Geotechnical Engineering Report

Proposed McDonald's Restaurant #5-1004
Southeast of East Stroh Road and South Parker Road
Parker, Colorado
March 24, 2022
Terracon Project No. 25225006

Prepared for:
McDonald's USA, LLC
Chicago, Illinois

Prepared by:
Terracon Consultants, Inc.
Wheat Ridge, Colorado

March 24, 2022

McDonald's USA, LLC
110 North Carpenter Street
Chicago, Illinois 60607

Attn: Ms. Frances Nuno
P: (630) 947 4103
E: frances.nuno@us.mcd.com

Re: Geotechnical Engineering Report
Proposed McDonald's Restaurant #5-1004
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Parker, Colorado
Terracon Project No. 25225006

Ms. Nuno:

We have completed the geotechnical engineering services for the above referenced project. This study was performed in general accordance with Terracon Proposal No. P25225006 dated January 18, 2022. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning earthwork and the design and construction of foundations, floor slabs, and pavements for the proposed project.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report or if we may be of further service, please contact us.

Sincerely,
Terracon Consultants, Inc.

Dwight D. Fadel
Geotechnical Staff Engineer

Scott B. Myers, P.E.
Senior Regional Consultant

REPORT TOPICS

Note: This report was originally delivered in a web-based format. **Orange Bold** text in the report indicates a referenced section heading. The PDF version also includes hyperlinks which direct the reader to that section and clicking on the ***GeoReport*** logo will bring you back to this page. For more interactive features, please view your project online at **client.terracon.com**.

FIGURES

ATTACHMENTS

Note: Refer to each individual Attachment cover page for a listing of contents.

REPORT SUMMARY

Topic [1]	Overview Statement [2]
Project Description	We understand the project consists of constructing a new single-story, about 4,250 square-foot building with a double drive thru, trash enclosure area, and associated parking areas and access drives. No below-grade levels are planned.
Geotechnical Characterization	Subsurface conditions encountered in the exploratory borings consisted of about 1 to 3 feet of existing fill underlain by native sand soils with varying amounts of clay, silt, and gravel and native clay soils with varying amounts of sand to depths of about 8 to 17 feet below ground surface (bgs). Existing fill materials consisted of sand with varying amounts of clay, silt, gravel and brick fragments and clay with varying amounts of sand and silt. Claystone bedrock was encountered below the native soils to the maximum depth explored of 30 feet bgs Groundwater was not encountered during our field exploration to the maximum depth explored of 30 feet bgs.
Geotechnical Considerations	Based on the results of the laboratory testing and our experience in the area, the existing sand fill materials have nil to low expansive potential while the clay layers within the existing fill materials have high expansive potential. The native sand and native clay soils are considered to have nil to low expansive potential. The claystone bedrock has moderate to very high expansive potential.
Earthwork	Remove existing fill materials from below shallow foundations, slabs-on-grade, and pavements. Portions of the existing fill materials and the native sand soils can be considered for reuse as engineered fill below foundation, slabs-on-grade, and pavement areas, and as general fill for this project provided they meet the requirements for imported soils in the **Material Types** subsection of this report.
Foundation Recommendations	Based on the subsurface conditions encountered in the exploratory borings and our geotechnical engineering analyses, the proposed restaurant may be constructed on a spread footing foundation system bottomed on native sand soils or new engineered fill, provided the owner is willing to accept the associated risk of movement.
Exterior Flatwork	Existing expansive fill materials may be encountered at exterior flatwork construction elevation. Construction of exterior flatwork on a zone of new engineered fill is recommended to improve performance. Where claystone is encountered below exterior flatwork, additional overexcavation will be required.
Pavements	Pavements should be constructed on zone of new engineered fill to improve performance. Where claystone is encountered below pavements, additional overexcavation will be required.
General Comments	This section contains important information about the limitations of this geotechnical engineering report.

1. If the reader is reviewing this report as a pdf, the topics above can be used to access the appropriate section of the report by simply clicking on the topic itself.
2. This summary is for convenience only. It should be used in conjunction with the entire report for design purposes.

Geotechnical Engineering Report

Proposed McDonald's Restaurant #5-1004
Southeast of East Stroh Road and South Parker Road
Parker, Colorado

Terracon Project No. 25225006
March 24, 2022

INTRODUCTION

This report presents the results of our subsurface exploration and geotechnical engineering services performed for the proposed McDonald's Restaurant #5-1004 to be located southeast of East Stroh Road and South Parker Road in Parker, Colorado.

The purpose of these services is to provide information and geotechnical engineering recommendations relative to:

- Subsurface soil conditions
- Groundwater levels
- Earthwork
- Drainage
- Lateral earth pressures
- Seismic site classification
- Foundation design and construction
- Floor slab design and construction
- Pavement design and construction

The geotechnical engineering Scope of Services for this project included the advancement of ten test borings (designated as Boring Nos. 1 to 5 and P1 to P5) to depths ranging from approximately 15 to 30 feet below existing site grades. Plans showing the site and boring locations are shown in the **Site Location and Exploration Plans** section. The results of the laboratory testing performed on soil and bedrock samples obtained from the site during the field exploration are included on the boring logs and as separate graphs in the **Exploration Results** section.

SITE CONDITIONS

The following description of site conditions is derived from our site visit in association with the field exploration and our review of publicly available geologic and topographic maps.

Item	Description
Parcel Information	The project is to be located southeast of East Stroh Road and South Parker Road in Parker, Colorado. The general location of the proposed project is 39.4772° N, 104.7568 ° W. See **Site Location**

Item	Description
Existing Improvements	The subject site currently consists of a previously developed vacant lot. Three single-story structures appear to have occupied the site as recently as 2018, but have been removed. The foundation systems of the previous structures are assumed to have been shallow spread footings.
Current Ground Cover	Ground cover on the subject site consists of grass, weeds, and barren land.
Existing Topography	The site is generally flat with an elevation difference of about 5 feet with the exception of the northeast corner of the project site where the site slopes up to the northeast with an elevation difference of about 16 feet.

PROJECT DESCRIPTION

Our initial understanding of the project was provided in our proposal and was discussed during project planning. Our final understanding of the project conditions is as follows:

Item	Description
Information Provided	McDonald's provided the following PDF document: ■ McDonald's Parker Stroh 3_Updated Concept Plan 2 BORING.pdf
Project Description	We understand the project consists of constructing a new single-story, about 4,250 square-foot building with a double drive thru, trash enclosure area, and associated parking areas and access drives. No below-grade levels are planned.
Building Construction	We anticipate the proposed building will be constructed of wood framing and concrete masonry units with a shallow foundation system and slab-on-grade floors.
Maximum Loads (assumed)	■ Columns: up to 50 kips ■ Walls: 2 to 6 kips per linear foot (klf) Slabs: 150 to 250 pounds per square foot (psf)
Grading/Slopes	Cut and fill, 3 feet (+/-) max over the majority of the project site. Additional grading up to about 16 feet (+/-) may be required in the northeast portion of this site.
Free-Standing Retaining Walls	None indicated, but if extensive cut/fill is planned, retaining walls may be required.
Below-Grade Areas	None
Pavements	New pavements for privately maintained pavement areas will likely consist of flexible asphalt and rigid concrete pavement. Traffic loads were not available

	at the time of this report. We have assumed traffic loads consistent with that of similar use.
Underground Utilities	We assume underground utilities will be installed within about 5 to 8 feet of finished site grades.

GEOTECHNICAL CHARACTERIZATION

We have developed a general characterization of the subsurface conditions based upon our review of the subsurface exploration, laboratory data, geologic setting, and our understanding of the project. This characterization, termed GeoModel, forms the basis of our geotechnical calculations and evaluation of site preparation and foundation options. Conditions encountered at each exploration point are indicated on the individual logs. The individual logs can be found in the **Exploration Results** section and the GeoModel can be found in the **Figures** section of this report. As noted in **General Comments**, the characterization is based upon widely spaced exploration points across the site, and variations are likely.

Subsurface Profile

As part of our analyses, we identified the following model layers within the subsurface profile. For a more detailed view of the model layer depths at each boring location, refer to the GeoModel.

Model Layer	Layer Name	General Description
1	**Fill**	Existing fill materials consisting of sand with varying amounts of clay, silt, gravel and brick fragments and clay with varying amounts of sand and silt; various densities
2	**Native Sand**	Native sand with varying amounts of clay, silt and gravel; loose to medium dense
3	**Native Clay**	Native clay with varying amounts of sand; very stiff
4	**Bedrock**	Bedrock consisting of claystone; soft to hard

Based on the results of the laboratory testing and our experience in the area, the existing sand fill materials have nil to low expansive potential while the clay layers within the existing fill materials have high expansive potential. The native sand and native clay soils are considered to have nil to low expansive potential. The claystone bedrock has moderate to very high expansive potential. A summary of laboratory test results is included in the **Exploration Results**.

Groundwater Conditions

The borings were observed while drilling and upon completion of drilling for the presence and level of groundwater. The water levels encountered in the boreholes can be found on the boring logs in **Exploration Results**, and are summarized below.

Boring No.	Shallowest depth to groundwater encountered while or upon completion of drilling [1]
1	None encountered to the maximum depth explored of 30 feet.
2	None encountered to the maximum depth explored of 30 feet.
3	None encountered to the maximum depth explored of 30 feet.
4	None encountered to the maximum depth explored of 30 feet.
5	None encountered to the maximum depth explored of 30 feet.
P1	None encountered to the maximum depth explored of 30 feet.
P2	None encountered to the maximum depth explored of 15 feet.
P3	None encountered to the maximum depth explored of 15 feet.
P4	None encountered to the maximum depth explored of 15 feet.
P5	None encountered to the maximum depth explored of 15 feet.

1. Due to safety concerns, borings were backfilled immediately after completion. Therefore, subsequent groundwater measurements were not obtained.

These observations represent groundwater conditions at the time of the field exploration, and may not be indicative of other times or at other locations. Groundwater levels can be expected to fluctuate with varying seasonal and weather conditions.

Zones of perched and/or trapped groundwater may also occur at times in the subsurface soils overlying bedrock, on top of the bedrock surface or within permeable fractures in the bedrock materials. The location and amount of perched water is dependent upon several factors, including hydrologic conditions, type of site development, irrigation demands on or adjacent to the site, fluctuations in water features, seasonal and weather conditions.

Groundwater level fluctuations occur due to seasonal variations in the amount of rainfall, runoff, and other factors not evident at the time the borings were performed. Groundwater levels during construction or at other times in the life of the building may be higher or lower than the levels indicated on the boring logs. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project.

GEOTECHNICAL OVERVIEW

Based on subsurface conditions encountered in the borings, the site appears suitable for the proposed construction from a geotechnical point of view provided certain precautions and design and construction recommendations outlined in this report are followed. We have identified

geotechnical conditions that could impact design and construction of the proposed building, and other site improvements.

Existing Fill Materials

Up to about 3 feet of fill materials were encountered in portions of the site. It should be noted that fill depths presented in the boring logs are approximate and the depth, lateral extents, and composition of fill should be expected to vary. We do not possess any information regarding whether the fill was placed under the observation of a geotechnical engineer.

Based upon the results of our field exploration and laboratory testing, it is our opinion the existing fill should not be used to support foundations, interior slabs, exterior slabs-on-grade, or pavement construction without complete removal and modification.

If the owner is willing to accept a higher risk of movement for pavements and exterior slabs, consideration could be given to overexcavating a portion of the existing fill materials below these elements, then processing, moisture conditioning and compacting the materials back to subgrade elevation.

It should be noted that there exists the potential for construction debris and/or domestic trash to be encountered within the fill on some portions of the site. Brick fragments were encountered within Boring No. P2. The potential for encountering construction debris is considered to be high, while the potential for encountering domestic trash is considered to be low. The fill materials should be observed for the presence of trash and debris during site grading and construction.

Portions of the existing fill can be reused as engineered fill below foundations, slabs-on-grade, and pavements, provided the material meets the requirements of imported soils in the **Material Types** subsection in **Earthwork** and any deleterious materials are removed. Some removal and replacement may be required if unsuitable or soft materials are exposed.

Expansive Soils and Bedrock

Based on the results of the laboratory testing and our experience in the area, the existing sand fill materials have nil to low expansive potential while the clay layers within the existing fill materials have high expansive potential and the native sand and native clay soils are considered to have nil to low expansive potential. The claystone bedrock has moderate to very high expansive potential.

Expansive clay lenses within the existing fill materials are not anticipated to significantly influence the proposed construction, however, the shallow bedrock in the northeast of the project site poses a substantial risk of movement to elements constructed on these materials. Therefore, if the site layout in the provided *McDonald's Parker Stroh 3_Updated Concept Plan 2 BORING.pdf* (*Plans*) document changes, we must be notified to re-evaluate the recommendations presented in this report.

This report provides recommendations to help mitigate the effects of soil and bedrock shrinkage and expansion. However, even if these procedures are followed, some movement and cracking in the building, pavements, and flatwork should be anticipated. The severity of cracking and other damage such as uneven floor slabs will probably increase if any modification of the site results in excessive wetting or drying of the expansive soils and bedrock. Eliminating the risk of movement and distress is generally not feasible, but it may be possible to further reduce the risk of movement if significantly more expensive measures are used during construction. It is imperative the recommendations outlined in the **Grading and Drainage** subsection of **Earthwork** in this report be followed to reduce movement.

Difficult Excavations

It is anticipated that excavations for the proposed improvements can be accomplished with conventional earthmoving equipment; however, heavy-duty equipment may be required for claystone bedrock excavation. Consideration should be given to obtaining a unit price for difficult excavation in the contract documents for the project.

Previous Structures

Multiple buildings and associated utilities once occupied the subject site. The foundation systems of the previous buildings are currently unknown, and we do not know if the structures had below-grade areas. We do not know if the previous foundations were completely removed or the utilities properly abandoned during demolition operations of the structures.

If old foundation systems are encountered during construction, they should be completely removed. If remnants of drilled pier foundations are encountered, the existing piers should be truncated a minimum depth of 3 feet below areas of planned new construction. If piers are encountered, the contractor should consider surveying existing pier locations so new construction does not encounter abandoned pier locations.

In addition, if abandoned utilities associated with previous structures are encountered, they should be completely removed or fully grouted in-place.

EARTHWORK

The following presents recommendations for site preparation, excavation, subgrade preparation, and placement of engineered fills on the project. All earthwork on the project should be observed and evaluated by Terracon.

Site Preparation

Strip and remove existing vegetation, organics, and other deleterious materials from proposed building and pavement areas. All exposed surfaces should be free of mounds and depressions that could prevent uniform compaction.

Stripped materials consisting of vegetation, unsuitable fills, and organic materials should be wasted from the site or used to revegetate landscaped areas or exposed slopes after completion of grading operations.

Where possible, the site should be initially graded to create a relatively level surface to receive fill and to provide for a relatively uniform thickness of fill beneath the proposed building and improvement areas. All exposed areas that will receive fill, once properly cleared, should be scarified to a minimum depth of 12 inches, conditioned to near optimum moisture content, and compacted. It is imperative the moisture content of prepared materials be protected from moisture loss.

