND (SC), FINE- TO COARSE-GRAINED, DENSE, MOIST, BROWN.

SANDSTONE BEDROCK, FINE- TO COARSE-GRAINED, HARD TO VERY HARD, SLIGHTLY MOIST TO WET (BELOW GROUND WATER), GOLD-BROWN TO TANISH-BROWN.

CLAYSTONE BEDROCK WITH VARIABLE FINE- TO COARSE-GRAINED SAND FRACTION, HARD TO VERY HARD, MOIST TO WET, TAN TO GRAY TO DARK BROWN, IRON OXIDE STAINING.

DRIVE SAMPLE, 2-INCH I.D. CALIFORNIA LINER SAMPLE.

20/12 DRIVE SAMPLE BLOW COUNT. INDICATES THAT 20 BLOWS OF A 140-POUND HAMMER FALLING 30 INCHES WERE REQUIRED TO DRIVE THE SAMPLER 12 INCHES.

15 DEPTH TO WATER LEVEL AND NUMBER OF DAYS AFTER DRILLING MEASUREMENT WAS MADE.

15 DEPTH AT WHICH BORING CAVED AND NUMBER OF DAYS AFTER DRILLING MEASUREMENT WAS MADE

NOTES

1. THE EXPLORATORY BORINGS WERE DRILLED ON MAY 31, 2022 WITH A 4-INCH-DIAMETER CONTINUOUS-FLIGHT POWER AUGER.
2. THE LOCATIONS OF THE EXPLORATORY BORINGS WERE MEASURED APPROXIMATELY BY PACING FROM FEATURES SHOWN ON THE SITE PLAN PROVIDED.
3. THE ELEVATIONS OF THE EXPLORATORY BORINGS WERE NOT MEASURED AND THE LOGS OF THE EXPLORATORY BORINGS ARE PLOTTED TO DEPTH.
4. THE EXPLORATORY BORING LOCATIONS SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.
5. THE LINES BETWEEN MATERIALS SHOWN ON THE EXPLORATORY BORING LOGS REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN MATERIAL TYPES AND THE TRANSITIONS MAY BE GRADUAL.
6. GROUNDWATER LEVELS SHOWN ON THE LOGS WERE MEASURED AT THE TIME AND UNDER CONDITIONS INDICATED. FLUCTUATIONS IN THE WATER LEVEL MAY OCCUR WITH TIME.
7. LABORATORY TEST RESULTS:
   WC = WATER CONTENT (%) (ASTM D2216);
   DD = DRY DENSITY (pcf) (ASTM D2216);
   +4 = PERCENTAGE RETAINED ON NO. 4 SIEVE (ASTM D6913);
   -200= PERCENTAGE PASSING NO. 200 SIEVE (ASTM D1140);
   LL = LIQUID LIMIT (ASTM D4318);
   PI = PLASTICITY INDEX (ASTM D4318);
   WSS = WATER SOLUBLE SULFATES (%) (CP-L 2103);
   A-7-6 (25) = AASHTO CLASSIFICATION (GROUP INDEX) (AASHTO M145).

