

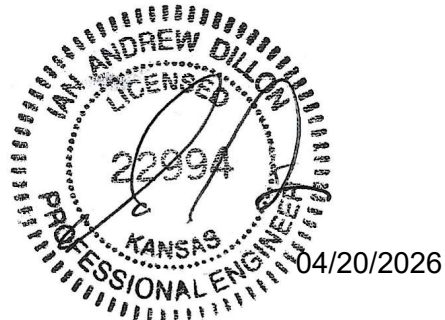
GEOTECHNICAL ENGINEERING REPORT

McDonalds - Basehor
Basehor, Kansas

Prepared for:

McDonalds USA, LLC

Chicago, Illinois



April 2026

Olsson Project No. 026-01964

Kansas Certificate
of Authorization #: E-516





April 20, 2026

McDonalds USA, LLC
Attn: Mr. Joshua Gatewood
110 N Carpenter Street
Chicago, Illinois 60607

RE: Geotechnical Engineering Report
McDonalds - Basehor
N 158th Street and Wolf Creek Parkway
Basehor, Kansas
Olsson Project No. 026-01964

Dear Mr. Gatewood,

Olsson, Inc. has completed the authorized geotechnical exploration for the above-referenced project. The geotechnical exploration was conducted to evaluate the subsurface conditions with respect to design and construction of the project. The enclosed report summarizes the project characteristics as we understand them, presents the findings of the exploration and laboratory testing, discusses the observed subsurface conditions, and provides our geotechnical engineering recommendations. A boring location map, boring logs, and a description of our exploration program, are provided in **Appendix A**.

We appreciate the opportunity to provide our geotechnical engineering services for this project and are prepared to provide construction phase services as well. If you have any questions or need further assistance, please contact us at your convenience.

Respectfully submitted,
Olsson, Inc.
Kansas Certificate of Authority No. E-516

A blue ink signature of JD Putnam, consisting of a stylized "J" and "D" followed by a horizontal line.

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EXECUTIVE SUMMARY

This Executive Summary provides a limited overview of the report and is subject to any and all clarifications, conditions, contingencies, limitations, and/or qualifications that may exist in the body of the report.

Project Understanding	
Project Description	The development consists of a single story, slab-on-grade, restaurant structure. Anticipated maximum column and exterior wall loads will be less than 50 kips and 5 kips per linear foot, respectively. Final grading plans have not been established at this time. The anticipated finished floor elevation is planned to be 975 (+/-) feet. Site regrading is not expected to exceed 5 feet for cuts and fills.
Subsurface Conditions	
Surficial and Fill Soils	The borings encountered an organic rootzone up to 12 inches thick. At an isolated boring, previously placed clayey fill soils extended to a depth of 3 feet.
Clayey Loess Soils	Native clayey loess soils were encountered and extended to depths ranging from approximately 10 feet to 15 feet below ground surface.
Clayey Glacial Till Soils	At greater depths, the loess transitioned into clayey glacial till, which continued to the base of the borings.
Water Level Observations	The drill crew observed the borings for subsurface water during and immediately after drilling operations. Subsurface water was not observed in the borings during either condition.
Geotechnical Considerations	
Previously Placed Fill	Between 4 feet of cut and 3 feet of fill occurred at the site during mass grading operations in 2020. Provided grading plans indicate that fill was generally placed in the northwest quadrant of the project site.
Variable Moisture Levels	Laboratory test results indicate some of the on-site clay soils generally have relatively low moisture contents. An isolated area encountered very moist clay soils. Moisture conditioning should be anticipated for the project site.
Foundation Recommendations	In our opinion, the proposed structure should be supported on a shallow foundation system bearing on native clayey soils.

1. PROJECT UNDERSTANDING

1.1 Project Information

We understand the project consists of a single story, slab on grade restaurant structure. The proposed structure is expected to be steel framed with a concrete masonry unit (CMU) exterior. At the time of this report, a grading plan had not been established, however, for the purposes of this report, we assume site grading will require cuts and fills of less than 5 feet. **Table 1** provides project information and **Figure 1** presents the proposed site layout at the time of this report. If the structural loads or site grading exceed these values, Olsson should be contacted to verify that the recommendations contained in this report remain valid.

Table 1. Project Information.

Project Detail	Value	Notes
Plan Area	4,175 square feet	Provided by Olsson Site Design Team
Finished Floor Elevation	975 feet	Assumed
Maximum Column Load	50 kips	Provided by Structural Engineer
Maximum Wall Load	< 5 kips per linear foot	Provided by Structural Engineer
Floor Slab Load	< 150 pounds per square foot	Assumed

