GEOTECHNICAL ENGINEERING REPORT

MCDONALD'S
605 SOUTH 7TH STREET
KANSAS CITY, KANSAS 66105

PREPARED FOR:
MCDONALD'S
605 SOUTH 7TH STREET
KANSAS CITY, KANSAS 66105

May 22, 2019

OLSSON PROJECT NO: 019-1175

1700 East 123rd Street · Olathe, KS 66061 · (913) 829-0078 · FAX (913) 829-0258

olsson®

May 22, 2019

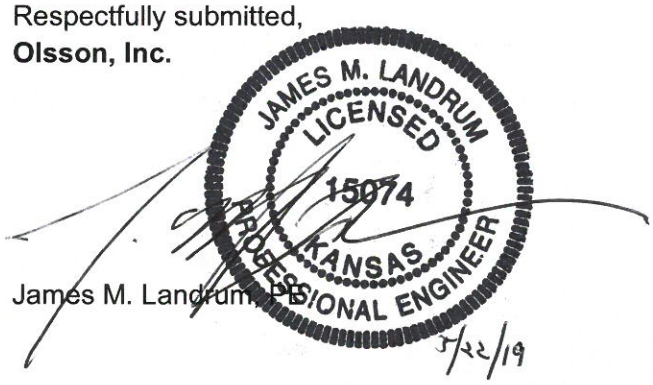
McDonald's USA
110 N. Carpenter Street
Chicago, Illinois 60607

Re: **Geotechnical Engineering Report**
McDonald's
605 South 7th Street
Kansas City Kansas 66105
Olsson Project No. 019-1175

Olsson, Inc. has completed this Geotechnical Engineering Report for the new McDonalds planned in Kansas City, Kansas. The enclosed report summarizes our understanding of the project, presents the findings of the borings and laboratory tests, and discusses the observed subsurface conditions encountered at the borings. Based on this information, this report provides our opinions and geotechnical engineering recommendations for foundation, pavement, and compaction design parameters for the new McDonald's.

We appreciate the opportunity to provide our Geotechnical Engineering Services for this project and look forward to providing the recommended material testing services. If you have any questions regarding this report, please contact us.

Respectfully submitted,
Olsson, Inc.