Although evidence of underground facilities such as septic tanks and basements were not observed during our exploration, such features could be encountered during construction. If unexpected fills or underground facilities are encountered, such features should be removed and the excavation thoroughly cleaned prior to backfill placement and/or construction.

It is anticipated that excavations for the proposed construction can be accomplished with conventional earthmoving equipment. However, heavy-duty construction equipment may be necessary when excavating into claystone bedrock. Consideration should be given to obtaining a unit price for a difficult excavation in the contract documents for the project.

Depending upon seasonal conditions, surface water may infiltrate into the excavations on the site. Water seeping into excavations at this site could most likely be controlled by shallow trenches leading to a sump pit where the water could be removed by pumping.

The stability of subgrade soils may be affected by precipitation, repetitive construction traffic, or other factors. If unstable conditions are encountered or develop during construction, workability may be improved by overexcavation of wet zones and mixing these soils with crushed gravel. Use of geotextiles could also be considered as a stabilization technique. Lightweight excavation equipment may be required to reduce subgrade pumping.

Material Types

Fill for this project should consist of engineered fill. Engineered fill is fill that meets the criteria presented in this report and has been properly documented.

Engineered fill should meet the following material property requirements:

Fill Type [1,2]	USCS Classification	Acceptable location for placement
On-site fine-grained soils	CL, ML	On-site fine-grained soils are not considered suitable for reuse as compacted fill below foundations, slabs, or pavement areas but can be used as general fill for this project.
On-site course grained soils	SP, SC, SM, SC-SM,	On-site sand soils are considered suitable for reuse as compacted fill below foundation, slab, and pavement areas and as general fill for this project.
Processed claystone bedrock [5]	N/A	Processed claystone bedrock is not considered suitable for reuse as compacted fill below foundation, slab, or pavement area. Processed claystone may be used as general fill for this project.
Imported soils	Varies	Imported soils meeting the gradation outlined herein can be considered acceptable for use as engineered fill beneath foundations, slabs, and pavements.

1. Controlled, compacted fill should consist of approved materials that are free of organic matter and debris. Frozen material should not be used, and fill should not be placed on a frozen subgrade. A sample of each material type should be submitted to the Geotechnical Engineer for evaluation.
2. Care should be taken during the fill placement process to avoid zones of dis-similar fill. Improvements constructed over varying fill types are at a higher risk of differential movement compared to improvements over a uniform fill zone.
3. On-site claystone bedrock materials should be staged separately from excavated soils and processed to a soil-like consistency with a maximum particle size of 3 inches.

Imported soils and on-site materials for engineered fill (if required) should meet the following material property requirements:

Gradation	Percent finer by weight (ASTM C136)
3"	100
1"	90-100
¾"	50-100
No. 4 Sieve	50-100
No. 200 Sieve	<35

- Liquid Limit ..... 30 (max)
- Plasticity Index ..... 15 (max)
- Maximum Expansive Potential (%) 0.5*

*Measured on a sample compacted to approximately 95 percent of the ASTM D698 maximum dry density at optimum water content. The sample is confined under a 200-psf surcharge and submerged.

Compaction Requirements

Engineered fill should be placed and compacted in horizontal lifts, using equipment and

procedures that will produce recommended moisture contents and densities throughout the lift.

Item	Description
Fill lift thickness	8-inches or less in loose thickness when heavy, self-propelled compaction equipment is used 4 to 6-inches in loose thickness when hand-guided equipment (i.e. jumping jack, plate compactor) is used
Compaction requirements [1,2]	Minimum of 95% of the material's standard Proctor maximum dry density (ASTM D698) for clay soils and a minimum of 98% of the material's standard Proctor maximum dry density for sand soils.
Moisture content cohesive soils (clay soils and processed claystone) [3]	+1 to +4% of the optimum moisture content
Moisture content cohesionless soils (sand soils)	-2 to +2% of the optimum moisture content

1. We recommend that engineered fill be tested for water content and compaction during placement. Should the results of the in-place density tests indicate the specified water or compaction limits have not been met, the area represented by the test should be reworked and retested as required until the specified water and compaction requirements are achieved.
2. Water levels should be maintained low enough to allow for satisfactory compaction to be achieved without the compacted fill material pumping when proofrolled.
3. Moisture conditioned clay soils and claystone bedrock should not be allowed to dry out. A loss of moisture within these materials could result in an increase in the materials expansive potential. Subsequent wetting of these materials could result in undesirable movement.

Excavation

Excavations into the subsurface soils and bedrock will encounter a variety of conditions. The individual contractor(s) is responsible for designing and constructing stable, temporary excavations as required to maintain stability of both the excavation sides and bottom. All excavations should be sloped or shored in the interest of safety following local and federal regulations, including current Occupational Safety and Health Administration (OSHA) excavation and trench safety standards.

Soils and bedrock penetrated by the proposed excavations may vary significantly across the site. The soil and bedrock classifications are based solely on the materials encountered in the exploratory borings. The contractor should verify that similar conditions exist throughout the proposed area of excavation. If different subsurface conditions are encountered at the time of construction, the actual conditions should be evaluated to determine any excavation modifications necessary to maintain safe conditions.

Construction site safety is the sole responsibility of the contractor who controls the means, methods, and sequencing of construction operations. Under no circumstances shall the information provided herein be interpreted to mean Terracon is assuming responsibility for

construction site safety or the contractor's activities; such responsibility shall neither be implied nor inferred.

Grading and Drainage

All grades must be adjusted to provide positive drainage away from the building during construction and maintained throughout the life of the proposed project. Infiltration of water into utility or foundation excavations must be prevented during construction. Landscaped irrigation adjacent to the foundation systems should be minimized or eliminated. Water permitted to pond near or adjacent to the perimeter of the structure (either during or post-construction) can result in significantly higher soil movements than those discussed in this report. As a result, any estimations of potential movement described in this report cannot be relied upon if positive drainage is not obtained and maintained, and water is allowed to infiltrate the fill and/or subgrade.

Permanent grades should be sloped at a minimum of 10 percent grade for at least 10 feet beyond the perimeter of the building. Asphalt pavement or concrete flatwork should be sloped at a minimum of 2 percent beyond the building perimeters for the life of the building. Where Americans with Disabilities Act (ADA) or other requirements or existing site features limit the gradient, slopes on the order of ½ to 1 percent minimum may be necessary to comply with the ADA, but do increase the risk of unanticipated movement. Backfill against footings, exterior walls, and in utility and sprinkler line trenches should be compacted in accordance with recommendations in this report and free of all construction debris to reduce the possibility of water infiltration. After building construction and prior to project completion, we recommend that verification of final grading be performed to document that positive drainage, as described above, has been achieved.

Where paving or flatwork abuts the structures, care should be taken that joints are properly sealed and maintained to prevent the infiltration of surface water.

Landscape or xeriscape areas within 10 feet of the foundation systems shall not be hindered by landscape edging, grade variations, or vegetation. In addition, consideration should be given to snow removal practices that will minimize the stockpiling of snow in planter and landscaped areas adjacent to structural improvements.

Planters located adjacent to the structures should be watertight. Sprinkler mains and spray heads should be located a minimum of 10 feet away from the building lines. Where drip line irrigation is located near the building, we recommend that drip line irrigation systems be located at least 5 feet from the outside edge of the foundations. Roof drains should discharge on pavements or be extended away from the structures a minimum of 10 feet through the use of splash blocks or downspout extensions.

Earthwork Construction Considerations

Upon completion of grading operations, care should be taken to maintain the moisture content of the subgrade prior to construction of slabs-on-grade, pavements, etc. Construction traffic over

prepared subgrade should be minimized and avoided to the extent practical. Construction traffic over processed clay subgrade will eventually reduce the moisture content and increase the density of the subgrade. Subsequent wetting of these materials will result in undesirable movement.

The site should also be graded to prevent ponding of surface water on prepared subgrade or in excavations. In areas where water is allowed to pond over a period of time, the affected area should be removed and allowed to dry out; however, allowing the clay soils to dry out below the optimum moisture content is not recommended. If constraints do not allow for moisture conditioning of affected clays as recommended in this report, the affected area should be overexcavated and replaced with engineered fill. As an alternative, geotextiles could also be considered as a stabilization technique.

The Geotechnical Engineer should be retained during the construction phase of the project to observe earthwork and to perform necessary tests and observations during overexcavation operations, excavations, subgrade preparation; proof-rolling; placement and compaction of controlled compacted fills; backfilling of excavations into the completed subgrade, and just prior to construction of building floor slabs.

FOUNDATION RECOMMENDATIONS

Based upon the results of the field exploration and laboratory testing program for this exploration, it is our opinion the proposed building could be constructed on shallow spread footings on native soils or new engineered fill, provided the proposed building location shown in the *Plans* does not change and provided the owner is willing to accept the associated risk of movement. If the building location changes from the *Plans*, we should be contacted to re-evaluate our foundation recommendations.

If the owner cannot accept the associated risk of movement with shallow spread footings, the proposed restaurant building should be constructed on a drilled pier foundation system over new engineered fill.

Spread Footing Foundation Recommendations

Design recommendations for spread footing foundation systems are presented in the following table and paragraphs.

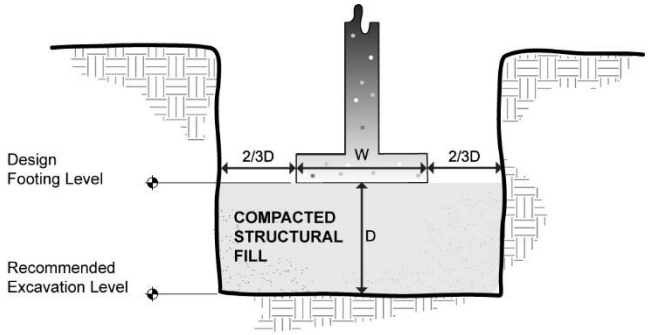
Description	Value
Thickness of Zone of New Engineered Fill	All existing fill materials must be removed to native soil and modified or replaced with new engineered fill, if necessary to achieve foundation subgrade elevation. The native soils should be scarified to a

Description	Value
	minimum depth of 8-inches,moisture conditioned, and compacted prior to foundation construction or the placement of new engineered fill.
Supporting Stratum	New engineered fill
Maximum Allowable Bearing Pressure [1,2]	2,500 psf
Coefficient of Friction (Sliding)	0.4
Minimum Footing Dimensions [4]	Isolated footings: 24 inches Continuous footings: 18 inches
Minimum Embedment Below Finished Grade for Frost Protection [5]	3 feet
Approximate Total Movement [6]	About 1 inch
Estimated Differential Movement [6,7]	About ¼ to ¾ inch

1. The recommended maximum allowable bearing pressure assumes that any existing fill or lower strength soils, if encountered, will be excavated and replaced with engineered fill.
2. The maximum allowable soil bearing pressure can be increased by 1/3 for transient loading conditions.
3. A minimum dead load pressure is not applicable for mat foundations.
4. Not applicable for mat foundations or stiffened structural slab-on-grade.
5. For perimeter footings, footings beneath unheated areas, and footings that will be exposed to freezing conditions during construction. Interior footings may bottom at a minimum depth of 12 inches below finished grade in heated areas.
6. Foundation movement will depend upon the variations within the subsurface soil profile, the structural loading conditions, the embedment depth of the footings, the thickness of engineered fill, and the quality of the earthwork operations and footing construction.
7. Footings should be proportioned on the basis of equal total dead load pressure to reduce differential movement between adjacent footings.

Additional foundation movements could occur if water from any source infiltrates the foundation soils; therefore, proper drainage should be provided in the final design and during construction and throughout the life of the structure. Failure to maintain the proper drainage as recommended in the **Grading and Drainage** section of **Earthwork** will nullify the movement estimates provided above.

Overexcavation of existing fill below footings should extend laterally beyond all edges of the footings at least 8 inches per foot of overexcavation depth below footing base elevation. The overexcavation should then be backfilled up to the footing base elevation with approved fill placed in lifts of 9 inches or less in loose thickness (6 inches or less if using hand-guided compaction equipment) and compacted to at least 98 percent of the material's standard effort maximum dry density (ASTM D698). The overexcavation and backfill procedure is described in the following figure.



Overexcavation / Backfill

The base of all foundation excavations should be free of water and loose soil prior to concrete placement. Concrete should be placed soon after excavating to reduce bearing soil disturbance. Should the soils at bearing level become excessively dry, disturbed or saturated, or frozen, the affected soil should be removed prior to placing concrete.

Footings, foundations, and masonry walls should be detailed and reinforced as necessary to reduce the potential for distress caused by differential foundation movement. The use of joints at openings or other discontinuities in masonry walls is recommended.

SEISMIC CONSIDERATIONS

The following table presents the seismic site classification based on the 2021 International Building Code (IBC) and the subsurface conditions encountered within the borings:

Code Used	Site Classification
2021 International Building Code (IBC) [1,2]	D

1. In general accordance with the 2021 International Building Code, Section 1613.2.2.
2. The 2021 International Building Code (IBC) requires a site subsurface profile determination extending a depth of 100 feet for seismic site classification. The current scope requested does not include the required 100-foot subsurface profile determination. The deepest borings of this exploration extended to a maximum depth of about 30 feet and this seismic site class definition considers that similar subsurface conditions exist below the maximum depth of the subsurface exploration.

INTERIOR FLOOR SYSTEM

Interior Floors

Slab-on-grade floors may be utilized for the interior floor systems, provided all existing fill is removed, slabs-on-grade are constructed on native soils or new engineered fill, and provided

some slab movement can be tolerated. If very little movement can be tolerated, structural floors, supported independent of the subgrade materials, are recommended.

For structural design of concrete slabs-on-grade, a modulus of subgrade reaction of 120 pounds per cubic inch (pci) may be used for point or limited area loads for floors supported on an engineered fill.

Additional floor slab design and construction recommendations are as follows:

- Positive separations and/or isolation joints should be provided between slabs and all foundations, columns, or utility lines to allow independent movement.
- Control joints should be provided in slabs to control the location and extent of cracking.
- Interior trench backfill placed beneath slabs should be compacted in accordance with recommended specifications described previously.
- The use of a vapor retarder should be considered beneath concrete slabs on grade that will be covered with wood, tile, carpet, or other moisture sensitive or impervious coverings, or when the slab will support equipment sensitive to moisture. When conditions warrant the use of a vapor retarder, the slab designer and slab contractor should refer to ACI 302 for procedures and cautions regarding the use and placement of a vapor retarder.
- Floor slabs should not be constructed on frozen subgrade.
- Other design and construction considerations, as outlined in Section 302.1R of the ACI Design Manual, are recommended.

