Professional Service Industries, Inc.
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March 25, 2022 (Revised: March 29, 2022)

Ms. Lori Ginther
Construction Coordinator
Taco Bell Corporation
1 Glen Bell Way
Irvine, CA 92618

Re: Geotechnical Subsurface Exploration Report
Proposed Taco Bell #315508
1551 West River Road
Elyria, Lorain County, Ohio
PSI Project No.: 0142-2517

Dear Ms. Ginther:

In accordance with the Project Agreement for Engineering/Consultant Services dated February 16, 2022, PSI has conducted a Geotechnical Investigation for the above referenced property.

Thank you for choosing PSI as your consultant for this project. If you have any questions, or if we can be of additional service, please contact us at your earliest convenience.

Respectfully submitted,

PROFESSIONAL SERVICE INDUSTRIES, INC.

Zaineddin Obeid
Project Manager

A. Veeramani, P.E.
Director/Principal Consultant

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Subsurface Exploration Report

for the

Taco Bell #315508
1551 West River Road
Elyria, Lorain County, Ohio

Prepared for

Taco Bell Corporation
1 Glen Bell Way
Irvine, CA 92618

Prepared by

Professional Service Industries, Inc.
5555 Canal Road
Cleveland, OH 44125

PSI Project No. 0142-2517

Zaineddin Obeid
Project Manager

A. Veeramani, P.E.
Director/Principal Consultant

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EXECUTIVE SUMMARY

PSI has completed a Geotechnical Investigation of the proposed Taco Bell #315508 located at 1551 West River Road in the City of Elyria, Lorain County, Ohio. The assessment was performed in general accordance with PSI's PSI Project Authorization Form, dated February 18, 2022.

This summary does not contain all the information that is found in the full report. The report should be read in its entirety to obtain a more complete understanding of the provided information, and to aid in any decisions made or actions taken based on this information.

1. The site is located at 1551 West River Road in the City of Elyria, Lorain County, Ohio.

2. The surface of the site at test boring locations B-2, B-3 and B-5 was covered with a layer of topsoil measuring approximately 5 to 6 inches in thickness. The surface at boring locations B-1, B-4, B-6, B-7 and B-8 is covered with a layer of asphalt measuring approximately 3 to 6 inches of which B-1, B-6, B-7 and B-8 were underlain with a layer of sand and gravel measuring approximately 8 to 9 inches in thickness. The surface and base materials at all the test boring locations were underlain by natural soils and extended to the terminal depths about 20 feet below the surface grade. The natural soils consisted of various combinations of lean clay and sandy silt with varying amounts of gravel and rock fragments. The natural soils exhibited moisture contents ranging from 8 to 26 percent. The natural soils exhibited a medium stiff to hard consistency, based on the Standard Penetration Tests.

3. Groundwater was not encountered during field drilling operations. However, it should be noted that groundwater levels at this site may be subject to seasonal fluctuations or other mechanical control.

4. Based on the subsurface conditions encountered during our drilling operations, the proposed structure can be supported on a conventional shallow spread and/or continuous wall footing foundation system bearing within the area's natural soils formation, designed for a maximum allowable soil bearing pressure of up to 2,500 pounds per square foot (psf).

Detailed analyses of subsurface conditions, alternate foundation types and pertinent design recommendations are included herein. The final decision as to which foundation type will be used should be based on the design parameters provided, costs, risk of foundation movement, and other factors beyond the scope of this study. PSI cannot be responsible for the interpretation or implementation of this report by others. PSI should be retained to perform services sufficient to determine compliance with its recommendations. If PSI is not retained, it will not accept any responsibility for the performance of the structure.

SUMMARY OF RECOMMENDATIONS		
Design Item	**Recommended Parameter**	**Reference Page No.**
Foundations:		
Allowable Bearing Pressure:		
Spread Footing	2,500 psf	5
Wall Footing	2,500 psf	5
Foundation Type	Continuous or Spread Footing	5
Bearing Materials	Natural soil or Compacted Engineered Fill	5
Passive Lateral Resistance (EFP)	N/A.	--
Coefficient of Friction	0.3	--
Soil Expansion Potential	Low	--
Geologic Hazards:		
Liquefaction Potential	Low	--
Nearest Fault and Magnitude	N/A	--
Fault Type	N/A	--
Seismic Zone	N/A	--
Site Class	'D'	3
Near-Source Distance	N/A	--
Seismic Coefficient, NA	N/A	--
Seismic Coefficient, NV	N/A	--
Subsidence Potential	N/A	--
Pavement:		
TI equal to 4.5 Light Traffic	3.0" AC / 6.0" Base	6
TI equal to 7.0 Heavy Traffic	3.5" AC / 8.0" Base	6
Slabs:		
Building Floor Slabs	Natural soil or Compacted Engineered Fill	6
Modulus of Subgrade Reaction	75 pci	6
Existing Site Conditions:		
Existing Fill	N/A	4
Groundwater Depth (Historical High)	N/A	--
Near-Surface Corrosivity	N/A	--
Estimated Cut and Fill	2 feet	2
Existing Underground Structures	N/A	--
Existing Aboveground Structures	1 story building	1
Special Notes:		

1 PROJECT INFORMATION

1.1 AUTHORIZATION

Authorization to perform this exploration and analysis was in the form of a Proposal Authorization Form, signed by Ms. Lori Ginther, Construction Coordinator of Taco Bell Corporation, on February 18, 2022.

1.2 PURPOSE AND SCOPE OF SERVICE

The purpose of this study was to determine the geotechnical engineering parameters of the site. All work was conducted in accordance with Yum! Brands, Inc. Guidelines for Environmental Assessments and Geotechnical Engineering Studies, dated August 2006.

The scope of the geotechnical exploration and analysis included subsurface exploration, field and laboratory testing, and an engineering analysis and evaluation of the foundation materials.

1.3 SITE LOCATION

The site is situated at 1551 West River Road in the City of Elyria, Lorain County, Ohio.

1.4 SITE DESCRIPTION AND CONDITIONS

The site for the proposed development is currently developed with single story building structure and associated pavement area. No topographical information was available at the time of this report. However, based on the Google Earth topographic maps, the site slopes downwards from east to west with an elevation difference of about 6 feet (695' MSL to 689' MSL) within the proposed development area.

1.5 PREVIOUS GEOTECHNICAL DATA

No previous geotechnical engineering assessment was conducted.

2 PROJECT DESIGN DATA

2.1 DEVELOPMENT PLANS

Based upon the information provided, it is understood that a "END20" prototype building structure measuring approximately 2,213± square feet in plan area will be constructed on the northern portion of the proposed development area. The proposed project will also include the construction of an associated trash enclosure, paved parking, drive-thru, and driveway areas. The proposed pavement areas will accommodate 22 car parking spaces and will be located on the south side of the proposed building structure. Also, one access driveway will be provided from West River Road and one access driveway will be provided from the Midway Mall Access Road. The proposed trash enclosure will be located on the southeast side of the proposed development area.

2.2 STRUCTURE TYPES

The building will be a single story, wood frame or masonry structure with a truss roof system supported on the exterior foundation only. The trusses span the transverse (short) direction of the building. At the front of the building, columns, which support beams and headers, are concealed within longitudinal exterior walls.

2.3 FOUNDATION LOADS

The maximum structural loads on longitudinal (side) bearing walls are about 1,300 pounds per linear foot (plf). Maximum column loads are approximately 20 kips. Maximum loads to the transverse (front and rear) non-bearing walls are about 300 plf (dead load only). The floor slab will carry a maximum design load of 100 pounds per square foot (psf).

2.4 GRADING AND SLOPES

No topographical information was available at the time of this report. However, based on the Google Earth topographic maps, the site slopes downwards from east to west with an elevation difference of about 6 feet (695' MSL to 689' MSL) within the proposed development area. However, the site within the proposed building footprint slopes in the same direction with an elevation difference of about 3 feet (694' MSL to 691' MSL).

At the time of this investigation, PSI was not provided with the final grading plan. However, we have assumed the final grade will be at or near the existing site grades (less than 2 foot of cut and fill). If any of this information is incorrect, please notify the geotechnical engineer so that he may determine if changes in the foundation recommendations are required.

2.5 PAVEMENT

Depending on the site conditions, either of two types of pavements may be used: Flexible Asphalt Concrete (AC) surfaced pavement; or Rigid Portland Cement (PC) Concrete pavement. It is anticipated that the parking lot will be divided into two areas: (1) driving lanes and (2) parking stalls. The driving lanes will be subject to minimum daily traffic of 1,000 cars and five (5) 20,000 to 25,000-pound load single axle heavy trucks. The parking stalls will be utilized by approximately 50 cars per day. Parking stall pavements will only be used where there are portions of lots that will not receive truck traffic. The structural section design shall be based on a twenty-year design period to determine pavement thickness and subgrade preparation requirements.

Pavement structural sections are to be designed according to American Association of State Transportation and Highway Official Standards, Portland Cement Association procedures, or applicable design procedures used by local government or State Transportation Department. Repeated stopping and starting motions will be considered during the design.