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I. PROJECT UNDERSTANDING

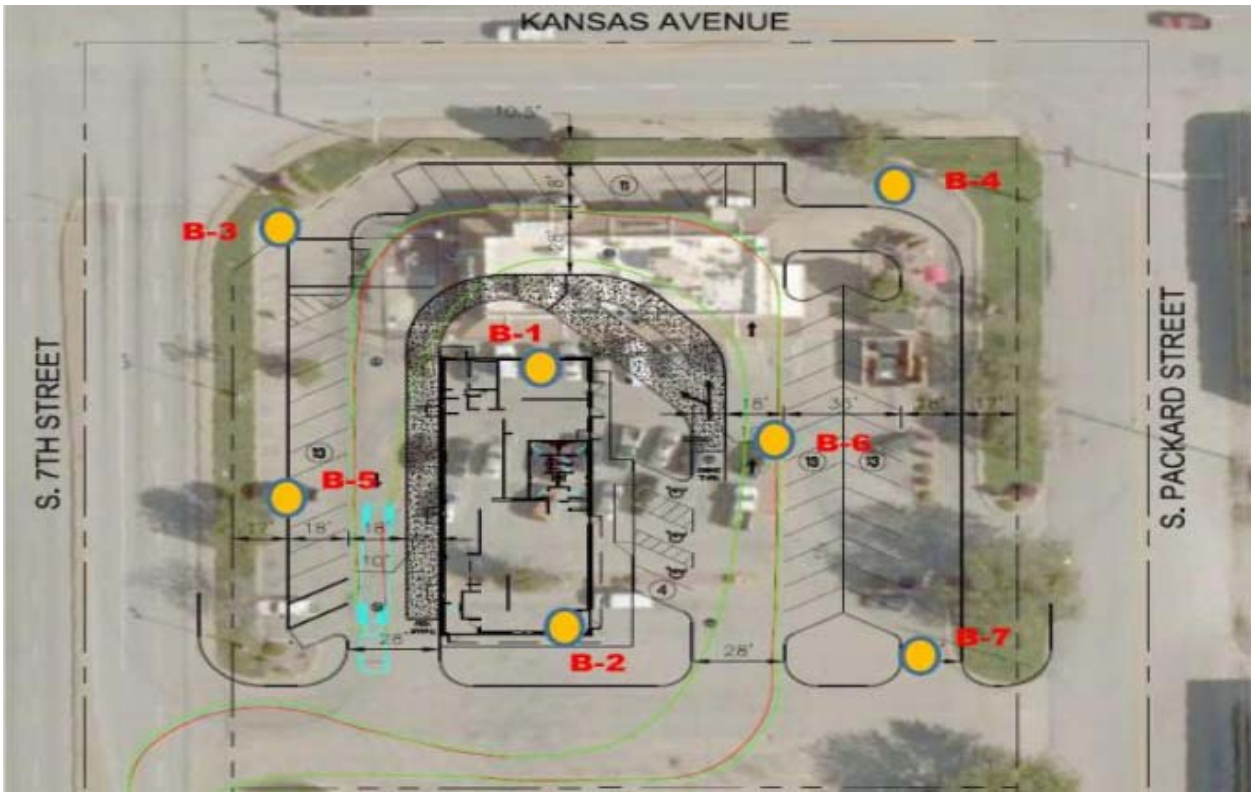
A. GEOTECHNICAL SCOPE

1. The McDonald's restaurant located at 605 South 7th Street in Kansas City, Kansas is planned to be rebuilt on the same lot. This Geotechnical Engineering Report presents the results of the subsurface exploration completed for the new McDonald's. The purposes of this exploration was to evaluate the existing subsurface conditions encountered at the seven borings drilled at the site and, based on these conditions, provide geotechnical design recommendations for foundations and floor slab subgrade preparation for the new building. Recommendations for pavement subgrade preparation and estimates of minimum pavement section thicknesses are also provided.

B. SITE AND PROJECT DESCRIPTION

1. Figure 1 shows the location of the existing site features as well as the location of the proposed McDonalds on the site. Historically, the site has been occupied by previous structures dating back to the 1800s. At the time of this exploration, the site was occupied by the existing McDonald's and associated pavement areas. We have assumed that the existing McDonald's is supported on a shallow foundation system with a grade supported floor slab. We have not been informed of any foundation or floor slab related distress within the existing McDonald's.

FIGURE 1 EXISTING AND PROPOSED SITE CONDITIONS



The site is relatively level, with surface runoff flowing south-southwest. We anticipate less than two feet of cut and/or fill will be required at the site. We further anticipate that foundation loads for the new store will be relatively light, less than 4 kips per lineal foot for walls and less than 60 kips for columns.

II. EXPLORATORY AND TEST PROCEDURES

A. FIELD EXPLORATION

1. The drill crew completed seven borings at the site, as shown in Figure 1 and on the boring location diagram in Appendix A. The drill crew located the borings in the field and determined the ground surface elevation at each boring using differential leveling techniques. The elevations were referenced to the finish floor elevation of the existing McDonald's. An arbitrary elevation of 100.0 feet (site datum) was used for this benchmark. The ground surface elevations indicated on the respective Borehole Reports in Appendix B are reported to the nearest tenth of a foot.

   Samples were obtained from each boring using a split barrel sampler during the performance of the Standard Penetration Test (SPT). A split-barrel sampler is a split steel tube, 2 inches in outside diameter, which is advanced into the hole by repeated blows of a 140 pound hammer falling 30 inches. The number of blows necessary to advance the split-barrel the last 12 inches of its normal 18 inch penetration is referred to as the standard penetration test value for that sample. The standard penetration test results are recorded at their depths of occurrence on the boring logs in Appendix B. The boreholes were backfilled and patched upon completion.

B. LABORATORY TESTING

1. The samples were sealed and returned to the laboratory for testing and classification. At our laboratory, we visually observed and measured the moisture content of the samples. The Atterberg limits were determined on selected samples to aid in the classification of the soils using the Unified Soil Classification System. Results of the laboratory tests are provided on the respective Borehole Reports in Appendix B.

III. SUBSURFACE CONDITIONS

A. SOIL STRATIGRAPHY

1. Specific conditions at each boring location are shown on the appended Borehole Reports. The drill crew prepared field logs of the material encountered during drilling. The logs include visual classifications of the materials encountered during drilling as well as the driller's interpretation of the conditions between samples. The boring logs provided in Appendix B represent the engineer's interpretation of the field logs based on visual classification and laboratory tests of the samples. The logs represent subsurface conditions at the specific boring locations; however, variations may occur between or beyond the borings. The stratification lines shown on the logs represent the approximate depths of soil types. The actual transition between materials usually occurs gradually.

   Beneath the 4 inches of existing pavement, the borings generally encountered predominantly low to medium plasticity clay soils grading to silt and silty sand with increasing depth. The upper two to three feet of soil encountered at several of the borings appeared to be fill and, with the past history of the site, fill could extend to greater depths or contain other materials in areas we did not explore. The fill encountered at the borings contained some rubble (brick, asphaltic concrete fragments, etc.). The borings were terminated at depths of 5 to 20 feet.

   In our laboratory, two samples obtained from boring B-2 at depths of 3.5 feet to 5 feet and 18.5 feet to 20 feet and two samples obtained from boring B-3 at depths of 1 to 2.5 feet and 3.5 to 5 feet exhibited a petroleum based fuel-like odor. However, olfactory perception (smell) does not provide information sufficient to characterize the odor. In order to determine the constituents within the soil that may be the source of the odor, samples would need to be subjected to analytical testing. The scope of services for the geotechnical portion of this project does not include either specifically or by implication any environmental assessment of the site or identification or prevention of pollutants, hazardous materials or conditions.

B. WATER LEVEL OBSERVATIONS

1. Water level observations were made in the borings during and immediately after auger drilling. Water was encountered in boring B-2 at roughly 18.5 feet at this time. 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 with time within specific borings. Groundwater levels may be expected to 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 groundwater conditions.