Movements of slab-on-grades using the above outlined technique will likely be reduced and tend to be more uniform. The estimates outlined previously assume that the other recommendations in this report are followed. Additional movement could occur should the subsurface soils become wetted to significant depths, which could result in potential excessive movement causing uneven floor slabs and severe cracking. This could be due to over watering of landscaping, poor drainage, improperly functioning drain systems, and/or broken utility lines. Therefore, it is imperative that the recommendations outlined in this section and in the **Grading and Drainage** subsection of **Earthwork** be followed.

EXTERIOR FLATWORK

Exterior slabs-on-grade and flatwork constructed on the existing fill materials will have a low to moderate risk of movement. The risk of movement can be slightly reduced if the exterior slabs-on-grade are overexcavated to a depth of at least 2 feet, moisture conditioned, and recompacted to grade. Where slabs-on-grade and flatwork are constructed on the expansive bedrock, the risk of movement is high. To improve performance, the bedrock below slabs-on-grade should be overexcavated to a depth of at least 3 feet, moisture conditioned, and recompacted to grade. New fill materials beneath slabs-on-grade should be placed and compacted as outlined in the **Earthwork** section of this report.

For structural design of exterior concrete slabs-on-grade, a modulus of subgrade reaction of 100 pci may be used for point or limited area loads for exterior slabs-on-grade at this site.

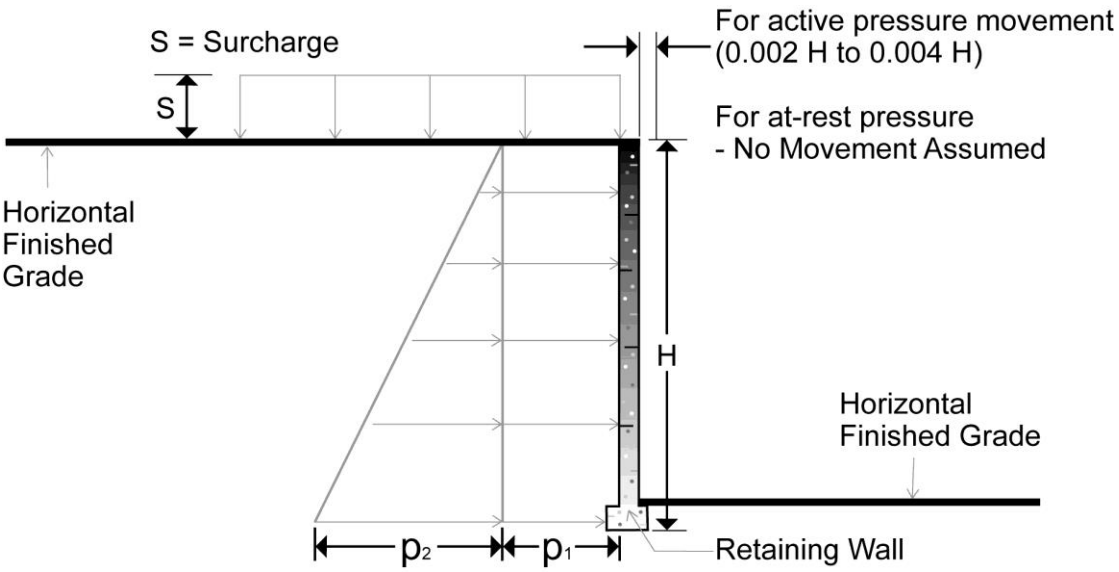
Additional slab design and construction recommendations are as follows:

- Minimizing moisture increases in the backfill.
- Controlling moisture-density during placement of backfill.
- Positive separations and/or isolation joints should be provided between exterior slabs and the building to allow independent movement.
- Control joints should be provided in slabs to control the location and extent of cracking.
- Exterior slabs should not be constructed on frozen subgrade
- Other design and construction considerations, as outlined in Section 302.1R of the ACI Design Manual, are recommended.

Movements of exterior slabs-on-grade using the above technique will likely be reduced and tend to be more uniform. Additional movement could occur should the subsurface soils and bedrock become wetted to significant depths, which could result in potential excessive movement causing uneven exterior slabs and severe cracking. This could be due to over watering of landscaping, poor drainage, and/or broken utility lines. Therefore, it is imperative that the recommendations outlined in the **Grading and Drainage** subsection of **Earthwork** be followed.

LATERAL EARTH PRESSURES

Below-grade walls or free-standing retaining walls are not anticipated for this project; however, we have included lateral earth pressures recommendations in case plans should change. Reinforced concrete walls with unbalanced backfill levels on opposite sides should be designed for earth pressures at least equal to those indicated in the following table. Earth pressures will be influenced by structural design of the walls, conditions of wall restraint, methods of construction and/or compaction and the strength of the materials being restrained. Two wall restraint conditions are shown. Active earth pressure is commonly used for design of free-standing cantilever retaining walls and assumes wall movement. The "at-rest" condition assumes no wall movement. The recommended design lateral earth pressures do not include a factor of safety and do not provide for possible hydrostatic pressure on the walls.



Earth Pressure Conditions	Lateral Earth Pressure Coefficient	Equivalent Fluid Density (pcf)	Surcharge Pressure, p_1 (psf)	Earth Pressure, p_2 (psf)
Active (Ka)	Claystone – 0.47 Native Soils – 0.35	60 42	(0.47)S (0.35)S	(60)H (42)H
At-Rest (Ko)	Claystone – 0.64 Native Soils – 0.52	80 62	(0.642)S (0.52)S	(80)H (60)H
Passive (Kp)	Claystone – 2.1 Native Soils – 2.88	250 346	---	---

Applicable conditions to the above include:

- For active earth pressure, wall must rotate about base, with top lateral movements of about 0.002 H to 0.004 H, where H is wall height
- For passive earth pressure to develop, wall must move horizontally to mobilize resistance.
- Uniform surcharge, where S is surcharge pressure
- In-situ soil backfill weight a maximum of 120 pcf
- Horizontal backfill, compacted to at least 95 percent of standard Proctor maximum dry density
- Loading from heavy compaction equipment not included
- No hydrostatic pressures acting on wall
- No dynamic loading
- No safety factor included in soil parameters

The preceding data are applicable only to cast-in-place concrete or modular block walls up to 7 feet in height. **If taller single walls, tiered walls, or Mechanically Stabilized Earth (MSE)**

walls will be included in the proposed development, additional site-specific studies and laboratory testing will be required. In addition, the wall designer should perform standard wall design practices including analysis for overturning, sliding, bearing capacity, and global stability, and results of these analyses should be provided for our review. Additional sampling, laboratory testing and document review associated with retaining walls is beyond the original scope of work but can be performed as a separate scope, for a separate fee.

PAVEMENTS

Design of privately maintained pavements for the project has been based on the procedures outlined by the Asphalt Institute (AI) and the American Concrete Institute (ACI).

Design Traffic

We assumed the following design parameters for Asphalt Institute flexible pavement thickness design:

- Automobile Parking Areas
  - Parking stalls and parking lots for cars and pick-up trucks, up to 50 stalls
- Main Traffic Corridors
  - Parking lots with a maximum of 5 trucks per day
- Subgrade Soil Characteristics
  - USCS Classification – CL-ML, SC-SM, and SM to SP (poor to medium subgrade)

We assumed the following design parameters for ACI rigid pavement thickness design based upon the average daily truck traffic (ADTT):

- Automobile Parking Areas
  - ACI Category A-1: Automobile parking with an ADTT of 1 over 20 years
- Main Traffic Corridors
  - ACI Category B: Commercial entrance and service lanes with an ADTT of 25 over 20 years
- Subgrade Soil Characteristics
  - USCS Classification – CL-ML, SC-SM, and SM to SP (low to medium support)
- Concrete modulus of rupture value of 500 psi

We should be contacted to confirm and/or modify the recommendations contained herein if actual traffic volumes differ from the assumed values shown above.

Subgrade Soils

Pavements and flatwork constructed on the existing fill materials will have a low to moderate risk of movement. The risk of movement can be slightly reduced if the exterior slabs-on-grade are

overexcavated to a depth of at least 2 feet, moisture conditioned, and recompacted to grade. Where slabs-on-grade and flatwork are constructed on the expansive bedrock, the risk of movement is high. To improve performance, the bedrock below pavements should be overexcavated to a depth of at least 3 feet, moisture conditioned, and recompacted to grade. New fill materials beneath slabs-on-grade should be placed and compacted as outlined in the **Earthwork** section of this report.

Based on subgrade soil Unified Soil Classifications of CL-ML, SC-SM, and SM to SP , AI classifies the subgrade soil as poor to medium, while ACI classifies the subgrade soil as low to medium support. Existing expansive native sand and clay soils, and claystone will be encountered below the proposed pavement areas. We recommend overexcavating to a depth of at least 2 feet, moisture conditioning, and recompacting the material to grade to improve performance. Where claystone is encountered below pavement areas, we recommend overexcavating to a depth of at least 3 feet and backfilling with new engineered fill to grade.

Recommended Minimum Pavement Sections and Materials

Recommended alternatives for flexible and rigid pavements are summarized for each traffic area as follows:

Traffic Area	Alternative	Preliminary Pavement Thickness (Inches)			
		Asphalt Concrete Surface	Aggregate Base Course	Portland Cement Concrete	Total
Automobile Parking (AI Class I and ACI Category A)	A	5½	--	--	5½
	B	4	6	--	10
	C [1]	--	--	5	5
Main Traffic Corridors (AI Class III and ACI Category B)	A	6½	--	--	6½
	B	5	6	--	11
	C	--	--	6	6

1. The minimum pavement section thickness per ACI

Each alternative should be investigated with respect to current material availability and economic conditions. A minimum 7-inch thickness of rigid reinforced concrete pavement is recommended at the location of dumpsters where trash trucks park and load, and in areas of tight turning radius.

Concrete pavement joint spacing and reinforcement should be in accordance with specifications in ACI 330R-08.

For analysis of pavement costs, the following specifications should be considered for each pavement component:

Pavement Component	Colorado Department of Transportation Criteria
Asphalt Concrete Surface	Grading S or SX
Aggregate Base Course	Class 5 or 6
Portland Cement Concrete	Class P

Pavement Maintenance

Future performance of pavements constructed at this site will be dependent upon several factors, including:

- Maintaining stable moisture content of the subgrade soils both before and after pavement construction.
- Providing for a planned program of preventative maintenance.

The performance of all pavements can be enhanced by minimizing excess moisture, which can reach the subgrade soils. The following recommendations should be implemented:

- Site grading at a minimum 2 percent grade onto or away from the pavements.
- Water should not be allowed to pond behind curbs.
- Compaction of any utility trenches for landscaped areas to the same criteria as the pavement subgrade.
- Sealing all landscaped areas in or adjacent to pavements, or providing drains to reduce the risk of moisture migration to subgrade soils.
- Placing compacted backfill against the exterior side of curb and gutter.
- Placing curb, gutter, and/or sidewalk directly on subgrade soils without the use of base course materials.

Preventative maintenance should be planned and provided for an ongoing pavement management program in order to enhance future pavement performance. Preventative maintenance activities are intended to slow the rate of pavement deterioration.

Preventative maintenance consists of both localized maintenance (e.g. crack sealing and patching) and global maintenance (e.g. surface sealing). Preventative maintenance is usually the first priority when implementing a planned pavement maintenance program.

Pavement Construction Considerations

Site grading is generally accomplished early in the construction phase. However, as construction proceeds, the subgrade may be disturbed due to utility excavations, construction traffic,

desiccation, or rainfall. As a result, the pavement subgrade may not be suitable for pavement construction and corrective action will be required. The subgrade should be carefully evaluated at the time of pavement construction for signs of disturbance or excessive rutting. If disturbance has occurred, pavement subgrade areas should be reworked, moisture conditioned, and properly compacted to the recommendations in this report immediately prior to paving.

We recommend the pavement areas be rough graded and then thoroughly proofrolled with a loaded tandem axle dump truck prior to final grading and paving. Particular attention should be paid to high traffic areas that were rutted and disturbed earlier and to areas where backfilled trenches are located. Areas where unsuitable conditions are located should be repaired by removing and replacing the materials with properly compacted fills. All pavement areas should be moisture conditioned and properly compacted to the recommendations in this report immediately prior to paving.

The placement of a partial pavement thickness for use during construction is not recommended without a detailed pavement analysis incorporating construction traffic. In addition, if the actual traffic varies from the assumptions outlined above, we should be contacted to confirm and/or modify the pavement thickness recommendations outlined above.

CORROSIVITY

The following table lists the results of laboratory water-soluble sulfate, water-soluble sulfides, water-soluble chlorides, pH, red-ox, and electrical resistivity testing performed on samples obtained during our field exploration. These values may be used to estimate potential corrosive characteristics of the on-site soils with respect to contact with the various underground materials which will be used for project construction.

Boring No.	Sample Depth (feet)	Water-Soluble Sulfates [1] (ppm)	Water-Soluble Sulfides (mg/kg)	Water-Soluble Chlorides (ppm)	pH	Red-Ox (mV)	Electrical Resistivity (ohm-cm)
3	0 – 5	6	Nil	35	7.37	+441	31000

1. Results of water-soluble sulfate testing indicate that sample of the on-site soils has an exposure class of S0 when classified in accordance with Table 19.3.1.1 of the American Concrete Institute (ACI) Design Manual. The results of the testing indicate ASTM Type I Portland Cement is suitable for project concrete in contact with on-site soils. However, if there is no (or minimal) cost differential, use of ASTM Type II Portland Cement is recommended for additional sulfate resistance of construction concrete. Concrete should be designed in accordance with the provisions of the ACI Design Manual, Section 318, Chapter 19.