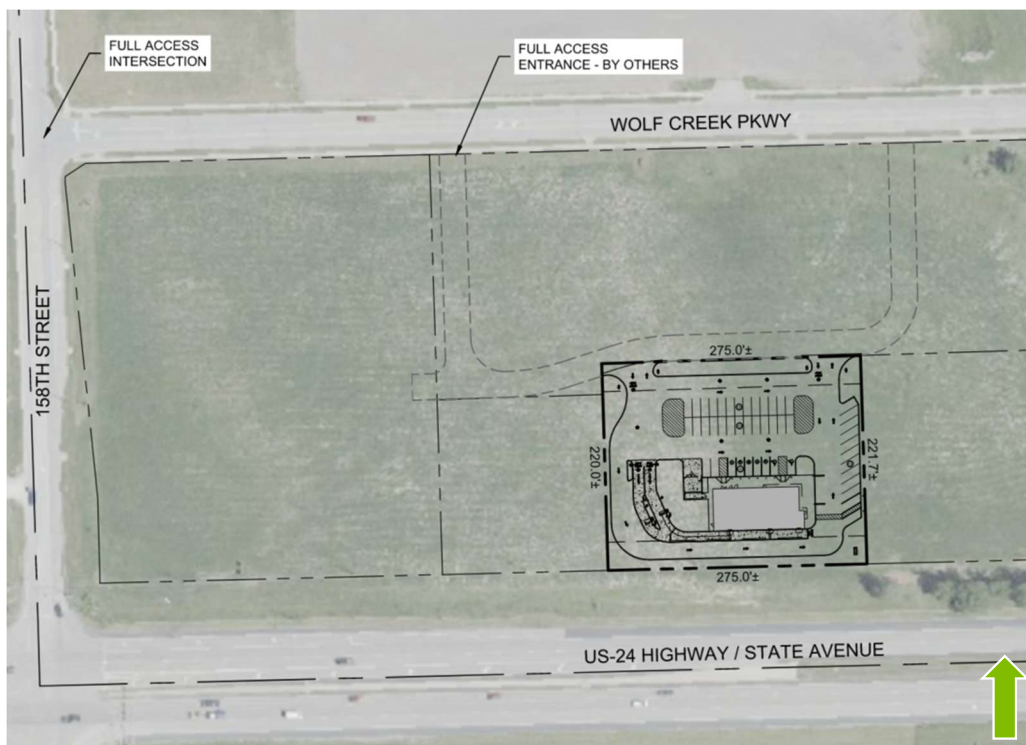


Figure 1. Proposed Site Layout

1.2 Site Description

The project site is located east of the intersection of State Avenue and N 158th Street in Basehor, Kansas (**Figure 2**). The partially grass covered site slopes from the southwest down to the northeast with elevations ranging from 973 feet to 976 feet.



Figure 2. August 2025 Aerial Photograph (Google Earth)

A review of historical aerial photographs indicates the site was used for agricultural purposes until May 2020 when mass grading efforts took place (**Figure 3**). We have reviewed plans from the mass grading efforts. We understand that up to 4 feet of cut and 3 feet of fill occurred at the site during the 2020 mass grading operations. Since 2020, shallow rooted vegetation has taken place (**Figure 4**).



Figure 3. May 2020 Aerial Photograph (Google Earth)



Figure 4. Project Site circa 2023

2. SUBSURFACE CONDITIONS

2.1 Subsurface Profile

The appended borehole reports represent subsurface conditions at the specific boring locations at the time of our field exploration; variations may occur between or beyond the borings. The stratification lines shown on the logs represent the approximate boundary between material types. However, the transition between layers may be gradual. The subsurface soils at this site comprised fill materials overlaying native clayey loess and glacial till soils. The general characteristics of each soil stratum are summarized below, with more detailed descriptions provided on the borehole reports in [Appendix A](#).

The surficial materials encountered in the borings consisted of an organic rootzone layer extending to depths of up to approximately 12 inches below ground surface. Beneath the rootzone, previously placed fill materials and native clayey soils were encountered. The fill, encountered in boring B-5, extended to depths of approximately 3 feet, and consisted of very moist clayey soils intermixed with silt and organic material.

Below the fill and rootzone, native clayey loess soils were encountered and extended to depths ranging from approximately 10 feet to 15 feet below ground surface. The loess was generally moderate-to-highly plastic, moist, firm to stiff, and silty. At greater depths, the loess transitioned into clayey glacial till, which continued to the base of the borings. The glacial till was generally moderately plastic, stiff to very stiff, slightly moist, and contained variable amounts of silt and sand.

2.2 Water Level Observations

Water level observations were made during and immediately after the completion of each boring during our exploration. Subsurface water was not encountered during our exploration at either condition. The lack of water should not be construed to represent a permanent or stable condition. Variations and uncertainties exist with relatively short-term water level observations in boreholes. Water levels can and should be anticipated to vary between boring locations, as well as time within specific borings. Water typically collects near the interface between different materials, such as soil and bedrock. Groundwater levels can fluctuate with variations in precipitation, site grading, drainage, and adjacent land use. Long-term monitoring with piezometers generally provides a more representative indication of the potential range of subsurface water conditions. Such monitoring was not completed as part of this exploration. Olsson can provide additional monitoring upon written request of McDonald's USA, LLC.

3. GEOTECHNICAL CONSIDERATIONS

Fill soils were encountered at boring (B-5). The fill, consisting of clay soils mixed with silt and organics, extended to a depth of 3 feet below the existing surface. As discussed in [Section 1](#), the project site was mass graded in 2020. Based on a review of grading plans from 2020 and 2025, we understand between 4 feet of cut and 3 feet of fill occurred at the site during mass grading. The plans indicate that fill was generally placed in the northwest quadrant of the project site. We have not been provided with fill placement documentation records during the preparation of this report.

Some of the on-site clays appeared to have relatively low moisture content levels. Drier and more desiccated soils could be present at the site in areas we did not explore. The on-site soils may require additional moisture conditioning to meet recommended moisture levels.

4. EARTHWORK CONSIDERATIONS

4.1 Site Preparation

Site preparation should commence with the stripping of any loose, soft, organic, or otherwise unsuitable materials. These materials should be carefully separated to avoid incorporation of unsuitable materials into new fill sections in the building or pavement areas. Site clearing, grubbing, and stripping operations should be performed during dry weather conditions. Operation of heavy equipment on the site during wet conditions could result in excessive rutting and mixing of construction debris with the underlying soils.

Upon completion of stripping operations, but prior to any new fill being placed on site, we recommend that the exposed ground surface be proofrolled with a loaded tandem axle dump truck weighing at least 20 tons or similar equipment. Proofrolling operations should be observed by a representative of Olsson. Unstable and unsuitable soils revealed by proofrolling should be removed and replaced with structural fill.