IV. GEOTECHNICAL CONSIDERATIONS

Existing fill was encountered at the borings. The fill appeared to extend to depths of about 2 to 5+ feet, although deeper deposits of fill could be present elsewhere across the site. The fill encountered at the borings consisted of a mixture of clay soils, brick, gravel, wood and other miscellaneous debris. The fill may be associated with former structures/basement areas or past utility corridors that could have been present on the site. It is also possible that other remnants of these former structures could be present. While the existing fill is supporting the existing pavement, foundations and floor slabs supported on the existing fill may not perform predictably. In our opinion, the existing fill should be entirely removed from beneath the planned building, extending laterally at least 5 feet beyond the building footprint. As the fill is currently supporting existing pavements, it should be possible to leave the fill in place beneath new parking areas, provided the upper 12 inches of the fill is moisture conditioned and recompacted.

As the widely spaced, small diameter borings provide only a limited amount of data regarding the existing fill, the existing fill may contain soft zones, debris or significantly greater amounts of unsuitable materials than could be reasonably inferred from the boring information. Test pits could be excavated prior to construction to further evaluate the extent and composition of the existing fill. As the test pits would result in excavating through existing pavement materials, the test pits may need to be excavated at the on-set of construction.

The clay soils at the site may be susceptible to disturbance by construction activity. Difficulties should be anticipated in developing the building pad when the silty soils are moist or wet. Construction activities on these soils during wet weather may require special site preparation procedures to facilitate construction. Chemical stabilization (soil cement or Class "C" fly ash), geogrid and/or baserock may be required to provide a stabilized construction platform, depending on conditions encountered at the time of construction.

V. SITE PREPARATION

A. BUILDING AND PAVEMENT AREAS

1. We anticipate that initial site preparation for the project will include removal of existing McDonalds and related pavements and underground utilities within proposed building area. Although not encountered in the borings, remnants of foundations of former structures could be encountered at this site. If encountered, these remnants should also be removed. In addition, all existing fill within the footprint of the new McDonalds should be removed, extending at least 5 feet beyond the building footprint. Existing fill present in pavement areas should be undercut a minimum of 1-foot below design subgrade elevation for a lateral distance of at least 5 feet beyond proposed curb lines. Areas disturbed during demolition of the existing features should be thoroughly evaluated by the geotechnical engineer prior to placement of structural fill. All disturbed soils should be undercut prior to placement of structural fill.

   Following over excavation of the existing fill, a representative of Olsson, Inc. (***Olsson***) should observe the exposed grades to help delineate areas requiring further undercutting. Although the existing fill is supporting the existing pavements, test pits may be needed to further evaluate the existing fill in pavement areas depending on conditions observed during construction.

   The construction area should then be observed for soft and/or unsuitable conditions. Some stabilization may be required. Depending on conditions observed, test pits and/or proofrolling may be needed to evaluate the exposed subgrade. Proofrolling should be accomplished using a fully loaded, tandem axle dump truck or other equipment providing an equivalent subgrade loading. Soft or unstable areas should be improved by compaction or by undercutting and placement of structural fill.

   Following visual observation and prior to placement of new fill, the moisture content of the exposed grades should be evaluated in all construction areas. Where moisture contents are outside the range recommended for controlled fill, the exposed grade should be scarified to a minimum depth of 6 inches, moisture conditioned and recompacted according to the recommendations presented in the "Structural Fill" section of this report. If desiccated (dry) clay soils are encountered, deeper reworking with moisture and density control will be required to reduce the soils' volume change potential.

B. STRUCTURAL FILL

1. All structural fill and backfill should consist of approved materials, free of organic matter (organic content less than 5 percent). The soils should not contain particle sizes larger than three inches. In our opinion, the on-site native clay soils are acceptable for use as structural fill beneath structures and pavements provided all rubble, debris, high plasticity clays or otherwise unsuitable material is completely removed. Imported fill soils should be similar to the on-site soils and generally exhibit a liquid limit less than 50 and a plasticity index less than 25. Samples of all proposed fill materials should be submitted to ***Olsson*** prior to use on the site. Laboratory Proctor compaction tests and classification tests should be performed on any fill material placed during mass grading

operations. We recommend that structural fill and backfill be compacted in accordance with the criteria provided in Table 1. An ***Olsson*** representative should observe fill placement operations and perform field density tests to indicate if the specified compaction is being achieved.

Table 1 Fill Placement Guidelines

Area of Fill Placement	Material	Compaction (Standard Proctor)	Moisture Content (Percent of Optimum)
Structural Fill – Placed during grading operations	On-Site Soils/ Imported Clay Soils with (LL < 50 and PI < 25) Or Well Graded Gravel (KDOT AB-3)	95%	-1 to +3 percent (Cohesive) Workable Moisture (Granular)
Granular Leveling Course – Drainage course beneath floor slabs	Clean Rock #57 Stone	65% of Relative Density	As necessary to obtain density
Pavement Subgrade – 12 inches compacted subgrade (Preferred: 9 inches stabilized soils)	On-Site Soils/ Imported Clay Soils with LL <50 and PI < 25 or Stabilized Onsite Soils[1]	95%	-1 to +3 percent