GENERAL COMMENTS

Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Natural variations will occur between exploration point locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Terracon should be retained as the Geotechnical Engineer, where noted in this report, to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Our Scope of Services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials, or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence or collaboration through this system are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third-party beneficiaries intended. Any third-party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client, and is not intended for third parties. Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly impact excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety, and cost estimating including, excavation support, and dewatering requirements/design are the responsibility of others. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

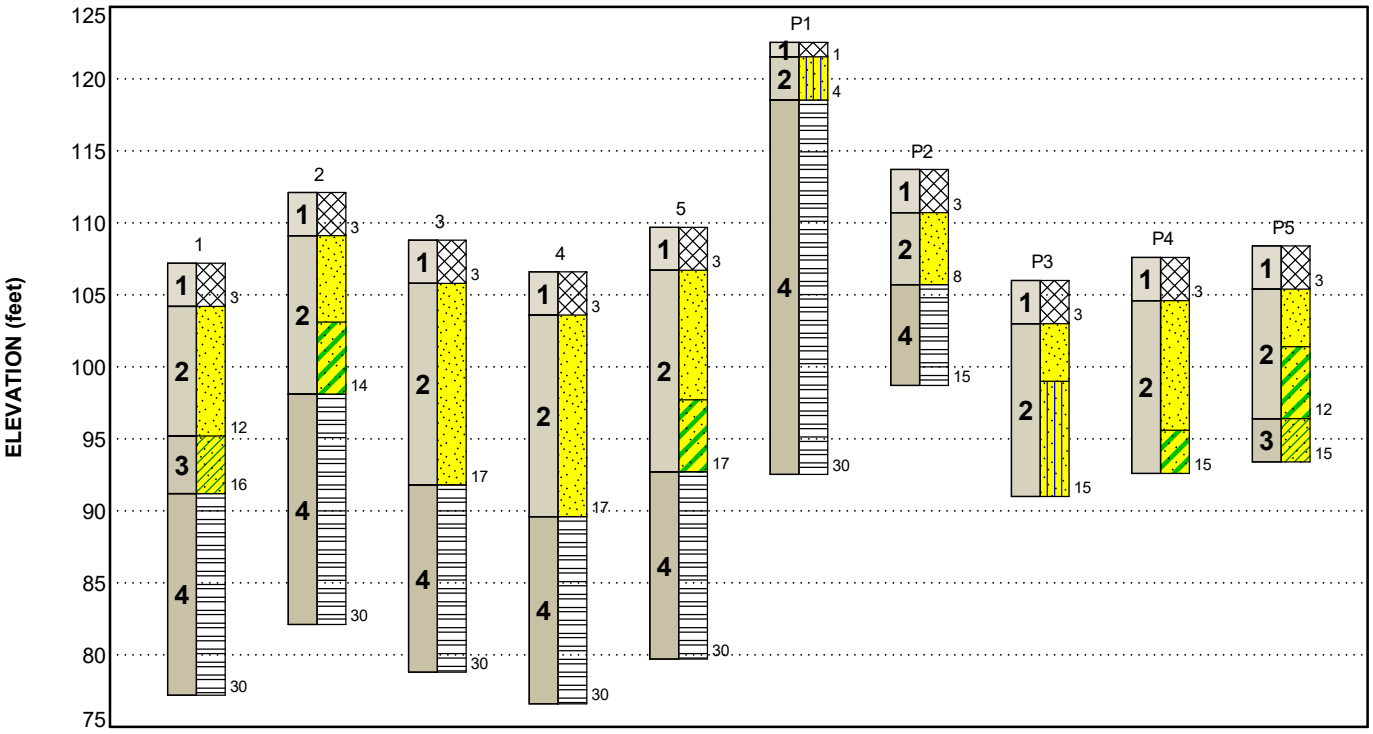
FIGURES

Contents:

GEOMODEL

Proposed McDonald's Restaurant #5-1004 ■ Parker, Colorado
March 24, 2022 ■ Terracon Project No. 25225006

Terracon GeoReport



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

Model Layer	Layer Name	General Description
1	Fill	Existing fill materials consisting of sand with varying amounts of clay, silt, gravel and brick fragments; various densities
2	Native Sand	Native sand with varying amouts of clay, silt and gravel; loose to medium dense
3	Native Clay	Native clay with varying amounts of sand; very stiff
4	Bedrock	Bedrock consisting of claystone with varying amounts of silt and sand; soft to hard

LEGEND

- Fill
- Poorly-graded Sand
- Sandy Lean Clay
- Claystone
- Clayey Sand
- Silty Sand

NOTES:
Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project. Numbers adjacent to soil column indicate depth below ground surface.

ATTACHMENTS

EXPLORATION AND TESTING PROCEDURES

Field Exploration

Boring Layout and Elevations: The locations of the borings are presented in the **Site Location and Exploration Plans**. The borings were located in the field by overlaying the site plan on Google Earth, recording the latitude and longitude coordinates, and staking the borings using a handheld, recreational-grade GPS unit. The accuracy of the latitude and longitude values is typically about +/- 25 feet when obtaining the values using this method. Elevations at the borings were obtained using a level and using the rim of the manhole cover located on the southwest corner of the site (approximately 39.4769° N, 104.7578° W) as a temporary benchmark with an assigned elevation of 100.0 feet. The accuracy of the boring locations and elevations should only be assumed to the level implied by the methods used.

Subsurface Exploration Procedures: The borings were drilled with CME-55 truck-mounted drill rig with solid-stem augers. During the drilling operations, lithologic logs of the borings were recorded by the field engineer. Relatively undisturbed samples were obtained at selected intervals utilizing a 2½-inch outside diameter modified California barrel sampler. Bulk samples were obtained from auger cuttings. Penetration resistance values were recorded in a manner similar to the standard penetration test (SPT). This test consists of driving the sampler into the ground with a 140-pound hammer free falling through a distance of 30 inches. The number of blows required to advance the barrel sampler 12 inches (18 inches for standard split-spoon samplers, final 12 inches are recorded) or the interval indicated is recorded and can be correlated to the standard penetration resistance value (N-value). The blow count values are indicated on the boring logs at the respective sample depths, barrel sampler blow counts are not considered N-values.

An automatic hammer was used to advance the samplers in the borings performed on this site. A greater efficiency is typically achieved with the automatic hammer compared to the conventional safety hammer operated with a cathead and rope. Published correlations between the SPT values and soil properties are based on the lower efficiency cathead and rope method. This higher efficiency affects the standard penetration resistance blow count value by increasing the penetration per hammer blow over what would be obtained using the cathead and rope method. The effect of the automatic hammer's efficiency has been considered in the interpretation and analysis of the subsurface information for this report.

The standard penetration test provides a reasonable indication of the in-place density of sandy type materials, but only provides an indication of the relative stiffness of cohesive materials since the blow count in these soils may be affected by the soil's moisture content. In addition, considerable care should be exercised in interpreting the N-values in gravelly soils, particularly where the size of the gravel particle exceeds the inside diameter of the sampler.

Groundwater measurements were obtained in the borings at the time of drilling. Due to safety concerns, the borings were backfilled with auger cuttings after drilling. Some settlement of the backfill may occur and should be repaired as soon as possible.

Laboratory Testing

Samples retrieved during the field exploration were returned to the laboratory for observation by the Geotechnical Engineer, and were classified in general accordance with the Unified Soil Classification System presented in the **Supporting Information**.

At this time, an applicable laboratory-testing program was formulated to determine engineering properties of the subsurface materials. Following the completion of the laboratory testing, the field descriptions were confirmed or modified as necessary, and the boring logs were prepared. The boring logs are included in the **Exploration Results**.

Laboratory test results are included in the **Exploration Results**. These results were used for the geotechnical engineering analyses and the development of foundation, earthwork, and pavement recommendations. All laboratory tests were performed in general accordance with the applicable local or other accepted standards.

Selected soil and bedrock samples were tested for the following engineering properties:

- Water content
- Dry density
- Grain size distribution
- Atterberg limits
- Swell/consolidation
- Water-soluble sulfate content
- Water-soluble sulfides
- Water-soluble chlorides
- pH
- Red-ox
- Electrical resistivity

SITE LOCATION AND EXPLORATION PLANS

Contents:

Note: All attachments are one page unless noted above.

SITE LOCATION

Proposed McDonald's Restaurant #5-1004 ■ Parker, Colorado
March 24, 2022 ■ Terracon Project No. 25225006

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

AERIAL PHOTOGRAPHY PROVIDED BY MICROSOFT BING MAPS

EXPLORATION PLAN WITH AERIAL IMAGE

Proposed McDonald's Restaurant #5-1004 ■ Parker, Colorado
March 24, 2022 ■ Terracon Project No. 25225006

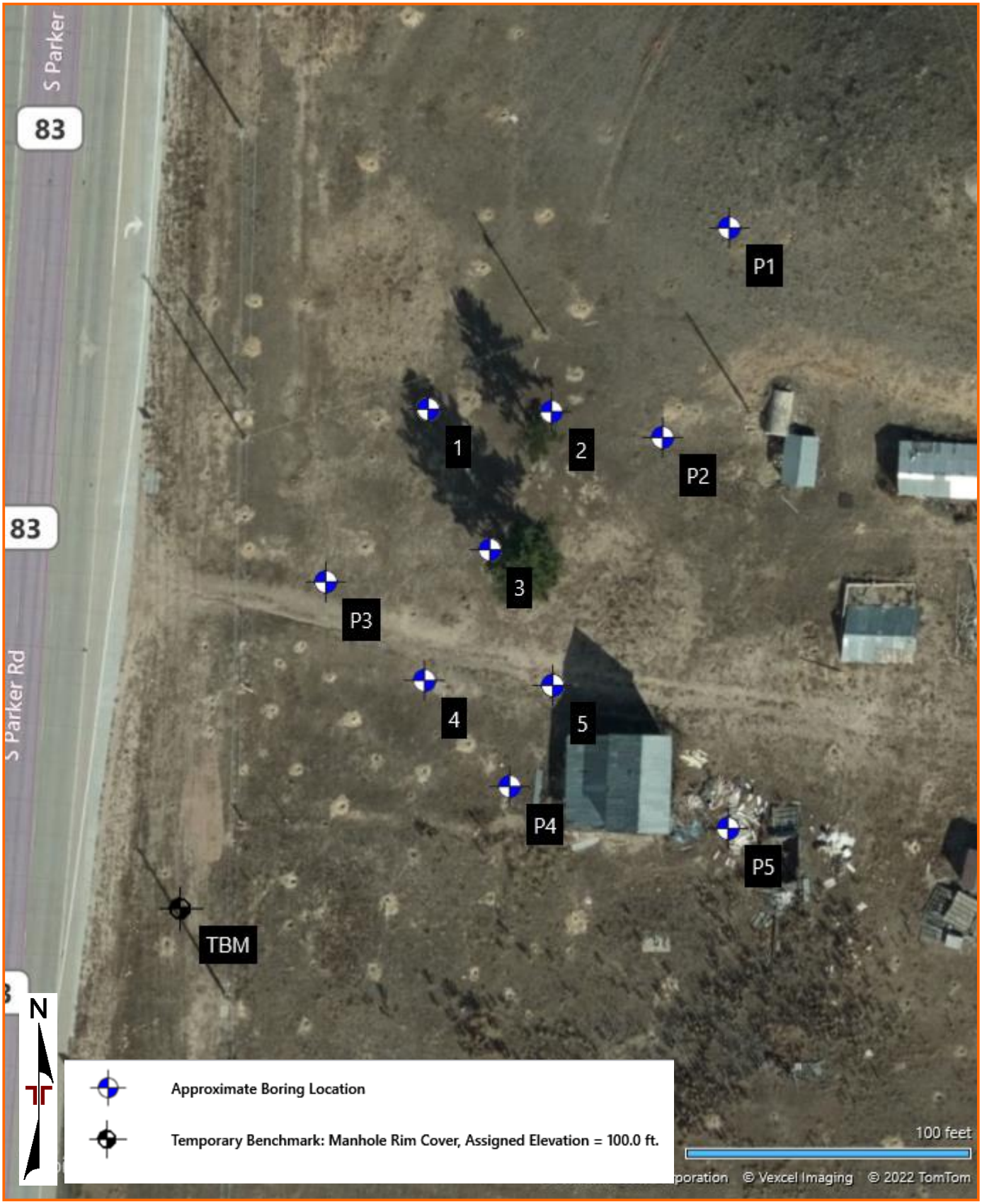


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

AERIAL PHOTOGRAPHY PROVIDED BY MICROSOFT BING MAPS

EXPLORATION PLAN WITH PROJECT OVERLAY

Proposed McDonald's Restaurant #5-1004 ■ Parker, Colorado
March 24, 2022 ■ Terracon Project No. 25225006

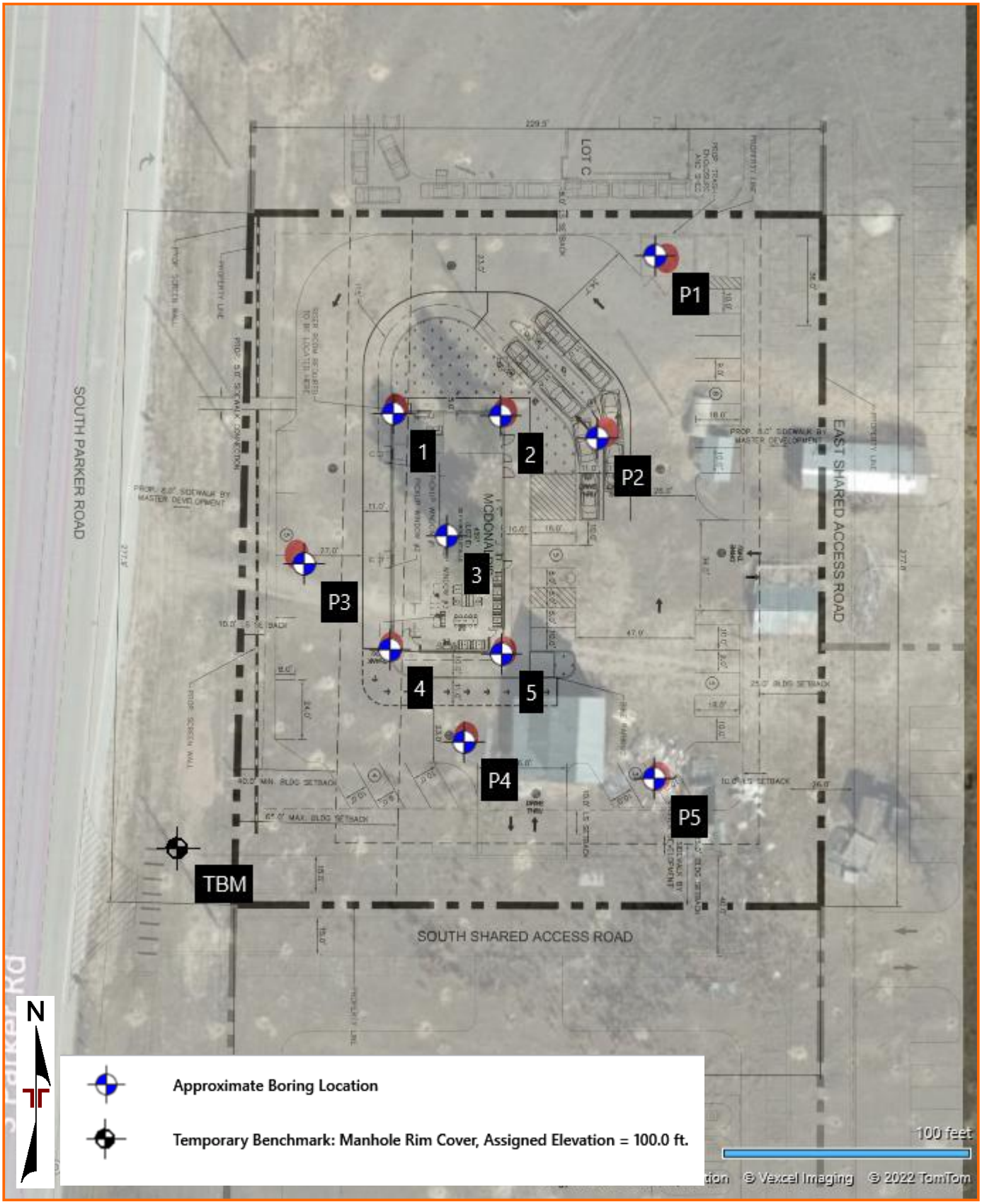


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

AERIAL PHOTOGRAPHY PROVIDED BY MICROSOFT BING MAPS

EXPLORATION RESULTS

Contents:

Note: All attachments are one page unless noted above.