2.6 SOIL BORINGS

A total of eight (8) test borings were performed with a drill rig equipped with a rotary head. Conventional hollow-stem augers were used to advance the holes. Standard Penetration Tests were performed in accordance with ASTM designation D1586. The samples were transported to our laboratory for visual classification and laboratory testing. The samples were identified according to boring number and depth and sealed in sample jars to protect against moisture loss.

2.7 FIELD TESTING

2.7.1 *PENETRATION TESTS*

During the sampling procedure, standard penetration tests were performed at regular intervals to obtain the standard penetration value of the soil. The standard penetration value (N) is defined as the number of blows a 140-pound hammer falling thirty (30) inches required to advance the split-spoon sampler one (1) foot into the soil. The sampler is lowered to the bottom of the drill hole and the number of blows recorded for each of three (3) successive increments of six (6) inches penetration. The "N" value is obtained by adding the second and third incremental numbers. The results of the Standard Penetration Test indicate the relative density and comparative consistency of the soils and thereby provide a basis for estimating the relative strength and compressibility of the soil profile components.

2.7.2 *WATER LEVEL MEASUREMENTS*

Water level depths were obtained during the test boring operations. They are noted on the test boring logs presented in the Appendix. In relatively pervious soils, such as sandy soils, the indicated depths are usually

reliable groundwater levels. In relatively impervious soils, a suitable estimate of the groundwater depth may not be possible, even after several days of observation. Seasonal variations, temperature, land-use, proximity to a river, canal, or large body of water and recent rainfall conditions may influence the depths to the groundwater. Volumes of water will largely depend on the permeability of the soils.

2.7.3 *GROUND SURFACE ELEVATIONS*

Ground surface elevations at the test boring locations were not provided. Therefore, references to depth of the various strata encountered are from the existing surface grade at the time of our drilling operations.

2.7.4 *INFILTRATION TEST*

Infiltration Field Testing was not performed for this project development.

2.8 LABORATORY TESTING

In addition to the field investigation, a supplemental laboratory testing program was conducted to determine additional pertinent engineering characteristics of the foundation materials necessary in analyzing the behavior of the foundation systems for the proposed restaurant.

The laboratory testing program included supplementary visual classification (ASTM D2487) and water content tests (ASTM D2216) on all the soil samples. Particle Size Analysis (D422) was performed on selected samples.

All phases of the laboratory testing program were conducted in general accordance with applicable ASTM Specifications. The results of these tests are to be found on the accompanying boring logs and report of soil analysis sheet in the Appendix.

3 FINDINGS AND INTERPRETATION

3.1 REGIONAL AND LOCAL GEOLOGY

Based upon a published Ohio Department of Natural Resources (ODNR) map reference, the project site lies within the glaciated portion of Northeast Ohio (White, 1982, Bulletin 68). The soils in the valley area at the toe of the slope are mapped as Alluvium, whereas the soils at the crest of the slope are mapped as glacial Lacustrine soils underlain by glacial till. Based upon a published ODNR geologic map, the upper bedrock formations consist of Mississippian aged Waverly and Maxville sandstone at the crest of the slope, transitioning to older Devonian aged Olentangy and Ohio Sandstone at lower elevations towards the valley.

3.2 SEISMICITY

Based on Table 1615.1.1 of the Ohio Building Code, local geology of the project area and test boring results, a site classification of “D” can be used for seismic design.

3.3 SUBSURFACE SOIL CONDITIONS

3.3.1 *GENERAL*

The types of foundation bearing materials encountered in the test borings have been visually classified. They are described in detail on the boring records. The results of the field penetration test (N), strength tests, water level observations, and other laboratory tests are presented on the boring records in numerical form. Representative samples of the soils were placed in sample jars and are now stored in the laboratory for further analysis, if desired. Unless notified to the contrary, all samples will be disposed of after 60 days.

The stratification of the soil, as shown on the boring records, represents the soil conditions at the actual boring locations. Variations may occur between, or beyond, the borings. Lines of demarcation represent the approximate boundary between the soil types, but the transition may be gradual, or not clearly defined.

It is to be noted that, whereas the test borings are drilled and sampled by experienced drillers, it is sometimes difficult to record changes in stratification within narrow limits, especially at great depths. In the absence of foreign substances, it is also difficult to distinguish between discolored soils and clean soil fill.

3.3.2 *SOIL CONDITIONS*

The site was explored by drilling a total of 8 soil test borings. The following summarizes the locations:

Boring Number	Existing Site Location	Proposed Construction Location
B-1	Pavement	Pavement Area
B-2	Grass	Building Area
B-3	Grass	Pavement Area
B-4	Pavement	Building Area
B-5	Grass	Pavement Area
B-6	Pavement	Pavement Area
B-7	Pavement	Trash Pad Area
B-8	Pavement	Pavement Area

The surface of the site at test boring locations B-2, B-3 and B-5 was covered with a layer of topsoil measuring approximately 5 to 6 inches in thickness. The surface at boring locations B-1, B-4, B-6, B-7 and B-8 is covered with a layer of asphalt measuring approximately 3 to 6 inches of which B-1, B-6, B-7 and B-8 were underlain with a layer of sand and gravel measuring approximately 8 to 9 inches in thickness.

The surface and base materials at all the test boring locations were underlain by natural soils and extended to the terminal depths about 20 feet below the surface grade. The natural soils consisted of various combinations of lean clay and sandy silt with varying amounts of gravel and rock fragments. The natural soils exhibited moisture contents ranging from 8 to 26 percent. The natural soils exhibited a medium stiff to hard consistency, based on the Standard Penetration Tests.

3.4 GROUNDWATER CONDITIONS

Groundwater was not encountered at the test boring locations during field drilling operations. However, it should be noted that groundwater levels at this site may be subject to seasonal fluctuations or other mechanical control.

4 ENGINEERING RECOMMENDATIONS

4.1 SPECIAL CONDITIONS AND MITIGATING MEASURES

In view of the test boring results, laboratory tests and analysis, the subsurface materials are generally considered suitable for support of shallow foundations.

4.2 FOUNDATION DESIGN

4.2.1 *PROPOSED STRUCTURE*

We understand that a shallow spread footing and grade beam system is the preferred foundation type for the proposed restaurant structure. Therefore, after the soils in the building area have been prepared as discussed in Section 4.9, the footings or grade beams can be placed at the design elevations; however, all perimeter foundations and grade beams should be placed at a minimum depth of 42 inches below the finished exterior grades in order to protect against frost action. Interior foundations can be placed at a minimum depth of 18 inches below the floor slab, provided they bear on acceptable materials. The footings or grade beams placed on natural soils or compacted structural fill should be designed for a maximum allowable bearing pressure of 2,500 psf.

A single isolated footing or grade beam designed as discussed should experience a settlement of less than 1 inch. However, if a cluster of closely spaced footings is planned, PSI should be contacted to calculate the potential settlement.

4.2.2 *PROPOSED TRASH ENCLOSURE*

Spread footings founded in the compacted engineered fill soil bearing at a minimum depth of 42 inches below existing grade, may be designed for a maximum allowable bearing pressure of 2,500 psf.

4.3 CONCRETE SLABS-ON-GRADE

Floor slabs utilized in conjunction with a continuous wall foundation system may consist of an earth supported slab-on-grade. After the soils in the building area have been prepared as discussed in Section 4.9, it is recommended that the subgrade surface be subjected to surface compaction to the extent that a minimum of 12 inches of materials underlying the subgrade elevation achieve a minimum in-place density of 98 percent of the maximum laboratory dry density and should be within $\pm$ 2 percent of the optimum moisture content, as determined in general accordance with ASTM D-698. Additionally, we recommend the placement of a minimum of 5 inches of crushed stone beneath the slabs. It may also be desirable to use polyethylene sheeting between the crushed stone and the slab as a vapor barrier. We recommend that a subgrade modulus (k) of 75 pci be used in floor slab design calculations. The floor slabs should be designed and constructed in accordance with ACI specifications.

4.4 EXPANSIVE SOILS

Expansive soils were not encountered at the test boring locations.

4.5 SLOPES

No slopes are planned to be a part of the final design for this site and therefore, no information is provided.

4.6 RETAINING WALL

The retaining wall structure will span along the north and west of the proposed site and measure approximately 225 feet in total length. The wall be supporting soils to maximum height of about 5 feet; therefore, the wall members should be designed as earth retaining structures. Surcharge loads should be taken as an equivalent uniform load having a rectangular distribution with depth. For evaluating the various loading conditions, the following values of the soil parameters and lateral earth pressures may be adopted:

Parameter	Value
Total weight of soil	120 pcf
Angle of Internal Friction (for cohesionless backfill)	30°
Equivalent Pressure (at rest)	60 pcf
Equivalent Pressure (active)	40 pcf
Equivalent Pressure (passive)	172 pcf
Unit weight of water	62.4 pcf
Coefficient of friction (between soil and concrete)	0.32

Based on the test boring results, laboratory test results, and the proposed construction, our analysis indicates that a continuous spread-footing foundation, bearing on natural soil or properly compacted engineered fill, will be suitable to support the proposed retaining wall structure, with an allowable bearing capacity of 2,000 psf. A representative of PSI should be present at the site during foundation excavation and construction.