Once proofrolling is complete, the upper 9 inches of exposed subgrade should be scarified, moisture conditioned, and recompacted to a minimum of 95 percent of the materials Standard Proctor maximum dry density (ASTM D-698) at a moisture content between 1 percent below optimum and 3 percent above optimum.

4.2 Structural Fill

All structural fill should consist of approved materials, free of organic matter (organic content less than 5 percent), debris, and particles with sizes larger than 3 inches. Structural fill soils should consist of clayey soils that exhibit a Liquid Limit (LL) less than 50 and a Plasticity Index (PI) less than 30. Some of the on-site soils may be suitable for use as structural fill and low volume change fill placed directly below the floor slabs. Any reused on-site soils or imported soils planned to be used at the site should be submitted to Olsson for laboratory Proctor and classification tests prior to placement on the site.

We recommend that all structural fill and backfill be compacted in accordance with the criteria provided in **Table 2** below. An Olsson representative should observe all fill placement operations at the site and perform field compaction tests, as required.

Table 2. Structural Fill Placement Guidelines.

Area of Fill Placement	Suitable Material (USCS or Description)	Compaction (ASTM D698 - Standard Proctor)	Moisture Content (Percent of Optimum)
Granular Leveling Course and PCC Pavement Clean Rock Base 4 inches below Floor Slabs and PCC Pavements	ASTM C-33 No. 57 Aggregate	65% Relative Density	As necessary to obtain density
Low Volume Change 18 inches below <i>Granular Leveling Course</i>	Cohesive Soils w/ LL < 45 PI < 25	95%	-1 to +3 percent
	KDOT AB-3 Baserock		As necessary to obtain density
Structural Fill On-site or Imported materials	Cohesive Soils w/ LL < 50 PI < 30	95%	-1 to +3 percent
AC and PCC Pavement Subgrade 9 inches below AC Base Course and PCC Clean Rock Base	Cohesive Soils w/ LL < 50 PI < 30	95%	-1 to +3 percent
Preferred AC Pavement Subgrade 9 inches below AC Base Course	Cohesive Soils w/ Soil Cement (5%) or Lime (5%)*	95%	-1 to +3 percent
* Percentage based on dry unit weights			

Suitable fill materials should be placed in thin loose lifts of 9 inches or less. Within small excavations, such as in utility trenches, around manholes, or behind retaining walls, the use of vibrating plat compactors, jumping jack compactors or walk behind sheepsfoot compactors may be used to facilitate compaction in these areas. Loose lifts thicknesses of 4 inches or less are recommended where small compaction equipment is used.

The moisture content for suitable borrow soils at the time of compaction should generally be maintained between the ranges specified above. More stringent moisture limits may be necessary with certain soils and some adjustments to moistures contents may be necessary to achieve compaction in accordance with project specifications.

4.3 Drainage and Groundwater Considerations

Water should not be allowed to collect at the ground surfaces near foundations, floor slabs, or areas of new pavement, either during or after construction. Provisions should be made to quickly remove accumulating seepage water or storm water runoff from excavations. Undercut or excavated areas should be sloped toward one corner to allow rainwater or surface runoff to be quickly collected and gravity drained or pumped from construction areas. Subgrade soils that are exposed to precipitation or runoff should be evaluated by Olsson prior to the placement of new fill, reinforcing steel, or concrete, to determine if corrective action is required.

To minimize concerns related to improper or inadequate drainage away from foundation bearing subgrades or from cohesive backfill materials used in utility or foundation trenches, we recommend the following:

- Site grading should provide for efficient drainage of rainfall or surface runoff away from new structures and pavement.
- Roof run-off should be collected and transferred directly to the storm sewer system or directed to a location with positive and rapid drainage away from new structures and pavements.
- External hose connections in unpaved areas should incorporate splash blocks to prevent accidental flooding of foundation bearing or backfill soils. External hose connections should have cut-off valves inside the building to prevent accidental or unauthorized use.
- Maintenance personnel should be informed of the potential problems associated with watering near the building.

4.4 Temporary Slopes and Excavations

Construction site safety is the sole responsibility of the general contractor. The contractor is also responsible for the means, methods, techniques, sequencing, and operations used during construction. Slope height, slope inclination, and excavation depths (including utility trench excavations) should in no case exceed those specified in local, state, or federal safety regulations.

4.5 Equipment Mobility

Some of the soils encountered at this site may be susceptible to softening under the action of construction equipment traffic in combination with wet weather. Mitigation of equipment mobility problems and management of soft surficial soils will depend on the severity of the problem, the season in which construction is performed, and prevailing weather conditions.

During construction, provisions should be made to quickly remove seepage water or storm water from excavations. Water should not be allowed to collect near foundations, floor slabs, pavements, or retaining walls either during or after construction. Undercut or excavated areas should be sloped toward one corner to facilitate the collection and removal of rainwater or surface runoff. Site grading should provide rapid drainage of water away from the structure and pavement areas throughout construction.

Additional guidelines for reducing equipment mobility problems are as follows:

- Optimize surface water drainage at the site.
- Allow for rain days in the construction schedule and wait for dry weather conditions to prevail whenever possible. Avoid operating construction equipment on the site during wet conditions. Rutting the surface will aggravate mobility problems.
- Use construction equipment that is suited for the intended job under the site conditions. Heavy rubber-tired equipment typically requires better site conditions than light, track-mounted equipment.

Ultimately, it may be necessary to take steps to aggressively improve equipment mobility if construction must proceed under unfavorable conditions. More aggressive methods for addressing equipment mobility problems may range from removing several feet of soft wet soils to utilizing crushed stone materials and/or appropriate stabilization fabrics or geogrids. Other methods include chemical stabilization with portland cement, fly ash, or cement kiln dust (CKD). The stabilization approach should be determined at the time of construction in consultation with Olsson.