BORING LOG NO. 1

PROJECT: Proposed McDonald's Restaurant #5-1004

CLIENT: McDonald's USA, LLC

SITE: Southeast of East Stroh Road and South Parker Road Parker, Colorado

LOCATION See Exploration Plan

Latitude: 39.4774° Longitude: -104.7575°

Approximate Surface Elev.: 107.2 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	SWELL (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1			**FILL - SILTY SAND (SM)**, trace gravel, interbedded with lean clay layers, fine to coarse grained, brown, medium dense				11-15	+6.2 @ 500 psf	7.9	115	22-19-3	30
		3.0	104+/-									
2			**POORLY GRADED SAND (SP)**, fine to coarse grained, light brown, medium dense				9-12		4.9	110		
				5								
							14-16		4.5	109		
		12.0	95+/-	10								
3			**SANDY LEAN CLAY (CL)**, brown, very stiff				10-11		18.3	105		
		16.0	91+/-	15								
4			**SANDY CLAYSTONE**, brown, firm to medium hard				12-22		34.7	85		
				20								
							16-21					
				25								
		30.0	77+/-				13-36					
			Boring Terminated at 30 Feet	30								

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

Hammer Type: Automatic

Advancement Method:
4-inch diameter solid stem continuous flight power auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

Elevation obtained using a level and assigning the rim of a manhole cover located on the southwest corner of the site (approximately 39.4769° N, 104.7578° W) an elevation of 100.0 feet.

WATER LEVEL OBSERVATIONS

None encountered while drilling

Terracon
10625 W I70 Frontage Rd N Ste 3
Wheat Ridge, CO

Boring Started: 02-09-2022 | Boring Completed: 02-09-2022

Drill Rig: CME-55 | Driller: Terracon

Project No.: 25225006

BORING LOG NO. 2

PROJECT: Proposed McDonald's Restaurant #5-1004

CLIENT: McDonald's USA, LLC

SITE: Southeast of East Stroh Road and South Parker Road Parker, Colorado

LOCATION See Exploration Plan

Latitude: 39.4774° Longitude: -104.7573°

Approximate Surface Elev.: 112.1 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	SWELL (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1			**FILL - SILTY CLAYEY SAND (SC-SM)**, trace gravel, fine to coarse grained, dark brown, medium dense				10-10		4.4	106	24-19-5	30
		3.0	109+/-									
2			**POORLY GRADED SAND (SP)**, fine to coarse grained, tan, medium dense				7-8		2.1			
		9.0	103+/-	5								
			CLAYEY SAND (SC), trace gravel, fine to coarse grained, light brown, medium dense				11-16		12.0	120		
		14.0	98+/-	10								
4			**CLAYSTONE**, light brown to bluish gray, firm to hard				9-19	+7.8 @ 500 psf	25.7	98		
				15								
							14-35					
				20								
							50/9"					
				25								
		30.0	with silt at 29 feet 82+/-				50/8"					
			Boring Terminated at 30 Feet	30								

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

Hammer Type: Automatic

Advancement Method:
4-inch diameter solid stem continuous flight power auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

Elevation obtained using a level and assigning the rim of a manhole cover located on the southwest corner of the site (approximately 39.4769° N, 104.7578° W) an elevation of 100.0 feet.

WATER LEVEL OBSERVATIONS

None encountered while drilling

Terracon
10625 W I70 Frontage Rd N Ste 3
Wheat Ridge, CO

Boring Started: 02-10-2022 | Boring Completed: 02-10-2022

Drill Rig: CME-55 | Driller: Terracon

Project No.: 25225006

BORING LOG NO. 3

PROJECT: Proposed McDonald's Restaurant #5-1004

CLIENT: McDonald's USA, LLC

SITE: Southeast of East Stroh Road and South Parker Road Parker, Colorado

LOCATION See Exploration Plan

Latitude: 39.4773° Longitude: -104.7574°

Approximate Surface Elev.: 108.8 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	SWELL (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1			**FILL - SILTY CLAYEY SAND (SC-SM)**, trace gravel, fine to coarse grained, brown, medium dense				14-16	-4.1 @ 500 psf	5.5	95	26-20-6	32
		3.0										
2			**POORLY GRADED SAND (SP)**, fine to coarse grained, light brown, medium dense				7-8		2.7			
				5								
							14-15		1.8			
				10								
							15-16		5.9	113		
				15								
							12-20		35.4	86		
4			**SANDY CLAYSTONE**, brown, firm to hard	20								
							11-25					
				25								
		30.0					50/8"					
			Boring Terminated at 30 Feet	30								
		17.0	92+/-									
			106+/-									
			79+/-									

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

Hammer Type: Automatic

Advancement Method:
4-inch diameter solid stem continuous flight power auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

Elevation obtained using a level and assigning the rim of a manhole cover located on the southwest corner of the site (approximately 39.4769° N, 104.7578° W) an elevation of 100.0 feet.

WATER LEVEL OBSERVATIONS

None encountered while drilling

Terracon
10625 W I70 Frontage Rd N Ste 3
Wheat Ridge, CO

Boring Started: 02-09-2022 | Boring Completed: 02-09-2022

Drill Rig: CME-55 | Driller: Terracon

Project No.: 25225006

BORING LOG NO. 4

PROJECT: Proposed McDonald's Restaurant #5-1004

CLIENT: McDonald's USA, LLC

SITE: Southeast of East Stroh Road and South Parker Road Parker, Colorado

LOCATION See Exploration Plan

Latitude: 39.4771° Longitude: -104.7575°

Approximate Surface Elev.: 106.6 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	SWELL (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1			**FILL - SILTY SAND (SM)**, trace gravel, interbedded with sandy lean clay layers, fine to coarse grained, brown, medium dense				13-15	+1.0 @ 500 psf	7.8	99	NP	30
		3.0	103.5+/-									
2			**POORLY GRADED SAND (SP)**, fine to coarse grained, light brown, loose to medium dense	5			5-4		2.3			
				10			11-14		1.7			
				15			10-11		5.4			
				20			8-16		29.5	87		
4			**CLAYSTONE**, trace sand, gray to grayish brown, firm to medium hard	25			50/11"					
		17.0	89.5+/-									
		30.0	76.5+/-	30			50/11"					
			Boring Terminated at 30 Feet									

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

Hammer Type: Automatic

Advancement Method:
4-inch diameter solid stem continuous flight power auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

Elevation obtained using a level and assigning the rim of a manhole cover located on the southwest corner of the site (approximately 39.4769° N, 104.7578° W) an elevation of 100.0 feet.

WATER LEVEL OBSERVATIONS

None encountered while drilling

Terracon
10625 W I70 Frontage Rd N Ste 3
Wheat Ridge, CO

Boring Started: 02-09-2022 | Boring Completed: 02-09-2022

Drill Rig: CME-55 | Driller: Terracon

Project No.: 25225006

BORING LOG NO. 5

PROJECT: Proposed McDonald's Restaurant #5-1004

CLIENT: McDonald's USA, LLC

SITE: Southeast of East Stroh Road and South Parker Road Parker, Colorado

LOCATION See Exploration Plan

Latitude: 39.4771° Longitude: -104.7573°

Approximate Surface Elev.: 109.7 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	SWELL (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1			**FILL - SILTY SAND (SM)**, fine to coarse grained, dark brown, medium dense				15-20		3.6		20-18-2	28
		3.0	106.5+/-									
2			**POORLY GRADED SAND (SP)**, trace clay, fine to coarse grained, tan, loose to medium dense				6-9		2.8			
				5								
							6-8		4.7			
				10								
		12.0	97.5+/-									
			CLAYEY SAND (SC), fine to coarse grained, light brown, medium dense				10-12		14.6			
				15								
		17.0	92.5+/-									
4			**CLAYSTONE**, pale brown, medium hard to hard				15-31		28.3	92		
				20								
							50/12"					
				25								
		30.0	79.5+/-				50/7"					
			Boring Terminated at 30 Feet	30								

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

Hammer Type: Automatic

Advancement Method:
4-inch diameter solid stem continuous flight power auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

Elevation obtained using a level and assigning the rim of a manhole cover located on the southwest corner of the site (approximately 39.4769° N, 104.7578° W) an elevation of 100.0 feet.

WATER LEVEL OBSERVATIONS

None encountered while drilling

Terracon
10625 W I70 Frontage Rd N Ste 3
Wheat Ridge, CO

Boring Started: 02-10-2022 | Boring Completed: 02-10-2022

Drill Rig: CME-55 | Driller: Terracon

Project No.: 25225006

BORING LOG NO. P1

PROJECT: Proposed McDonald's Restaurant #5-1004

CLIENT: McDonald's USA, LLC

SITE: Southeast of East Stroh Road and South Parker Road Parker, Colorado

LOCATION See Exploration Plan

Latitude: 39.4776° Longitude: -104.7571°

Approximate Surface Elev.: 122.53 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	SWELL (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		1.0	121.5+/-	**FILL - SILTY CLAY (CL-ML)**, trace sand, brown									
2		4.0	118.5+/-	**SILTY SAND (SM)**, trace gravel, fine to medium grained, light brown, medium dense				10-14					
4		30.0	92.5+/-	**SANDY CLAYSTONE**, gray to grayish brown, soft to hard	5			10-12	+5.4 @ 200 psf	24.4	99		
					10			11-22					
					15			50/11"		31.7	87	71-40-31	63
					20			16-22		33.0	86		
					25			12-16					
					30			50/9"					
				Boring Terminated at 30 Feet									

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

Hammer Type: Automatic

Advancement Method:
4-inch diameter solid stem continuous flight power auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

Elevation obtained using a level and assigning the rim of a manhole cover located on the southwest corner of the site (approximately 39.4769° N, 104.7578° W) an elevation of 100.0 feet.

WATER LEVEL OBSERVATIONS

None encountered while drilling

Terracon
10625 W I70 Frontage Rd N Ste 3
Wheat Ridge, CO

Boring Started: 02-09-2022 | Boring Completed: 02-09-2022

Drill Rig: CME-55 | Driller: Terracon

Project No.: 25225006

BORING LOG NO. P2

PROJECT: Proposed McDonald's Restaurant #5-1004

CLIENT: McDonald's USA, LLC

SITE: Southeast of East Stroh Road and South Parker Road Parker, Colorado

LOCATION See Exploration Plan

Latitude: 39.4774° Longitude: -104.7572°

Approximate Surface Elev.: 113.7 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	SWELL (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1			**FILL - POORLY GRADED SAND (SP)**, trace clay, silt and brick fragments, fine to coarse grained, light brown, medium dense				10-7					
		3.0	110.5+/-									
2			**POORLY GRADED SAND (SP)**, varies to silt with sand, fine to coarse grained, light brown, medium dense	5			13-16		3.5		NP	74
		8.0	105.5+/-									
4			**SANDY CLAYSTONE**, grayish brown, firm	10			15-14					
		15.0	98.5+/-	15			10-17		33.0	87		
			Boring Terminated at 15 Feet									

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

Hammer Type: Automatic

Advancement Method:
4-inch diameter solid stem continuous flight power auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

Elevation obtained using a level and assigning the rim of a manhole cover located on the southwest corner of the site (approximately 39.4769° N, 104.7578° W) an elevation of 100.0 feet.

WATER LEVEL OBSERVATIONS

None encountered while drilling

Terracon
10625 W I70 Frontage Rd N Ste 3
Wheat Ridge, CO

Boring Started: 02-09-2022 | Boring Completed: 02-09-2022

Drill Rig: CME-55 | Driller: Terracon

Project No.: 25225006

BORING LOG NO. P3

PROJECT: Proposed McDonald's Restaurant #5-1004

CLIENT: McDonald's USA, LLC

SITE: Southeast of East Stroh Road and South Parker Road Parker, Colorado

LOCATION See Exploration Plan

Latitude: 39.4772° Longitude: -104.7576°

Approximate Surface Elev.: 106.0 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	SWELL (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1			**FILL - SILTY SAND (SM)**, fine to coarse grained, tan to light brown, medium dense				8-12		8.3		21-19-2	28
		3.0	103+/-									
			POORLY GRADED SAND (SP), fine to coarse grained, tan, medium dense				7-10		3.2			
		7.0	99+/-	5								
2			**SILTY SAND (SM)**, fine to coarse grained, brown to light brown, medium dense				10-9		3.9			
		15.0	91+/-	10								
			Boring Terminated at 15 Feet	15			11-12					

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

Hammer Type: Automatic

Advancement Method:
4-inch diameter solid stem continuous flight power auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

Elevation obtained using a level and assigning the rim of a manhole cover located on the southwest corner of the site (approximately 39.4769° N, 104.7578° W) an elevation of 100.0 feet.

WATER LEVEL OBSERVATIONS

None encountered while drilling

Terracon
10625 W I70 Frontage Rd N Ste 3
Wheat Ridge, CO

Boring Started: 02-10-2022 | Boring Completed: 02-10-2022

Drill Rig: CME-55 | Driller: Terracon

Project No.: 25225006

BORING LOG NO. P4

PROJECT: Proposed McDonald's Restaurant #5-1004

CLIENT: McDonald's USA, LLC

SITE: Southeast of East Stroh Road and South Parker Road Parker, Colorado

LOCATION See Exploration Plan

Latitude: 39.4770° Longitude: -104.7574°

Approximate Surface Elev.: 107.6 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	SWELL (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1			**FILL - SILTY SAND (SM)**, trace gravel, fine to coarse grained, brown, medium dense				13-15				22-20-2	23
		3.0	104.5+/-									
2			**POORLY GRADED SAND (SP)**, fine to coarse grained, light brown, loose to medium dense	5			8-10					
				10			3-6					
		12.0	95.5+/-									
			CLAYEY SAND (SC), trace gravel, fine to coarse grained, light brown to brown, medium dense									
		15.0	92.5+/-	15			7-8					
			Boring Terminated at 15 Feet									

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

Hammer Type: Automatic

Advancement Method:
4-inch diameter solid stem continuous flight power auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

Elevation obtained using a level and assigning the rim of a manhole cover located on the southwest corner of the site (approximately 39.4769° N, 104.7578° W) an elevation of 100.0 feet.