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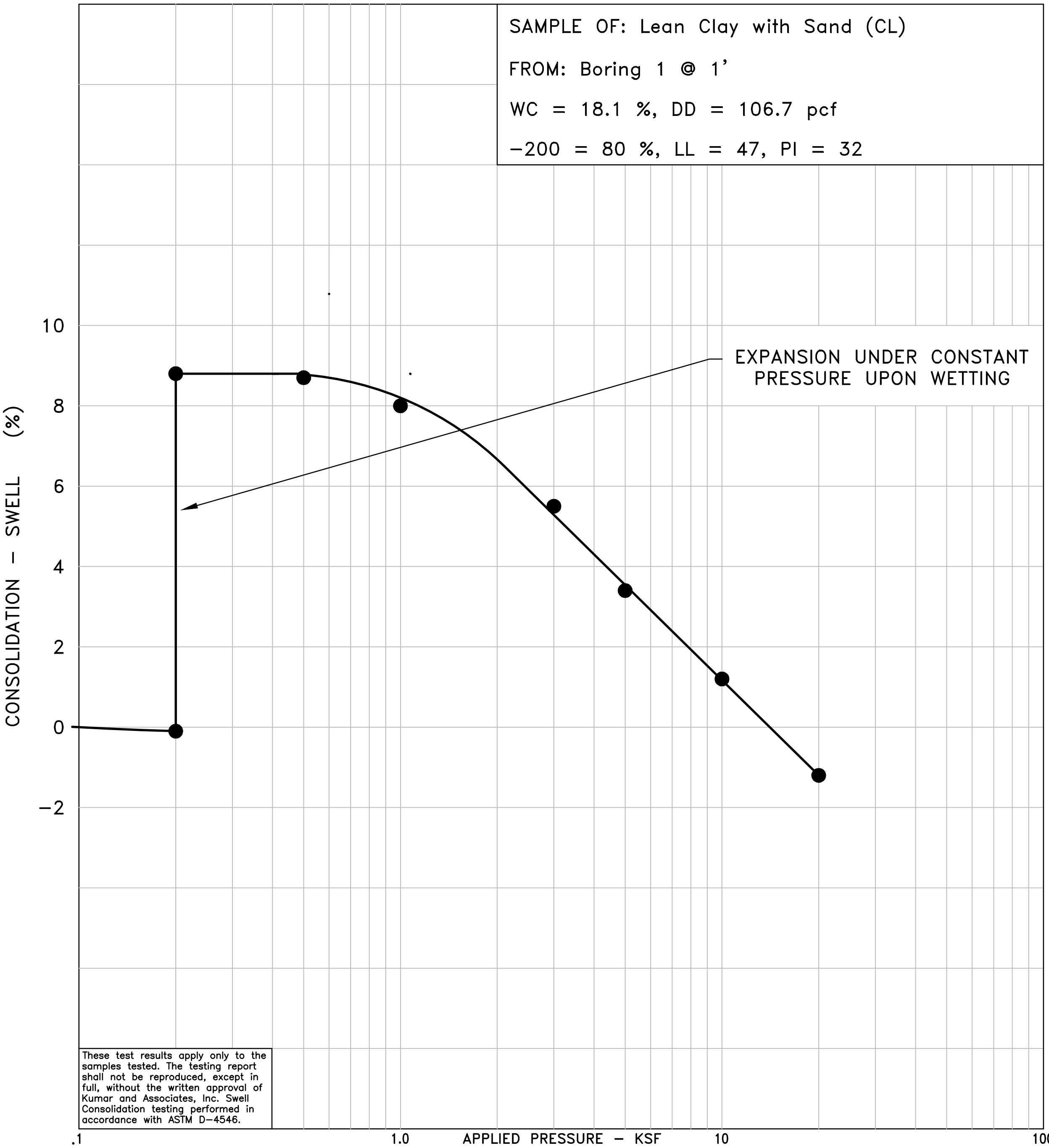

These test results apply only to the samples tested. The testing report shall not be reproduced, except in full, without the written approval of Kumar and Associates, Inc. Swell Consolidation testing performed in accordance with ASTM D-4546.

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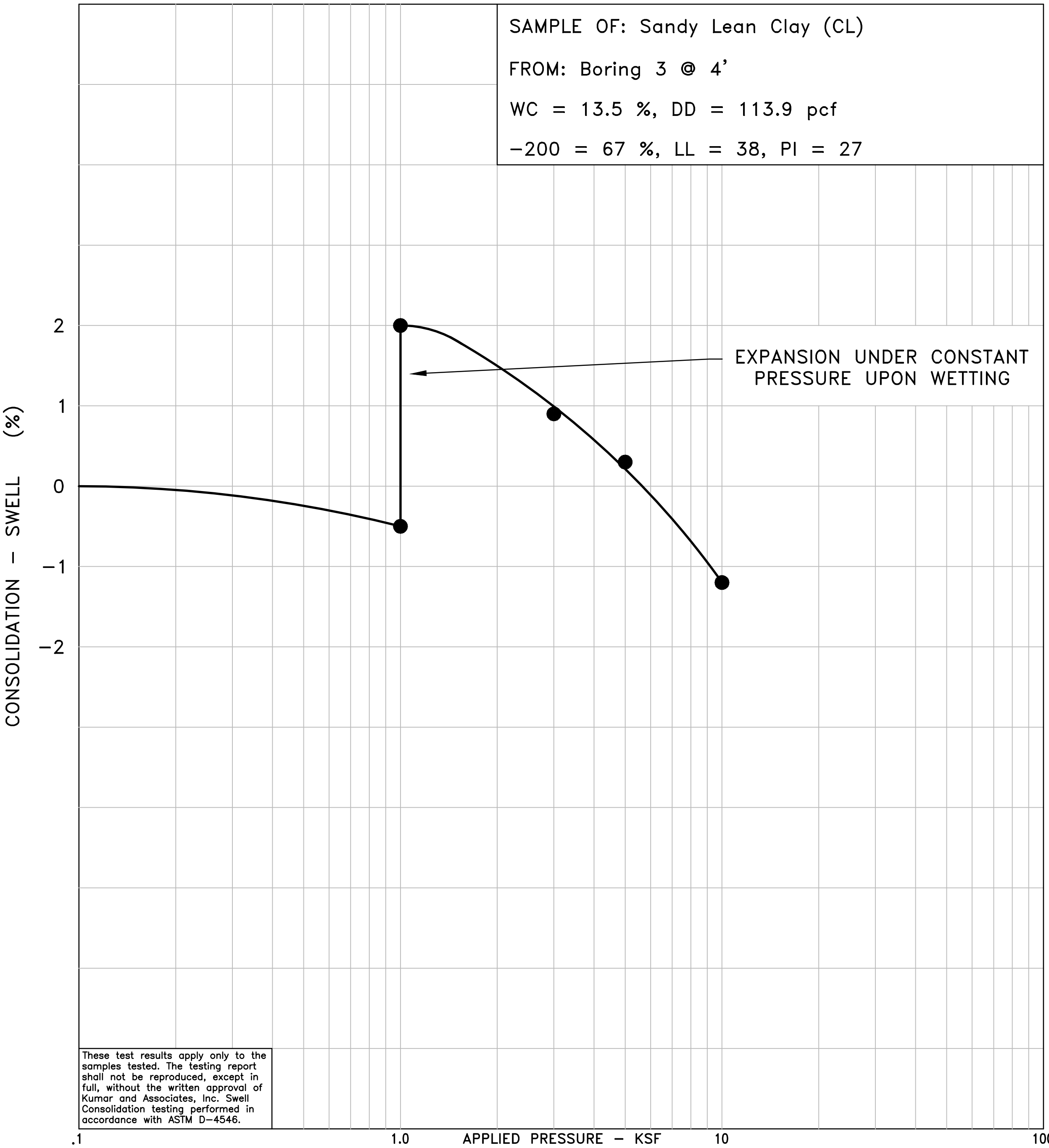
22-1-322	Kumar & Associates	SWELL-CONSOLIDATION TEST RESULT	Fig. 4