A factor of safety of 2.0 should be applied for selection of foundation dimensions. Footing bearing surfaces are to be critically inspected and tested to verify consistency and compatibility with subsurface exploration data, and to assure that the recommended bearing capacity is being achieved. It is recommended that a representative of Geotechnical Engineer should be present at the site throughout foundation excavation and construction.

A blanket of freely draining granular materials is to be placed against the back face of the walls along their full length. The wall drainage blanket should have a minimum thickness of two feet and is to be capped with a two-foot-thick layer of cohesive materials to prevent direct surface water ingress. Once the wall is built, over-compaction of the materials against the lower level walls is to be avoided under all circumstances to prevent undue lateral earth pressures.

The bottom of the retaining wall should be placed at a minimum depth of 42 inches below the exterior finished grade in order to protect against frost action.

Extreme care should be taken to prevent weakening of the foundation bearing materials because of prolonged atmospheric exposure, construction activity disturbance, or an increase in moisture content.

4.7 EXCAVATION DE-WATERING

As previously discussed, groundwater was not encountered at the test boring locations during drilling operations. However, it should be noted that groundwater levels at this site may be subject to seasonal fluctuations or other mechanical control. Therefore, groundwater and/or seepage will be encountered during the foundation excavation and construction.

Because the foundation materials generally tend to soften when exposed to free water, every effort should be made to keep any excavations dry if water is encountered or if storm water runoff enters the excavation. A gravity drainage system, sump pump, or other conventional minor dewatering procedure should be sufficient for excavations shallower than about 6 feet. Sloping excavations to one corner will aid in removal of accumulated groundwater or surface runoff.

4.8 PAVEMENT DESIGN

Pavement design will include proper preparation of subgrade sectors, careful design of the pavement area drainage systems and utilization of an aggregate base course with asphalt concrete or concrete surface course. Preparation of pavement subgrades should be in accordance with recommendations outlined in the Site Preparation and Engineered Fill sections of the report. Careful attention will be required in fine-grading the subgrade surfaces in order to eliminate undulations and depressions that would tend to collect water.

Based on the subsurface materials encountered at the test boring locations, an average California Bearing Ratio (CBR) value of 4 can be utilized for the design of the pavement structures, provided that the subgrade materials consist of engineered fill or natural soils and are compacted to the minimum specified degree, as recommended. The subgrade soils should be verified by PSI prior to the placement of the aggregate base course. The pavement design values presented below should be considered the minimum recommended thickness. Based on the traffic information provided, the pavement thickness values are shown in the following tables. These design thicknesses assume that a properly compacted subgrade has been achieved.

Pavement Design Parameters					
Design Parameters	**Flexible**	**Rigid**	**Design Parameters**	**Flexible**	**Rigid**
Light Duty - Design 18-kip EAL's	30,000	30,000	Initial Serviceability:	4.5	4.2
Heavy Duty - Design 18-kip EAL's	100,000	100,000	Terminal Serviceability:	2.5	2.5
Reliability:	80%	80%	Design CBR	4	--
Overall Deviation:	0.49	0.39	Design Life (Years):	20	20
Subgrade Modulus (k, pci)	--	100			

The recommended light and heavy-duty rigid flexible pavement sections are provided in the following table:

Flexible Pavement	Light Duty	Heavy Duty
Compacted ODOT #448 (Surface, Type 1)	1.5"	1.5"
Compacted ODOT #448 (Intermediate, Type 2)	1.5"	2.0"
Compacted ODOT #304 (Aggregate Course)	6"	8"
Compacted Subgrade (Minimum)	18"	18"

The recommended light and heavy-duty rigid concrete pavement sections are provided in the following table:

Rigid Pavement	Light Duty	Heavy Duty
Reinforced Concrete	5"	6"
Compacted ODOT #304 (Agg. Course)	6"	8"
Compacted Subgrade (Minimum)	18"	18"

Dense aggregate base materials in flexible pavement areas should be placed in maximum 8-inch loose lifts and compacted to at least 98 percent of the Standard Proctor (ASTM D-698) maximum dry density near optimum moisture content.

The use of concrete for paving has become more prevalent in recent years due to a decrease in the material cost of concrete and to the long-term maintenance cost benefits of concrete compared to asphaltic pavements. Should concrete pavement be utilized, the concrete should be properly jointed, and should have a minimum 28-day compressive strength of 3000 psi. 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 minimized.

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. Concrete pavement at least eight (8) inches thick is recommended for the trash dump approach due to the high wheel and impact loads that this area receives. Concrete pavement is recommended in areas, which receive continuous repetitive traffic such as drive-thru or loading lanes and parking lot entrances.

4.9 SITE GRADING

Precautions should be exercised during the removal of the existing building foundation at the proposed site. All existing foundations, utilities, floor slabs, etc., should be completely removed from the proposed construction areas. The excavations should be cleaned of all foreign debris and then backfilled with compacted engineered fill materials to lessen potential settlement that may occur beneath the proposed construction area.

Prior to placing concrete floors or engineered fill on this site, general site area clearing should be carried out. All pavement, topsoil, grass, trees, roots, excessively wet soils, highly organic soils, and soft/loose or obviously compressible materials, should be completely removed from the proposed construction areas. The excavation side slopes should be sloped or benched in accordance with OSHA requirements. The bottom of the excavation should be sloped to drain toward one end in the event rain and/or groundwater occurs while the excavation is open. The bottom of the excavation should then be compacted using a sheepsfoot vibratory compactor making a minimum of 8 passes across the excavation. The area should be checked by a geotechnical engineer and judged suitable prior to the placement of compacted fill. Compacted fill should then be placed in accordance with the guidelines and procedures found in the following paragraphs.

In parking and drive areas of the site, the subgrade should be proof rolled to detect zones of loose, soft and/or wet soils. Proof rolling consists of repeated passes over the subgrade with a loaded dump truck. Areas, which rut or pump excessively should be undercut and replaced with properly compacted fill. To reduce the undercut depths in these areas, a geotextile fabric, such as an Amoco 2000 series may be used in lieu of undercutting greater than 2 feet below subgrade. The fabric would serve to reinforce the subgrade and provide a suitable working base for fill placement. Since no grading plans have been provided at this time, we recommend PSI review the plans prior to construction to check that our recommendations have been implemented properly.

We recommend that all fill be compacted to a minimum of 98 percent of the soils standard Proctor maximum dry density (ASTM D-698), with moisture content within 2 percentage points of the optimum moisture. Lift thickness should be 8 inches or less, loose measure. Fill soils should have the following characteristics:

- A liquid limit (LL) of less than 40 and a plasticity index (PI) of less than 15.
- A standard Proctor maximum dry density of at least 110 pounds per cubic foot.
- The fill soils have a maximum particle size of no more than 3 inches.

It will be important to maintain positive site drainage during construction. Storm water runoff should be diverted around the building and parking areas. The site should be graded at all times such that water is not allowed to pond. If any surface soils become wet due to rains, they should be removed or allowed to dry prior to further site work operations and/or fill placement.

Fill placement should be monitored and tested during construction by experienced engineering technicians. Field density tests should be conducted as required to document compaction requirements with a minimum of 5 tests conducted for every lift of fill placed. Any area failing to achieve both the required compaction and moisture requirements should be re-compacted and/or moisture conditioned and retested.

5 REPORT LIMITATIONS

The recommendations submitted in this report are based on the available subsurface information obtained by PSI and design details furnished by GPD Group for the purpose of this project. If there are any 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 notified of such changes, PSI will not be responsible for the impact of those changes on the project.

Subsurface conditions may vary between boring locations. We recommend that the contract specifications include the following clause:

“The contractor will, upon becoming aware of subsurface or latent physical conditions differing from those disclosed by the original soil exploration work, promptly notify the owner verbally to permit verification of the conditions, and in writing, as to the nature of the differing conditions. No claim by the contractor for any conditions differing from those anticipated in the plans and specifications and disclosed by the soil studies will be allowed unless the contractor has so notified the owner, verbally and in writing, as required above, of such differing conditions.”

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. At this time, it may be necessary to submit supplementary recommendations. If PSI is not retained to perform these functions, PSI will not be responsible for the impact of those conditions on the project. This report has been prepared for the exclusive use of Taco Bell Corporation for the specific application to the proposed Taco Bell #315508 located at 1551 West River Road in the City of Elyria, Lorain County, Ohio.