WATER LEVEL OBSERVATIONS

None encountered while drilling

Terracon
10625 W I70 Frontage Rd N Ste 3
Wheat Ridge, CO

Boring Started: 02-10-2022 | Boring Completed: 02-10-2022

Drill Rig: CME-55 | Driller: Terracon

Project No.: 25225006

BORING LOG NO. P5

PROJECT: Proposed McDonald's Restaurant #5-1004

CLIENT: McDonald's USA, LLC

SITE: Southeast of East Stroh Road and South Parker Road Parker, Colorado

LOCATION See Exploration Plan

Latitude: 39.4770° Longitude: -104.7571°

Approximate Surface Elev.: 108.4 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	SWELL (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1			**FILL - SILTY SAND (SM)**, trace gravel, fine to coarse grained, light brown to brown, medium dense				11-17		3.3			
		3.0	105.5+/-									
			POORLY GRADED SAND (SP), fine to coarse grained, tan, loose				7-7		4.1			
		7.0	101.5+/-	5								
2			**CLAYEY SAND (SC)**, trace gravel, fine to coarse grained, brown, medium dense				7-12		16.2	112		
		12.0	96.5+/-	10								
3			**SANDY LEAN CLAY (CL)**, brown, very stiff				7-14		25.3	97		
		15.0	93.5+/-	15								
			Boring Terminated at 15 Feet									

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

Hammer Type: Automatic

Advancement Method:
4-inch diameter solid stem continuous flight power auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

Elevation obtained using a level and assigning the rim of a manhole cover located on the southwest corner of the site (approximately 39.4769° N, 104.7578° W) an elevation of 100.0 feet.

WATER LEVEL OBSERVATIONS

None encountered while drilling

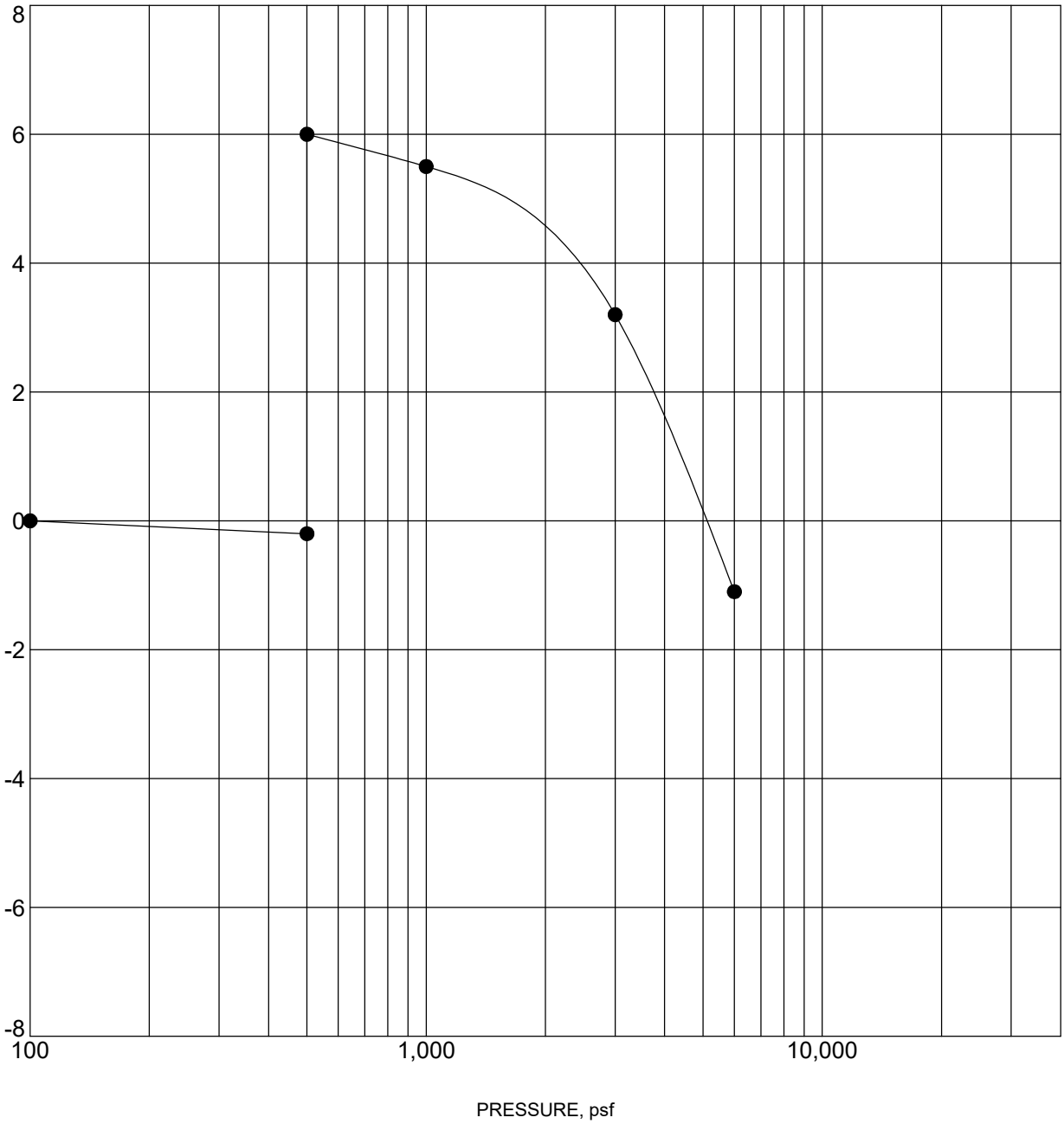
Terracon
10625 W I70 Frontage Rd N Ste 3
Wheat Ridge, CO

Boring Started: 02-10-2022 | Boring Completed: 02-10-2022

Drill Rig: CME-55 | Driller: Terracon

Project No.: 25225006

SWELL CONSOLIDATION TEST



Specimen Identification			Classification	γ_d, pcf	WC, %
●	1	2 - 3 ft	FILL - SANDY LEAN CLAY (CL)	115	7.9

NOTES: Water was added at 500 psf.

PROJECT: Proposed McDonald's Restaurant #5-1004

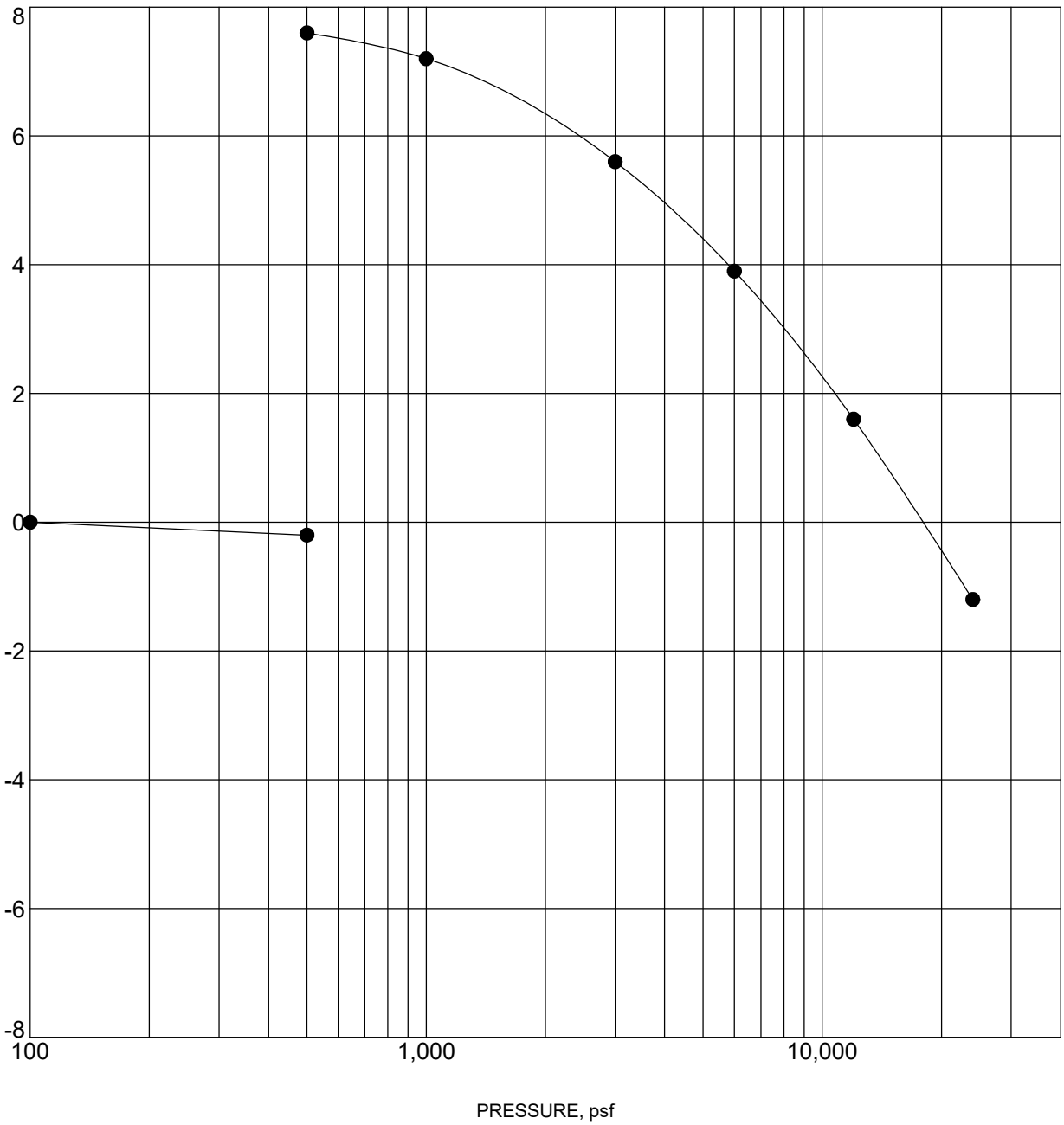
SITE: Southeast of East Stroh Road and South Parker Road Parker, Colorado

Terracon
10625 W I70 Frontage Rd N Ste 3
Wheat Ridge, CO

PROJECT NUMBER: 25225006

CLIENT: McDonald's USA, LLC

SWELL CONSOLIDATION TEST



Specimen Identification			Classification	γ_d, pcf	WC, %
●	2	14 - 15 ft	CLAYSTONE	98	25.7

NOTES: Water was added at 500 psf.

PROJECT: Proposed McDonald's Restaurant #5-1004

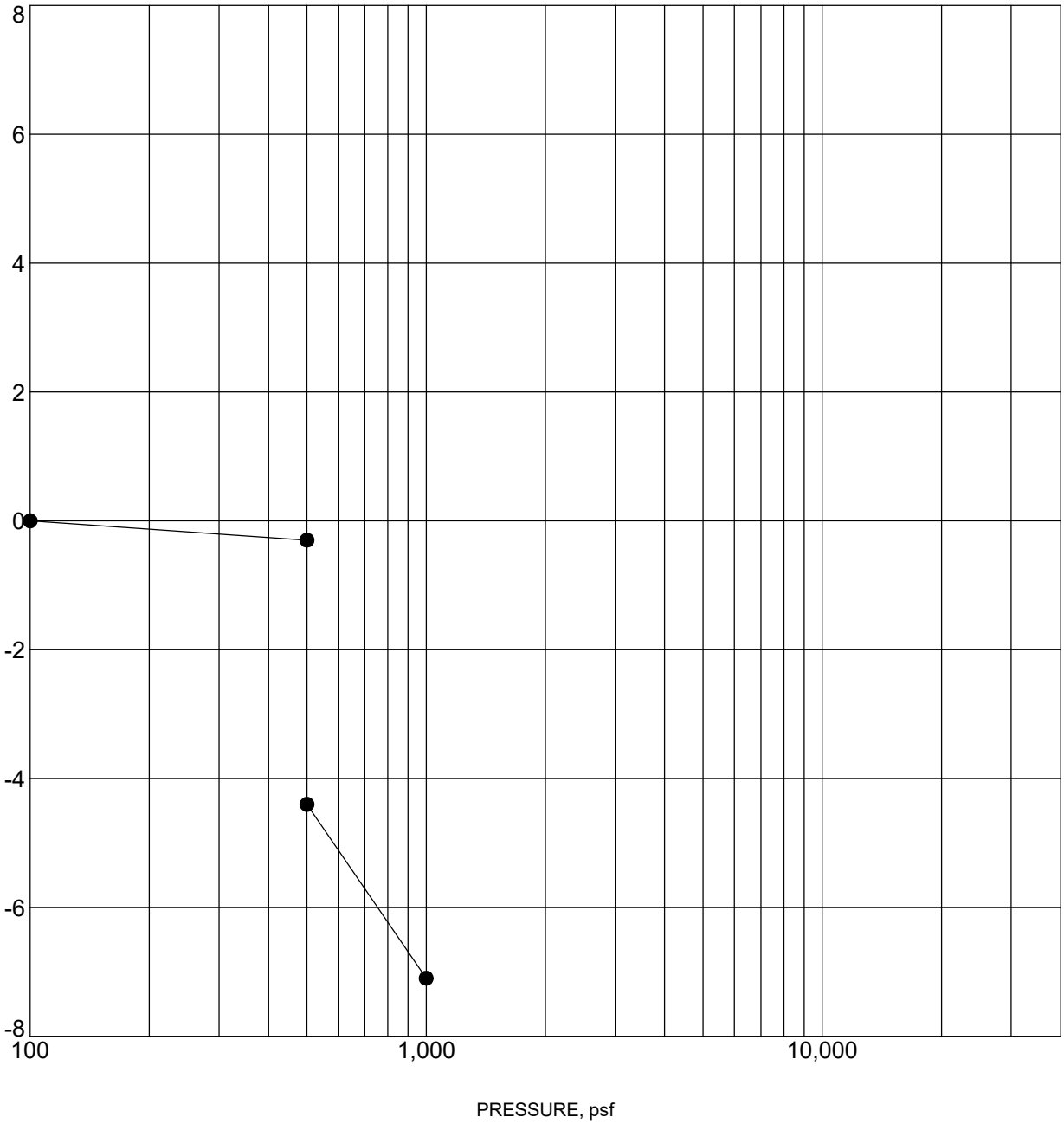
SITE: Southeast of East Stroh Road and South Parker Road Parker, Colorado

Terracon
10625 W I70 Frontage Rd N Ste 3
Wheat Ridge, CO

PROJECT NUMBER: 25225006

CLIENT: McDonald's USA, LLC

SWELL CONSOLIDATION TEST



Specimen Identification			Classification	γ_d, pcf	WC, %
●	3	2 - 3 ft	FILL - SILTY CLAYEY SAND (SC-SM)	95	5.5

NOTES: Water was added at 500 psf.