The contractor is responsible for creating and maintaining a stable working platform. Soils that are disturbed by construction activity or adverse weather conditions should be corrected by the contractor to conform with project specifications and this report.

5. FOUNDATION RECOMMENDATIONS

5.1 Shallow Foundations

Based on the results of our exploration, laboratory testing program, and our engineering analysis, in our opinion, the proposed structure could be supported by conventional shallow foundations bearing on native clayey soils. Design parameters for shallow foundations supported on such soils are provided in **Table 3**.

Table 3. Shallow Foundation Design Parameters.

Design Parameter	Recommended Value
Net Allowable Soil Bearing Pressure	2,000 psf
Estimated Total Settlement	1 inch
Estimated Differential Settlement	½ inch
Minimum Exterior Foundation Depth	3 feet
Minimum Interior Foundation Depth	2 feet
Minimum Isolated Column Footing Width	30 inches
Minimum Continuous Footing Width	18 inches
Minimum Earth Formed Trench Footing Width	12 inches
Soil-Concrete Ultimate Friction Coefficient	0.35

The net allowable bearing pressure is the bearing pressure in excess of the minimum surrounding overburden pressure at the foundation level. The net allowable soil bearing pressure may be increased by 1/3 for transient loads such as wind or seismic loads.

Exterior footings and footings in unheated areas should bear at the minimum depth recommended in **Table 3**. Minimum foundation depth is measured from the lowest adjacent final ground surface.

Soft or otherwise unsuitable soils could be encountered during foundation construction. Therefore, foundation subgrades should be observed by an Olsson representative to identify such soils and provide remediation recommendations, as necessary. After foundation subgrades have been observed and any required remedial measures are performed, concrete should be placed as quickly as possible to avoid exposure of the foundation subsoils to wetting, drying, or freezing. If foundation soils are subjected to such conditions, Olsson should be contacted to reevaluate the foundation bearing materials.

Provided shallow foundations are designed and constructed in accordance with the recommendations of this report, total post-construction settlements are anticipated to be less than the values tabulated in **Table 3**. To reduce the effects of differential settlement, floor slabs should be separated from wall and column footings with expansion joints.

5.2 Floor Slab Subgrade Preparation

Our laboratory tests indicate that some of the on-site soils at and near the proposed finished floor elevation have a moderate risk for subgrade volume change with fluctuating moisture contents. To reduce this risk, we recommend the placement of a 22-inch zone of low volume change (LVC) material beneath the base of the ground supported floor slab.

The upper 4 inches of the zone should consist of free draining granular material (e.g., ASTM C-33 No. 57 aggregate). The free draining material should be compacted to 65 percent of the material's relative density, and moisture conditioned to a level that is necessary to obtain the recommended density. Underlying the free draining granular material, 18 inches of additional LVC material should be installed. The additional material should consist of cohesive soils exhibiting a Liquid Limit less than 45 and a Plasticity Index less than 25, or a well graded granular material such as KDOT AB-3 baserock, or equivalent. The additional 18 inches of LVC material should be compacted and moisture conditioned to the levels recommended in **Table 2** of this report. If on-site soils are desired to be reused as LVC fill, samples should be submitted to Olsson for laboratory Proctor and classification tests prior to placement on the site.

Upon completion of grading operations in the building area, care should be taken to maintain the recommended subgrade moisture content and density prior to construction of the new floor slabs. If the floor slab subgrade soils should become saturated, desiccated, frozen, disturbed, or altered by construction activity, the subgrade should be restored to the conditions recommended in **Table 2**.

The procedures recommended above will reduce future subgrade volume change and resultant floor slab movement. However, depending on many factors, including the size and shape of the floor area, the location of construction joints in the slab, the rigidity of the slab and foundation connection, and the magnitude of movement that occurs, cracks within the floor slab should be anticipated. Leaking utility lines or water allowed to accumulate beneath the slab could lead to significant slab movement.

5.3 Seismic Site Classification

For this project site, the soil conditions encountered at the boring are consistent with Site Class "D" as defined by ASCE 7-16.

6. PAVEMENT RECOMMENDATIONS

6.1 Pavement Subgrade Preparation

As previously mentioned, fill was placed in the northeast corner of the project site during mass grading operations in 2020, in addition to the fill encountered at boring B-5. We have not been provided with fill placement records from the mass grading operations. Therefore, at a minimum, fill soils encountered within pavement areas should be undercut to a minimum depth of 2 feet below the base of the new pavements, extending at least 2 feet beyond the edge of the curblines. The undercut areas should be backfilled with suitable structural fill that has been compacted and moisture controlled as recommended herein.

At a minimum, all pavements should be supported on 9 inches of recompacted, and moisture conditioned cohesive soils. The soils should be compacted to 95 percent of the material's maximum dry density (ASTM D-698) at a moisture level between 1 percent below and 3 percent above optimum. We recommend that a 4-inch clean rock base consisting of free draining aggregate (ASTM C-33 No.57) be placed directly below the base of the Portland cement concrete pavements.

As a preferred option, and to increase the serviceability life of the pavements, we recommend that the cohesive subgrade below the asphaltic concrete pavements be chemically stabilized with 5 percent soil cement or 5 percent lime (percentages based on dry unit weights). In our opinion, the chemically stabilized subgrade should be compacted to 95 percent of the material's maximum dry density (ASTM D-698) and moisture conditioned to a level between 1 percent below and 3 percent above optimum.