APPENDIX

SOIL BORING LOCATION PLAN

FENCED DIAGRAM

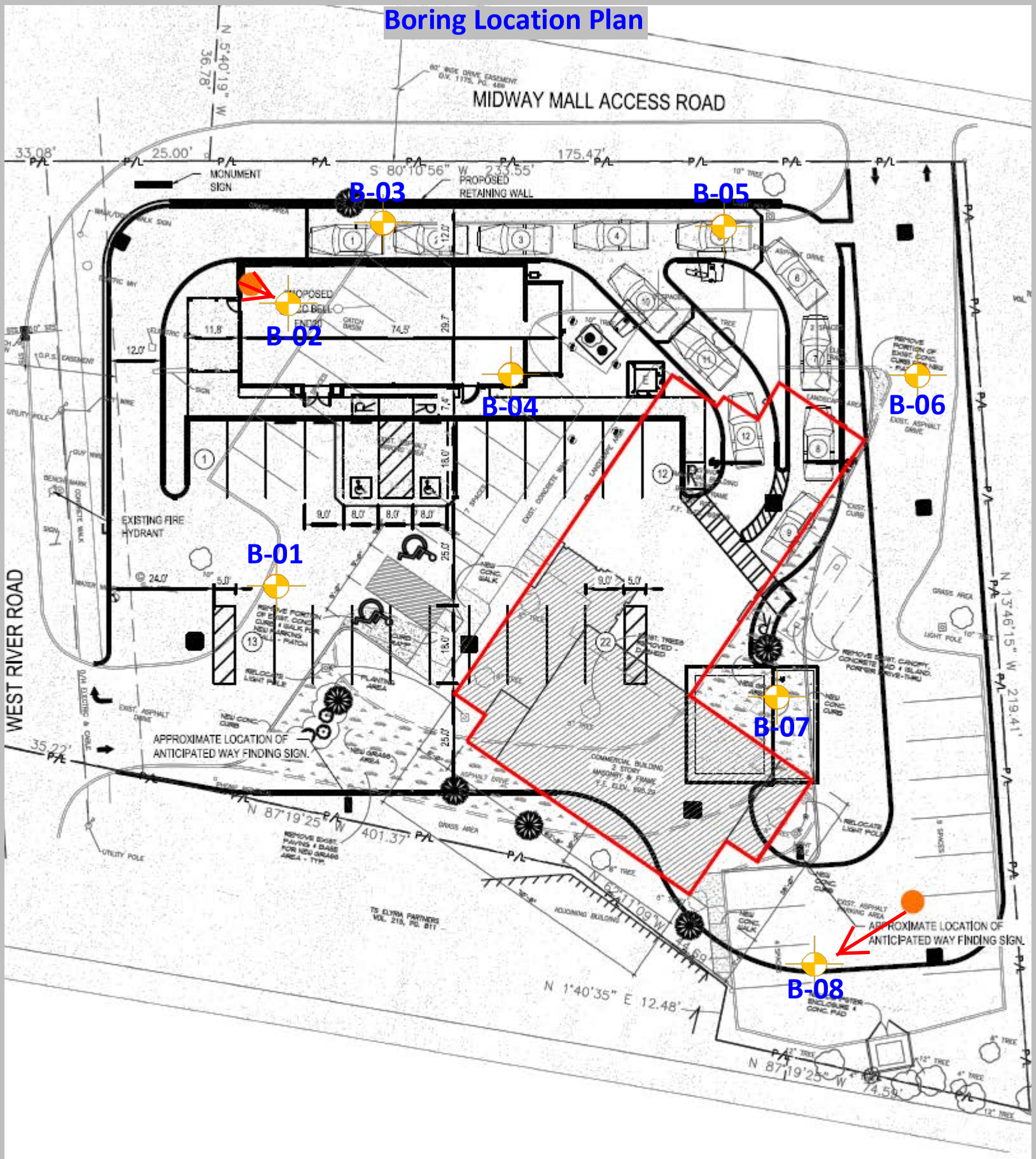
BORING LOGS

GRAIN SIZE GRAPH

GENERAL NOTES

USCS SOIL CLASSIFICATION CHART

Boring Location Plan



Project: Taco Bell #315508, Elyria, OH

PSI Project No: 0142-2517

0 30

15 60

1"=30' Horizontal Scale in Feet

N

N 5°40'19" W 36.78'

60' WIDE DRIVE EASEMENT D.V. 1175, PG. 469

S 80°10'56" W 233.55'

175.47'

25.00'

33.08'

ORIGINAL CENTERLINE

N 13°46'15" W 135.00'

WEST RIVER RD.

N 13°46'15" W 219.41'

B-01 REMOVE PORTION OF EXIST. CONC. CURB & WALK FOR NEW PARKING STALL - PATCH

B-02

B-03

B-04

B-05

B-06

B-07

B-08

WALK/DONT WALK SIGN

TRAFFIC MH

ELECTRIC BOX

SIGN

CATCH BASIN

12" STS

10" STS

8" STS

O.P.S. EASEMENT

GUY WIRE

UTILITY POLE

GUY WIRE

BENCH MARK

CONCRETE WALK

SIGN

GAS METER

WATER METER

10" TREE

GRASS AREA

CATCH BASIN

8 SPACES

EXIST. ASPHALT PARKING AREA

7 SPACES

EXIST. CONCRETE WALK

LANDSCAPE AREA

EXISTING COMMERCIAL BUILDING 1 STORY BRICK & FRAME FLAT ROOF F.F. ELEV. 695.29

EXIST. ASPHALT DRIVE

10" TREE

LIGHT POLE

2 SPACES

10" TREE

2 SPACES

ELEC. TRANS.

REMOVE PORTION OF EXIST. CONC. CURB FOR NEW - PATCH

LANDSCAPE AREA

EXIST. ASPHALT DRIVE

EXIST. 1' CURB

TOYS R US VOL. 1404, PG. 81

GRASS AREA

10" TREE

LIGHT POLE

REMOVE EXIST. CANOPY, CONCRETE PAD & ISLAND. FORMER DRIVE-THRU

NEW CONC. CURB

NEW GRASS AREA

9'-0"

9'-0"

9'-0"

18'-0"

NEW CONC. WALK

CURB RAMP

8" TREE

EXIST. TREES REMOVED - DASHED

18" TREE

8" TREE

PLANTING AREA

RELOCATE LIGHT POLE

COMMERCIAL BUILDING 2 STORY MASONRY & FRAME F.F. ELEV. 695.29

NEW CONC. CURB

8'-0"

NEW GRASS AREA

ASPHALT DRIVE

RELOCATE LIGHT POLE

8" TREE

LIGHT POLE

9 SPACES

NEW CONC. CURB

EXIST. ASPHALT PARKING AREA

38'-0"

62'-8"

10'-2"

GRASS AREA

PHONE PEDESTAL

35.22'

N 87°19'25" W 401.37'

8" TREE

8" TREE

NEW CONC. WALK

4 SPACES

4'-6"

70'-8"

ADJOINING BUILDING

N 62°11'09" W 44.69'

B-08 DUMPSTER ENCLOSURE & CONC. PAD

N 1°40'35" E 12.48'

8" TREE

12" TREE

12" TREE

4" TREE

4" TREE

12" TREE

12" TREE

LIVING WORD WESLEYAN CHURCH VOL. 1409, PG. 477

N 87°19'25" W 74.59'

O/H ELECTRIC & CABLE

REMOVE EXIST. PAVING & BASE FOR NEW GRASS AREA - TYP.

TS ELYRIA PARTNERS VOL. 215, PG. 811

BENCHMARK:
TOP TURNING NUT OF HYDRANT AT FRONT OF SITE ON E. SIDE OF WEST RIVER ROAD.
ELEV. 691.51

SCALE: 1" = 10'

SCALE IN FEET
0 5 10 20

LEGEND

BRADFORD PEAR TREE - 1 3/4" CAL. TYP.	
EXIST. TREE	
SPOT ELEVATION	X 693.92
LIGHT POLE	
MANHOLE	
CATCH BASIN	
GAS METER	
WATER METER	
HYDRANT	
WATER VALVE	
MONUMENT FOUND	

DEED REFERENCE:
SPIKE & MECKLER PROPERTIES
VOL. 580, 96. 199
PPN: 33 06 24 172 000 024

REVISED:

John Hancock & Associates
INCORPORATED
ENGINEERS – SURVEYORS
326 E. MARKET STREET SANDUSKY, OHIO 44870
(419) 625-7838

SURVEY & SITE PLAN

SPIKE MECKLER & BRILL, L.L.P.
1551 WEST RIVER RD.
PART OF ORIGINAL LOT 172, WEST OF THE BLACK RIVER
ELYRIA, LORAIN COUNTY, OHIO

JOB NO.:	131702
DRN BY:	SDC, TJW
FILE NO.:	131702
DATE:	4/9/02
SCALE:	1"= 10'
SHEET NO.:	1

SITE SKETCH

DATE: 09/27/2021
GPD Job# 2021088.98 #23

GPD GROUP
Glaus, Pyle, Schomer, Burns & DeHaven, Inc.
520 South Main Street, Suite 2531
Akron, OH 44311
330.572.2100 Fax 330.572.2101

PROJECT INFORMATION

Site #: 315508
Entity #: 457586
Store #: -
Address: 1551 West River Road
City, State: Elyria, OH

Project Type: New
Building Image: Endeavor 20
Provided Parking: 22 Req'd Parking: 12
Drive-Thru Stack: 12
Site Signage: 1 Monument Sign