1 Stabilized with approximately 15 percent Class "C" fly ash, 5 percent hydrated lime, or 6 percent soil cement

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

C. CONSTRUCTION EQUIPMENT MOBILITY

1. The existing soils encountered and the anticipated new fills may be susceptible to softening under construction equipment traffic during periods of wet weather. Reducing equipment mobility problems and managing soft surface soils will be greatly dependent on the severity of the circumstances, the season in which construction is performed, and prevailing weather conditions. Some general guidelines for reducing equipment mobility problems and addressing potential soft and wet surface soils are as follows:

   - Optimize surface water drainage at the site during construction.
   - Whenever possible, wait for dry weather conditions to prevail, and do not operate construction equipment on the site during wet conditions. Ruts caused by construction vehicle traffic will accelerate subgrade disturbance. Disk or scarify wet surface soils during periods of favorable weather to accelerate drying. Temporarily recompact loose subgrade soils if rain is forecast to promote site drainage and minimize moisture infiltration.
   - Use construction equipment that is well suited for the intended job under the existing site conditions. Heavy rubber-tired equipment typically requires better site conditions than light, track-mounted equipment.

It may be necessary to take steps to aggressively improve equipment mobility if construction must proceed during unfavorable conditions. Such steps could include incorporating soil amendments such as, soil cement within the subgrade or placing crushed stone or recycled crushed concrete, used alone or combined with one or more layers of geotextile fabric. ***Olsson*** engineers can assist in providing recommendations for stabilizing unsuitable soils at the time of construction.

VI. BUILDINGS AND STRUCTURES

A. SHALLOW FOUNDATION DESIGN

1. Based on the subsurface conditions observed at the borings, the foundations for the addition will likely bear on stiff clay soils or structural fill. For shallow foundations supported on stiff clay soils or structural fill, a maximum net allowable soil bearing pressure of 2,000 pounds per square foot can be used for design. The net allowable soil bearing pressure refers to the bearing pressure at foundation level in excess of surrounding overburden pressure.

   Exterior footings should bear at a minimum depth of 3 feet below the lowest adjacent final ground surface. Footings should have a minimum foundation width of 18 inches for continuous footings and 30 inches for isolated column footings. Earth formed trench footings should have a minimum width of 12 inches.

   Lightly loaded interior partition walls (applying less than 0.75 kips per lineal foot (klf)) may be supported directly on the slab-on-grade floor. Depending on the floor slab design and the specific wall loads, it may be necessary to increase the floor slab reinforcement or provide a thickened slab cross-section below interior walls. For interior walls with loads greater than 0.75 klf, we recommend a footing be installed, independent of the floor slab, to properly distribute the wall loads to the underlying soils and reduce the potential for floor slab damage.

   Olsson should observe and test all foundation bearing materials. The base of all foundation excavations should be free of all water and loose material prior to placing concrete. After foundation subgrades have been observed and evaluated by an ***Olsson*** representative, concrete should be placed as soon as possible to avoid subjecting the exposed soils to drying, wetting, or freezing conditions. If unsuitable bearing materials are encountered in footing excavations, the excavations should be extended deeper to suitable soils. The footings could bear directly on these materials at the lower level or on lean concrete backfill placed in the excavations. If foundation subgrade soils are subjected to such conditions, ***Olsson*** should be contacted to reevaluate the foundation bearing materials.

   Foundations designed and constructed as recommended above would be expected to experience post-construction total settlements less than 1 inch. Differential settlements of less than ½ inch between adjacent soil supported foundation elements would be expected.

B. SEISMIC SITE CLASSIFICATION

1. For Seismic design and analysis according to the 2012 International Building Code (IBC) and ASCE 7, the subsurface profile is consistent with the description given for Site Class "D".

C. FLOOR SLAB SUBGRADE PREPARATION

1. To limit the amount of shrink and swell beneath the floor slabs, the soils located beneath the slab should consist of cohesive soils having a liquid limit less than 50 and a plasticity index less than 25 or well-graded granular materials (KDOT AB-3 or equivalent). Any soils encountered during construction that exhibit a liquid limit greater than 50 or a plasticity index greater than 25 should be removed to within 18 inches of the base of the floor slab.

   Upon completion of grading operations in the building areas, care should be taken to maintain the recommended subgrade moisture content and density until the floor slabs are constructed. Areas of the completed subgrade that become desiccated, saturated, frozen or disturbed by construction activity should be reconditioned to meet the recommendations of this report prior to placement of the granular leveling course and construction of the slabs.

   A free-draining, compacted granular leveling course (e.g. ASTM C 33 Size No. 57 aggregate) having a minimum thickness of 4 inches should be placed below the floor slabs to provide uniform slab support. The layer of free-draining granular material should be in addition to the minimum 18-inch thick low volume change zone recommended below the building floor slab. If moisture vapor transmission through the concrete slab is a concern (e.g. if moisture sensitive floor coverings will be used), a vapor barrier should be used.

   The procedures recommended above may not eliminate all future subgrade volume change and resultant floor slab movement. However, the procedures outlined should significantly reduce the potential for subgrade volume change. Common construction practice is to tie the slab-on-grade into the foundation elements to limit the impact of differential movement at doorways. Depending on the location of construction joints in the slab, the rigidity of the slab and foundation connection, and the magnitude of actual movement that occurs, some minor cracking within the floor slab could occur and should be anticipated.