We recommend that the prepared subgrade extend a minimum of 2 feet outside the pavements, where feasible. Olsson should be present during subgrade preparation to observe, document, and test compaction of the materials at the time of placement. As recommended for all prepared soil subgrades, heavy, repetitive construction traffic should be controlled, especially during periods of wet weather, to minimize disturbance. The final prepared subgrade should be proof rolled with a loaded dump truck or similar rubber-tired equipment with a total weight of at least 20 tons, immediately prior to placement of new pavements. Proofrolling operations should be observed and documented by Olsson. Unstable or unsuitable soils revealed by proofrolling should be reworked to provide a stable subgrade or removed and replaced with structural fill.

Construction scheduling often involves grading and paving by separate contractors and can involve a time lapse between the end of grading procedures and the commencement of paving operations. Disturbance, desiccation, or wetting of the subgrade soils between grading and paving operations can result in the deterioration of the previously completed subgrade. If soft

and/or wet areas are identified during subgrade preparation or if the subgrade soils have been exposed to adverse weather conditions, frost, excessive construction traffic, standing water, or similar conditions, Olsson should be consulted to determine if corrective action is necessary.

It is important that the pavement subgrade support be relatively uniform, with no abrupt changes in the degree of support. Non-uniform pavement support can occur as a result of varying soil moisture contents or soil types, or where improperly placed utility backfill has been placed across or through areas to be paved. Improper subgrade preparation such as inadequate vegetation removal, failure to identify soft or unstable areas by proofrolling, and inadequate or improper compaction can also produce non-uniform subgrade support.

6.2 Recommended Pavement Sections

Table 4 summarizes typical pavement sections for Full Depth Asphaltic Concrete (AC) and Portland Cement Concrete (PCC). The sections represent typical minimum thicknesses. Routine maintenance of the pavement will be required, consisting of periodic seal coats and possible one intermediate mill, in addition to regular crack maintenance.

Table 4. Recommended Pavement Sections.

	Layer	Layer Thickness (inches)		
		Parking Stalls	Drive Lanes	Heavy Vehicle Areas
Full Depth AC	AC Surface Course	2	2	--
	AC Base Course	4	6	--
	Subgrade	9	9	--
Full Depth PCC	PCC	6	6	8
	Clean Rock Base	4	4	4
	Subgrade	9	9	9

Concrete pavements in areas where heavy vehicles will not be concentrated should have a minimum thickness of 6 inches in areas. In areas where heavy vehicles are concentrated, concrete pavements should have a minimum thickness of 8 inches. PCC pavements are recommended for trash receptacle pads and other areas where heavy wheel loads will be

concentrated. The clean rock base for PCC pavements should be uniform and pavement subgrade should be graded to provide positive drainage of the granular base section. The granular section should be graded to adjacent storm sewer inlets and provisions should be made to provide drainage from the granular section into the storm sewers. Drainage of the granular base is particularly important where two different sections of pavements abut (such as AC and PCC), so that water does not pond beneath the pavements and saturate the subgrade soils. We further recommend that the length of concrete sections be such that no heavy truck wheels are allowed to rest on asphaltic concrete sections during loading/unloading operations.

The performance of the pavements will be dependent upon a number of factors, including subgrade conditions at the time of paving, rainwater runoff, and traffic. Rainwater runoff should not be allowed to seep below pavements from adjacent areas. Pavements should be sloped approximately $\frac{1}{4}$ inch per foot to provide for rapid surface drainage.

Proper drainage below the pavement section helps prevent softening of the subgrade and has a significant impact on pavement performance and pavement life. Therefore, we recommend that a granular blanket drain be constructed at all storm sewer inlets within the pavement areas. The blanket drain should consist of clean, crushed rock extending a minimum of 6 inches below pavement subgrade level. The blanket drains should extend radially to a minimum of 8 feet from each of the storm sewer inlets. The grade within the blanket drain should be sloped toward the storm sewer inlet, and weep holes should be drilled through the inlet to provide drainage of the granular section into the inlet. Placement of a geotextile filter fabric across the weepholes could be considered to prevent loss of aggregate through the weep holes.

Construction traffic on the pavements has not been considered in the above noted typical sections. If construction scheduling dictates that the pavements will be subjected to traffic by construction equipment, increasing the pavement thickness should be considered to include the effects of additional traffic loading. Construction traffic should not be allowed on partially completed pavements as the pavements will not have adequate structural capacity and could be damaged.

7. REPORT LIMITATIONS

The conclusions and recommendations presented in this report are based on the information available regarding the proposed construction, geotechnical information obtained from our field exploration and laboratory testing, as well as our experience with similar projects. Our borings and testing represent a limited statistical sampling of the subsurface. Conditions may be encountered during construction that are substantially different from those encountered in this exploration and adjustments to design and construction may be necessary.

In the event of any changes in the nature of the proposed project as outlined in this report, the opinions in this report cannot be considered valid unless Olsson reviews the changes, and the opinions of this report are modified or affirmed by Olsson.

The scope of this exploration did not include any environmental assessment for the presence of wetlands and/or hazardous or toxic materials in the soil or groundwater on or near the site. Any statements in this report regarding odors, discoloration, or suspicious conditions are strictly for the information of our client.

This report is based on generally accepted professional geotechnical engineering practice at the time of this report, within this geographic area. No warranty, express or implied, is intended or made. This report has been prepared for the exclusive use of McDonalds USA, LLC, and their authorized representatives for specific application to the project discussed herein.

APPENDIX A

Exploration Maps, Logs, and Information

Field Exploration

Our drill crew advanced the borings for this exploration with a truck-mounted drill rig using continuous-flight augers. Boring locations were located in the field by the drill crew using a hand-held GPS unit. The approximate locations of the borings are shown on the Boring Location Map. The boring elevations that are shown on the appended boring logs were obtained by plotting the approximate boring locations on a site topographic map and interpolating between the contour lines. These interpolated elevations are reported to the nearest foot on the logs. True surface elevations at these locations could differ due to interpolation, and other differences could occur from superposing approximate boring locations on the topographic plan. The boring locations and elevations should be considered accurate only to the degree implied by the means and methods used to define them.