TACO BELL USE

	Signature	Date	Approved
BD:			☐
REM:			☐
CM:			☐
ORL:			☐

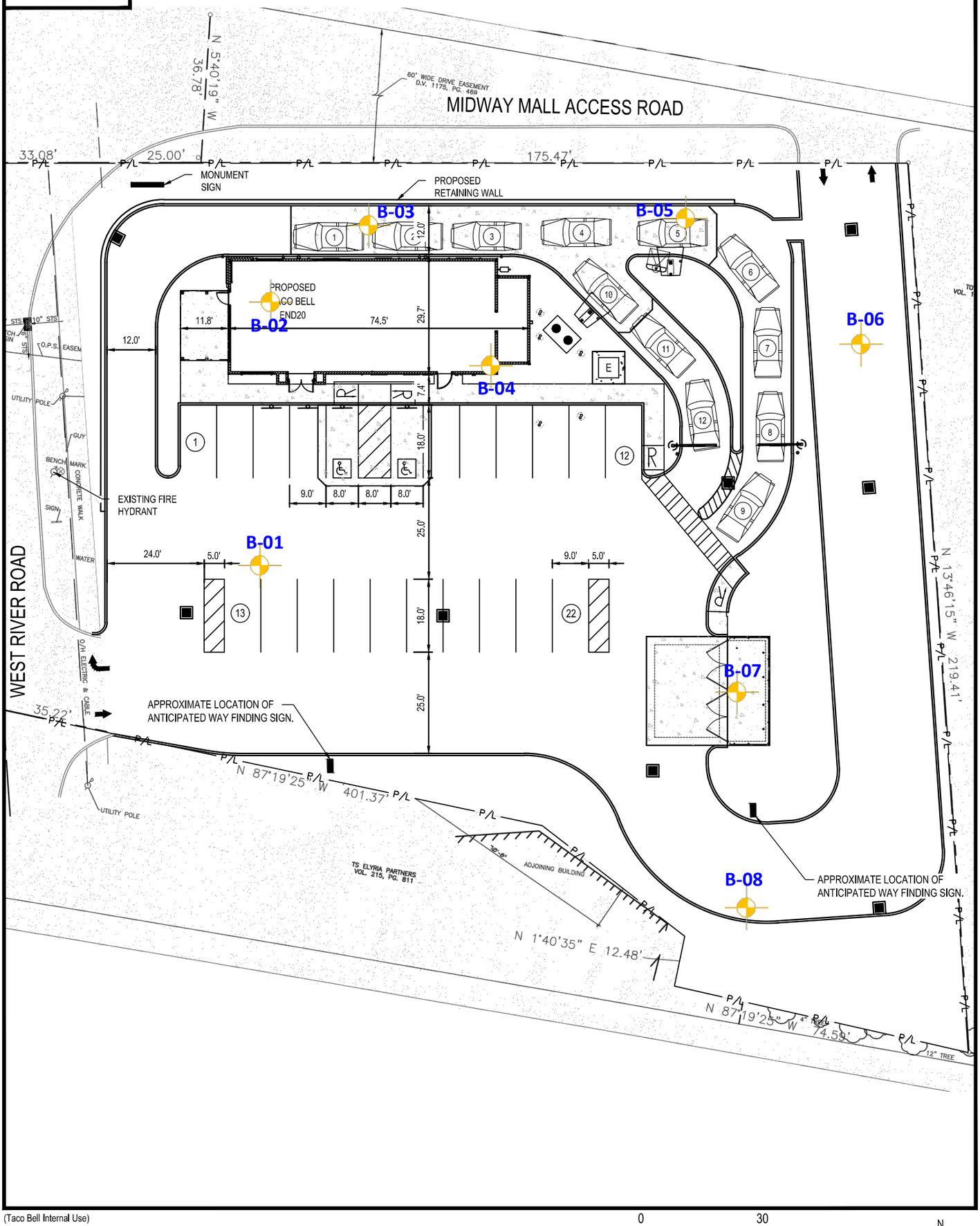
Special Considerations:

REM Comments:

CM Comments:

ORL Comments:

SITE AREA :
+/- 0.90 AC.

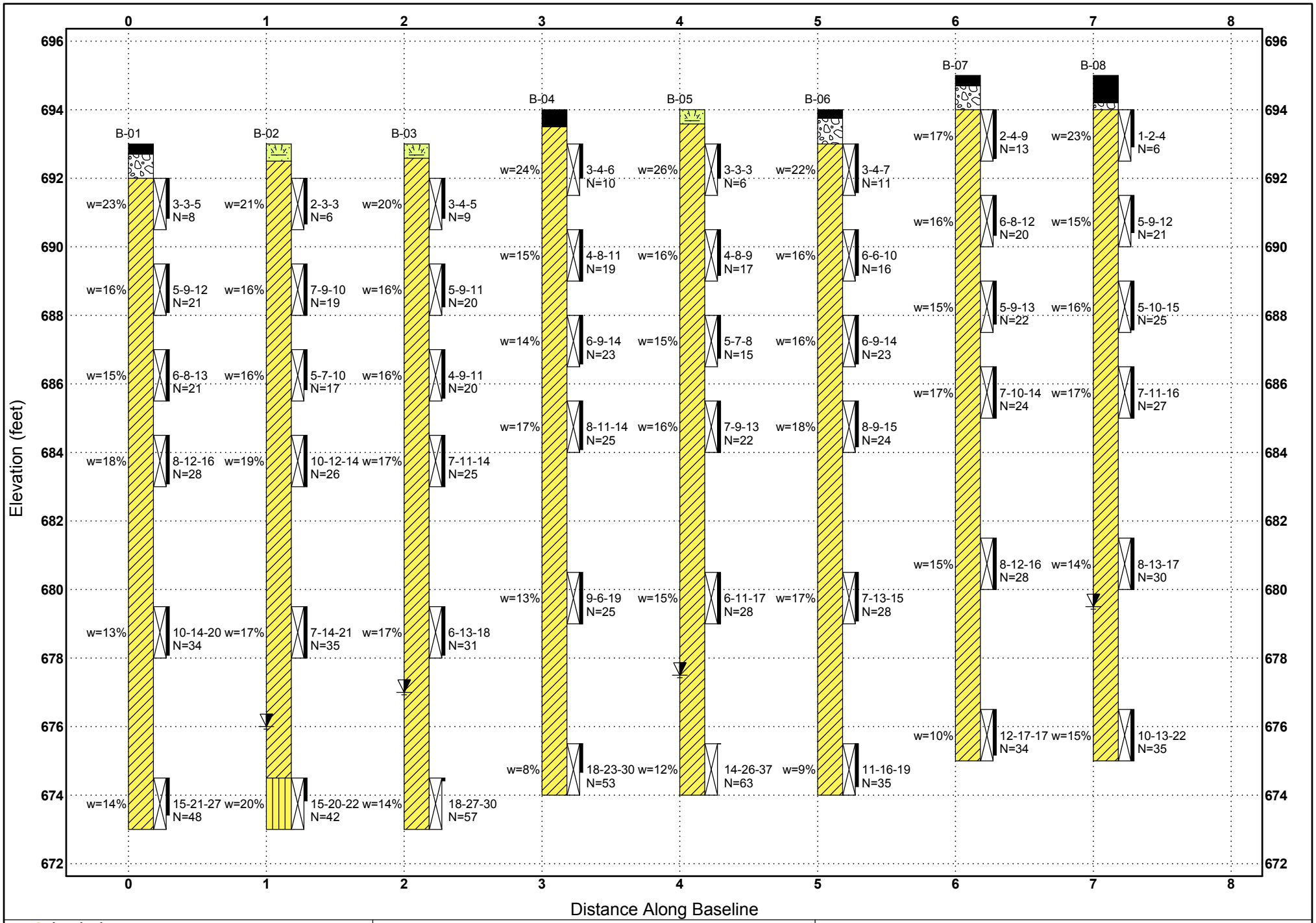


(Taco Bell Internal Use)

1. CONFORMS TO STANDARD UNLESS NOTED.
2. PROPERTY DIMENSIONS, SITE SQUARE FOOTAGE AND EXISTING SURFACE FEATURES ARE APPROXIMATE AND MAY BE SUBJECT TO CHANGE UPON THE ARRIVAL OF A CERTIFIED SURVEY.
3. PROPERTY BOUNDARY INFORMATION PROVIDED BY COMMERCIAL DUE DILIGENCE SERVICES.