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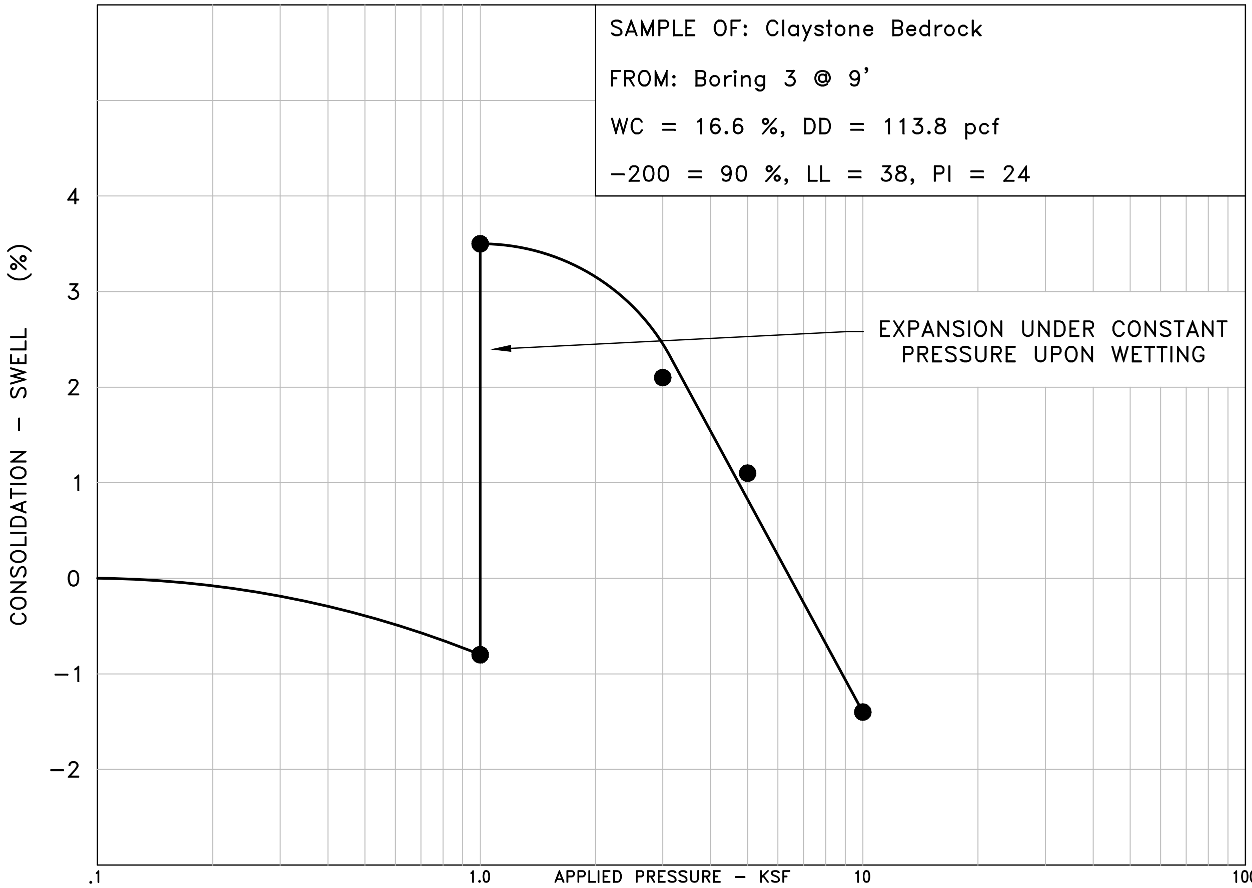
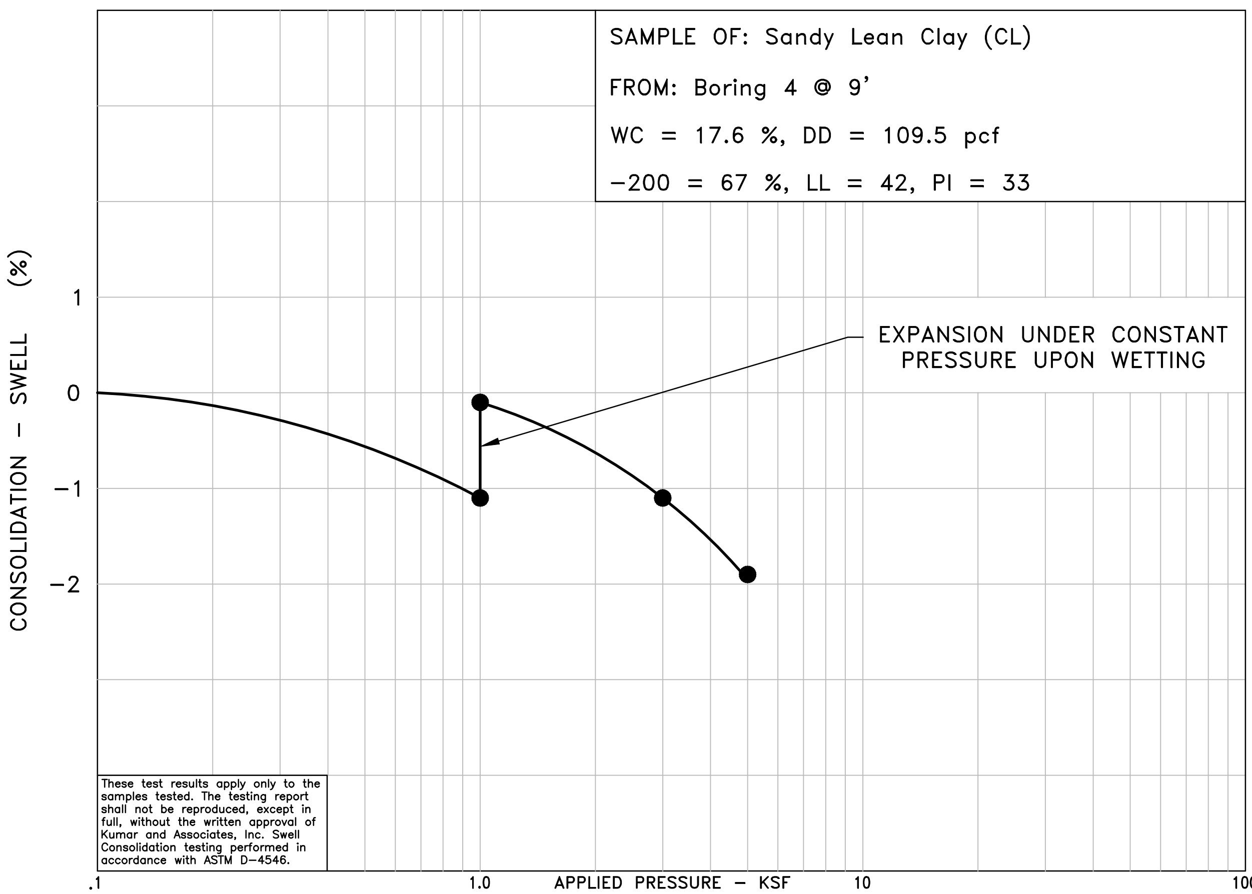
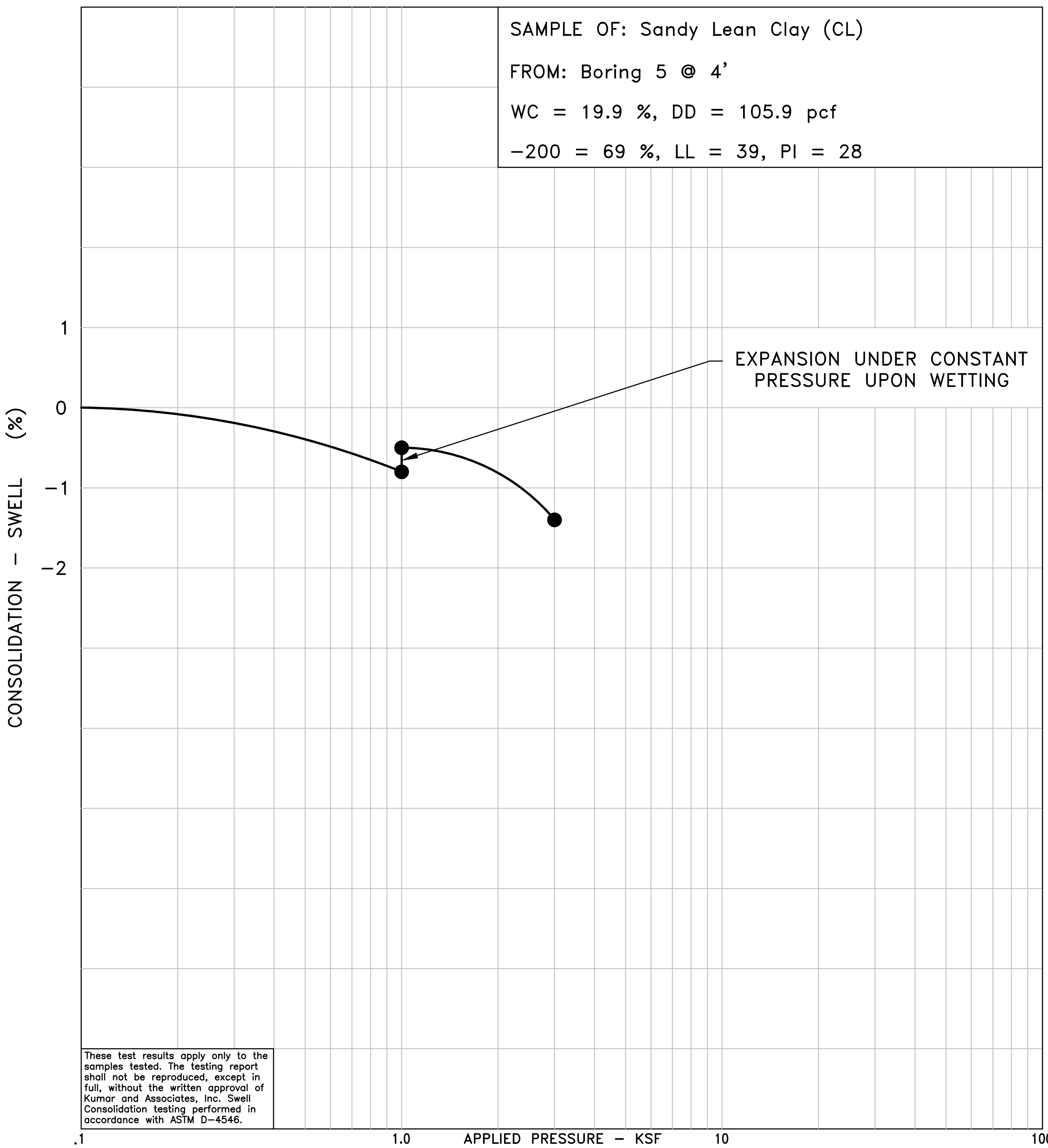
22-1-322	Kumar & Associates	SWELL-CONSOLIDATION TEST RESULT	Fig. 5