Samples were obtained using the methods and at the depths shown on the logs. Recovered samples were sealed in containers, labeled, and protected for transportation to the laboratory for testing.

The drill crew prepared field boring logs during drilling operations. The field logs include drilling and sampling methods, sampling intervals, groundwater measurements, and general descriptions of the observed soil conditions. The final boring logs represent our engineering interpretation of the field logs based on visual classification and laboratory testing of the collected samples.



Boring Location Map

McDonalds - Basehor
Basehor, Kansas

Olsson Project No:	026-01964
Client:	McDonalds USA, LLC
Last Revision Date:	4/16/2026
Engineer:	JD Putnam, EI

SYMBOLS AND NOMENCLATURE

DRILLING NOTES

DRILLING AND SAMPLING SYMBOLS

SS: Split-Spoon Sample (1.375" ID, 2.0" OD)	HSA: Hollow Stem Auger	NE: Not Encountered
U: Thin-Walled Tube Sample (3.0" OD)	CFA: Continuous Flight Auger	NP: Not Performed
CS: Continuous Sample	HA: Hand Auger	NA: Not Applicable
BS: Bulk Sample	CPT: Cone Penetration Test	% Rec: Percent of Recovery
MC: Modified California Sampler	WB: Wash Bore	WD: While Drilling
GB: Grab Sample	FT: Fish Tail Bit	IAD: Immediately After Drilling
SPT: Standard Penetration Test Blows per 6.0"	RB: Rock Bit	AD: After Drilling
	PP: Pocket Penetrometer	CI: Cave In

DRILLING PROCEDURES

Soil samples designated as "U" samples on the boring logs were obtained in using Thin-Walled Tube Sampling techniques. Soil samples designated as "SS" samples were obtained during Penetration Test using a Split-Spoon Barrel sampler. The standard penetration resistance 'N' value is the number of blows of a 140 pound hammer falling 30 inches to drive the Split-Spoon sampler one foot. Soil samples designated as "MC" were obtained in using Thick-Walled, Ring-Lined, Split-Barrel Drive sampling techniques. Recovered samples were sealed in containers, labeled, and protected for transportation to the laboratory for testing.

WATER LEVEL MEASUREMENTS

Water levels indicated on the boring logs are levels measured in the borings at the times indicated. In relatively high permeable materials, the indicated levels may reflect the location of groundwater. In low permeability soils, the accurate determination of groundwater levels is not possible with only short-term observations.

SOIL PROPERTIES & DESCRIPTIONS

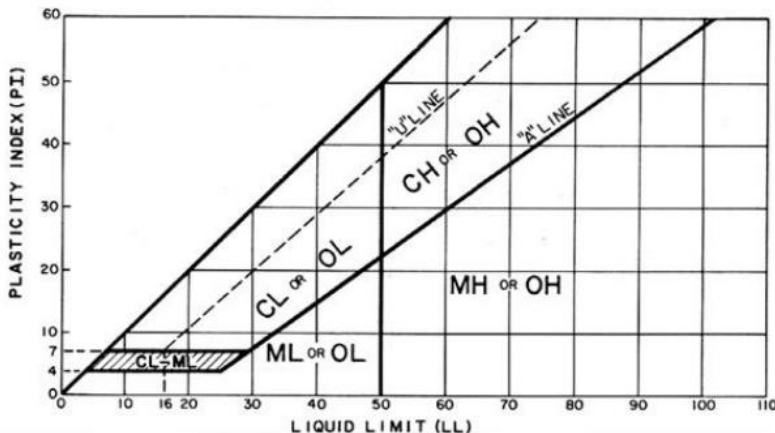
Descriptions of the soils encountered in the soil test borings were prepared using Visual-Manual Procedures for Descriptions and Identification of Soils.

PARTICLE SIZE

Boulders	12 in. +	Coarse Sand	4.75mm-2.0mm	Silt	0.075mm-0.005mm
Cobbles	12 in.-3 in.	Medium Sand	2.0mm-0.425mm	Clay	<0.005mm
Gravel	3 in.-4.75mm	Fine Sand	0.425mm-0.075mm		

COHESIVE SOILS		COHESIONLESS SOILS		COMPONENT %	
Consistency	Unconfined Compressive Strength (Qu) (tsf)	Relative Density	'N' Value	Description	Percent (%)
Very Soft	<0.25	Very Loose	0 - 3	Trace	<5
Soft	0.25 - 0.5	Loose	4 - 9	Few	5 - 10
Firm	0.5 - 1.0	Medium Dense	10 - 29	Little	15 - 25
Stiff	1.0 - 2.0	Dense	30 - 49	Some	30 - 45
Very Stiff	2.0 - 4.0	Very Dense	≥ 50	Mostly	50 - 100
Hard	> 4.0				

PLASTICITY CHART

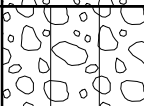
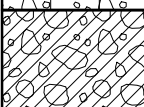
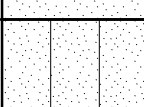
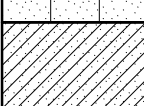
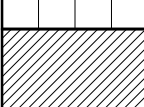
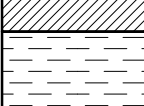
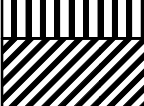
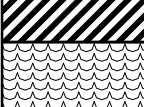
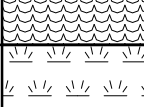