0 30
15 60
1"=30' Horizontal Scale in Feet

N



intertek psi

Professional Service Industries, Inc.
5555 Canal Road
Cleveland, OH 44125
Telephone: (216) 447-1335

Profile

Taco Bell Restaurant #315508
PSI Project Number: 0142-2517

BORING B-01

DATE STARTED:	3/12/22	**DRILL COMPANY:**	PSI, Inc.
DATE COMPLETED:	3/12/22	**DRILLER:** JJ	**LOGGED BY:** ZO
COMPLETION DEPTH	20.0 ft	**DRILL RIG:**	Truck D-50
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	693 ft	**SAMPLING METHOD:**	2-in SS
LATITUDE:		**HAMMER TYPE:**	Automatic
LONGITUDE:		**EFFICIENCY**	94%
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	AV

REMARKS:

Water		
	While Drilling	N/A
	Upon Completion	N/A
	Caved Depth	N/A

BORING LOCATION:
Pavement Area

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	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					**4" Asphalt over 8" Sand & Gravel**	Asphalt Gravel				
				1	14	Stiff to Hard, Moist, Brown to Gray, **Lean CLAY**, Trace Gravel		3-3-5 N=8	23		
690				2	17			5-9-12 N=21	16		
	5			3	18			6-8-13 N=21	15		
685				4	17			8-12-16 N=28	18		
	10						CL				
680				5	17			10-14-20 N=34	13		
	15										
675				6	13			15-21-27 N=48	14		
	20										

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Telephone: (216) 447-1335

PROJECT NO.: 0142-2517
PROJECT: Taco Bell Restaurant #315508
LOCATION: 1551 West River Road
Elyria, Lorain County, Ohio

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

BORING B-02

DATE STARTED:	3/20/22	**DRILL COMPANY:**	PSI, Inc.
DATE COMPLETED:	3/20/22	**DRILLER:** JJ	**LOGGED BY:** ZO
COMPLETION DEPTH	20.0 ft	**DRILL RIG:**	Truck D-50
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	693 ft	**SAMPLING METHOD:**	2-in SS
LATITUDE:		**HAMMER TYPE:**	Automatic
LONGITUDE:		**EFFICIENCY**	94%
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	AV

REMARKS:

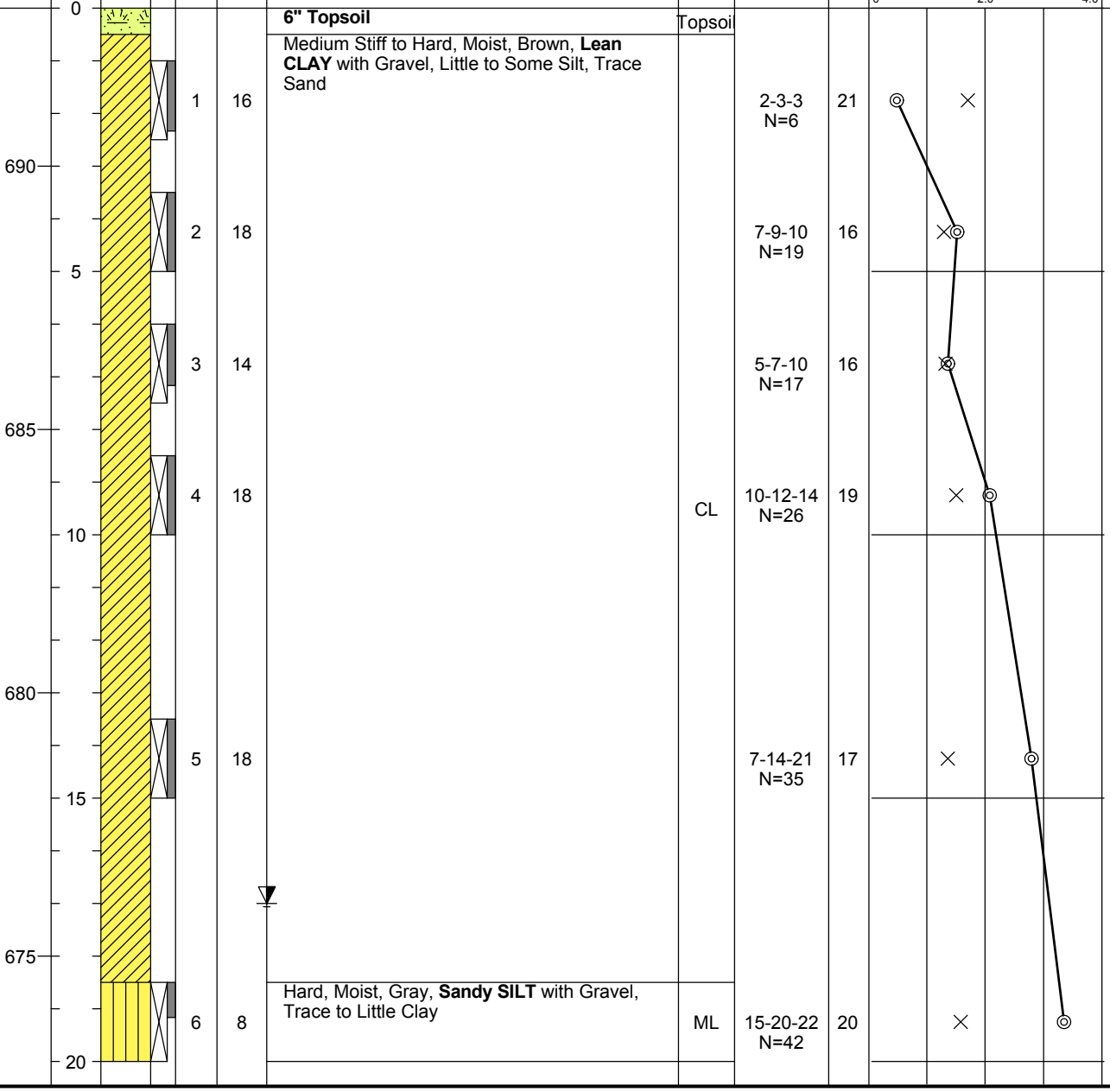
Water		
	While Drilling	N/A
	Upon Completion	N/A
	Caved Depth	17 feet

BORING LOCATION: Building Area

Elevation (feet)	Depth, (feet)	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %
	0			**6" Topsoil**	Topsoil		
		1	16	Medium Stiff to Hard, Moist, Brown, **Lean CLAY** with Gravel, Little to Some Silt, Trace Sand		2-3-3 N=6	21
690		2	18			7-9-10 N=19	16
	5	3	14			5-7-10 N=17	16
685		4	18		CL	10-12-14 N=26	19
	10						
680		5	18			7-14-21 N=35	17
	15						
675		6	8	Hard, Moist, Gray, **Sandy SILT** with Gravel, Trace to Little Clay	ML	15-20-22 N=42	20
	20						

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



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5555 Canal Road
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PROJECT NO.: 0142-2517
PROJECT: Taco Bell Restaurant #315508
LOCATION: 1551 West River Road
Elyria, Lorain County, Ohio

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

BORING B-03

DATE STARTED:	3/20/22	**DRILL COMPANY:**	PSI, Inc.
DATE COMPLETED:	3/20/22	**DRILLER:** JJ	**LOGGED BY:** ZO
COMPLETION DEPTH	20.0 ft	**DRILL RIG:**	Truck D-50
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	693 ft	**SAMPLING METHOD:**	2-in SS
LATITUDE:		**HAMMER TYPE:**	Automatic
LONGITUDE:		**EFFICIENCY**	94%
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	AV

REMARKS:

Water		
	While Drilling	N/A
	Upon Completion	N/A
	Caved Depth	16 feet

BORING LOCATION:
Pavement Area

Elevation (feet)	Depth, (feet)	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %
690	0			**5" Topsoil**	Topsoil		
		1	14	Stiff to Hard, Moist, Brown to Gray, **Lean CLAY**, Trace to Some Gravel, Little Boulders, Little Silt		3-4-5 N=9	20
	5	2	15			5-9-11 N=20	16
685		3	17			4-9-11 N=20	16
	10	4	18		CL	7-11-14 N=25	17
680		5	17			6-13-18 N=31	17
	15						
675				@ 18.5 ft; Pushed Boulder			
	20	6	1			18-27-30 N=57	14

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

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Professional Service Industries, Inc.
5555 Canal Road
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Telephone: (216) 447-1335

PROJECT NO.: 0142-2517
PROJECT: Taco Bell Restaurant #315508
LOCATION: 1551 West River Road
Elyria, Lorain County, Ohio

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

BORING B-04

DATE STARTED:	3/12/22	**DRILL COMPANY:**	PSI, Inc.
DATE COMPLETED:	3/12/22	**DRILLER:** JJ	**LOGGED BY:** ZO
COMPLETION DEPTH	20.0 ft	**DRILL RIG:**	Truck D-50
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	694 ft	**SAMPLING METHOD:**	2-in SS
LATITUDE:		**HAMMER TYPE:**	Automatic
LONGITUDE:		**EFFICIENCY**	94%
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	AV

REMARKS:

Water		
	While Drilling	N/A
	Upon Completion	N/A
	Caved Depth	N/A

BORING LOCATION: Building Area

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	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					**6" Asphalt**	Asphalt				
						Stiff to Hard, Moist, Brown/Gray to Gray, **Lean CLAY** with Silt, Trace Sand, Trace to Little Gravel					
				1	12			3-4-6 N=10	24		
690											
	5			2	18			4-8-11 N=19	15		
				3	17			6-9-14 N=23	14		
685											
	10			4	17		CL	8-11-14 N=25	17		
680											
	15			5	18			9-6-19 N=25	13		
675											
	20			6	10			18-23-30 N=53	8	>>	

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5555 Canal Road
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Telephone: (216) 447-1335

PROJECT NO.: 0142-2517
PROJECT: Taco Bell Restaurant #315508
LOCATION: 1551 West River Road
Elyria, Lorain County, Ohio

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

BORING B-05

DATE STARTED:	3/20/22	**DRILL COMPANY:**	PSI, Inc.
DATE COMPLETED:	3/20/22	**DRILLER:** JJ	**LOGGED BY:** ZO
COMPLETION DEPTH	20.0 ft	**DRILL RIG:**	Truck D-50
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	694 ft	**SAMPLING METHOD:**	2-in SS
LATITUDE:		**HAMMER TYPE:**	Automatic
LONGITUDE:		**EFFICIENCY**	94%
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	AV

REMARKS:

Water		
	While Drilling	N/A
	Upon Completion	N/A
	Caved Depth	16.5 feet

BORING LOCATION:
Pavement Area

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	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					**5" Topsoil**	Topsoil				
						Medium Stiff to Very Stiff, Moist, Brown to Gray, **Lean CLAY** with Gravel, Trace Sand, Little Silt					
				1	12			3-3-3 N=6	26		
690				2	16			4-8-9 N=17	16		
	5			3	15			5-7-8 N=15	15		
685				4	18			7-9-13 N=22	16		
	10						CL				
680				5	18			6-11-17 N=28	15		
	15										
						@ 18.5 ft; Pushed Boulder					
675				6	0			14-26-37 N=63	12	>>◎	
	20										

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Cleveland, OH 44125
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PROJECT NO.: 0142-2517
PROJECT: Taco Bell Restaurant #315508
LOCATION: 1551 West River Road
Elyria, Lorain County, Ohio

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

BORING B-06

DATE STARTED:	3/12/22	**DRILL COMPANY:**	PSI, Inc.
DATE COMPLETED:	3/12/22	**DRILLER:** JJ	**LOGGED BY:** ZO
COMPLETION DEPTH	20.0 ft	**DRILL RIG:**	Truck D-50
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	694 ft	**SAMPLING METHOD:**	2-in SS
LATITUDE:		**HAMMER TYPE:**	Automatic
LONGITUDE:		**EFFICIENCY**	94%
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	AV

REMARKS:

Water		
	While Drilling	N/A
	Upon Completion	N/A
	Caved Depth	N/A

BORING LOCATION:
Pavement Area

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	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					**3" Asphalt over 9" Sand & Gravel**	Asphalt Gravel				
				1	17	Stiff to Hard, Moist, Brown to Gray, **Lean CLAY**, Trace to Little Gravel		3-4-7 N=11	22		
690				2	16			6-6-10 N=16	16		
	5			3	17			6-9-14 N=23	16		
685				4	16			8-9-15 N=24	18		
	10						CL				
680				5	17			7-13-15 N=28	17		
	15										
675				6	15			11-16-19 N=35	9		
	20										

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PROJECT NO.: 0142-2517
PROJECT: Taco Bell Restaurant #315508
LOCATION: 1551 West River Road
Elyria, Lorain County, Ohio

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

BORING B-07

DATE STARTED:	3/12/22	**DRILL COMPANY:**	PSI, Inc.
DATE COMPLETED:	3/12/22	**DRILLER:** JJ	**LOGGED BY:** ZO
COMPLETION DEPTH	20.0 ft	**DRILL RIG:**	Truck D-50
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	695 ft	**SAMPLING METHOD:**	2-in SS
LATITUDE:		**HAMMER TYPE:**	Automatic
LONGITUDE:		**EFFICIENCY**	94%
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	AV
REMARKS:			

Water		
	While Drilling	N/A
	Upon Completion	N/A
	Caved Depth	N/A

BORING LOCATION:
Trash Pad Area

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	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					**4" Asphalt over 8" Sand & Gravel**	Asphalt Gravel				
				1	17	Stiff to Hard, Moist, Brown to Gray, **Lean CLAY**, Trace to Some Gravel, Some Silt		2-4-9 N=13	17		
				2	14			6-8-12 N=20	16		
690	5										
				3	15			5-9-13 N=22	15		
				4	18			7-10-14 N=24	17		
685	10						CL				
				5	18			8-12-16 N=28	15		
680	15										
				6	16			12-17-17 N=34	10		
675	20										

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PROJECT NO.: 0142-2517
PROJECT: Taco Bell Restaurant #315508
LOCATION: 1551 West River Road
Elyria, Lorain County, Ohio

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BORING B-08

DATE STARTED:	3/20/22	**DRILL COMPANY:**	PSI, Inc.
DATE COMPLETED:	3/20/22	**DRILLER:** JJ	**LOGGED BY:** ZO
COMPLETION DEPTH	20.0 ft	**DRILL RIG:**	Truck D-50
BENCHMARK:	N/A	**DRILLING METHOD:**	Hollow Stem Auger
ELEVATION:	695 ft	**SAMPLING METHOD:**	2-in SS
LATITUDE:		**HAMMER TYPE:**	Automatic
LONGITUDE:		**EFFICIENCY**	94%
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	AV

REMARKS:

Water		
	While Drilling	N/A
	Upon Completion	N/A
	Caved Depth	15.5 feet

BORING LOCATION: Pavement Area

Elevation (feet)	Depth, (feet)	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %
	0			**4" Asphalt over 8" Sand and Gravel**	Asphalt Gravel		
		1	13	Medium Stiff to Hard, Moist, Brown to Gray, **Lean CLAY**, Trace Gravel, Some Silt, Little Sand		1-2-4 N=6	23
		2	13			5-9-12 N=21	15
690	5						
		3	17			5-10-15 N=25	16
		4	18			7-11-16 N=27	17
685	10				CL		
		5	18			8-13-17 N=30	14
680	15						
		6	18			10-13-22 N=35	15
675	20						

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

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Telephone: (216) 447-1335

PROJECT NO.: 0142-2517
PROJECT: Taco Bell Restaurant #315508
LOCATION: 1551 West River Road
Elyria, Lorain County, Ohio

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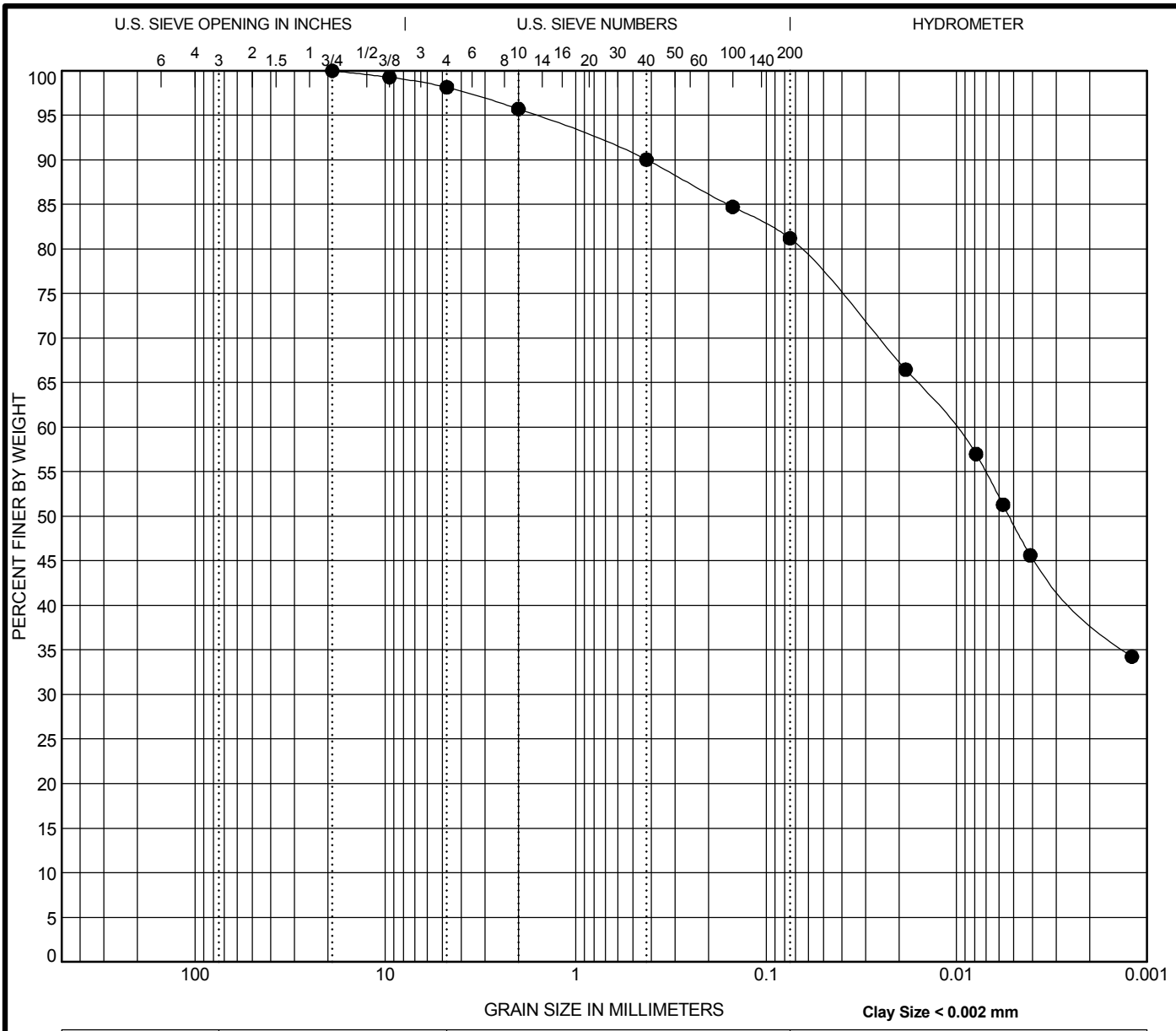

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	**B-6**	**1.8**	Lean CLAY (CL)	**45**	**22**	**23**		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-6**	**1.8**	**19**	**0.01**			**1.8**	**17.0**	**42.2**	**39.0**

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GRAIN SIZE DISTRIBUTION

Project: Taco Bell Restaurant #315508
PSI Job No.: 0142-2517
Location: 1551 West River Road
Elyria, Lorain County, Ohio

GENERAL NOTES

SAMPLE IDENTIFICATION

The Unified Soil Classification System (USCS), AASHTO 1988 and ASTM designations D2487 and D-2488 are used to identify the encountered materials unless otherwise noted. Coarse-grained soils are defined as having more than 50% of their dry weight retained on a #200 sieve (0.075mm); they are described as: boulders, cobbles, gravel or sand. Fine-grained soils have less than 50% of their dry weight retained on a #200 sieve; they are defined as silts or clay depending on their Atterberg Limit attributes. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size.