These test results apply only to the samples tested. The testing report shall not be reproduced, except in full, without the written approval of Kumar and Associates, Inc. Swell Consolidation testing performed in accordance with ASTM D-4546.

22-1-322	Kumar & Associates	SWELL-CONSOLIDATION TEST RESULT	Fig. 6



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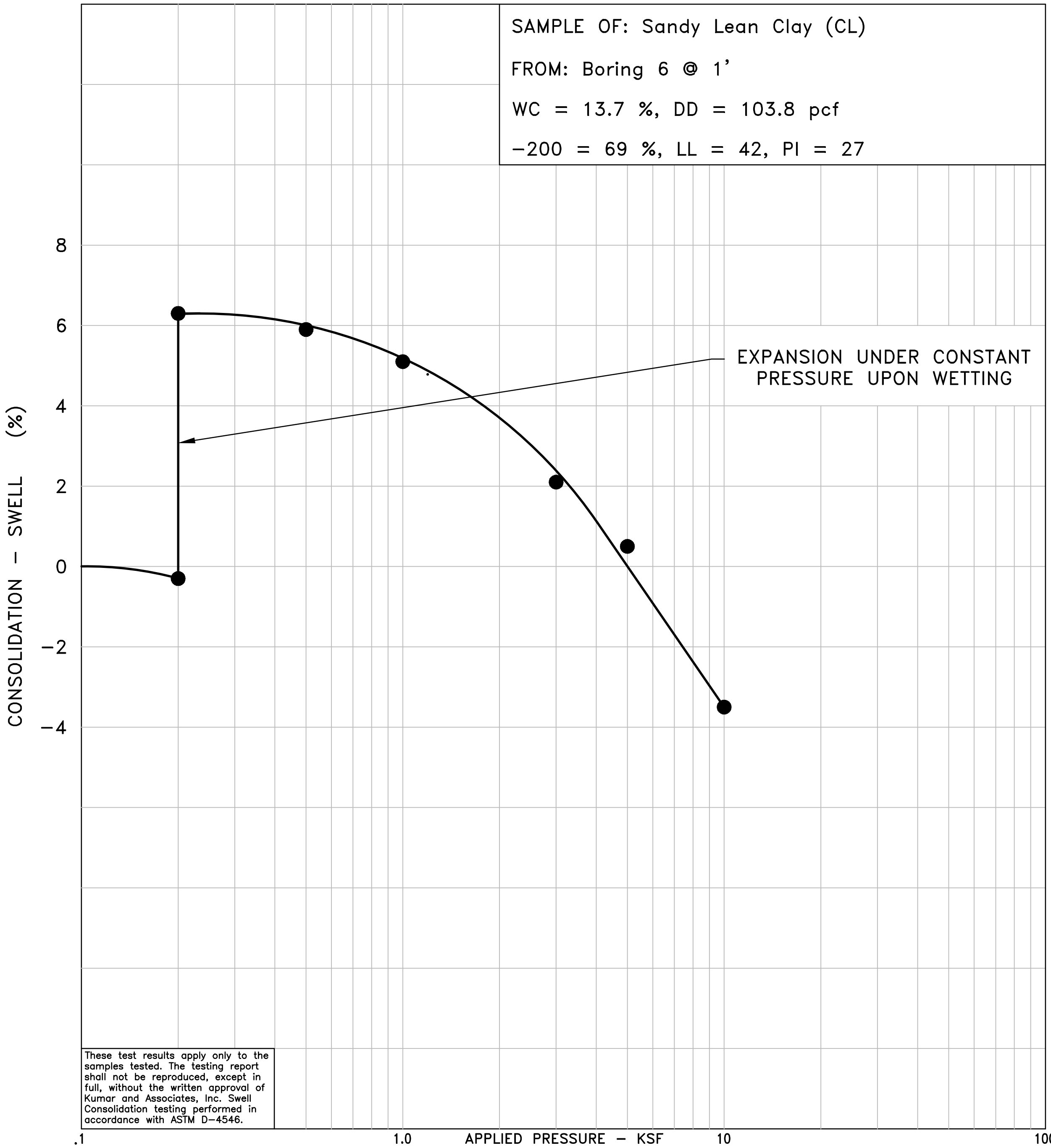
22-1-322	Kumar & Associates	SWELL-CONSOLIDATION TEST RESULT	Fig. 7



22-1-322	Kumar & Associates	SWELL-CONSOLIDATION TEST RESULT	Fig. 8

TABLE I
SUMMARY OF LABORATORY TEST RESULTS

PROJECT NO.: 22-1-322
PROJECT NAME: Proposed Future Fire Station- Harvey Brown Parcels, Thornton, Colorado
DATE SAMPLED: 5-31-2022
DATE RECEIVED: 6-3-2022

SAMPLE LOCATION		DATE TESTED	NATURAL MOISTURE CONTENT (%)	NATURAL DRY DENSITY (pcf)	PERCENT PASSING NO. 200 SIEVE	ATTERBERG LIMITS		WATER SOLUBLE SULFATES (%)	AASHTO CLASSIFICATION (group index)	SOIL OR BEDROCK TYPE
BORING	DEPTH (feet)					LIQUID LIMIT (%)	PLASTICITY INDEX (%)			
1	1	6-7-2022	18.1	106.7	80	47	32	0.73	A-7-6 (25)	Lean Clay with Sand (CL)
1	14	6-7-2022	22.7	102.4	27	30	15			Clayey Sand (SC)
2	9	6-7-2022	16.5	113.5	49	25	14			Clayey Sand (SC)
3	4	6-7-2022	13.5	113.9	67	38	27		A-6 (15)	Sandy Lean Clay (CL)
3	9	6-7-2022	16.6	113.8	90	38	24			Claystone Bedrock
4	9	6-7-2022	17.6	109.5	67	42	33			Sandy Lean Clay (CL)
5	4	6-7-2022	19.9	105.9	69	39	28		A-6 (16)	Sandy Lean Clay (CL)
6	1	6-7-2022	13.7	103.8	69	42	27		A-7-6 (16)	Sandy Lean Clay (CL)
6	14	6-7-2022	16.6	114.7	53	33	19			Claystone Bedrock