PROJECT: Proposed McDonald's Restaurant #5-1004

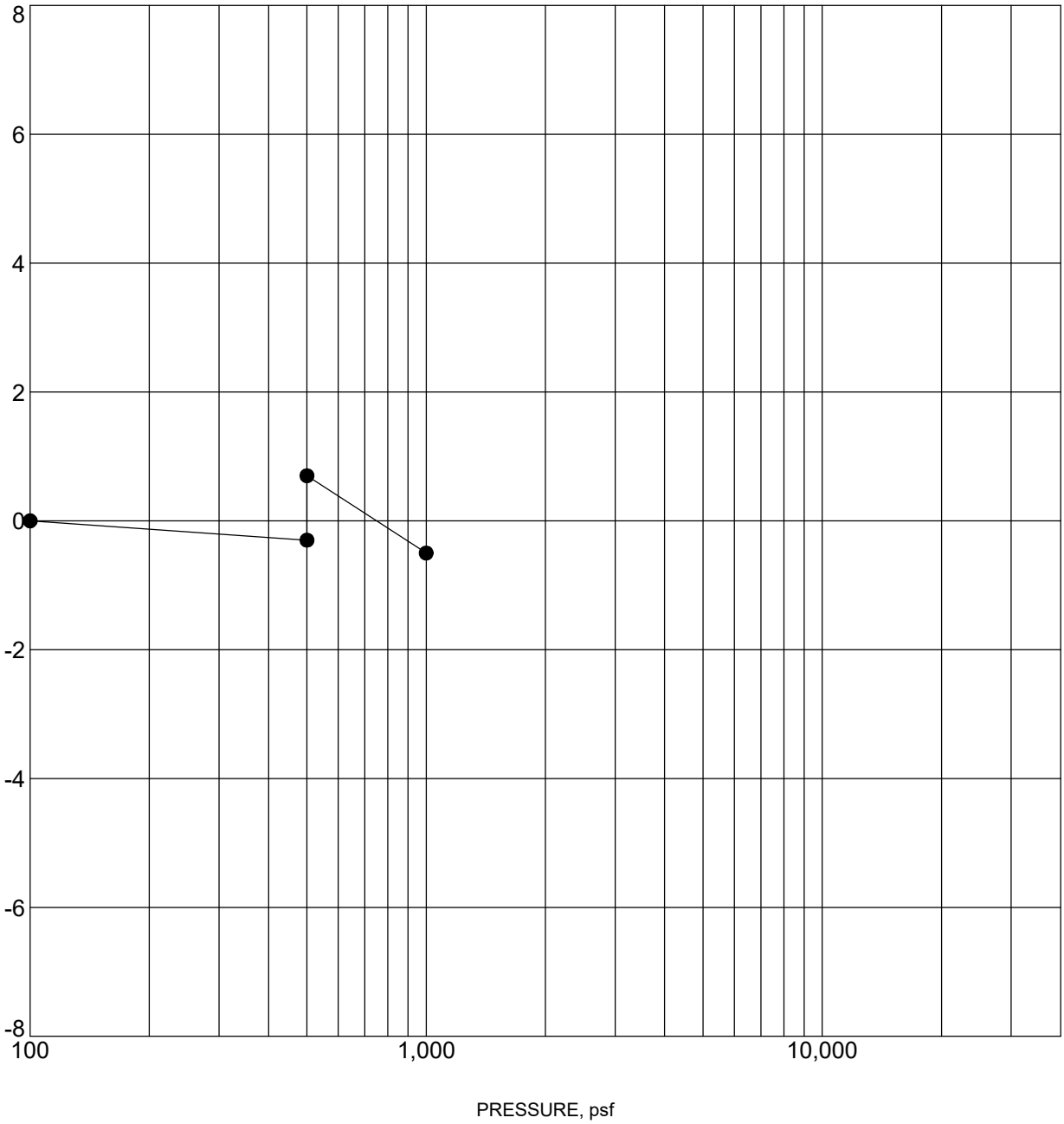
SITE: Southeast of East Stroh Road and South Parker Road Parker, Colorado

Terracon
10625 W I70 Frontage Rd N Ste 3
Wheat Ridge, CO

PROJECT NUMBER: 25225006

CLIENT: McDonald's USA, LLC

SWELL CONSOLIDATION TEST



Specimen Identification			Classification	γ_d, pcf	WC, %
●	4	2 - 3 ft	FILL - SANDY LEAN CLAY (CL)	99	7.8

NOTES: Water was added at 500 psf.

PROJECT: Proposed McDonald's Restaurant #5-1004

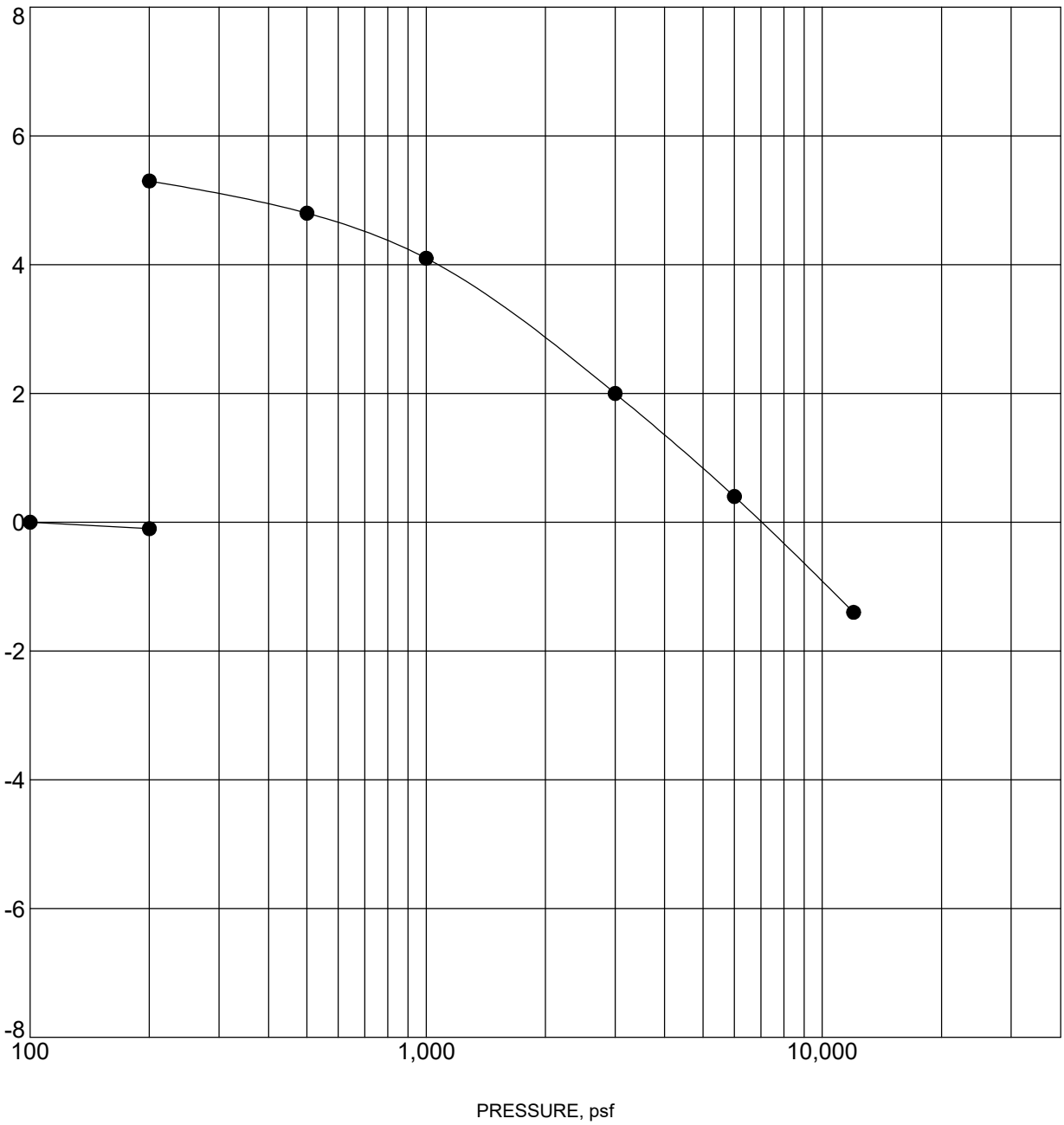
SITE: Southeast of East Stroh Road and South Parker Road Parker, Colorado

Terracon
10625 W I70 Frontage Rd N Ste 3
Wheat Ridge, CO

PROJECT NUMBER: 25225006

CLIENT: McDonald's USA, LLC

SWELL CONSOLIDATION TEST



Specimen Identification			Classification	γ_d, pcf	WC, %
●	P1	4 - 5 ft	CLAYSTONE	99	24.4

NOTES: Water was added at 200 psf.

PROJECT: Proposed McDonald's Restaurant #5-1004

SITE: Southeast of East Stroh Road and South Parker Road Parker, Colorado

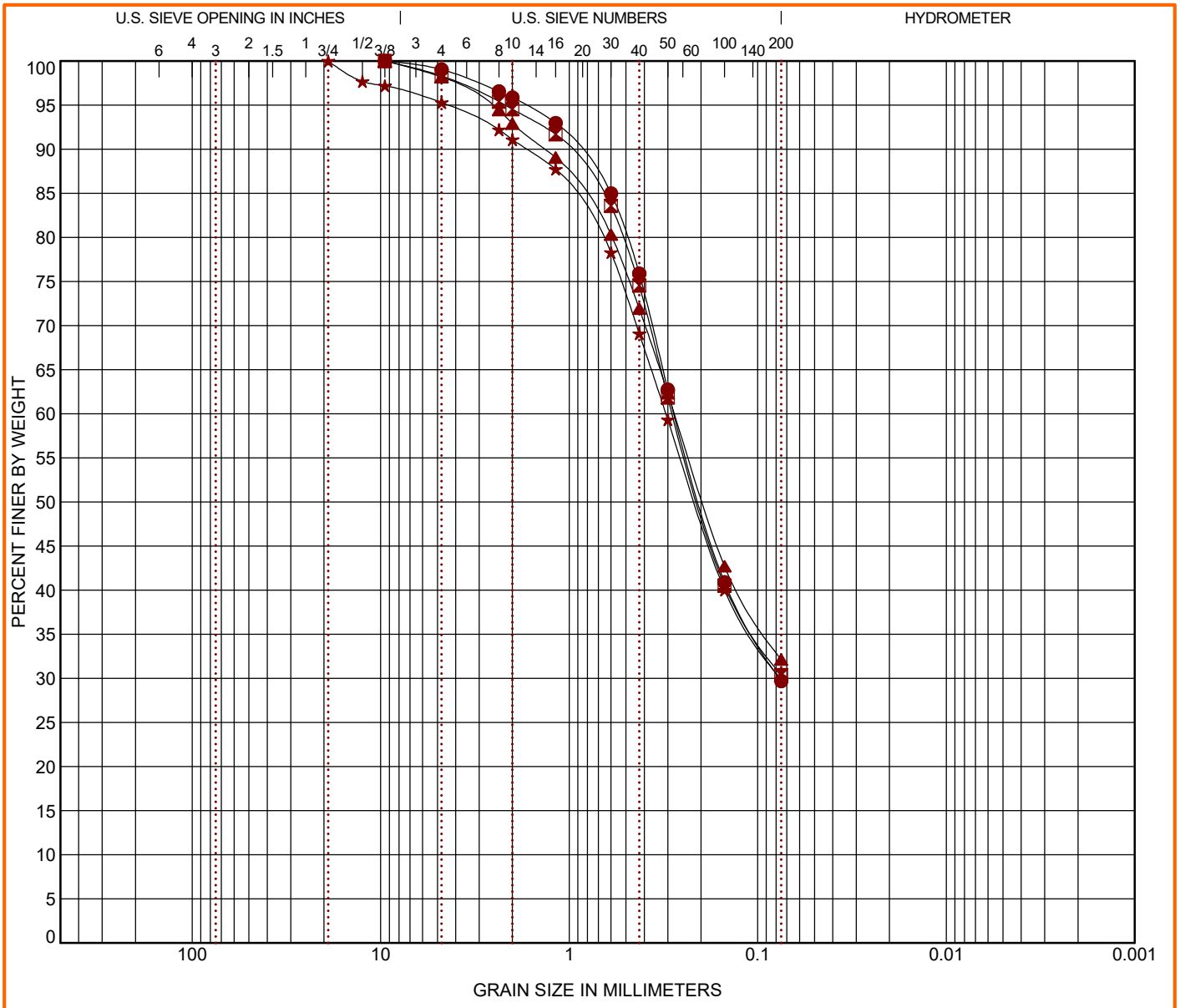
Terracon
10625 W I70 Frontage Rd N Ste 3
Wheat Ridge, CO

PROJECT NUMBER: 25225006

CLIENT: McDonald's USA, LLC

GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Boring ID	Depth	USCS Classification	AASHTO Classification	WC (%)	LL	PL	PI	Cc	Cu
●	1	0 - 5	SILTY SAND (SM)	A-2-4 (0)		22	19	3		
⊠	2	0 - 5	SILTY, CLAYEY SAND (SC-SM)	A-2-4 (0)		24	19	5		
▲	3	0 - 5	SILTY, CLAYEY SAND (SC-SM)	A-2-4 (0)		26	20	6		
★	4	0 - 5	SILTY SAND (SM)	A-2-4 (0)		NP	NP	NP		

	Boring ID	Depth	D_{100}	D_{60}	D_{30}	D_{10}	%Gravel	%Sand	%Silt	%Fines	%Clay
●	1	0 - 5	9.5	0.275	0.076		1.0	69.3		29.7	
⊠	2	0 - 5	9.5	0.283			1.7	67.9		30.4	
▲	3	0 - 5	9.5	0.276			1.8	66.1		32.1	
★	4	0 - 5	19	0.307	0.076		4.7	65.4		29.9	