VII. PAVEMENTS

A. PAVEMENT SUBGRADE PREPARATION

1. All pavements should be supported on a minimum of 12 inches of subgrade prepared in accordance with the recommendations presented in the *Site Preparation* section of this report. Construction scheduling often involves grading and paving by separate contractors and can involve a time lapse between the end of grading operations and the commencement of paving. Disturbance, desiccation or wetting of the subgrade soils between grading and paving can result in deterioration of the previously completed subgrade. If soft areas are identified during the 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 at the transition from cut to fill areas, or 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.

   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 proofrolled 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.

   Although not required, in our opinion, full depth flexible pavements supported on a stabilized subgrade tend to perform better and have longer design lives than pavements supported directly on a clay soil subgrade. As a preferred pavement subgrade, the upper 9 inches of pavement subgrade should be stabilized with Class "C" fly ash, hydrated lime or soil cement.

B. PAVEMENT DESIGN

1. We anticipate the new parking lots and drive areas will be subjected to personal vehicle traffic (cars, pickup trucks and SUVs) as well as school buses and garbage trucks. Table 2 summarizes typical pavement sections for the parking and drive areas for full-depth asphaltic concrete (AC) and Portland cement concrete (PCC) with an aggregate base. The sections represent typical minimum thicknesses. Routine

maintenance of the pavement will be required, consisting of periodic seal coats and possibly intermediate millings, in addition to regular crack maintenance.

Table 2 Minimum Recommended Pavement Sections – Parking and Drive Areas

Light Duty Vehicles (Personal Cars, SUVs, and Pickup Trucks)		Heavy Vehicle Areas*
Parking Areas	**Drive Areas**	
Full Depth AC: 2" AC Surface 4" AC Base 12" Prepared Subgrade[1]	Full Depth AC: 2" AC Surface 6" AC Base 12" Prepared Subgrade[1]	Full Depth PCC: 8" PCC 4" Crushed Stone 12" Prepared Subgrade
Full Depth PCC 5" PCC 4" Crushed 12" Prepared Subgrade Stone	Full Depth PCC 6" PCC 4" Crushed Stone 12" Prepared Subgrade	*Heavy Vehicle Areas Consist of Loading/ Unloading Areas, Trash Receptacle Pads and Approaches, etc.

1 Preferred subgrade – 9 inches stabilized with approximately 15 percent Class "C" fly ash, 5 percent hydrated lime or 6 percent soil cement

The performance of 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 1/4 inch per foot to provide rapid surface drainage.

PCC pavements are recommended for loading/unloading areas, trash receptacle pads and approaches, and other areas where heavy wheel loads will be concentrated. Concrete pavements in these areas should have a minimum thickness of 8 inches. It is also recommended that a 4-inch crushed stone layer be placed below all PCC pavements and that appropriate sub-drainage or other connection to a suitable gravity outfall be provided to remove water. The pavement subgrade should be graded to provide positive drainage below the granular base section. Drainage of the granular base is particularly important where two different sections of pavements (such as AC and PCC) abut, 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 AC sections during loading/unloading operations.

Surface drainage around the pavement and proper maintenance are also important to long-term performance. All pavement joints should be caulked and any cracks should be quickly patched or sealed to prevent moisture from reaching and softening the subgrade.

Construction traffic on the pavements has not been considered in the above noted typical sections. If construction scheduling dictates that the pavements will be subject to traffic by construction equipment/vehicles, 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.

VIII. DRAINAGE CONSIDERATIONS

Water should not be allowed to collect at the ground surfaces near foundations or floor slabs, 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
- Roof run-off should be collected and transferred directly to a location with positive and rapid drainage away from new structures.

IX. CONCLUSIONS AND LIMITATIONS

A. CONSTRUCTION OBSERVATION AND TESTING

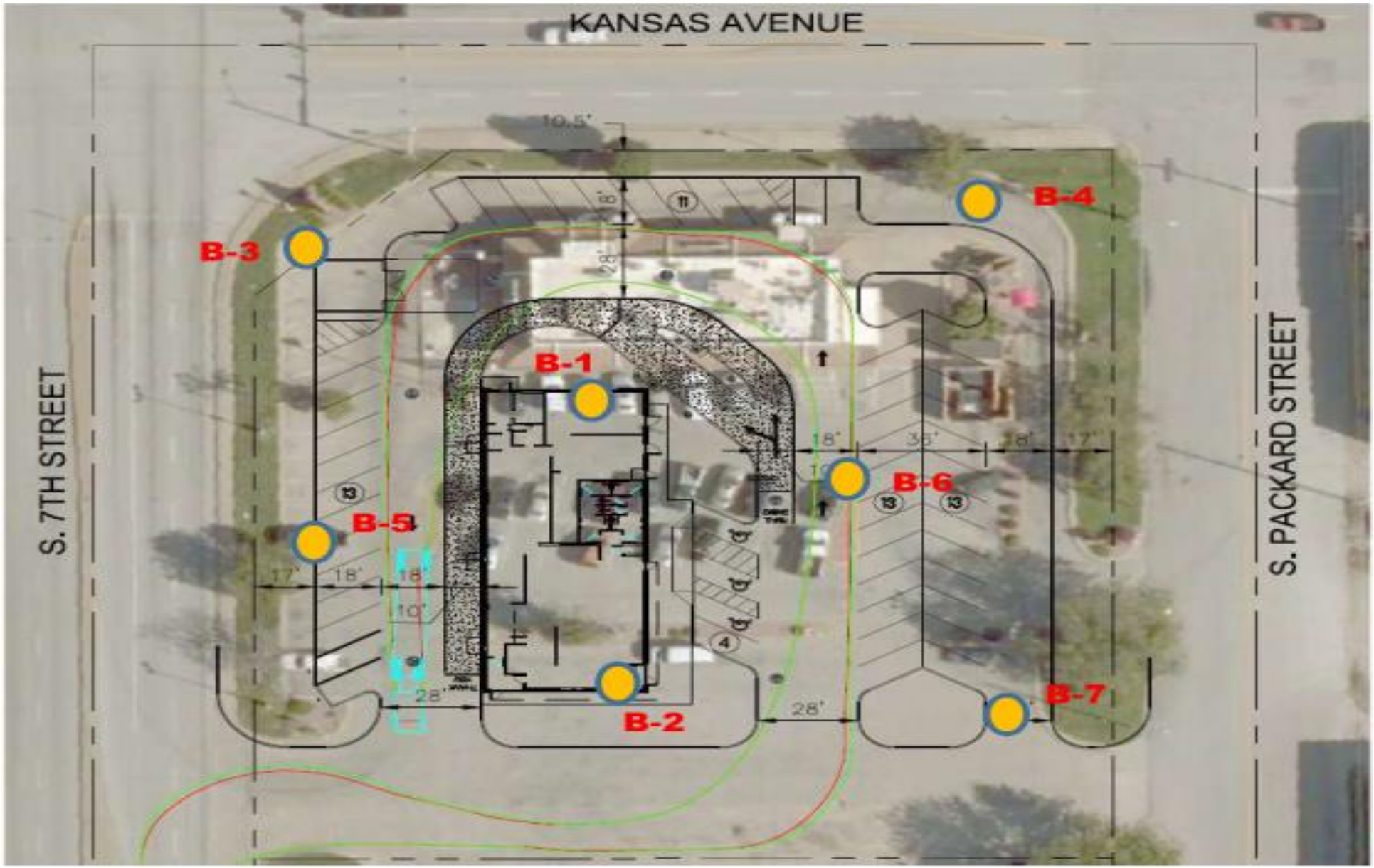
1. We recommend that all earthwork during construction be monitored by a representative of ***Olsson***, including site preparation, placement of all structural fill and trench backfill. The purpose of these services would be to provide ***Olsson*** the opportunity to observe the soil conditions encountered during construction, evaluate the applicability of the recommendations presented in this report to the soil conditions encountered, and recommend appropriate changes in design or construction procedures if conditions differ from those described herein.

B. LIMITATIONS

1. The conclusions and recommendations presented in this report are based on the information available regarding the proposed construction, the results obtained from our borings and sampling procedures, the results of the laboratory testing program, and our experience with similar projects. The borings represent a very small statistical sampling of subsurface soils and it is possible that conditions may be encountered during construction that are substantially different from those indicated by the borings. In these instances, adjustments to design and construction may be necessary. This geotechnical report is based on the information provided to ***Olsson*** and our understanding of the project as noted in this report. Changes in the location or design of new structures could significantly affect the conclusions and recommendations presented in this geotechnical report. ***Olsson*** should be contacted in the event of such changes to determine if the recommendations of this report remain appropriate for the revised site design. Structural loads were not available at the time of this report. Once the structural loads are known, ***Olsson*** should be retained to review the recommendations provided in this report.

   This report was prepared under the direction and supervision of a Professional Engineer registered in the State of Kansas with the firm of **Olsson, Inc**. The conclusions and recommendations contained herein are based on generally accepted, professional geotechnical engineering practices at the time of this report, within this geographic area. No other warranty is expressed or implied. This report has been prepared for the exclusive use of **McDonald's USA** and their authorized representatives for specific application to the proposed project.

APPENDIX A
Boring Location Map



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Boring Location Map

McDonalds Rebuild 7th and Kansas KCKS
Kansas City, Kansas

Olsson Project No:	019-1175
Client:	McDonalds USA LLC
Last Revision Date:	5/8/2019
Engineer:	J. Landrum

APPENDIX B
Symbols and Nomenclature
Boring Logs

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
				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

Consistency	Unconfined Compressive Strength (Qu) (tsf)
Very Soft	<0.25
Soft	0.25 – 0.5
Firm	0.5 – 1.0
Stiff	1.0 – 2.0
Very Stiff	2.0 – 4.0
Hard	> 4.0

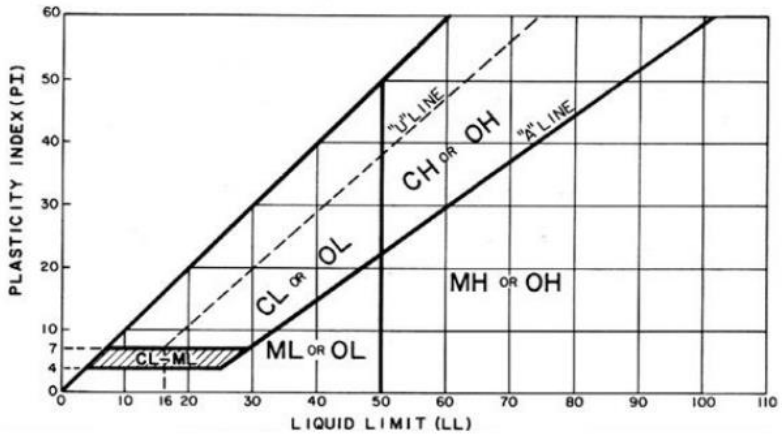
COHESIONLESS SOILS

Relative Density	'N' Value
Very Loose	0 – 3
Loose	4 – 9
Medium Dense	10 – 29
Dense	30 – 49
Very Dense	≥ 50

COMPONENT %

Description	Percent (%)
Trace	<5
Few	5 - 10
Little	15 - 25
Some	30 - 45
Mostly	50 - 100

PLASTICITY CHART



ROCK QUALITY DESIGNATION (RQD)

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

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BOREHOLE REPORT NO. B-1

Sheet 1 of 1

PROJECT NAME	CLIENT
McDonalds Rebuild 7th and Kansas KCKS	McDonalds USA LLC
PROJECT NUMBER	**LOCATION**
019-1175	Kansas City, Kansas

Split Spoon

APPROX. SURFACE ELEV. (ft): 99.7

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
	CONCRETE 0.3'		0								
	LEAN CLAY 1.0'										
	Reddish brown to dark brown			SS 1	CL	5-9-4 N=13		23.3		38/18	
	Dark brown to grayish brown, silty										
	3.5'										
95	*Dark grayish brown, with silt*		5	SS 2		4-4-5 N=9		26.9			
	8.5'										
	SILT										
90	*Dark grayish brown, clayey*		10	SS 3		4-4-3 N=7		24.0			
	13.5'										
	SILTY SAND										
85	*Gray to grayish brown* 15.0'		15	SS 4		12-13-14 N=27		8.4			
	SAND										
	Gray to grayish brown										
80	20.0'		20	SS 5		13-20-22 N=42		11.5			
	BASE OF BORING AT 20.0 FEET										

WATER LEVEL OBSERVATIONS	
WD	▽ Not Encountered
IAD	▼ Not Encountered
AD	▼ Not Performed

OLSSON, INC.
1700 E. 123RD STREET
OLATHE, KANSAS 66061

STARTED:	5/6/19	FINISHED:	5/6/19
DRILL CO.: RC DRILLING		DRILL RIG:	B-53
DRILLER:	LUKE	LOGGED BY:	DEREK ALAN
METHOD: CONTINUOUS FLIGHT AUGER			

BOREHOLE REPORT NO. B-2

Sheet 1 of 1

PROJECT NAME	CLIENT
McDonalds Rebuild 7th and Kansas KCKS	McDonalds USA LLC
PROJECT NUMBER	**LOCATION**
019-1175	Kansas City, Kansas

Split Spoon

APPROX. SURFACE ELEV. (ft): 99.2

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
	CONCRETE 0.3'		0								
	LEAN CLAY *Brown to dark brown, silty, with sand*			SS 1		5-5-6 N=11		21.3			
	3.5'										
95	***SILTY SAND*** *Dark grayish brown, trace clay, petroleum-like odor*		5	SS 2		4-4-4 N=8		19.0			
	8.5'										
90	***SILT*** *Brown to light brown and grayish brown*		10	SS 3		7-5-4 N=9		15.7			
	13.5'										
85	***SILTY SAND*** *Brown to grayish brown, trace red*		15	SS 4		9-6-5 N=11		21.1			
	▽ 18.5'										
80	***SAND*** *Brown, petroleum-like odor*		20	SS 5		13-11-10 N=21		12.8			
	20.0'										
	BASE OF BORING AT 20.0 FEET										

WATER LEVEL OBSERVATIONS	
WD	▽ 18.5 ft
IAD	▼ Not Encountered
AD	▼ Not Performed

OLSSON, INC.
1700 E. 123RD STREET
OLATHE, KANSAS 66061

STARTED:	5/6/19	FINISHED:	5/6/19
DRILL CO.: RC DRILLING		DRILL RIG:	B-53
DRILLER:	LUKE	LOGGED BY:	DEREK ALAN
METHOD: CONTINUOUS FLIGHT AUGER			

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BOREHOLE REPORT NO. B-3

Sheet 1 of 1

PROJECT NAME	CLIENT
McDonalds Rebuild 7th and Kansas KCKS	McDonalds USA LLC
PROJECT NUMBER	**LOCATION**
019-1175	Kansas City, Kansas

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
	☒ Split Spoon										
	CONCRETE 0.3'		0								
	FILL *Brown to dark brown, clay, with sand, gravel and silt, trace brick and petroleum-like odor* 2.5'			SS 1		7-6-6 N=12		20.5			
	SILTY SAND *Dark grayish brown, trace clay, petroleum-like odor* 5.0'		5	SS 2		2-3-2 N=5		27.0			

BASE OF BORING AT 5.0 FEET

WATER LEVEL OBSERVATIONS	
WD	▽ Not Encountered
IAD	▼ Not Encountered
AD	▼ Not Performed