ROCK QUALITY DESIGNATION (RQD)

Description	RQD (%)
Very Poor	0 - 25
Poor	25 - 50
Fair	50 - 75
Good	75 - 90
Excellent	90 - 100

olsson

SOIL CLASSIFICATION CHART

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

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

BORING LOG NO. B-1							Sheet 1 of 1					
PROJECT NAME				CLIENT								
McDonald's – Basehor				McDonald's USA, LLC								
PROJECT NUMBER				LOCATION								
026-01964				Basehor, KS								
ELEVATION (ft)	MATERIAL DESCRIPTION		GRAPHIC LOG	DEPTH (ft)	SAMPLE TYPE NUMBER	CLASSIFICATION (USCS)	BLOWS/6" (N-VALUE)	UNC STR (tsf)	MOISTURE (%)	DRY DENSITY (pcf)	LL/PI (%)	ADDITIONAL DATA/REMARKS
	LAT: 39.116767 LONG: -94.943219 APPROX. SURFACE ELEV. (ft):975											
	ROOT ZONE		0.5'	1								
	LEAN CLAY (CL), very stiff, brown with reddish brown and gray, moist, silt, sand, trace organics, (GLACIAL TILL)			2	SPT-1		3-8-11 (19)		23.2			
				3								
				4	ST-2							
970.0	LEAN CLAY (CL), light brown with reddish brown, silt, trace sand, (GLACIAL TILL)		5.0'	5								5.0 ft: P.P. = 4.5+
				6								
				7								
				8								
965.0	LEAN CLAY (CL), stiff to very stiff, brown with reddish brown and gray, moist to slightly moist, silt, sand, (GLACIAL TILL)		8.5'	9	SPT-3		4-4-7 (11)		22.2			
				10								
				11								
				12								
				13								
960.0	BASE OF BORING AT 15.0 FEET		15.0'	14	SPT-4		7-8-12 (20)		17.4			P-200 = 66%
				15								
				16								
				17								
				18								
955.0				19								
				20								
				21								
				22								
				23								
950.0				24								
				25								
				26								
				27								
				28								
945.0				29								
				30								
				31								
				32								
				33								
				34								
WATER LEVEL OBSERVATIONS						STARTED: 03/30/2026		FINISHED: 03/30/2026				
WD	☐	Not Encountered				DRILL CO.: CFS Engineers		EQUIPMENT: SIMCO 145				
IAD	▼	Not Encountered				DRILLER: J.W.		LOGGED BY: K.S.				
AD	☒	Not Performed				METHOD: Continuous Flight Auger						

BORING LOG NO. B-2							Sheet 1 of 1					
PROJECT NAME					CLIENT							
McDonald's – Basehor					McDonald's USA, LLC							
PROJECT NUMBER					LOCATION							
026-01964					Basehor, KS							
ELEVATION (ft)	MATERIAL DESCRIPTION		GRAPHIC LOG	DEPTH (ft)	SAMPLE TYPE NUMBER	CLASSIFICATION (USCS)	BLOWS/6" (N-VALUE)	UNC STR (tsf)	MOISTURE (%)	DRY DENSITY (pcf)	LL/PI (%)	ADDITIONAL DATA/REMARKS
	LAT: 39.116722 LONG: -94.943078 APPROX. SURFACE ELEV. (ft):975											
	ROOT ZONE		0.6'									
	FAT CLAY (CH), stiff, dark brown to, moist, silt, trace organics, (LOESS)			1	SPT-1	CH	4-6-4 (10)		28.0		62/34	5.0 ft: P.P. = 4.5+
				2								
	LEAN CLAY (CL), very stiff, reddish brown with gray, silt, sand, (GLACIAL TILL)		3.0'	3	ST-2				20.6	104.9		
970.0				4								
				5								
	LEAN CLAY (CL), stiff, brown with gray, moist, silt, trace sand, (GLACIAL TILL)		7.0'	6	SPT-3		4-5-5 (10)		21.4			P-200 = 88%
				7								
965.0				8								
				9								
	LEAN CLAY (CL), very stiff, light reddish brown with gray, slightly moist, silt, sand, (GLACIAL TILL)		12.5'	10	SPT-4		6-7-10 (17)		17.4			
				11								
				12								
				13								
960.0				14								
	BASE OF BORING AT 15.0 FEET		15.0'	15								
				16								
				17								
				18								
				19								
				20								
				21								
				22								
				23								
				24								
				25								
				26								
				27								
				28								
				29								
				30								
				31								
				32								
				33								
				34								
WATER LEVEL OBSERVATIONS						STARTED: 03/30/2026		FINISHED: 03/30/2026				
WD	☐	Not Encountered				DRILL CO.: CFS Engineers		EQUIPMENT: SIMCO 145				
IAD	▼	Not Encountered				DRILLER: J.W.		LOGGED BY: K.S.				
AD	☒	Not Performed				METHOD: Continuous Flight Auger						