PROJECT: Proposed McDonald's Restaurant #5-1004

SITE: Southeast of East Stroh Road and South Parker Road Parker, Colorado

Terracon
10625 W I70 Frontage Rd N Ste 3
Wheat Ridge, CO

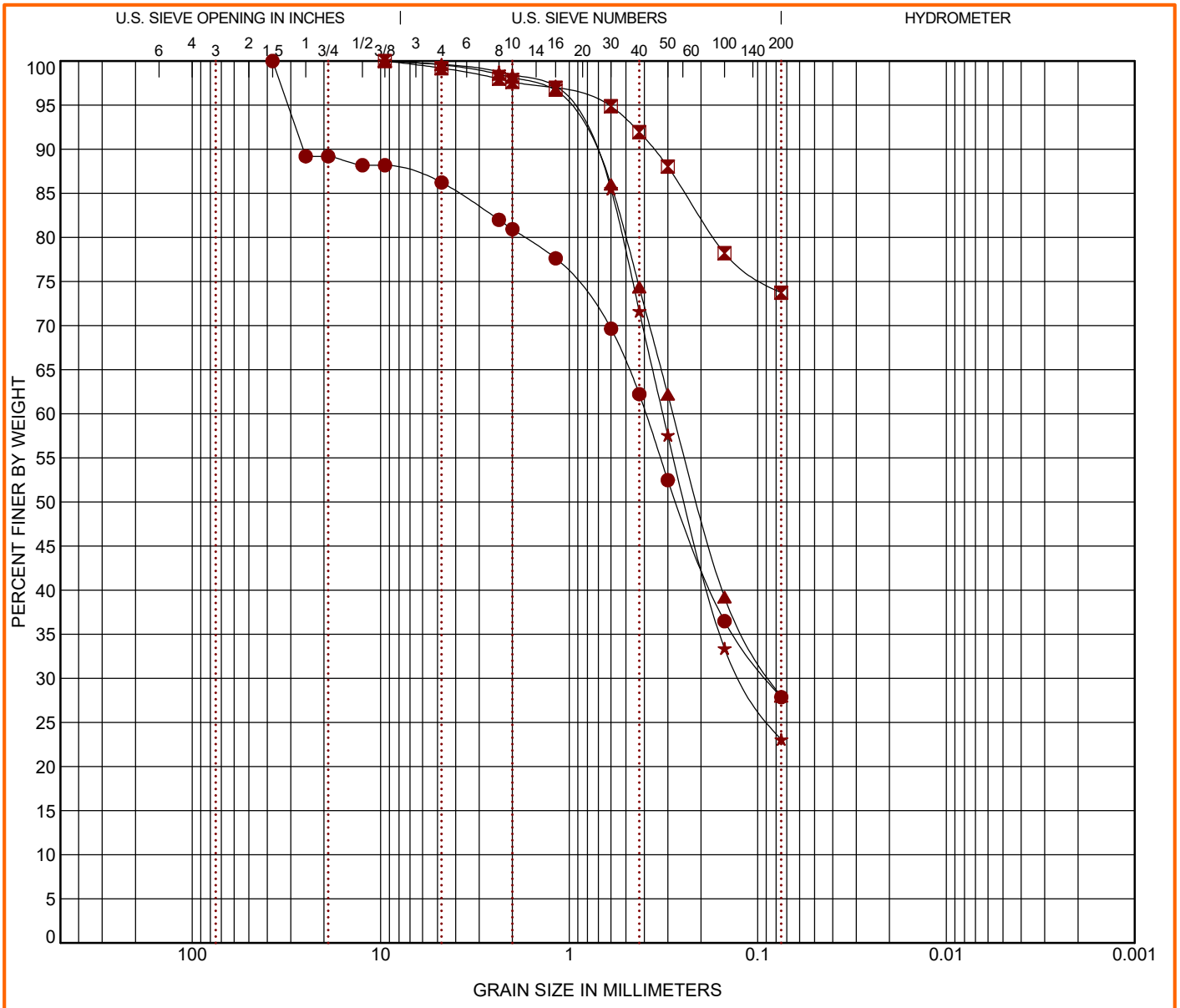
PROJECT NUMBER: 25225006

CLIENT: McDonald's USA, LLC

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS & AASHTO DESC COMBINED 25225006 PROPOSED PARKER A.GPJ TERRACON_DATATEMPLATE.GDT 3/22/22

GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Boring ID	Depth	USCS Classification	AASHTO Classification	WC (%)	LL	PL	PI	Cc	Cu
●	5	0 - 5	SILTY SAND (SM)	A-2-4 (0)		20	18	2		
⊠	P2	4 - 5	SILT with SAND (ML)	A-4 (0)	3.5	NP	NP	NP		
▲	P3	0 - 5	SILTY SAND (SM)	A-2-4 (0)		21	19	2		
★	P4	0 - 5	SILTY SAND (SM)	A-2-4 (0)		22	20	2		

	Boring ID	Depth	D_{100}	D_{60}	D_{30}	D_{10}	%Gravel	%Sand	%Silt	%Fines	%Clay
●	5	0 - 5	37.5	0.393	0.089		13.8	58.4		27.9	
⊠	P2	4 - 5	9.5				0.8	25.5		73.7	
▲	P3	0 - 5	9.5	0.281	0.085		0.4	71.6		28.0	
★	P4	0 - 5	9.5	0.319	0.119		0.4	76.6		23.1	

PROJECT: Proposed McDonald's Restaurant #5-1004

SITE: Southeast of East Stroh Road and South Parker Road Parker, Colorado

Terracon
10625 W I70 Frontage Rd N Ste 3
Wheat Ridge, CO

PROJECT NUMBER: 25225006

CLIENT: McDonald's USA, LLC

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS & AASHTO DESC COMBINED 25225006 PROPOSED PARKER A.GPJ TERRACON_DATATEMPLATE.GDT 3/22/22

15 Marway Cir Ste 2B
Rochester, NY 14624
(585) 247-3471

Client
McDonald's USA, LLC
Chicago, IL

Project
Proposed McDonald's Restaurant #5-1004
25225006

Date Received: 2/24/2022

Results from Corrosion Testing

Sample Location	Boring No. 3
Sample Depth (ft.)	0 - 5
pH Analysis, ASTM G 51	7.37
Water Soluble Sulfate (SO4), ASTM C 1580 (ppm)	6
Sulfides, AWWA 4500-S D, (mg/kg)	Nil
Chlorides, ASTM D 512, (ppm)	35
Red-Ox, ASTM G 200, (mV)	+441
Resistivity (Saturated), ASTM G 57, (ohm-cm)	31000

Analyzed By: Kyle Lemcke
Laboratory Supervisor

SUMMARY OF LABORATORY TEST RESULTS

Proposed McDonald's Restaurant #5-1004 - Parker, Colorado

Terracon Project No. 25225006

Boring No.	Depth (ft)	USCS Class.	Initial Water Content (%)	Initial Dry Density (pcf)	Swell/Consolidation		Particle Size Distribution, Percent Passing by Weight							Atterberg Limits		Water Soluble Sulfates (ppm)	Water Soluble Sulfides (mg/kg)	Water Soluble Chlorides (ppm)	Red-Ox (mV)	pH	Resistivity (ohm.cm)	Remarks
					Surcharge (ksf)	Swell (%)	1 1/2"	1"	3/4"	#4	#10	#40	#200	LL	PI							
1	0 - 5	SM					100	100	100	99	96	76	30	22	3							
1	2	CL	7.9	115	0.5	+6.2																3,4
1	4	SP	4.9	110																		4
1	9	SP	4.5	109																		4
1	14	CL	18.3	105																		4
1	19		34.7	85																		4
2	0 - 5	SC-SM					100	100	100	98	95	75	30	24	5							
2	2	SC-SM	4.4	106																		4
2	4	SP	2.1																			4
2	9	SC	12.0	120																		4
2	14		25.7	98	0.5	+7.8																3,4
3	0 - 5	SC-SM					100	100	100	98	93	72	32	26	6	6	Nil	35	+441	7.37	31000	
3	2	SC-SM	5.5	95	0.5	-4.1																3,4
3	4	SP	2.7																			4
3	9	SP	1.8																			4
3	14	SP	5.9	113																		4
3	19		35.4	86																		4
4	0 - 5	SM					100	100	100	95	91	69	30	NV	NP							
4	2	CL	7.8	99	0.5	+1.0																3,4
4	4	SP	2.3																			4
4	9	SP	1.7																			4
4	14	SP	5.4																			4
4	19		29.5	87																		4
5	0 - 5	SM					100	89	89	86	81	62	28	20	2							
5	2	SM	3.6																			4
5	4	SP	2.8																			4
5	9	SP	4.7																			4
5	14	SC	14.6																			4
5	19		28.3	92																		4
P1	4		24.4	99	0.2	+5.4																3,4
P1	14		31.7	87									63	71	31							4,5

Notes:

Initial Dry Density and Initial Water Content are in-situ values unless otherwise noted.

* = Partially disturbed sample

- = Compression/settlement

NV = no value

NP = non-plastic

Remarks:

1 Remolded Compacted density (about 95% of ASTM D698 maximum density near optimum moisture content)

2 Remolded Compacted density (about 95% of ASTM D1557 maximum density near optimum moisture content)

3 Water added to sample

4 Dry density and/or moisture content determined from one ring of a multi-ring sample

5 Minus #200 Only

6 Moisture-Density Relationship Test Method ASTM D698/AASHTO T99

7 Moisture-Density Relationship Test Method ASTM D1557/AASHTO T180

SUMMARY OF LABORATORY TEST RESULTS

Proposed McDonald's Restaurant #5-1004 - Parker, Colorado

Terracon Project No. 25225006

Boring No.	Depth (ft)	USCS Class.	Initial Water Content (%)	Initial Dry Density (pcf)	Swell/Consolidation		Particle Size Distribution, Percent Passing by Weight							Atterberg Limits		Water Soluble Sulfates (ppm)	Water Soluble Sulfides (mg/kg)	Water Soluble Chlorides (ppm)	Red-Ox (mV)	pH	Resistivity (ohm.cm)	Remarks
					Surcharge (ksf)	Swell (%)	1 1/2"	1"	3/4"	#4	#10	#40	#200	LL	PI							
P1	19		33.0	86																		4
P2	4	ML	3.5				100	100	100	99	98	92	74	NV	NP							4
P2	14		33.0	87																		4
P3	0 - 5	SM					100	100	100	100	98	74	28	21	2							
P3	2	SM	8.3																			4
P3	4	SP	3.2																			4
P3	9	SM	3.9																			4
P4	0 - 5	SM					100	100	100	100	98	72	23	22	2							
P5	2	SM	3.3																			4
P5	4	SP	4.1																			4
P5	9	SC	16.2	112																		4
P5	14	CL	25.3	97																		4

Notes:
Initial Dry Density and Initial Water Content are in-situ values unless otherwise noted.
* = Partially disturbed sample
- = Compression/settlement
NV = no value
NP = non-plastic

Remarks:
1 Remolded Compacted density (about 95% of ASTM D698 maximum density near optimum moisture content)
2 Remolded Compacted density (about 95% of ASTM D1557 maximum density near optimum moisture content)
3 Water added to sample
4 Dry density and/or moisture content determined from one ring of a multi-ring sample
5 Minus #200 Only
6 Moisture-Density Relationship Test Method ASTM D698/AASHTO T99
7 Moisture-Density Relationship Test Method ASTM D1557/AASHTO T180

SUPPORTING INFORMATION

Contents:

Note: All attachments are one page unless noted above.

GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

Proposed McDonald's Restaurant #5-1004 ■ Parker, Colorado

March 24, 2022 ■ Terracon Project No. 25225006

Terracon GeoReport

SAMPLING	WATER LEVEL	FIELD TESTS
Auger Cuttings Modified California Ring Sampler	**Water Initially Encountered** **Water Level After a Specified Period of Time** **Water Level After a Specified Period of Time** **Cave In Encountered** Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.	**N** Standard Penetration Test Resistance (Blows/Ft.) **(HP)** Hand Penetrometer **(T)** Torvane **(DCP)** Dynamic Cone Penetrometer **UC** Unconfined Compressive Strength **(PID)** Photo-Ionization Detector **(OVA)** Organic Vapor Analyzer

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification as noted on the soil boring logs is based Unified Soil Classification System. Where sufficient laboratory data exist to classify the soils consistent with ASTM D2487 "Classification of Soils for Engineering Purposes" this procedure is used. ASTM D2488 "Description and Identification of Soils (Visual-Manual Procedure)" is also used to classify the soils, particularly where insufficient laboratory data exist to classify the soils in accordance with ASTM D2487. In addition to USCS classification, coarse grained soils are classified on the basis of their in-place relative density, and fine-grained soils are classified on the basis of their consistency. See "Strength Terms" table below for details. The ASTM standards noted above are for reference to methodology in general. In some cases, variations to methods are applied as a result of local practice or professional judgment.

LOCATION AND ELEVATION NOTES

Exploration point locations as shown on the Exploration Plan and as noted on the soil boring logs in the form of Latitude and Longitude are approximate. See Exploration and Testing Procedures in the report for the methods used to locate the exploration points for this project. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

STRENGTH TERMS

RELATIVE DENSITY OF COARSE-GRAINED SOILS (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance			CONSISTENCY OF FINE-GRAINED SOILS (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance				BEDROCK		
Descriptive Term (Density)	**Standard Penetration or N-Value Blows/Ft.**	**Ring Sampler Blows/Ft.**	**Descriptive Term (Consistency)**	**Unconfined Compressive Strength Qu, (psf)**	**Standard Penetration or N-Value Blows/Ft.**	**Ring Sampler Blows/Ft.**	**Ring Sampler Blows/Ft.**	**Standard Penetration or N-Value Blows/Ft.**	**Descriptive Term (Consistency)**
Very Loose	0 - 3	0 - 5	Very Soft	less than 500	0 - 1	< 3	< 24	< 20	Weathered
Loose	4 - 9	6 - 14	Soft	500 to 1,000	2 - 4	3 - 5	24 - 35	20 - 29	Firm
Medium Dense	10 - 29	15 - 46	Medium Stiff	1,000 to 2,000	4 - 8	6 - 10	36 - 60	30 - 49	Medium Hard
Dense	30 - 50	47 - 79	Stiff	2,000 to 4,000	8 - 15	11 - 18	61 - 96	50 - 79	Hard
Very Dense	> 50	≥ 80	Very Stiff	4,000 to 8,000	15 - 30	19 - 36	> 96	>79	Very Hard
			Hard	> 8,000	> 30	> 36			

RELEVANCE OF SOIL BORING LOG

The soil boring logs contained within this document are intended for application to the project as described in this document. Use of these soil boring logs for any other purpose may not be appropriate.

UNIFIED SOIL CLASSIFICATION SYSTEM

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]					Soil Classification	
					Group Symbol	Group Name [B]
Coarse-Grained Soils: More than 50% retained on No. 200 sieve	**Gravels:** More than 50% of coarse fraction retained on No. 4 sieve	**Clean Gravels:** Less than 5% fines [C]	$Cu \geq 4$ and $1 \leq Cc \leq 3$ [E]		GW	Well-graded gravel [F]
			$Cu < 4$ and/or [Cc<1 or Cc>3.0] [E]		GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH		GM	Silty gravel [F, G, H]
			Fines classify as CL or CH		GC	Clayey gravel [F, G, H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	**Clean Sands:** Less than 5% fines [D]	$Cu \geq 6$ and $1 \leq Cc \leq 3$ [E]		SW	Well-graded sand [I]
			$Cu < 6$ and/or [Cc<1 or Cc>3.0] [E]		SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH		SM	Silty sand [G, H, I]
			Fines classify as CL or CH		SC	Clayey sand [G, H, I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	**Silts and Clays:** Liquid limit less than 50	**Inorganic:**	PI > 7 and plots on or above "A"		CL	Lean clay [K, L, M]
			PI < 4 or plots below "A" line [J]		ML	Silt [K, L, M]
		Organic:	Liquid limit - oven dried	< 0.75	OL	Organic clay [K, L, M, N]
			Liquid limit - not dried			Organic silt [K, L, M, O]
	Silts and Clays: Liquid limit 50 or more	**Inorganic:**	PI plots on or above "A" line		CH	Fat clay [K, L, M]
			PI plots below "A" line		MH	Elastic Silt [K, L, M]
		Organic:	Liquid limit - oven dried	< 0.75	OH	Organic clay [K, L, M, P]
			Liquid limit - not dried			Organic silt [K, L, M, Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor				PT	Peat

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

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

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

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

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

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

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

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

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

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

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

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

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

[N] PI ≥ 4 and plots on or above "A" line.

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

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

[Q] PI plots below "A" line.