OLSSON, INC.
1700 E. 123RD STREET
OLATHE, KANSAS 66061

STARTED:	5/6/19	FINISHED:	5/6/19
DRILL CO.:	RC DRILLING	DRILL RIG:	B-53
DRILLER:	LUKE	LOGGED BY:	DEREK ALAN
METHOD: CONTINUOUS FLIGHT AUGER			

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BOREHOLE REPORT NO. B-4

Sheet 1 of 1

PROJECT NAME	CLIENT
McDonalds Rebuild 7th and Kansas KCKS	McDonalds USA LLC
PROJECT NUMBER	**LOCATION**
019-1175	Kansas City, Kansas

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
	Split Spoon										
	CONCRETE ***0.3'***		0								
	FILL *Dark grayish brown, trace red, clay, trace sand, brick, and organics* ***2.5'***			SS 1		4-4-50/1"		19.2			
	FAT CLAY *Dark brown, trace silt* ***5.0'***		5	SS 2		5-5-5 N=10		27.9			

BASE OF BORING AT 5.0 FEET

WATER LEVEL OBSERVATIONS	
WD	▽ Not Encountered
IAD	▼ Not Encountered
AD	▼ Not Performed

OLSSON, INC.
1700 E. 123RD STREET
OLATHE, KANSAS 66061

STARTED:	5/6/19	FINISHED:	5/6/19
DRILL CO.: RC DRILLING		DRILL RIG:	B-53
DRILLER:	LUKE	LOGGED BY:	DEREK ALAN
METHOD: CONTINUOUS FLIGHT AUGER			

BOREHOLE REPORT NO. B-5

Sheet 1 of 1

PROJECT NAME	CLIENT
McDonalds Rebuild 7th and Kansas KCKS	McDonalds USA LLC
PROJECT NUMBER	**LOCATION**
019-1175	Kansas City, Kansas

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
	☒ Split Spoon										
	CONCRETE ***0.3'***		0								
	FILL *Dark brown with gray and red, clay, with silt, sand, brick, gravel* ***2.5'***			SS 1		6-4-7 N=11		28.1			
	LEAN CLAY *Dark brownish gray* ***3.5'***										
	Dark brown, trace red, silty ***5.0'***		5	SS 2	CL	7-7-5 N=12		25.1		41/22	

BASE OF BORING AT 5.0 FEET

WATER LEVEL OBSERVATIONS	
WD	▽ Not Encountered
IAD	▼ Not Encountered
AD	▼ Not Performed

OLSSON, INC.
1700 E. 123RD STREET
OLATHE, KANSAS 66061

STARTED:	5/6/19	FINISHED:	5/6/19
DRILL CO.: RC DRILLING		DRILL RIG:	B-53
DRILLER:	LUKE	LOGGED BY:	DEREK ALAN
METHOD: CONTINUOUS FLIGHT AUGER			

BOREHOLE REPORT NO. B-6

Sheet 1 of 1

PROJECT NAME	CLIENT
McDonalds Rebuild 7th and Kansas KCKS	McDonalds USA LLC
PROJECT NUMBER	**LOCATION**
019-1175	Kansas City, Kansas

Split Spoon

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
	CONCRETE 0.3'		0								
	LEAN CLAY 1.0'										
	Brown, silty			SS 1		4-5-6 N=11		22.9			
	Dark brown, silty, with sand 3.5'										
	SILTY SAND			SS 2		5-5-4 N=9		12.1			
	Brown to light brown 5.0'		5								

BASE OF BORING AT 5.0 FEET

WATER LEVEL OBSERVATIONS	
WD	▽ Not Encountered
IAD	▼ Not Encountered
AD	▼ Not Performed

OLSSON, INC.
1700 E. 123RD STREET
OLATHE, KANSAS 66061

STARTED:	5/6/19	FINISHED:	5/6/19
DRILL CO.: RC DRILLING		DRILL RIG:	B-53
DRILLER:	LUKE	LOGGED BY:	DEREK ALAN
METHOD: CONTINUOUS FLIGHT AUGER			

BOREHOLE REPORT NO. B-7

Sheet 1 of 1

PROJECT NAME	CLIENT
McDonalds Rebuild 7th and Kansas KCKS	McDonalds USA LLC
PROJECT NUMBER	**LOCATION**
019-1175	Kansas City, Kansas

Split Spoon

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
	CONCRETE *0.3'*		0								
	FILL										
	Dark brown with brown, clay, with silt, sand, gravel, asphalt, and brick			SS 1		2-3-4 N=7		23.3			
	5.0'		5	SS 2		4-8-4 N=12		21.7			

BASE OF BORING AT 5.0 FEET

WATER LEVEL OBSERVATIONS	
WD	▽ Not Encountered
IAD	▼ Not Encountered
AD	▼ Not Performed

OLSSON, INC.
1700 E. 123RD STREET
OLATHE, KANSAS 66061

STARTED:	5/6/19	FINISHED:	5/6/19
DRILL CO.: RC DRILLING		DRILL RIG:	B-53
DRILLER:	LUKE	LOGGED BY:	DEREK ALAN
METHOD: CONTINUOUS FLIGHT AUGER			