BORING LOG NO. B-3							Sheet 1 of 1					
PROJECT NAME				CLIENT								
McDonald's – Basehor				McDonald's USA, LLC								
PROJECT NUMBER				LOCATION								
026-01964				Basehor, KS								
ELEVATION (ft)	MATERIAL DESCRIPTION		GRAPHIC LOG	DEPTH (ft)	SAMPLE TYPE NUMBER	CLASSIFICATION (USCS)	BLOWS/6" (N-VALUE)	UNC STR (tsf)	MOISTURE (%)	DRY DENSITY (pcf)	LL/PI (%)	ADDITIONAL DATA/REMARKS
	LAT: 39.116664 LONG: -94.942922 APPROX. SURFACE ELEV. (ft):975											
	ROOT ZONE 0.5'			1								
	FAT CLAY (CH), firm, dark brown, moist, silt, trace organics, (LOESS)			2	SPT-1		3-3-4 (7)		25.2			
				3								
	LEAN CLAY (CL), stiff, light brown with gray, moist, silt, (GLACIAL TILL) 3.8'			4	SPT-2		3-5-8 (13)		22.2			
970.0				5								
	LEAN CLAY (CL), very stiff, reddish brown with gray, moist to slightly moist, silt, sand, (GLACIAL TILL) 7.0'			6								
				7								
				8								
965.0				9	ST-3			2.0	23.0	110.7		
				10								
				11								
				12								
				13								
				14	SPT-4		7-9-13 (22)		15.2			P-200 = 69%
960.0	BASE OF BORING AT 15.0 FEET 15.0'			15								
				16								
				17								
				18								
955.0				19								
				20								
				21								
				22								
				23								
950.0				24								
				25								
				26								
				27								
				28								
				29								
945.0				30								
				31								
				32								
				33								
				34								
WATER LEVEL OBSERVATIONS						STARTED: 03/30/2026		FINISHED: 03/30/2026				
WD	☐	Not Encountered				DRILL CO.: CFS Engineers		EQUIPMENT: SIMCO 145				
IAD	☐	Not Encountered				DRILLER: J.W.		LOGGED BY: K.S.				
AD	☐	Not Performed				METHOD: Continuous Flight Auger						

BORING LOG NO. B-4							Sheet 1 of 1					
PROJECT NAME				CLIENT								
McDonald's – Basehor				McDonald's USA, LLC								
PROJECT NUMBER				LOCATION								
026-01964				Basehor, KS								
ELEVATION (ft)	MATERIAL DESCRIPTION		GRAPHIC LOG	DEPTH (ft)	SAMPLE TYPE NUMBER	CLASSIFICATION (USCS)	BLOWS/6" (N-VALUE)	UNC STR (tsf)	MOISTURE (%)	DRY DENSITY (pcf)	LL/PI (%)	ADDITIONAL DATA/REMARKS
	LAT: 39.116989 LONG: -94.943494 APPROX. SURFACE ELEV. (ft):974											
	ROOT ZONE 0.5'			1								
	LEAN CLAY (CL), very stiff, brown to light brown and gray, dry, silt, sand, (GLACIAL TILL)			2	ST-1				11.0	108.6		
	3.5'			3								3.0 ft: P.P. = 4.5+
969.0	LEAN CLAY (CL), stiff, reddish brown with brown, slightly moist, silt, trace sand, (GLACIAL TILL)			4	SPT-2		6-4-5 (9)		19.4			
				5								
				6								
				7								
				8								
	8.5'			9	SPT-3		6-7-10 (17)		15.4			P-200 = 68%
964.0	LEAN CLAY (CL), very stiff, light reddish brown with gray, slightly moist, silt, sand, (GLACIAL TILL)			10								
	10.0'			11								
	BASE OF BORING AT 10.0 FEET			12								
				13								
959.0				14								
				15								
				16								
				17								
				18								
954.0				19								
				20								
				21								
				22								
				23								
				24								
949.0				25								
				26								
				27								
				28								
				29								
944.0				30								
				31								
				32								
				33								
				34								
WATER LEVEL OBSERVATIONS						STARTED: 03/30/2026		FINISHED: 03/30/2026				
WD	☐	Not Encountered				DRILL CO.: CFS Engineers		EQUIPMENT: SIMCO 145				
IAD	☒	Not Encountered				DRILLER: J.W.		LOGGED BY: K.S.				
AD	☒	Not Performed				METHOD: Continuous Flight Auger						

BORING LOG NO. B-5							Sheet 1 of 1					
PROJECT NAME				CLIENT								
McDonald's – Basehor				McDonald's USA, LLC								
PROJECT NUMBER				LOCATION								
026-01964				Basehor, KS								
ELEVATION (ft)	MATERIAL DESCRIPTION		GRAPHIC LOG	DEPTH (ft)	SAMPLE TYPE NUMBER	CLASSIFICATION (USCS)	BLOWS/6" (N-VALUE)	UNC STR (tsf)	MOISTURE (%)	DRY DENSITY (pcf)	LL/PI (%)	ADDITIONAL DATA/REMARKS
	LAT: 39.117003 LONG: -94.942906 APPROX. SURFACE ELEV. (ft):973											
	ROOT ZONE		1.0'	1								
	FILL, dark brown clay, very moist, silt, organics		3.0'	2	ST-1	CH			31.3	91.6	65/34	
	LEAN CLAY (CL), stiff, light brown with light reddish brown, moist, silt, sand, (LOESS)			3								
968.0				4	SPT-2		3-4-5 (9)		29.8			
				5								
				6								
				7								
				8								
963.0			10.0'	9	SPT-3		3-3-7 (10)		33.9			
	BASE OF BORING AT 10.0 FEET			10								
				11								
				12								
958.0				13								
				14								
				15								
				16								
				17								
953.0				18								
				19								
				20								
				21								
				22								
				23								
948.0				24								
				25								
				26								
				27								
				28								
				29								
943.0				30								
				31								
				32								
				33								
				34								
WATER LEVEL OBSERVATIONS						STARTED: 03/30/2026		FINISHED: 03/30/2026				
WD	☐	Not Encountered	DRILL CO.: CFS Engineers			EQUIPMENT: SIMCO 145						
IAD	▼	Not Encountered	DRILLER: J.W.			LOGGED BY: K.S.						
AD	☑	Not Performed	METHOD: Continuous Flight Auger									

MCDONALDS - BASEHOR

Basehor, Kansas

April 2026

Olsson Project No. 026-01964