DRILLING AND SAMPLING SYMBOLS

SFA: Solid Flight Auger - typically 4" diameter flights, except where noted.
HSA: Hollow Stem Auger - typically 3¼" or 4¼ I.D. openings, except where noted.
M.R.: Mud Rotary - Uses a rotary head with Bentonite or Polymer Slurry
R.C.: Diamond Bit Core Sampler
H.A.: Hand Auger
P.A.: Power Auger - Handheld motorized auger

SS: Split-Spoon - 1 3/8" I.D., 2" O.D., except where noted.
ST: Shelby Tube - 3" O.D., except where noted.
BS: Bulk Sample
PM: Pressuremeter
CPT-U: Cone Penetrometer Testing with Pore-Pressure Readings

SOIL PROPERTY SYMBOLS

N: Standard "N" penetration: Blows per foot of a 140 pound hammer falling 30 inches on a 2-inch O.D. Split-Spoon.
N_{60}: A "N" penetration value corrected to an equivalent 60% hammer energy transfer efficiency (ETR)
Q_u: Unconfined compressive strength, TSF
Q_p: Pocket penetrometer value, unconfined compressive strength, TSF
w%: Moisture/water content, %
LL: Liquid Limit, %
PL: Plastic Limit, %
PI: Plasticity Index = (LL-PL),%
DD: Dry unit weight, pcf
▼,▽,▼ Apparent groundwater level at time noted

RELATIVE DENSITY OF COARSE-GRAINED SOILS

Relative Density	N - Blows/foot
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	50 - 80
Extremely Dense	80+

ANGULARITY OF COARSE-GRAINED PARTICLES

Description	Criteria
Angular:	Particles have sharp edges and relatively plane sides with unpolished surfaces
Subangular:	Particles are similar to angular description, but have rounded edges
Subrounded:	Particles have nearly plane sides, but have well-rounded corners and edges
Rounded:	Particles have smoothly curved sides and no edges

GRAIN-SIZE TERMINOLOGY

Component	Size Range
Boulders:	Over 300 mm (>12 in.)
Cobbles:	75 mm to 300 mm (3 in. to 12 in.)
Coarse-Grained Gravel:	19 mm to 75 mm (¾ in. to 3 in.)
Fine-Grained Gravel:	4.75 mm to 19 mm (No.4 to ¾ in.)
Coarse-Grained Sand:	2 mm to 4.75 mm (No.10 to No.4)
Medium-Grained Sand:	0.42 mm to 2 mm (No.40 to No.10)
Fine-Grained Sand:	0.075 mm to 0.42 mm (No. 200 to No.40)
Silt:	0.002 mm to 0.075 mm
Clay:	<0.002mm to <0.005 mm depending on agency

PARTICLE SHAPE

Description	Criteria
Flat:	Particles with width/thickness ratio > 3
Elongated:	Particles with length/width ratio > 3
Flat & Elongated:	Particles meet criteria for both flat and elongated

RELATIVE PROPORTIONS OF FINES

Descriptive Term	% Dry Weight
Trace:	< 5%
With:	5% to 12%
Modifier:	>12%

GENERAL NOTES

(Continued)

CONSISTENCY OF FINE-GRAINED SOILS

Q_U - TSF	N - Blows/foot	Consistency
0 - 0.25	0 - 2	Very Soft
0.25 - 0.50	2 - 4	Soft
0.50 - 1.00	4 - 8	Firm (Medium Stiff)
1.00 - 2.00	8 - 15	Stiff
2.00 - 4.00	15 - 30	Very Stiff
4.00 - 8.00	30 - 50	Hard
8.00+	50+	Very Hard

MOISTURE CONDITION DESCRIPTION

Description	Criteria
Dry:	Absence of moisture, dusty, dry to the touch
Moist:	Damp but no visible water
Wet:	Visible free water, usually soil is below water table

RELATIVE PROPORTIONS OF SAND AND GRAVEL

Descriptive Term	% Dry Weight
Trace:	< 15%
With:	15% to 30%
Modifier:	>30%

STRUCTURE DESCRIPTION

Description	Criteria
Stratified:	Alternating layers of varying material or color with layers at least ¼-inch (6 mm) thick
Laminated:	Alternating layers of varying material or color with layers less than ¼-inch (6 mm) thick
Fissured:	Breaks along definite planes of fracture with little resistance to fracturing
Slickensided:	Fracture planes appear polished or glossy, sometimes striated
Blocky:	Cohesive soil that can be broken down into small angular lumps which resist further breakdown
Lensed:	Inclusion of small pockets of different soils
Layer:	Inclusion greater than 3 inches thick (75 mm)
Seam:	Inclusion 1/8-inch to 3 inches (3 to 75 mm) thick extending through the sample
Parting:	Inclusion less than 1/8-inch (3 mm) thick

SCALE OF RELATIVE ROCK HARDNESS

Q_U - TSF	Consistency
2.5 - 10	Extremely Soft
10 - 50	Very Soft
50 - 250	Soft
250 - 525	Medium Hard
525 - 1,050	Moderately Hard
1,050 - 2,600	Hard
>2,600	Very Hard

ROCK BEDDING THICKNESSES

Description	Criteria
Very Thick Bedded	Greater than 3-foot (>1.0 m)
Thick Bedded	1-foot to 3-foot (0.3 m to 1.0 m)
Medium Bedded	4-inch to 1-foot (0.1 m to 0.3 m)
Thin Bedded	1¼-inch to 4-inch (30 mm to 100 mm)
Very Thin Bedded	½-inch to 1¼-inch (10 mm to 30 mm)
Thickly Laminated	1/8-inch to ½-inch (3 mm to 10 mm)
Thinly Laminated	1/8-inch or less "paper thin" (<3 mm)

ROCK VOIDS

Voids	Void Diameter
Pit	<6 mm (<0.25 in)
Vug	6 mm to 50 mm (0.25 in to 2 in)
Cavity	50 mm to 600 mm (2 in to 24 in)
Cave	>600 mm (>24 in)

GRAIN-SIZED TERMINOLOGY

(Typically Sedimentary Rock)

Component	Size Range
Very Coarse Grained	>4.76 mm
Coarse Grained	2.0 mm - 4.76 mm
Medium Grained	0.42 mm - 2.0 mm
Fine Grained	0.075 mm - 0.42 mm
Very Fine Grained	<0.075 mm

ROCK QUALITY DESCRIPTION

Rock Mass Description	RQD Value
Excellent	90 -100
Good	75 - 90
Fair	50 - 75
Poor	25 -50
Very Poor	Less than 25

DEGREE OF WEATHERING

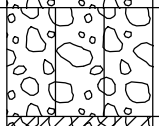
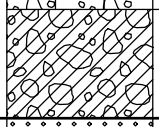
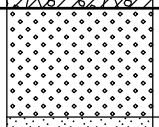
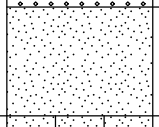
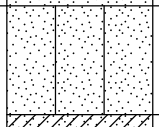
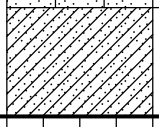
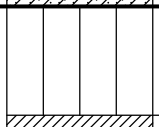
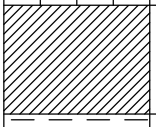
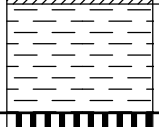
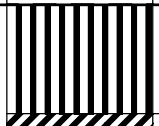
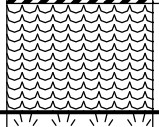
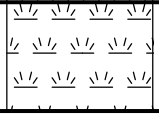
Slightly Weathered: Rock generally fresh, joints stained and discoloration extends into rock up to 25 mm (1 in), open joints may contain clay, core rings under hammer impact.

Weathered: Rock mass is decomposed 50% or less, significant portions of the rock show discoloration and weathering effects, cores cannot be broken by hand or scraped by knife.

Highly Weathered: Rock mass is more than 50% decomposed, complete discoloration of rock fabric, core may be extremely broken and gives clunk sound when struck by hammer, may be shaved with a knife.

SOIL CLASSIFICATION CHART

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	(LITTLE OR NO FINES)		GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
		(APPRECIABLE AMOUNT OF FINES)		GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	SAND AND SANDY SOILS	CLEAN SANDS		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	(LITTLE OR NO FINES)		SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES		SM	SILTY SANDS, SAND - SILT MIXTURES
		(APPRECIABLE AMOUNT OF FINES)		SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS